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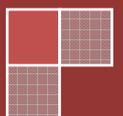
*Special Issue for INTE 2017  
October 2017*

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## **Message from the Editor-in-Chief**

Dear Colleagues,

We are very pleased to publish Special Issue for INTE-2017, ITICAM 2017 & IDEC 2017 conferences. This issue covers the papers presented at International Conference on New Horizons in Education, International Trends and Issues in Communication & Media Conference and International Distance Education Conference which were held in Freie Universität Berlin, Germany. These papers are about different research scopes and approaches of new developments and innovation in education, communication, media and technology.

### Call for Papers

TOJET invites you article contributions. Submitted articles should be about all aspects of educational technology. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJET. Manuscripts must be submitted in English. TOJET is guided by its editors, guest editors and advisory boards. If you are interested in contributing to TOJET as an author, guest editor or reviewer, please send your CV to [tojet.editor@gmail.com](mailto:tojet.editor@gmail.com).

October, 2017

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# **(In)Coinsistency Between Theory and Practice in the View of Teachers-Practitioners and Teachers-Theorists**

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## **ABSTRACT**

The article reflects the current situation in educational theory and practice, in which a significant disproportion between theory and educational reality in schools appeared so as the lack of methods complying with the requirements of the Framework Educational Program and gaps in the knowledge base of nursery and primary schools teachers, which stems from their ignorance of the curriculum and functional vocabulary. A study based on research and theoretical essay analysis identifies and seeks the causes of discrepancies between theory and practice. It looks at whether there is a direct correlation between changes in curriculum and practice, and whether the skew of theory and practice is also reflected in the training of future teachers. Results of the research have provided the basis for drafting the project OP RDE engaged in building a network of schools and creating a collegial peer training centres, ideological platforms that bring together practitioners and theorists.

**Keywords:** Curriculum, educational theory, Framework Educational Program, inclusion, pedagogical practice

## **INTRODUCTION**

The relation between theory and practice is old but it becomes topical and more discussed in the current conditions of rapid social changes, information and communication technologies and also in curricular reforms and the transformation of education. The old adage *primum vivere, deinde philosophari* (first live, then philosophize), is still valid and applies to the educational process (cp. Falque, 2016; Adorno, 2008; Novák, 2010). Like in other areas of life, it is however necessary to analyze, measure, examine and compare the practical approaches and based on the results of these investigations to deduce generally valid theoretical conclusions. The impetus for the study of issues related to pedagogical theory and practice was the awareness of a growing and deepening tension between teachers-theorists (academia) and teachers-practitioners, which is enhanced due to the ongoing transformation of the current curriculum, the so called main educational pillars which also corresponds with the content of text books.

The most recent change affecting the practice in schools, at present, is mainly the correction of Framework Educational Program for Basic Education (FEP) due to the incoming joint (inclusive) learning trend (Janík, 2005; Vlčková, 2010). What most common shortcomings, contradictions in the relationship between educational theory and practice are seen by teachers-practitioners and teachers-theorists? What is the cause of theory and practice skew? Do the curricular changes affect the educational practice? Do the teachers consider inclusion, the so called joint education of pupils and pupils with special educational needs, just as theoretical and "modern" trend of curriculum reform or, according to them, is the inclusion applicable in practice? Do the frequent changes and adaptations of curricula derogate the theory from the practice even more? We did look in the research issues from the perspective of teacher-practitioners and teachers-theorists, academics.

Skalková (1984) states that an effective putting theory into practice cannot be founded on the simplified conception that the theory can be simply transferred into practice, which passively awaits what it will bring. According to Korthagen (2001; 2011), if this process between theory and practice should be carried out efficiently and promptly, presupposes mutual communication, constant mutual interest in public discussion and the flow of information between the realization sphere (educational practice) and researchers (institutions). Science is considering how to increase the quality, comprehensiveness, timelines of new knowledge, how to speak in clear language to the sphere of use (Korthagen, 2001; Korthagen et al., 2011; Janík, 2005). Practice should be able to benefit from the innovations, listen sensitively and receive and validate new information and provide feedback (cp. Janík, 2005). One of the criteria of the ability to implement the research results is the educational preparedness and the level of preparedness of teachers (Korthagen, 2001; Korthagen et al., 2011).

Maňák (2011) points out, that students of pedagogical faculties are also aware of deepening the skew of theory and practice as well as their constant mutual spacing and in contact with practice they argue for strengthening of practical and methodical readiness for the exercise of their profession.

The legacy of their view might be supported by the distress from their educational practice stemming from a lack of teaching experience and a low number of pedagogical practice tuition at pedagogical faculties or including the methodologies of field didactics, paradoxically, in upper classes (cp. Korthagen, 2001; Korthagen et al., 2011; Janík, 2005; Vlčková, 2010).

The study is based on the comparative analysis of theoretical studies and research surveys dealing with this issue. Deep analysis of educational theory and practice was carried by Shoemaker (2010), who wanted to contribute to the integration of both phenomena to improve the education. Smith (2000) focuses on theory and practice of the curriculum, which leads teachers to work with curriculum watching not only the final product but also the process leading to it and its practical application. The benefit for the concept of the teaching profession is the Terhart's (2001) manuscript. It criticizes the fact that teaching at universities is focused only on specialized subjects and emphasizes the need for practical training. He notes that teachers' professionalism is not in the traditionally strengthening of science skills, but besides that cognitive dimension, the area of social, personal and creative skills is equally important. Fresh impetus to the new solutions brings the publication of Korthagen (2001), in which the author thinks over the technical-rational model of the teaching profession, according to which the pedagogical theory should be included in the training program. Very inspiring is not only the author's conception, but also realization of teacher training, which aligns linking pedagogical theory and practice in a successful symbiosis between universities and training schools. This will return the preparation of teachers to the intentions of the former educational training institutes, to link preparation of teachers and ongoing school with the life.

#### **INSIGHT INTO MUTUAL DETERMINATION OF THEORY AND PRACTICE**

Conceptual separation of theory and practice seems according to Maňák (2011) as an accurate, clear and non-problematic. Maňák (2011) defines theory as a system of scientific principles generalizing empirical knowledge of reality, as collated knowledge, as a set of knowledge enabling to understand the context of real issues. Practice is referred to as a physical, sensory objectively purposeful activity, such as the negotiation process, act, activities that relate to various forms of human activity (cp. Korthagen, 2001, 2011; Janík, 2005 etc.). According to Maňák (2011) the importance of the information society increases demanding kinds of practices in connection with theoretical knowledge, the so called external communication, which increases the transfer of knowledge between the theoretical and the practical sphere. The relation between theory and practice in education accompanies the whole history of humanity (cp. Falque, 2016; Adorno, 2008). At the beginning (Korthagen et al. 2001), the practice aimed at survival was typically dominated.

Education took place spontaneously. The development of civilization was growing knowledge, theoretical knowledge which upgraded practical activities. With the advent of the information explosion the acceleration of knowledge and theoretical concepts increased. The school has been given an important role. Pupil started to adopt knowledge and skills by codified standards of behaviour and followed them (Janík, 2005; Vlčková, 2010). With enormous increasing of knowledge, the school focuses more on the acquisition of knowledge, so there was a lack of time for practical training in application of acquired knowledge (Janík, 2005). This will also increasingly create the gap between theory and practice. Czech authors (Janík 2005, Mandel, 1997, Slavík and Janík, 2005) conclude that the growing contradiction must be overcome by combining theoretical approaches and practical activities. Also, the current pedagogy solves the dilemma of theory and practice (it is eg. reflected in the framework programs).

#### **CHRONIC RUPTURE OF THEORY AND PRACTICE**

Variable conception of educational content and frequent theoretical controversy over the definition of subjects contribute to the tight relationship between theory and practice. Main reasons for this are the rapid pace of life, the impact of research and information and communication technologies (ICT), which ensures rapid transfer of knowledge into practice, which may not be ready to respond to them adequately. Many theorists are convinced of the necessity of certain practices in education and create a theoretical construction of what education should be like (Průcha, 2000). The drawback of these constructs is that there is no one to bring the ideal theories into practice. Theory can only get into practice when the practitioner takes the theory up and implements it (Slavík, 2003).

The practice and the theory are never consistent and departmental communication has therefore often the nature of practice criticism of and chastise of teachers. This criticism can be viewed (cp. Foucault, 1981, 1994) as an

exercise of theorist's power, as the representatives of the programming field and their institutions, the so called universities, research institutes, government agencies, school inspection and others. This type of communication is causing a deepening distrust between theory and practice and their mutual skew, reflected on the side of theories by highly sophisticated publishing of articles about confusing academic problems, and to the practice of searching for clues in the superficial methodologies with banal descriptions of manufacturing processes, easily administered, and therefore comprehensible and immediately applicable in practice (cp. Slavík, Dyrtrtová, & Fulková, 2010; Korthagen et al., 2011; Janík, 2005). "Chronic rupture of Practice and Theory" (Slavík, Dyrtrtová, & Fulková, 2010: 225) is a positive sign of dynamics of the field but also brings undesirable consequences.

The aims of this study (based on comparison of theoretical articles and simple research probe) are a) to confirm the existence of discrepancies between educational theory (curriculum) and practice; b) to identify the causes of discrepancies between theory (current curriculum) and educational practice; and c) to analyse the causes of this in the view of teacher-practitioners and teacher-theorists (academics).

Furthermore, to determine whether teachers understand the current inclusive curriculum changes and if, according to them, this "theory" is applicable in practice. Among others, we mapped the opinions of teachers-practitioners on how to evaluate the training of future teachers, the so called graduates of secondary pedagogical schools and pedagogical universities. The results will serve as material for piloting the project OP RDE "Schools as centres of peer support", which will be implemented from March 2017.

## METHODOLOGY

C This research was conducted through a short questionnaire consisting of 10 closed-item questions with a choices and has been conducted in January 2017. Open items were included in order to justify choices of concrete answers. It is therefore a quantitative-qualitative research. Anonymous questionnaire of our own design was prepared for the teachers-practitioners and teachers-theorists, and distributed in hardcopy by educational institution ASTERIA, the educational centre, Ltd. as a part of the evaluation questionnaires for teacher-practitioners at the end of completed accredited educational programs for further education of teachers in Portal Publishing, Ltd. Prague. The total sample consists of 68 teachers from practice and theory. The questionnaires prepared for teacher-theorists were sent electronically and from 25 questionnaires 72% (18) returned back. Teacher-practitioners got the questionnaires on paper and the 100% (50) returned back, as they were provided personally at the training session.

**Table 1:** Respondents

		THE RESPONSE RATE	
<b>GROUP A</b>	nursery and basic school teachers	50	100%
<b>GROUP B</b>	university workers	18	72%

**Table 1:** The response rate, groups A, B, 2017

The research sample A, has been consisted of teacher-practitioners respondents (i.e. teachers in kindergarten and first grade of primary schools in the Czech Republic) aged 26-56 years, with the length of practice from 2 to 32 years. The research sample B has been consisted of teachers-theorists respondents (from various universities in the Czech Republic aged 30-75 years, with the length of practice from 2 to 40 years.

As a helping method we used the interview with teachers from both research samples. We needed to improve clarity and to specify views on the skew existence of theory and practice and on curriculum documents changes, which are mainly caused by the trend of inclusive education.

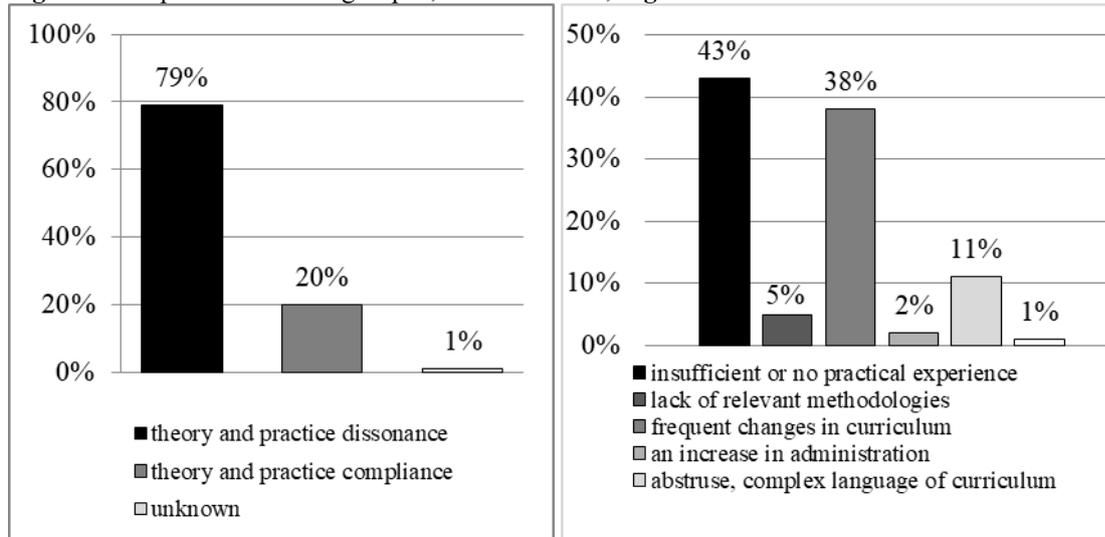
## RESULTS

### *(In)consistency between theory and practice*

According to the A group of respondents as seen in Figure 1, 20% of respondents says that the theory is consistent with the practice, 1% of respondents do not know and 79% of respondents feels that there is a mismatch between educational theory and practice. The cause of this statement they justify as follows (Figure 2):

- Inadequate or no practical experience of university teachers / theorists
- Lack of relevant methodologies suited to the needs of practice
- Frequent changes in the curriculum that cause chaos and poor orientation
- Increase of administration
- Unclear, too complex language of curriculum (where 60% of 50 respondents feel FEP as a sufficient support, but many times do not understand the terms)
- Inclusive trend causing a correction of Framework Educational Programs brings chaos and clutter to the curriculum (the idea of inclusion was supported by 51% of 50 respondents)

**Figure 1:** Respondent's views group A, skew existence; **Figure 2:** Skew causes A



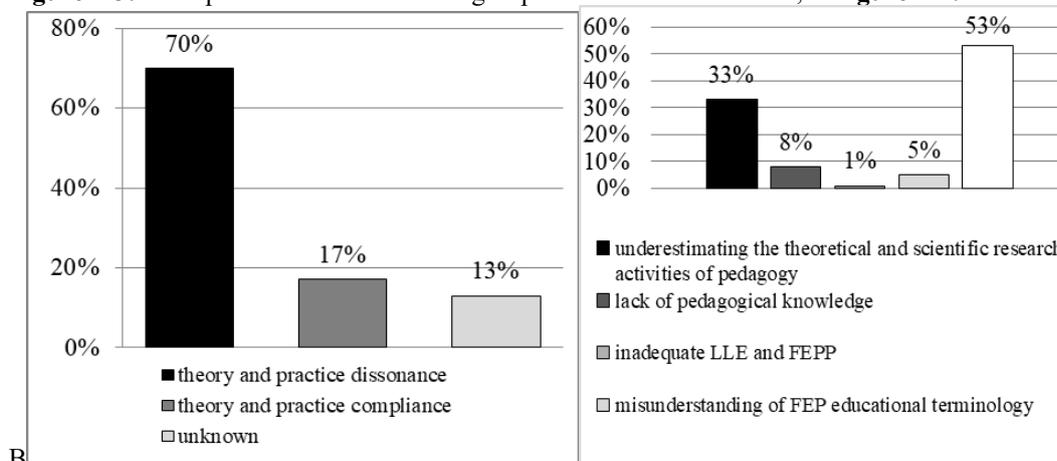
**Causes of the skew between theory and practice**

It shows that the majority of respondents (teacher-theorists) from group B (almost 70% of the 25 respondents) believe that there is a skew (mismatch) between educational theory and practice. The cause of this statement they justify as follows:

- Education activities
- Lack of theoretical knowledge of practitioners
- Inadequate lifelong and further education of teachers
- Misunderstanding of educational terminology in Framework Educational Programs and failure to use a functional vocabulary
- Ignorance or disregarding of RVP, random selection of literature

Research study also showed that teachers-practitioners with educational experience up to 20 years, who constitute 65% of the total number of 50 respondents, consider the Framework educational program as educational support and mandatory curriculum document that allows the teacher to work freely and creatively, even though 80% of teachers in kindergartens and 1st stage of elementary schools use textbooks and methodologies according to their own discretion and not in accordance with the FEP recommendations. Only 2% of the 50 teachers-practitioners respondents emphasize earlier curriculum as they regard FEP to be an "abstract" and vague document. 82% of 50 teachers-practitioners respondents criticize constant changes in curriculum across the age spectrum. The idea of joint education of children and students with disabilities is welcomed by 71% of respondents from 50 teachers-practitioners, of which 58% determine the realization of joint education to be the subject for supporting measures, as adequate financial and material equipment with regard to the specific peculiarities of the educator and the necessary presence of an assistant teacher.

**Figure 3:** Respondent's views - group B skew existence; **Figure 4:** Skew causes



## DISCUSSION

Research study provided us with information on the views of teachers-practitioners and teachers-theorists on the current relationship of educational theory (curriculum) and the practice and skew causes, relationship to the curriculum and its transformations, relationship to inclusion and its possible applicability in practice.

In the context of issues of theory and practice we do indicate complementary results of the survey realized by the College of European and Regional Studies, public service company in České Budějovice in order to produce an analysis of need for realisation of OPIC project for primary and secondary school teachers "New teaching methods and use of information technologies in the realization of school education program in primary and secondary schools in the Central Region", reg. no. CZ.1.07 / 1 March 04 /01.0027 - (2009-2012) and the project "New teaching methods and use of information technologies in the realization of school education program in primary and secondary schools in the South Bohemian region," Reg. No.: CZ.1.07 / March 1, 06 / 01.0026 - (2012).

Research has shown that 84% of respondents of 100% surveyed teachers from elementary and secondary schools collectively in both regions see the biggest positives in the methodological and mainly practical training of secondary pedagogical schools graduates and emphasize their better linkage to teacher's practice than the graduates of pedagogical faculties. 73% of respondents of 100 surveyed teachers from primary and secondary schools notes, that graduates of pedagogical faculties have broader theoretical overview than graduates from secondary pedagogical schools, but practical skills are lower. Therefore, graduates of pedagogical faculties attend seminars within DVPP with methodological and experiential content more often than graduates of secondary pedagogical schools. Almost 70% of respondents of 100% surveyed teachers from elementary and secondary schools see the greatest deficiency of pedagogical faculties graduates in the absence of practice. Although graduates of secondary pedagogical schools are praised for their practical skills by almost 82% of the 100 respondents, 18% of respondents criticize them for their emotional immaturity and the difficulties in communication with parents.

Based on our findings, the majority of respondents from both theoreticians and practitioners confirm the existence of theory and practice skew, which is according to practitioners caused mostly by insufficient practical experience of university teacher trainers and insufficient practical training of pedagogical faculties graduates. Another cause is the lack of relevant methodologies, increase administration, the constant changes in the curriculum, specialized terminology incomprehensibility that is unnecessarily complicated and does not meet the needs of the practice. Inclusive education is considered to be necessary by teachers, but in terms of the Czech educational system difficult to implement, and if so, then only with strong material, financial and personnel support. These results coincide with a survey conducted by Agency for Market Research and Public Opinion IPSOS, which took place in August 2015 and involved 4,000 teachers. Respondents-theorists see the causes of theory and practice skew in underestimating of pedagogical research activity, in lack of theoretical and methodological knowledge of teachers in practice and in misunderstanding the content and language of educational programs. They also criticize the random selection of scientific literature that is recommended by FEP.

Almost identical results are presented in a study carried out by Šobánková (2011) analyzing the problem of the teacher and his knowledge of the curriculum. Exaggerated disproportion between educational theory and practice in schools is mainly caused by the lack of knowledge of curriculum, terminology and functional vocabulary. This is also confirmed by Bruckner (2011) who argues that teachers do not read FEP and do not use it. Moreover, both also point out to the lack of using literature recommended by FEP. In line with Hazuková (2005), our results suggest that teachers perceive and use the RVP as educational support, but they collect literature at their own discretion. sees the current problem in poor implementation of theoretical knowledge into practice and related skew of both areas, and gaps in the knowledge base for teacher's training. Although there is no great amount of research related to the survey yet, we can still use the comparative survey of a wider range of curricular reform at grammar schools, which, among other things, examine the familiarity with the curriculum (Janík et al., 2010: 28). The research has included all of approbation and the differences between them have been proved as relatively small. According to respondents' subjective estimation, the level of their familiarity with reform plans appeared to be slightly above average. The authors point out that the answers might certainly be distorted by the so-called social desirability of a positive response. As a positive they consider the effort to implement inclusive education.

## CONCLUSION

The aim of this contribution was to identify and analyse the discrepancies between theory and practice (and their causes) in the view of teachers-theorists and teachers-practitioners. Results of the research will be used for implementation of the project "Schools as centres of peer support" within the calls OP RDE, which encourages mutual learning and exchange of experiences. Formation of methodological materials and their piloting verification will become the basis for subsequent correction of FEP. Research surveys, realization of discussion platforms, workshops and meetings of theorists, methodologists and practitioners, as well as analysis of theory and practice separation causes are becoming major issues in the educational environment and will help approximation of theory and practice.

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# **“I Love It But I Don’t Use It”: Students’ Perceptions on the Use of Padlet as an Educational Tool for Learning**

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## **ABSTRACT**

Web 2.0 tools have become ubiquitous in many university classrooms. These tools support collaboration and community building, enhance media sharing, and improve collective knowledge constructions- features that are valuable to learning. Many studies have in fact found that the inclusion of these tools into the teaching and learning processes creates positive learning experiences with many reported preferences of using these tools over traditional methods of learning. This small-scale study which involved 37 undergraduate students, investigated students’ perceptions on the use of a web 2.0 tool, namely Padlet, as an educational tool and students’ frequency of use of and their engagement with it to support their learning of communication concepts. The study, which employed a qualitative approach used two data collection tools: a qualitative questionnaire and analyses of students’ activities on the virtual walls. The study found that even though a small number of students had some negative perceptions of Padlet use, disclosing technical issues, lack of notification and reward, and preference over paper to technology, most of the students perceived Padlet use very positively. Despite this, the study found that most students were only actively engaged with Padlet activities on case-study-related tasks and only prior to assessments but not for independent learning tasks. The study also shows that students’ positive perception of Padlet as a learning tool did not influence students’ frequency of use. Pedagogical strategies are shared to improve the use of Padlet as an educational tool to support students’ learning.

## **INTRODUCTION**

Integration of web 2.0 tools and their impact on learning in higher education has been documented in many studies. Many of these studies have uncovered the benefits of incorporating web 2.0 tools into teaching. Blogging, for example has been found to be a good tool to trigger reflection and promote learning in collective environment (Baird & Fisher, 2005). Findings from a study by Farmer and Bartlett-Bragg (2005) support these findings as they found that blogging improved learners’ ability to regulate and personalise their learning. The use of Twitter, on the other hand, because of its functionality, encouraged participants to produce concise but critical reflections and created a sense of connections between users (Ruckert et al., 2014, p. 17). Similarly, Gilbert, Morton & Rowley, (2007) reported that discussion boards and peer collaborative support were the highlighted aspects of an e-learning module investigated. A study by Leow and Neo (2014) who analysed 182 students’ interactions when using web 2.00 tools also found that peer interactions on this platform “stimulated students to actively use internet resources” and encouraged peer evaluation to avoid misunderstanding and to reduce mistakes (p. 192). A study by Wood and Ryan (2010) supported these findings when it found that web 2.0 tools like blogs and social bookmarking services had a positive effect on students’ learning of History as they generated significant interactions between students and their peers as well as with their tutors (p. 195). Studies on students’ perceptions on the use of web 2.0 tools as educational tools, however, often report mixed results. The assumption that students who are digital natives would embrace the use of these tools for learning has been challenged and proven erroneous in many studies. A study by Wynn (2013), for example, found that even though students wanted and anticipated technological tools in their classroom, they did not welcome these tools to be part of their learning. In many cases, students were reluctant to use ICTs to interact with each other for academic purposes (Veira, Leacock & Warrican, 2014) and they showed reservation about mixing academic and social spheres when tools like Twitter and Facebook were adopted as learning tools (Osgerby & Rush, 2015). In fact, it was found that students often feel “disempowered, disenchanted and alienated when it comes to technology-related activities” (Veira, Leacock & Warrican, 2014, p. 229). This could be because many students are unfamiliar with their use and functions (Edirisingha et al., 2007) as they are not intentionally designed for learning. It would be a waste of an academic’s time and effort if his or her students refuse to engage with a specific technology simply because they dislike it.

It is thus important to understand students’ perception on the use of web 2.0 tools to support their learning. Investigating students’ perceptions on the use of a web 2.0 tool for learning would also bridge the research gap in the area as many past studies focused on the effectiveness of technological endeavours within the classroom

but not on the investigation of student perceptions on the varied use of technological innovations introduced into the classroom (Wynn, 2013).

It is also important to understand whether students' perceptions of a web tool that is used for educational purposes has any effect on students' engagement with it. Logically, it can be assumed that if students have a negative perception of a web 2.0 tool, they will not use it often enough or perhaps would engage with it only superficially. A study by Ferreira and Santoso (2008) for example shows that student's positive perceptions of Accounting has a positive impact on students' engagement and performance in the subject. Past studies have reported that students' engagement with technological tools were influenced by the nature of the activities (Whitton, 2009), external pressures (Sharpe and Benfield, 2005), and relevance and needs (Eridisingha et al., 2007). There have been limited reports which link students' perceptions to participation in and engagement with web 2.0 tools. Findings from such studies contribute significantly to the understanding of the impact of students' perceptions of a technological tool on their use or engagement with it as a tool to support their learning.

This study attempted to gather understanding on students' perceptions of a web 2.0 tool, namely Padlet. The study also sought to understand whether students' perceptions of Padlet has an impact on the frequency of Padlet use. Its other objective is to understand students' perception of sharing on Padlet and identify whether students' perception on sharing on Padlet has an impact on their engagement with it. This is because past studies have reported that students distanced themselves from using 2.0 tools because of issues with openness (An, Aworua, Ballard & Williams, 2009) or fear of open communication (Ahmed, Almunim and Mbuh, 2016; An and Williams, 2010).

The current study thus has three important research questions:

1. What were students' perceptions of Padlet as an educational tool?
2. What were their perceptions of sharing on Padlet?
3. Did their perception of Padlet affect frequency of Padlet use?

## **THE STUDY**

### **The Context of Padlet Use in the Current Study**

Padlet is a web 2.0 tool that enables the creation of virtual walls. On these walls, users can post files in different format (audio, pictures, video etc.). In the current study, Padlet was used as an educational tool to support students' learning of communication concepts for Communication Skills module and prepare students for summative assessments.

After the completion of a topic, students would be given a Padlet task to complete as part of their revision of the topic. Most of the questions in these revision exercises were past year examination questions. Most of the time, revision exercises were done as part of independent learning. Prior to students' case study test, Padlet activities containing past year case study questions were also prepared. Some of case study-test-related Padlet tasks were done as part of classroom activity but some due to time limitation were done as part of independent learning.

Students were asked to immediately respond to Padlet exercises when they were done as part of classroom activities and their answers were marked and commented on often before the class ended. Often, answers that students submitted on Padlet walls during these in-class sessions became a source of discussion. When Padlet activities were done as part of independent learning, the teacher commented on or marked students' answers within 7 days.

As Padlet walls functions like a virtual (white)board, students could view and read each other's contributions to the wall. In this way, Padlet enabled collective knowledge sharing. Students could also read comments given by the teacher and view how answers were graded and in this way Padlet supported interactivity between students and the teacher particularly when the teacher reacted to students' answers and students reacted to teacher's comments and the grading of their work. This also somehow made teacher's comments formative as sometimes students worked on teachers' comments, and resubmitted their improved answers for a second round of marking. To ensure privacy and to encourage sharing some 'security measures' were imposed for example, the Padlet exercises were password protected and the links and the passwords were only made available for her students.

## **METHODOLOGY**

The study adopted a classroom action research model and its main objective was to improve practice. Employing a qualitative approach, the study used two data collection tools: a survey (qualitative) questionnaire which comprised of 5 open-ended questions, and analyses of students' responses to the Padlet exercises. Even though analysis of open-ended responses is more tedious, the adoption of a qualitative survey questionnaire was

pertinent because open-ended responses have more “nuance, depth, and substance than open-ended responses” (Ruel, Wagner III & Gillespie, 2016, p. 68).

The qualitative questionnaire sought to get students’ responses on the following 1) their perception of the use of Padlet as an educational tool, 2) their perception on sharing on Padlet, 3) frequency of visits to Padlet walls, 4) reasons for visiting Padlet walls, and 5) suggestions for further improvement. Analyses of content of Padlet walls recorded 1) number of contributors per Padlet activity/wall, 2) students’ reactions to Padlet activities and teacher’s feedback, 3) number of viewers per padlet wall and, 4) peaked time for visits to Padlet walls. Out of 47 students, 37 Hospitality/Accounting and Finance students completed the qualitative survey questionnaire.

Data analyses for the qualitative survey questionnaire involved survey coding which was a process of categorising open-ended responses into groups (Popping, 2012). To understand students’ general perceptions of Padlet as an educational tool and the idea of sharing on Padlet, frequency counts of recurring items were also done.

Analyses of students’ responses or activities on Padlet wall were done once the semester was over. The teacher visited the walls and recorded the number of students’ responses to the question on each wall, the number of times students resubmitted their work to be remarked, and whether students remained anonymous or revealed their identity when they shared their answers. As Padlet also recorded the number of visitors to the Padlet walls throughout the semester, the teacher also analysed the graph which recorded number of visits to Padlet walls (provided by Padlet) to get an overview of when visits to Padlet walls peaked and when it was at its lowest points.

## **FINDINGS**

### **What were students’ perceptions of Padlet as an educational tool?**

The number of qualitative responses recorded on students’ perception of Padlet was 38 statements and out of these, 29 were positive and 9 were negative. There were 6 categories of positive statements: ‘ease of use’, ‘ease of access’, ‘perceived usefulness’ (alternative source, platform for sharing, viewing others’ work, feedback, source of reference, testing ground), - ‘stress-free’ (anonymity, flexibility), ‘new medium of learning’ and ‘preferred learning medium’. Five categories of negative statements were identified: ‘accessibility issues’ (time-lag, require internet connection, not hassle free), ‘readability issues’, ‘unfamiliar tool’, ‘not preferred learning method’, and ‘no clear guidelines’.

Positive statements made by students were clearly related to how Padlet assisted them in their learning of the module. Most importantly, students could identify the perceived usefulness of Padlet. Students mentioned that Padlet provided them with a platform to share their answers, view others’ responses, and get feedback. Students also valued the function of Padlet as a place where resources were stored. It served as another source of reference. As an educational tool, students also found Padlet easy to use and access. The other aspects of Padlet use which students appreciated was closely related to the way the teacher has designed its use which promoted flexibility and anonymity.

As for negative statements, students’ main grouses were generally concerned with technical factors (accessibility and readability) and the way Padlet was used. As most activities on Padlet was designed as part of students’ independent learning, some might have felt lost and felt that more guidelines were necessary. These were reflected in the suggestions students gave to improve Padlet use in Communication Skills classrooms as some requested that more guidance is provided, and reminders are given to complete the tasks on Padlet walls. Some of the other suggestions given also showed that students prefer more teacher-controlled environment as some requested that the Padlet activities were completed during class time, and all the activities were made compulsory for all students to complete.

### **What were students’ perception on sharing on Padlet?**

Thirty-three statements were recorded when students were asked about their perceptions on sharing on Padlet and out of these, 31 were positive statements and two were negative. Students were appreciative of Padlet’s ease of access and use, and the way it was used which fostered anonymity and flexibility. One student also mentioned that sharing on Padlet evoked positive feelings.

Despite the measures taken to ensure anonymity, one student found that sharing answers on Padlet as a threatening experience. Another student who responded negatively to sharing on Padlet simply did not favour the use of technology for teaching and preferred the traditional pen and paper to answer questions.

Analyses of students' responses to Padlet tasks also showed that students generally preferred to respond to the tasks individually. Most students who contributed to the walls used pseudonyms with only four students who constantly used their real names.

### **Did students' perception of Padlet affect frequency of Padlet use?**

Data from the qualitative questionnaire found that only six students were active users of Padlet as they always visited the walls 1) "to see how answers are marked and look at how other people answered the questions", 2) as "... "the only way I can test myself".

Thirty-one students admitted that they visited the walls 'sometimes' or 'rarely'. Students reported of having other commitments and this seemed to become a barrier for them to be active on Padlet. Students for example mentioned that they were "busy with other subjects that I rarely have time" and that their "focus was on other subjects". Others highlighted that they did not receive enough prompting or clear guidelines. One student for example explained his inactivity on Padlet wall because he/she "was not a self-learner" and required "guidelines from my lecturer before I use something". Some protested that "there is no notification when lecturer update/upload new questions" and that they will "forget unless people around me inform me". There is a possibility that some students found the independent learning tasks difficult to handle as they were not autonomous as reflected in some of the reasons students provided for visits to the walls: "Because the teacher said so"/ "when teacher asks us... to do work on it".

Students also highlighted the fact that they did not feel motivated because of lack of reward (no marks were given when Padlet exercises were completed), technology was not the preferred method of learning, and Padlet was not used by many thus "there's not much post in them" and was not their preferred tool for learning- "Less opportunity to think about Padlet unlike Facebook".

However, it was found that the number of visitors to Padlet walls peaked prior to assessments and there were clearly more number of contributors to Padlet walls containing case study questions. The number of contributors to case-study-test-related tasks, was 14 (the lowest) and 33 (the highest). Contributors to revision exercises, on the other hand, fluctuated between 2 and 5 students (even though these revision exercises comprised of past year examination questions). One possible reason for students' fluctuating pattern of Padlet use was because most of the revision tasks were done as part of independent learning. The higher recorded student contributors to the walls with case study questions could be because some of these were attempted in class. Having said that, the number of contributors to case-study-test-related activities remained higher than the number of contributors to the walls with revision exercises.

Also, it was interesting to note that the number of visitors to the walls peaked at 503 (the highest), recorded on October 2nd; and 278 (second highest), recorded on Dec 6<sup>th</sup>. Unsurprisingly, these dates coincided with students' preparation for two assessments, a case study test and a final examination respectively. At other times, students' collective number of visits to the walls was between 34 and 76 visits. Students' activity or inactivity on Padlet seemed to be influenced by assessments as found in some of the reasons given for visiting the walls: "because of exam and midterm test" and to "get a glimpse of how the exam question would actually look like".

It was also interesting to mention that only 5 students out of the 37 who mentioned that their main reason for visiting Padlet walls was to improve their understanding of lesson learnt: "To try to answer in Padlet... so that I can improve the level of my understanding". Most of the students mentioned that their main reasons for visiting the walls were to read teacher's feedback and view other students' answers: "To check my classmates' answers and comments from Ms. (the teacher)". This shows that even though students were not active contributors to Padlet walls, they were actively reading others contribution and teacher's comments.

## **DISCUSSIONS**

The study found that students' perceptions of Padlet were generally positive. Many perceived Padlet as having values for learning. However, some students had some negative perceptions of Padlet use and these were found to be related to internal and external factors. Students' differences (Miller, 2009) relating to preference over method and tool for learning, lack of autonomy and low motivation were identified to be factors within students which resulted in negative perceptions of Padlet as an educational tool. The last two factors were not clearly related to Padlet as a tool for learning but more to how Padlet was pedagogically embedded within teaching and used as a learning tool. As some Padlet activities were designed as part of independent learning, students who were not self-regulated or lack autonomy struggled. Furthermore, as Padlet activities were more formative than summative (thus there were no concrete rewards in term of marks), some students were not motivated to be active on Padlet walls.

The other identified factors were external and were related to the technical aspects (Ng, 2007; An, Aworuwa, Ballard & Williams, 2009): issues of accessibility and ease of Padlet use, and time constraint (An, Aworuwa,

Ballard & Williams, 2009) due to workload from other modules. The teacher's pedagogical decisions to improve students' privacy had resulted in only one student feeling threatened and the rest feeling safe. Issues with openness, in other words, did not seem to inhibit participation on Padlet as observed in other studies (An, Aworwuwa, Ballard & Williams, 2009). This was perhaps due to the layers of 'security measures' to protect students' identity and privacy. However, doing so created another barrier for Padlet use.

The study also found that positive perceptions of Padlet as an educational tool did not have a positive impact on students' Padlet use. Furthermore, the study showed that despite perceiving the use of Padlet as having learning values, which have been proven as the motivating factor for students' use of technological tools (Hardy et al., 2005; Cole, 2009), students' use of Padlet to support their learning was inconsistent. This shows that positive perceptions of Padlet was inadequate to sustain or encourage students to use Padlet for learning, particularly when external factors became main inhibitors. This also shows students' use of technological tool was very much context-dependent. It is also interesting to note that even though many students were not posting answers on the walls, except for case-study-related tasks, many of them mentioned that they visited Padlet walls to check and read others' submission and to read teachers' comments. In other words, these students were 'lurking' around, not being active contributors but still perhaps 'learning' from reading the responses and comments given (Slevin, 2008).

The findings of this study also show that students' participation on Padlet were assessment- driven, judging from the number of contributors and number of visitors to the walls. This shows that students' use of Padlet was purposive and this supports findings of other studies (Yaakop, 2015; Cole, 2009; Hardy et al., 2005).

From the suggestions given by the students to improve Padlet activities, it was also obvious that for some students having too much flexibility did not work for them. Some required more support, guidelines, and reminders from the teacher. Perhaps flexibility reduced students' sense of urgency and as they were not held accountable, not being active contributors on Padlet did not matter. This shows that technology does not guarantee participation as participation often requires prompting (Whitton, 2009).

The study also shows that pedagogical decisions involving the use of a specific web or technological tool can influence students' use of the tool, their perception and their motivation to use it for learning. This shows that at times, it is not the tool but the way the tool is used to support learning which influences its use.

### **IMPLICATIONS FOR TEACHING**

The findings of this study have several pedagogical implications. It is important that a teacher identifies how students feel about a technological tool but what is also vital is to check on students' use of the tool to support their learning. This means that a quick survey to investigate how they feel about the tool (in this case, Padlet) and how they are managing their use of it could have signalled to the teacher and raised red flags if she needs to adjust her instructions to improve students' learning experiences. The study also found that students appreciated flexibility; however, too much flexibility held some of the students back in their participation on Padlet thus their learning. It is therefore important to reconsider flexibility. Perhaps, students should be gradually introduced to autonomy by providing clear guidance and scaffolding, and structuring the use of Padlet as part of classroom activities before introducing them as independent learning tasks. Students also want to be held accountable for completing their preparatory work (Ruckert et al., 2014) thus some work done on Padlet should perhaps be made compulsory and discussions are carried out on the answers that are posted on Padlet during classroom activities.

The study also finds that protecting students' privacy results in them having low inhibition about sharing on Padlet. However, to be inclusive, students need to also be given options to complete Padlet tasks on students' preferred medium of learning or of choice. To increase students' participation and use of technological tool for learning, it is also important to design activities that are closely related to assessments as students use of these tools are often found to be purposive.

The study also suggested that students' perceptions of Padlet were affected by Padlet as a tool and by how it was pedagogically embedded in the teaching and learning processes. In investigating perceptions on a technological tool, students' perceptions of the tool and how it is used to support learning should be made distinct.

### **CONCLUSION**

This study found that students' positive perceptions of Padlet did not have a positive impact on students' use of Padlet. However, as a tool, despite some rejection from students, Padlet has been found to be supportive of students' learning of communication skills concept. To use the tool more effectively, teachers need to consider students' perceptions of the tool and its pedagogical design to support students' learning. It is also important for teacher to consistently monitor their students' engagement with the activities on Padlet. As students are diverse,

it is also crucial that pedagogical decisions made about Padlet use (or any other technological tool) are constantly revised or readjusted to ensure inclusivity.

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# **A Comparative Study on the Concept of Imagination: Based on the Philosophies of Kant And Dewey**

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## **INTRODUCTION**

The necessity and goal of cultivating and expanding imagination is the content shared by all of us living in a rapidly changing society, therefore, I believe it will be not too much to emphasize. 2009/2015 In Korea, elementary education curriculum is promoting imagination as a way to realize the human image pursued by educators. However, there is no definite definition of the concept of imagination. Education is defined in many ways, but it is usually referred as 'an intentional and systematic process to form desirable humans'. The process of this sort of education is also to form the value or idea of life that the learner should aim the concept through knowledge. Therefore, when imagination is applied in education, it should start by establishing a clear concept.

Thus, the purpose of this study is to contribute the concept of imagination that leads to the foundation of education practices for cultivating creativity. To this end, this study explores particularly in the imaginations of Kant and Dewey.

## **Imagination of Kant**

Kant argues for the independence of mind as a subject through knowledge. For this reason, he is generally referred to as a reason-centered philosopher or ideologist. However, on the other hand, he maintains the position that the mind can not know any knowledge by its structure and concept except experience, and it sets a step to overcome the confrontation between rationalism and empiricism. At this time, imagination is the most important mediator to overcome the confrontation between reason and experience. In other words, Kant divides the source of cognition into two axes of reason (intellect) or experience (emotion), and by insisting that imagination integrates the two, it provides an opportunity to distinguish the roles and functions of imagination from before and after modern times .

### 1) Kant's epistemology: experience as a necessary condition and reason as a sufficient condition

In *critique of pure reason*, Kant calls the structures and forms that are the sources of perception. 'transcendental elements', which claims that they are at the center of human recognition of a given object. But the transcendental element is only a condition that makes the recognition possible.

Kant calls intuition as the sensuous perception about the object of recognition, which is the ability to accept a given representation. It can be said that the recognition object is accepted through the various sensory organs of the recognition subject. Without this intuition, it is obvious that no perception can arise. However, this intuition comes to us by thinking that given representations are conceptualized.

In Kant's epistemology, intuition and concept are notions corresponding to emotion and intelligence. It is because the object of recognition is given to intuition through the action of emotion, and because the intuitive object is thought according to the concept through the action of intelligence. But why we recognize a specific object among many objects? This is because we get something from the object through senses, for example, seeing or touching objects. In other words, because the subject stimulates our emotions. Thus, Kant explains that cognition has two lines of emotion or intellect, when emotions convey to us an object, the intelligence recognizes what have been given to us by thinking of it, finally we can come to the cognition(Kant, 1781: 236; 273). Therefore, it is the key to the establishment of recognition that how the two sources of perception (i. e. intuition and concept, emotion and intellect) are related to each other.

### 2) Imagination as the key to recognition by linking experience and reason.

Kant defines imagination as "an activity that binds various representations together and grasps the various things within them" (Kant, 1781: 296), and suggests a solution that synthesizes the two sources of recognition. If imagination achieves comprehensive unification, it will lead to judgment and thinking. Therefore, imagination is the ability to make judgment, and imagination and judgment are closely related to each other.

Kant distinguishes judgment as both formal and reflective. Firstly, regulatory judgment is a synthesis according to the concept. This is a function that is concerned with examining whether a particularity conforms to the universal concept. In other words, regulatory judgment is merely submerged under the universal and transcendental laws of intellect(Kant, 1790: 163; 168). At this time, the imagination constructs a unified experience by unifying and linking the representations (combining them under certain rules without the subject's present). Kant calls the imagination of this function as a regenerative imagination. Regenerative imagination does not function alone, but requires productive imagination as an objective basis. In short, it is a productive imagination to create an objective basis to unify representations, and it is a regenerative imagination to unite representations based on the productive imagination.

Thus, Kant argues that the interaction between emotion and intellect with the action of these imaginations leads to the recognition. In this way, imagination is an important factor that provides us a meaningful and unified experience. But on the other hand, there can be no objective experience that does not rely on (productive) imagination. Productive imagination (even if it is a transcendent function, and comes from our senses), which limits our ability to create new sensory representations that our senses have not experienced(Cho, 1993: 11). Ultimately, the imagination-productive and regenerative imagination-associated within regulatory judgment can not go beyond empirical perspectives. Therefore, it can be seen that it means only a coordinated and common sense union.

Secondly, reflective judgment plays a role in discovering the universal within which only specific things are given. However, in order to reflective judgment for performing its role, it must rely on the principle given from the inside. In other words, while we have to contemplate the possibilities of infinitely diverse empirical laws in nature, and recognize the various things, judgment must include the rule of lawful unity that can be combined into a possible experience by itself(Kant, 1790: 168-169). Kant calls this lawful unity purposiveness of nature. In other words, reflective judgment does not conceptualize a given object, but determine its purposiveness based on a given material. (Hwang, 2006: 82). Reflective judgment forms a new concept by organizing what our mind receives through senses according to its purposiveness. The imagination that acts at this time can be said to play a role in creating new order and meaning.

Judgement of taste as a representative example of reflective judgment, which Kant derives from a free play of imagination by reflecting the possible structuring of the subject being experienced. A free play can be said to mean that the object or phenomenon being judged is not guided by any definitional concept or rule but the imagination functions freely. In this sense, imagination in judgement of taste is characterized by being independent, active, infinitely creative beyond the simple mediating role. In short, Kant's imagination in epistemology based on the ability is to make judgment and thinking possible by combining and integrating a given object as it develops, and the imagination in reflective judgment - especially hobby judgment - It is an unique and active ability to form or capture forms. When we look at the relationship between imagination and intellect, the former seems to be a vertical relationship in which imagination is subordinated to intellect, and the latter is in a position similar to intellect, and maintains a horizontal relationship as a more central role (Kim, 2010: 305). Although there are big and small differences in roles, characteristics, and degrees, it is clear that these imaginations play a bridge between thoroughly separated 'experiences and reason' and 'subjectivity and objectivity'. Kant thus overcame the confrontation between rationalism and empiricism. And, on the other hand, raised the position(image) of imagination that was considered to be inferior to reason.

### 3) Criticism of Ambiguity About the Location of Imagination

To Kant, imagination is necessary to bring recognition to the mind by mediating intuition and concept, as well as intelligence and emotion, but the formal possibility or unification of all phenomena is possible through intelligence. According to this, imagination is inevitably included under intelligence and reason. Kant, however, raised both the importance of emotion and the spontaneity and creativity of imagination through discussion of judgment of taste. Nonetheless, creative imagination is limited to specific areas, such as arts. Moreover, the question remains as to somewhere to set the position of imagination. As pointed out by Johnson (2000), the ambiguity about the location of imagination seems to be a fundamental problem in Kant's metaphysics in which he thoroughly distinguishes between emotion and intellect, experience and reason. I would like to find out the possibility of overcoming this limitation from Dewey.

#### Imagination of Dewey

In this chapter, we explore the concept and role of imagination through the possibility of aesthetic sublimation of human experience, focusing on Dewey's late authoring *art as experience*.

##### 1) Dewey's epistemology: An experience and quality.

Dewey, in the process of exploring nature, has established a philosophical framework in which experience continues as a process of constant change. Especially, Dewey's experience is not a mere external change but an overall process in which everything in a specific situation affects each other, and all internal personalities and temperaments change all the time. From the perspective of Dewey's experience, there is no absolute truth, and knowledge is constituted, reconstructed, changed, and developed through experience. Moreover, recognizing something to construct knowledge can be said to refer to both "the perception of an object and the state in which the result of such perception composes the mind"(Park, 2016(1): 114). In other words, Dewey is based on a philosophical basis that everything we perceive can not be distinguished between subject and object, as well as reason and emotion. And the ideal model which overcomes this distinction realized the possibility of integration, which is called "aesthetic experience"(Yang, 2004: 114). Because the inherent and most important feature of aesthetic experience is that there is no longer any distinction between the self and the world(Dewey, 1934: 254). 'An experience' is accomplished by capturing the particular nature of a subject-it can link the situation into a context- in a transactional situation. This particular nature includes some energy or feelings that create(s) a context. Therefore, it is impossible to make a conceptual definition. Because an experience has its own storyline, hence it has the beginning, the process, and the end. The process, in particular, is a process of organic and rhythmic change, and development that has a unique 'quality' that can not be found in any other experience(Dewey, 1934: 43).

This unique quality can never be revealed unless the contents and processes which make up the experience are continuous and integrated very closely and naturally. In other words, the quality of experience depends on the degree to which all interactions penetrate and integrate with each other within the experience. It is the moment of the aesthetic experience that Dewey tells when the end of one experience that is interpenetrated and completed this way (Dewey, 1934: 24-25).

In Dewey's view, subjects and objects exist in a changing context, and they become aware of each other or something in the context. Therefore, it is not a real problem to have what is unchanged or to figure it out. When the situation in which the experience occurs is concluded in any way, it is important to capture the conclusion, the meaning or value that it gains from it. To Dewey, therefore, perception is not to grasp objective facts or truth but to realize the integrated meaning and value including it.

## 2) The Key to the Systematization of Quality and the Establishment of Aesthetic Experiences: Imagination

Dewey believes that one experience with qualities must be cumulatively integrated in order for it to be completed, and that this process must include aesthetic elements. (Dewey, 1934: 45). The intellectual experience, which we consider to be far from emotional and aesthetic, is accompanied by an emotional nature in the process of being systematically structured and finalized. For example, the sense of accomplishment, mistake, and insufficiency that we feel after solving difficult mathematical problems. In addition, when we see an art work or listen to an instrument, we have an immediate feeling about it. In such a case like arts, emotional and aesthetic qualities directly appear in the materials. In the end, any experience has the qualities to characterize and distinguish it as an experience if its meaning expands and accumulates through successive actions taking place in the process of the experience. And by taking these qualities, the experience becomes an aesthetic experience. Thus, understanding the qualities in experience is an important key to establishing an experience (that is an aesthetic experience).

Dewey defines an aesthetic experience as an experience through the action of imagination (Dewey, 1934: 276). As mentioned earlier, experience can be an aesthetic experience by having meaning and value depending on the degree to which all the elements in it are harmonized and integrated. In light of these facts, imagination plays a role in harmonizing and integrating elements in experience. So Dewey defines the imagination as "a characteristic that is prevalent in all the processes of experience and makes the process vital" or "a way to see and feel things or events so that things or events can make one unified whole" (Dewey, 1934: 271). This imagination can never be purely intellectual or purely emotional in that it makes it a conscious experience by forming the overall union of elements in experience and finding meaning. Therefore, the experience as a result of working with imagination can not be classified as intellectual or emotional. Dewey saw that imagination provided a way for a thoughtful type of thinking before such thought to occur (Dewey, 1910: 6). In other words, imagination and thinking are closely related and characterize the nature of experience. And they combine the past meaning with the present to create a new meaning, thereby ensuring the continuity of experience.

According to Dewey, “thinking is the intentional endeavor to discover specific connections between something which we do and the consequences which result, so that the two become continuous”(Dewey, 1916: 229), and “the act of thinking upon a sense of sharing in the consequences of what goes on”(Dewey, 1916: 232). Through this argument, we can see that the close relationship between action and result is important. The relationship between them can also be said to unify the qualities flowing through the experience process. In this way, it can be seen that thinking must involve the ability to imagine concepts and form orderly relationships in response to the change, that is, imagination. In short, the key to discovering qualities and forming aesthetic sentiments is to understand the relevance of everything and to create a sense of unity in experience, in this sense, imagination plays this role.

### 3) Imagination to expand the horizon of experience

Imagination is the most important factor that enables an aesthetic experience to be made, so all aesthetic experience can be recognized as an imaginative experience. In other words, when our daily experience becomes "events filled with imaginative mediations" (Jeong, 2001: 399), it becomes aesthetic experience. Thus, the basis of Dewey's philosophy is that daily experience is not different from the aesthetic experience, which means that the source of aesthetic experience is the activity of creature. Creature interacts with the environment and maintains life. And it tries to overcome this process of life that has resulted in constant conflict with the environment, and to maintain balance. In this process, Creature grows in a more desirable direction and adapts to the environment. This balance state is not maintained continuously, but repeats the process of harmony. And balance restored through the active adaptation of creature. This is the way creature is maintained, and the basic pattern in which life and the environment relate to each other, and Dewey calls it "rhythm" (Dewey, 1934: 154). In other words, rhythm is a structure in which creature forms the order in change. When one cycle of rhythm is completed, creature and environment are integrated, and a process is completed. At this time, “fulfillment punctuate experience with rhythmically enjoyed intervals” will be take placed, such as joy, sorrow, hopes and despair (Dewey, 1934: 23). At the moment of aesthetic experience, the distinction disappears between experience subject and environment, and also each element is uniquely integrated. Through these facts, Dewey criticizes the dualism of the traditional philosophy which thoroughly distinguishes between the “mind and substance”, “reason and emotion”, or “mind and body”. In Dewey's philosophy, imagination brings an aesthetic character by allowing the ego. And the environment in experience to be mutually integrated and connects the artist's inner vision with outers. It also plays a role in integrating past, present and future by finding meaning and value in the completed experience. As an expression of this imagination, works of art enable humans to emerge and communicate with each other so that they can move away from separation and isolation. The power of art of engaging and uniting humans comes from the imagination that breaks the boundaries and bridges the connections. The imagination which reveals through the aesthetic experience plays a role in raising the quality of human life by revealing the meanings of experience or spreading horizons as the foundation of all life actions.

## **Educational Discussion**

### 1) Limitations of Kant's imagination in terms of Dewey

In Dewey's view, the integration of imagination in Kant's epistemology combines external sensory qualities with internal priori reasons (Dewey, 1928: 136-137). At this time, imagination plays a role in helping the intelligence to order the given representation under the rule of reason. In other words, Imagination of Kant's epistemology, for Dewey, is limited to passive ability to conceptualize experiences or to help shape ideas.

Of course, In Kant's aesthetic judgment, imagination reveals a more advanced aspect to form and capture an aesthetic form through its own and proactive ability by triggering emotions of pleasure. Kant is regarded as contributing to the opening of the new horizon by bringing the imagination, which was inferior in comparison with the reason until the pre-modern period, as an unique and imaginative function of active and free imagination, however, Kant equated contemplation with the sense of aesthetic form through an aesthetic judgment based on or not targeting concepts. Kant believes that the judgment of a beautiful thing presupposes a mind that is in a 'stationary contemplation' (Kant, 1790: 252). In Dewey's view, if the moment when Kant's aesthetic judgment occurs is the same as the moment of 'stationary contemplation', beauty is irrelevant to desire, action, and emotional excitement, and contemplation is a result of aesthetic perception about the content of rational thought (Dewey, 1934: 258). To Dewey, contemplation is the balance and internal equilibrium of impulses, such as desires and affection for the sensuous qualities that can be found in cognitive activities. (Dewey, 1934: 261). In other words, it means that various minds-impulses of the object have been brought into equilibrium by being well integrated with each other, thereby emphasizing that the mind which faces the object can not be separated. And Dewey's imagination always plays a role in expanding the experience at the center of this integration.

Kant upgraded imagination to the ability to make aesthetic judgments as a free play. Nonetheless, "genius" within the ability for performing these imaginary functions is a natural ability, and this genius limits the area in which it is exercised to art. This would allow a class with a particular ability to be applied, and if applied to an educational situation, it might close the door of hope for learning or the possibility of achievement. Especially, from past to present, I believe that it does not help to overcome the disadvantages of rationalism which has stigmatized the education loser through the result of test. In Kant's epistemology and aesthetic judgment, imagination is considered to be dependent on or independent of reason, and the difficulty of establishing this position can be difficult to clarify the concept of imagination.

## 2) New possibilities of Dewey's imagination concept

There are some differences, but Kant and Dewey both see the imagination as the ability to make the processes of human thinking not to be confined to the realm of reason, and to emphasize or harmonize the realm of emotion to make it more balanced and rich in thought. Imagination for Kant proves that human beings can practice objective truth by mediating experience and reason, while imagination for Dewey allows to grasp the aesthetic qualities of experience so that it can be continuously reconstructed. Ultimately, they place the value of imagination in order for humans to lead a more desirable life, which is highly suggestive of the concept of educational imagination. However, from the viewpoint of Dewey, Kant has the limitation of restricting the function and location of imagination from his basic ideas that thoroughly distinguish reason and emotion, as well as objectivity and subjectivity.

Dewey laments that there are no words that can express both artistic and aesthetic at the same time. Because his ideas are ultimately based on the fact that nothing is separated, but an integrated interaction itself. Thus, the importance of the medium that leads to the integration and harmony is bound to be emphasized, and the imagination is the foundation or the core power to create and reconstruct the medium of integration and harmony. When we approach education from this point of view, imaginative education can not stay in interesting activities that draw what we have not experienced in our mind or create and reflect on new and exciting things simply. When educational activities such as making, speaking, experiencing, and so on are made and their outputs are produced, they are not merely outcomes or end results, but It should be a medium to influence and to have relationships with learners, the environment, and other subjects. Imagination should not be treated simply as a capacity to nurture, but as a nutrient that can be harmonized and melted to make everything grow in abundance. Also, to Dewey, who deals with art as daily experience, imagination is not limited to artistic values or special superiority. Rather, it is characterized by 'universality' that insights and connects the values and visions of whole human life. In other words, Dewey's imagination is a function of translating, integrating and expanding meaning so that art can become a daily experience. Nowadays, there is a lot of criticism that the real education is collapsing. It is because of the phenomenon that hierarchy is separated and humanity disappears. Imagination within this function allows the meaning of the things that humans experience together to have a different meaning for the individual, or to translate and communicate as a common meaning towards others. This allows the minds of people within a group to be integrated, translated or expanded to mean that the mind is communicated to other groups. I believe this imagination is a concept that opens up the possibility, that is, the life itself can become a sort of education.

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# **A Comparison Between Motivations and Personality Traits In Religious Tourists and Cruise Ship Tourists**

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## **ABSTRACT**

The purpose of this paper is to analyze the motivations and the personality traits that characterize tourists who choose religious travels versus cruises. Participating in the research were 683 Italian tourists (345 males and 338 females, age range 18–63 years); 483 who went to a pilgrimage travel and 200 who chose a cruise ship in the Mediterranean Sea. Both groups of tourists completed the Travel Motivation Scale and the Big Five Questionnaire. Results show that different motivations and personality traits characterize the different types of tourists and, further, that motivations for traveling are predicted by specific —some similar, other divergent— personality traits.

## **INTRODUCTION**

According to the definition of the World Tourism Organization, tourism comprises the activities of persons who are traveling to and staying in places outside of their usual environments for not more than one consecutive year, for leisure, business and other purposes. Different types of tourists correspond to different types of tourism. The types of tourists include those who are interested in visiting architectures and/or cultural and historical aspects of unknown regions; those who are mainly aiming to a rest and relax; and those who are traveling for special purposes (e.g., educational, sportive, or religious events). Social and psychological analyses are needed in order to understand the specific characteristics of these categories of travelers. Among these different types of tourists, two seem to be very different regarding aims and modalities of travelling: religious tourists and cruise ship tourists.

Religious tourism involves traveling to holy sites for pilgrimages, spiritual journeys, and conventions. According to estimates from the World Tourism Organization, more than 300 million travelers move about for religious reasons. However, up to 18 billion of dollars every year swell the coffers of what could be called a full-fledged religious tourism industry (UNWTO 2013). In Europe, with some exceptions such as Rome and Santiago de Compostela, the most popular destinations are represented by Marian shrines, e.g., Lourdes, Fatima, Czestochowa, Medjougorje, and Pompei.

With very different aims and modalities, cruise ship tourism is also making its mark in the tourism industry with its dynamic development of the peculiar, arousing more interests and providing specialized operators. It is a business that sources identify as the fastest growing of all of tourism businesses by virtue of its lower costs, which make it accessible to even larger segments of the market and favor a decisive seasonal adjustment of tourist flows.

The cruise may be perceived as an all-inclusive holiday, engaging in an experience very different from everyday routine, in a microcosm perfectly structured and planned in detail, protecting from any problem. In this sense, the cruise ship can be defined a “non-place” i.e. a typical product of postmodern society - such as resorts, airports and hypermarkets - with all the structural and functional characteristics outlined by Augé (1992): standard spaces and facilities where nothing is random, each particular is programmed, e.g. meal times, path lengths, internal and external events. Defined as the collective experience more comfortable and reassuring from a psychological point of view, the cruise has become a growing tourism product not only in terms of social expectations, but also on the economic dimension. The latest estimates of the World Tourism Organization set cruises as 1,8% of the global tourism, with a significant growth potential that can predict achieving a total of 30 million cruise passengers in 2020 (UNWTO 2013).

These two types of tourism have some elements in common because both are popular and represent accessible, reasonably priced travel. At the same time, both are supposed to symbolize different meanings: reflective and contemplative for religious tourism, and comfort and levity for cruise tourism.

The objective of this research is to point out and to compare the central motivations that underlie religious and cruise ship travel and to investigate the personality traits that characterize the two types of tourists associated with both types of travel.

The substantial importance of the motivation for tourism research and management can be exemplified by the fact that researchers, when defining a “tourist,” commonly refer to the person’s motives for travel (Leiper 1979). In travel-motivation studies, the underlying idea is that specific psychological needs and motivations qualify travel behavior and that a traveler chooses a type of travel to satisfy his or her internal requests (Dann 1977; Meng and Uysal 2008). Thus, push motivations can drive the tourist to search for destinations, situations, and events that assure his/her psychological needs, i.e., escaping from a daily routine, rest and relaxation, prestige, health and fitness, adventure and social interaction, family togetherness, and excitement. Pull factors, such as a destination’s attractiveness—art, beaches, facilities, cultural attractions, entertainment, natural scenery—can also motivate people to travel.

The past decades have produced noteworthy advancements in interpreting and understanding tourist motivation (Crompton 1979; Moscardo and Pearce 2004; Plog 1994; Prentice 2004), as by evaluating motivation, researchers can classify types of tourists (McIntosh and Goeldner 1990) and better decide their corresponding travel and behavioral patterns (Crompton 1979). Furthermore, findings that are derived from tourist motivation research can be useful to tourism marketers for the development and evaluation of services, brand image, promotional activities, and destination positioning.

A number of studies empirically identify the motivations of travelers (e.g. Crompton 1979; Jamrozy and Uysal 1994; Hoye and Lillis 2008; Lee and Pearce 2002; Pearce and Lee 2005; Yuan and McDonald, 1990) but very sparsely with regard to religious tourism or cruise ship tourism (Kerstetter et al. 2005).

A review of religious travel motivation literature suggests that deciding on this kind of travel is related to numerous factors. Timothy and Olsen (2006) emphasized how some people travel in order to maintain certain identities, others to satisfy the feelings of nostalgia, some to experience the transcendent, and some to fulfill the requirements of particular faith-based groups. MacCannell (1976) referred to these tourists as “pilgrims of modernity,” choosing holy sites for reasons other than religious ones, specifying that many different motivations—not all of a religious nature—drive people to engage in pilgrimages, particularly in the context of the worries and concerns that are typical of the modern world. A question has arisen in scientific debates concerning the tourist who searches for modernity or authenticity. Sharpley (2008) has pointed out the spiritual dimension of tourism by examining the relationship between authenticity and tourism and by considering the ways in which tourists look to their heritages and histories in searching for the authentic roots of their identities. Religious travel may be an occasion for meditation and may also provide experiences that afford individuals the

potential to reconstruct meanings related to identity. Indeed, Cohen (1979) proposed that tourists often choose elective spiritual centers that are external to the mainstream of their native societies and cultures.

With regard to cruise ship tourism, Hung and Petrick (2011) analyzed the role of motivation regarding the intention to go on a cruise by developing a measurement scale for cruise motivation. Their findings suggested that relaxation, enhancing kinship, relationships, or friendships, and convenience were the major motivations for taking a cruise. Both Petrick (2004) and Petrick and Sirakaya (2004) found that fidelity and being a satisfied first-time cruiser had a great impact on intentions to go on a cruise. Further, Petrick (2004) suggested that less loyal or first-time cruisers are less price-sensitive and spend more. Li and Petrick (2008) found that a cruise passenger's fidelity is a function of his or her satisfaction with earlier cruises, the quality of the alternatives offered, and the size of the investment made in the relationship. Petrick, Li and Park (2007), using Crompton's (1992) choice set model, more deeply analyzed cruise passengers' decision-making processes and found that loyalty, familiarity, and social influences were the main motives for a passenger's decision to go on a cruise. Finally, Teye and Leclerc (2003) examined the motivations for going on a cruise on the basis of tourists' ethnicities and observed that the most important motives for Caucasians were dimensions that referred to social aspects, such as cultural discovery or family and kinship, whereas for ethnic minorities, they were the opportunity for uninhibited pursuits and entertainment.

Another area of interest that has received much relevance in tourism research has been the connection between personality traits and touristic choices (e.g. Crouch, Perdue, Timmermans and Uysal 2004; Berno and Ward 2005; Landers and Lounsbury 2006; Leung and Law 2010). In fact, personality has often been taken into consideration for market segmentation purposes; for example, Plog's (1974) delineation of *travel personality* types along an allocentrism-psychocentrism continuum received considerable interest. The motivational concepts of *strangeness-familiarity* (Cohen 1972) and *travel career ladder* (Pearce 1988) are pertinent also to personality traits. Personality has also been associated with the choice of travel destinations, of leisure activities engaged during the vacation, and of other travel-related decisions (Madrigal 1995; Nickerson and Ellis 1991). In addition, classifying a tourist's personality has been established as appropriate in order to direct a client to a destination in the course of travel agent-client contact (Griffith and Albanese 1996).

Several studies have analyzed the personality profile of religious tourist traveling to different religious destinations. Religious tourism in general is changing, so today, it should not be described in a stereotypical way (Ambrosio 2001; Collins-Kreiner and Kliot 2000; Lanquar 2008). Scaffidi Abbate and Di Nuovo (2013) explored motivations for choosing travel to Medjugorje and the relationship between such motivations and personality traits. The authors found that that both gender and age differentiate religious travelers along certain psychological variables. In synthesis, male travelers to Medjugorje seemed to be characterized primarily by a motivation focused on the need for discovery, while women showed a greater desire for socialization and openness to other people.

## **THE STUDY**

This study aims to assess the differences in motivations and in personality traits for people who choose religious travel and people who choose to take cruises.

## **METHOD**

### ***Participants***

Participants were Italian tourists who had chosen a travel package for the Marian Sanctuary of Medjugorje and others who had chosen to take a cruise in the Mediterranean Sea. The participants were selected with the help of a specialized travel agency; data were collected before the travel. The sample was composed of 683 subjects, 345 males, and 338 females. The age range was 18–63 years (Mean = 40.23; s.d. = 13.96). Religious tourists totaled 483 (244 males, 239 females), and cruisers totaled 200 (101 males, 99 females). Preliminary statistical analyses were carried out to ensure that the two groups were matched on all of the main variables: age (religious tourists Mean = 40.35, s.d. = 12.82; cruisers Mean = 40.11, s.d. = 15.10;  $t = 0.21$ ,  $p = 0.83$ ); level of education (chi-square between groups = 2.55,  $p = 0.64$ ); and gender (chi-square = 0.06,  $p = 0.94$ ).

### **Instruments**

The instruments used were:

1) The *Travel Motivation Survey* developed by Figler, Weinstein, Sollers and Devan (1992) and adapted in Italian by Maeran (2000). The questionnaire explores, by means of 35 items on a five-point Likert scale, seven motivational categories: Culture, Self-seeking, Sensation-seeking, Status, Sociality, Relaxation, and Nature. In a previous principal components factor analysis using a Varimax rotation, the items of the scale loaded on three main factors that accounted for 40% of the total variance, and were labeled *Curiosity and discovery*, *Out-of-routine*, and *Self and sociality*. The *curiosity and discovery* factor includes items that measure a wish to see unknown sites and a curiosity for different cultural experiences. The *out-of-routine* factor includes items that measure a wish to have unusual experiences and to escape from one's daily routines. The third factor, *self and sociality*, includes items that measure the extent to which travel is seen as a means of rediscovering one's self through socialization. Cronbach alphas for the three factor scores were .82, .64, and .68, respectively.

2. The *Big Five Questionnaire* (BFQ, Costa and McCrae 1992) aimed to measure five personality factors, summarized as follows:

*Energy/Activity*: tendency to show assertiveness, active behaviors, and positive emotions.

*Agreeableness/Cooperation*: tendency to behave friendly and cooperatively rather than showing antagonism in interpersonal relations.

*Conscientiousness*: tendency to show planned, self-disciplined behavior and to control, regulate, and direct impulses.

*Emotional stability*: tendency to avoid unpleasant emotions and excessive sensitivity as well as to be calm and free from persistent negative feelings.

*Openness to experience*: tendency to appreciate new emotions, unconventional beliefs, adventure, curiosity, and a variety of experiences.

The Italian edition of BFQ, adapted by Caprara, Barbaranelli and Borgogni (1993), was used for our study.

### **RESULTS**

Preliminary analyses on the whole sample (Table 1) show significant differences between genders in one out of three motivational factors (self and sociality), and in three out of five personality factors: energy/activity and emotional stability are higher in females, and conscientiousness is higher in males, as expected on the basis of the general standardization of the test. Therefore, subsequent analyses were performed while taking into account the gender variable.

**Table 1:** Gender differences in motivation and personality factors.

	<i>M</i>		<i>F</i>		<i>t</i>
	<i>Mean</i>	<i>s.d.</i>	<i>Mean</i>	<i>s.d.</i>	
Curiosity and discovery	3.39	0.78	3.32	0.89	1.11
Out-of-routine	1.88	0.98	1.85	1.03	0.34
Self and sociality	3.05	0.78	3.26	0.79	-3.64*
Energy/Activity	78.43	8.96	76.33	8.80	3.23*
Agreeableness/Cooperation	79.23	8.98	80.43	9.69	-1.74
Conscientiousness	82.42	9.59	79.51	10.49	3.93*
Emotional stability	72.47	14.94	68.00	12.18	4.51*
Openness to experience	80.60	8.58	79.20	10.53	1.98

\*  $p < 0.05$ , after Bonferroni's correction

Independent sample t tests were conducted to examine whether tourist motivations differed significantly by group of tourists (tables 2 and 3). Significant differences in all three motivational variables were found between the two groups. In particular, cruise ship passengers compared with religious tourists have significantly higher scores in curiosity/discovery, out-of-routine, and self/sociality factors. These differences are found for both males and females.

Regarding personality factors, significant differences were found between the two groups divided by gender. In fact, as Table 2 shows, male cruisers have higher scores in the BFQ energy factor than do male religious tourists, while male religious tourists have higher scores in the agreeableness factor. Comparing the two groups of male tourists, no difference was found in the other personality factors.

A similar pattern of differences occurs in the female sample (Table 3), in which cruise tourists have higher scores in energy (as is the case with males) and also in the openness-to-experience factor. As do males, female religious tourists have higher scores in the agreeableness factor.

**Table 2:** Differences in motivation and personality factors in different types of male tourists.

	<i>Religious Tourists</i>		<i>Cruise Tourists</i>		<i>t</i>
	<i>Mean</i>	<i>s.d.</i>	<i>Mean</i>	<i>s.d.</i>	
Curiosity and discovery	3.33	0.86	3.53	0.51	-2.23*
Out-of-routine	1.40	0.48	3.02	0.94	-21.27*
Self and sociality	2.92	0.72	3.37	0.83	-5.03*
Energy/Activity	77.66	9.01	80.32	8.58	-2.53*
Agreeableness/Cooperation	82.64	8.04	71.00	4.85	13.56*
Conscientiousness	81.85	7.77	83.79	12.92	-1.72
Emotional stability	71.51	12.17	74.78	20.02	-1.86
Openness to experience	80.57	8.65	80.69	8.45	-0.13

\*  $p < 0.05$ , after Bonferroni's correction

**Table 3:** Differences in motivation and personality factors in different types of female tourists.

	<i>Religious Tourists</i>		<i>Cruise Tourists</i>		<i>t</i>
	<i>Mean</i>	<i>s.d.</i>	<i>Mean</i>	<i>s.d.</i>	
Curiosity and discovery	2.94	0.92	3.86	0.50	-9.47*
Out-of-routine	1.38	0.49	3.34	0.83	-26.86*
Self and sociality	3.13	0.75	3.81	0.58	-8.12*
Energy/Activity	75.28	8.50	79.05	9.48	-3.59*
Agreeableness/Cooperation	83.17	8.91	71.71	6.81	11.48*
Conscientiousness	79.49	9.98	77.79	11.99	1.34
Emotional stability	68.61	12.17	67.19	11.32	-0.99
Openness to experience	77.45	10.44	82.02	10.22	-3.69*

\*  $p < 0.05$ , after Bonferroni's correction

A discriminant analysis performed on the whole sample confirmed the utility of the motivational and personality variables in differentiating the two groups. For motivational factors, the analysis obtained a Wilks' Lambda =

0.38,  $F = 413.76$  ( $p < 0.001$ ), canonical correlation = 0.79. The classification matrix yields a satisfying total percentage of correct classification (0.90). The most discriminant factor is out-of-routine ( $F$ -to-remove = 985.81), and the less discriminant is curiosity/discovery ( $F = 0.02$ ).

For personality traits, an analogous analysis obtained a Wilks' Lambda = 0.64,  $F = 83.81$  ( $p < 0.001$ ), canonical correlation = 0.60, total percentage of correct classification = 0.84. The most discriminant factor is agreeableness ( $F$ -to-remove = 377.87), and the less discriminant is conscientiousness ( $F = 0.92$ ).

A multiple regression analysis separated by group of tourists was carried out to explore what personality traits, measured by BFQ scores, significantly predict the motivations for travel in each group.

Table 4 shows that in the religious tourists group, the openness trait (positively) and agreeableness (negatively) are predictive for motivation to curiosity and discovery. The agreeableness and conscientiousness traits, both negatively, are also predictive of out-of-routine motivation. Finally, the openness-to-experience trait is negatively linked to self-and-sociality factor scores.

In the cruiser group, the regression analysis (Table 5) shows a different pattern. Curiosity motivation is positively predicted both by openness (as in the other group) and agreeableness; in the religious group, this predictor was in the opposite direction. Curiosity is also predicted inversely by conscientiousness. Conscientiousness and emotional stability predict, both negatively, out-of-routine motivation. While for the religious tourist group the openness-to-experience trait negatively predicts self-and-sociality motivation, for the cruisers, the trait is positively linked to this motivation, which is also predicted by the energy and conscientiousness traits.

**Table 4:** Multiple regression analysis of personality traits on motivational variables for religious tourists.

<i>Dependent Variables:</i>	<i>Curiosity and discovery</i> $R^2=0.15$		<i>Out-of-Routine</i> $R^2=0.22$		<i>Self and Sociality</i> $R^2=0.20$	
	<i>Std</i> <i>coeffic.</i>	<i>t</i>	<i>Std</i> <i>coeffic.</i>	<i>t</i>	<i>Std</i> <i>coeffic.</i>	<i>t</i>
Predictors:						
Energy/ Activity	0.02	0.41	-0.02	-0.37	0.08	1.56
Agreeableness/ Cooperation	-0.11	-2.31*	-0.18	-4.04*	-0.01	-0.23
Conscientiousness	-0.01	-0.16	-0.11	-2.11*	-0.06	-1.22
Emotional stability	-0.02	-0.46	0.01	0.22	-0.03	-0.60
Openness to experience	0.13	2.44*	0.01	0.28	-0.17	-3.34*

\*  $p < 0.05$

**Table 5** – Multiple regression analysis of personality traits on motivational variables for cruise tourists.

<i>Dependent Variables:</i>	<i>Curiosity and discovery</i> $R^2=0.24$		<i>Out-of-Routine</i> $R^2=0.21$		<i>Self and Sociality</i> $R^2=0.28$	
	<i>Std</i> <i>coeffic.</i>	<i>t</i>	<i>Std</i> <i>coeffic.</i>	<i>t</i>	<i>Std</i> <i>coeffic.</i>	<i>t</i>
Predictors:						
Energy/ Activity	0.00	0.04	-0.18	-1.87	-0.42	-4.46*
Agreeableness/	0.15	2.07*	-0.02	-0.31	0.07	1.01

Cooperation						
Conscientiousness	-0.57	-5.67*	-0.36	-3.53*	-0.50	-5.05*
Emotional stability	-0.12	-1.65	-0.15	-1.96*	-0.11	-1.53
Openness to experience	0.42	3.66*	0.17	1.50	0.65	5.84*

\*  $p < 0.05$

## DISCUSSION

The purpose of this study was to explore motivations for choosing different types of travel—in particular, religious tourism and cruise ship tourism—and the relationship between such motivation and personality traits.

Data show that cruisers, compared with religious tourists, seem to be characterized by the strongest motivations, showing significantly higher scores in curiosity-and-discovery, out-of-routine, and self-and-sociality factors. We can hypothesize that, in the experience of religious tourism, the travel generates less curiosity to see new things and to be willing to meet new people, with the spirit of inquiry and adventure or a willingness to change the previous outlook on life being less prevalent. Religious tourists, probably driven mainly by reasons of faith, do not start to feel out of their routines, as the people's religious sentiment creates a continuum between everyday life and travel. Compared with the cruise ship tourists, religious tourists have a less marked dynamic personality—i.e., a confident and enthusiastic approach to the various circumstances of life; they are less openness to experience—a willingness to accept new ideas and others' values and feelings. According to the principles of their faiths, religious travelers are more cooperative and empathic and have a friendlier attitude.

Moreover, the findings of our research indicate that motivations to travel are predicted by specific personality traits, some similar and other divergent, in different types of tourists.

Openness to experience, i.e. a willingness to understand new ideas and to appreciate others' values, positively predict curiosity for discovery both in religious and cruiser tourists; in both groups, conscientiousness (i.e., the tendency to control and to regulate impulses and show self-discipline) is a negative predictor of out-of-routine motivation.

Some personality traits are predictors that differentiate motivations in the religious and cruise travelers. Agreeableness (i.e., predisposition to friendliness) predicts curiosity negatively in religious tourists, while the opposite case exists for cruisers, who are more driven by relational aspects and expectations in search for discovery. Openness to experience is a positive predictor of the motivation for traveling, linked to self and sociality in cruisers, who are more open to variety in emotional experiences, while the opposite happens in religious tourists, who tend to prefer familiarity over novelty. Out-of-routine motivation is negatively predicted by agreeableness in religious tourists and by emotional stability in cruisers. This signifies that travelers for religious reasons tend to preserve usual routines when they are more disposed to friendliness, while those who choose cruise ship travel tend to maintain routines depending on their emotional instability, i.e., their tendency to experience unpleasant emotions easily. Finally, motivations that are pertinent to self and sociality are negatively predicted in cruisers by energy and conscientiousness, i.e., characteristics such as surgency and assertiveness and preference for planned rather than spontaneous behaviors.

The complexity of the experience of each type of tourism, the inherent heterogeneity of motivational components and content, and the difficulty with ordering them in a unified theory are all evident. For this reason, we think that trying to capture the motivations—also on the basis of personality traits—of specific categories of tourists can be a useful tool for designing appropriate marketing campaigns and for supporting a choice of the trip.

To know specific tourists' attitudes, perceptions, motivations is relevant for promoting their satisfaction (Ryan 1995), and for developing more suitable services and promotional activities by tourism marketers. Also, personality traits could be predictors of satisfaction both during and after traveling differentiating the genders.

Tour operators and guides should pay attention to participants' specific personality traits to ensure optimal treatment in organizing and monitoring different types of touristic experiences.

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## **A Comparison of Different Approaches to Self-Evaluation Processes**

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### **ABSTRACT**

The paper is based on the results achieved in the common project concerning quality assurance processes in Portugal and Slovakia. Over the past decades, countries all over the world have become increasingly concerned about the level of education of their citizens. Quality of primary and lower secondary education can significantly influence the life of young people, particularly the approach of learners to further education, either formal or informal. Results from PISA show educators and policy makers the quality and equity of learning outcomes achieved in different countries, and allow them to learn from the policies and practices applied in diverse contexts. The quality assurance processes in Slovakia and Portugal as well as PISA results achieved by young people in these countries will be analysed and discussed.

**Key words:** quality assurance, self-evaluation processes, policies and practices in Slovakia and Portugal

### **INTRODUCTION**

Most educators and teachers would like to offer education of high quality to their learners as they consider them followers of what they have achieved. In general, teachers want their students to reach more than they have achieved as teachers are ones that inspire, guide, enlighten and motivate. While fifty years ago, education was based on knowledge, later skills, currently, the focus is on competences. However, it is not possible to develop our competencies without being knowledgeable and skilful. A 21<sup>st</sup> century market place challenges educational institutions since the changing environments require different approaches to education from ones that used to be sufficient. The labour market demands higher-level skills, such as several information-processing skills. According to frameworks from European Skills, Competences, Qualifications and Occupations (ESCO), three broad categories are presented: foundational literacies, competencies and character qualities. The category of literacies includes literacy and numeracy that are globally assessed, but also scientific literacy, ICT literacy, financial literacy and cultural and civic literacy that are considered core skills to everyday tasks. Since the abilities concerning identifying, analysing and evaluating situations and information in order to formulate responses to problems are in demand, critical thinking or problem solving is the way of approaching complex challenges, apart from creativity, communication and collaboration. The 21<sup>st</sup> century requires character qualities such as curiosity, initiative, persistence, adaptability, leadership, and social and cultural awareness (World Economic Forum, 2015).

Some of the above-mentioned key competences and skills are assessed through performances of learners as well as employed people across countries. The comparison of the results reveals how variably certain literacies and

competencies are perceived in different local contexts due to culture, experiences and open-mindedness. On the other hand, it is important to mention that countries have developed differently and some of them can respond more slowly to changing societies, innovation-driven economy and more challenging demands of the labour market.

## **THE STUDY**

Within the common project called ‘Self-evaluation Relevant for Primary and Secondary Schools as a Process Towards Improvements and Quality Assurance’ that has been carried out since 2016 in cooperation between Trnava University and Porto University within the grant scheme of Portuguese and Slovak Research and Development Agencies, researchers from Porto University and Trnava University focused on the changes in their societies, comparing the system of quality assurance, prevalingly self-evaluation processes. During research, three researchers from Porto University visited primary and secondary schools in Slovakia in May 2016 and three university teachers from Trnava University visited primary and secondary schools in Portugal, observing self-evaluation processes in different local contexts and analyzing them. Therefore, several studies have been conducted so far. This study focuses on comparing scores in literacies and competences achieved by respondents from both Portugal and Slovakia.

## **THE STUDY ON COMPETENCIES OF ADULTS**

The Programme for the International Assessment of Adult Competencies (PIAAC) is the first international survey of skills used by adults in their work. This survey of adult skills or competences measures adults’ proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments – and gathers information and data on how adults use their skills at home, at work and in the wider community. This programme is supported by the European Union as life-long education is one of 16 key indicators that are important to meet Lisbon goals in the domain of education. The programme focuses on literacies of adults such as reading, mathematical and problem-solving in technology-rich environments and how adults develop these literacies, how they use them and what benefits they can get from using them. The gathered information reveals how these literacies influence adults’ participation in the labour market, income, health, social and political engagement. What is more it can provide information about effectiveness of education and technical preparation and help adjust tools of educational policies for development of key competencies that enable adults to fit the labour market and society in general. The survey was conducted in 2011-2012, using data from 157,000 adults at the age 16-65 from 24 countries (22 OECD member states and two partner countries). The survey in Slovakia was conducted on the sample of 5,702 adults (2,697 males and 3,005 females). The survey of adults’ competencies (PIAAC) measures the effectiveness of the educational system and can be considered an independent external system of evaluation of the level of education in the country and the effectiveness of secondary schools and higher education institutions. The results of Slovak adults in reading literacy show that the Slovak system of education focuses on average reading skills achievements and the number of graduates with a higher level of reading literacy is lower than in other countries such as Poland and Ireland. A lower level of mathematical literacy of young Slovak adults might result from the loss of position mathematics used to have as one of the main general subjects by decreasing the number of lessons per week, reduction of subject content and exclusion of maths from the list of obligatory subjects in the school-leaving examinations. According to the results (PIAAC, 2016), a long-term decrease of mathematical literacy was not compensated by a significant increase of reading literacy. The interventions into the system of education in the previous years led to the decline of mathematical literacy and did not mean the growth of reading literacy.

Problem solving in technology-rich environments is based on a combination of computer literacy (the ability to use ICT tools) and cognitive skills that are necessary while solving problems. The goal of testing was not to measure an isolated skill of using ICT applications but to judge the ability of adults to use ICT meaningfully and systematically to get, retrieve and analyse information. The difficulty of tasks is linked with cognitive demands and tasks complexity as well as the character of equipment and applications necessary for achieving the results. For example, a more demanding task requires information transfer from one application to another, subsequently transformed into the procedures that lead to reaching the goal, while using several steps and tackling the obstacles (Bunčák et al., 2013).

As 22% of Slovak respondents did not have previous experience with using a computer, 2.2% of respondents did not take a basic test of computer literacy and 12.2% decided to be tested in paper form. The proficiency test in solving problems in technically-developed environments was done by 63.6% of computer-literate respondents. Out of 36.4% of those who did not take part in this test, two-thirds were not able to sit such a test at all. In this case, Slovakia alongside with Italy, Poland, Korea and Spain is a country in which one-fourth of population is computer illiterate. From the present-day perspective, these people are in a similar situation as people in the half of the last century were, when they could not read and write (Bunčák et al., 2013).

In an international comparison of inhabitants' abilities to solve problems in technology-rich environments, Slovakia lags behind the OECD average. In contrast with reading and mathematical literacies, the level of abilities to solve problems in technically-developed environment matches the level of achieved education in a lesser extent. Reading and mathematical literacies are mutually linked by a strong correlation, a higher level in one literacy correlates with a higher level in another one in the OECD countries, despite the fact they are based on two different types of literacies. The correlation coefficient in the OECD countries is 0.867 and in Slovakia 0.855 (OECD Skills Outlook, 2013).

On the contrary such a strong correlation does not exist between reading and mathematical literacies on one side and ICT literacy in a technology-rich environment on the other side. It is natural that more and more people can achieve a higher level of reading and mathematics, however, they are ICT illiterate as the former literacies are traditionally supported literacies, while the latter is completely new for an older generation.

Average	Reading literacy	Mathematical literacy	ICT literacy
OECD countries	273	269	34
Slovakia	274	276	26

Table 1 A comparison of averages in reading, mathematics and ICT literacy in Slovakia and OECD countries

Due to the character of these three literacies, there are significant differences between the levels achieved by inhabitants in each of OECD countries. In an international comparison with other OECD countries, the representatives from Slovakia have achieved average reading literacy, above-average mathematical literacy, and a below-average level of ability to solve problems in technology-rich environments (Table 1). In the Slovak Republic, more than 20% of the most proficient adults are out of the labour force, which represents a relatively large pool of skills that could be activated and Slovakia should make greater economic use of their highly skilled talent pool (OECD, 2013).

## STUDIES OF COMPETENCES OF 15-YEAR OLDS

The Programme for International Student Assessment (PISA) is a worldwide study, organised by the Organisation for Economic Co-operation and Development (OECD) conducted in member and non-member countries of 15-year-old school pupils' scholastic performances on mathematics, science, and reading. It was first performed in 2000 and then repeated every three years. Its aim is to provide comparable data with a view to enabling countries to improve their education policies and outcomes. It measures problem solving and cognition in daily life situations, focusing on what 15-year-old students know and what they can do with what they know, having acquired knowledge and skills that should enable them to actively participate in changing societies (OECD, 2014).

As it has been mentioned in the article Quality Assurance – Myth or Reality (Béřešová, 2017), Slovakia is more and more concerned in external measurements of students' performances, introducing external school-leaving examinations in 2000, later followed by Monitor 9 and Monitor 5. The school-leaving examinations are taken by secondary-school leavers obligatorily in the mother tongues and target languages, and voluntarily in mathematics. However, the results achieved by students are still not accepted by universities as they are autonomous bodies and can claim their own requirements for admission processes. Monitor 9 is obligatory for students who complete their primary school education and the results from the external part can influence their admission at secondary schools, prevailing at secondary grammar schools. Monitor 5 was piloted last year by those who voluntarily wanted to participate in the external measurement process. The idea behind the introduction of external measurement was to ensure validity, reliability and objectivity.

On the contrary, the Portuguese society emphasises internal evaluation through self-evaluation processes. The emphasis is placed on the operation of primary and secondary schools as a whole. Good learning environments promote students' involvement in learning processes, parents' engagements in school functioning and teachers' initiatives in improving their teaching. The role of school management resulted from the programme called "New Opportunities" that enabled to introduce "school clusters" bridging together several schools in a single educational project. Professionally managed school activities remain therefore of high priority.

The changing conditions in both countries have had an impact on education. For the comparison of different approaches to evaluation processes, it seemed to be logical to use data based on officially-conducted assessment of those who are affected by the introduced changes. In the following analysis the scores of 15-year-old students from both countries are compared. The data chosen for a detailed examination are the students' achievements in PISA 2012 and PISA 2015.

In each of their cycles, PISA examines three areas of functional literacy of students – mathematical, scientific and reading literacies. Approximately half of the test items are devoted to the tasks of the main domain. 512,343 students from 65 countries, out of which 34 were OECD countries and 31 so called partner countries took part in PISA measurements in 2012. Slovakia had taken part in PISA measurements for the fourth time and Slovak students from 231 schools (4,678 in paper and 1,059 in electronic forms) were tested in mathematical, reading, scientific and financial literacies. The number of girls (2,748) was higher than the number of boys (2,654).

Focusing on an analysis of two countries, Portugal and Slovakia, it is necessary to conclude that students from both countries reached a mean score in mathematics lower than the mean score of OECD countries (494). Despite the fact that both countries did not reach the mean score of OECD countries (496) in reading literacy, the mean score of Portuguese students is much higher than that of Slovak students. Quite a big difference between Portuguese and Slovak students is recognisable in scientific literacy the OECD mean score of which was 501 (Table 2).

Countries	Science	Mathematics	Reading
OECD countries	501	494	496
Portugal	489	487	488
Slovakia	471	482	463

Table 2 Mean Scores in PISA 2012

In 2015, the main testing domain was scientific literacy. The rest of the tasks were distributed between two other domains, supplemented by team problem-solving, the results of which will be presented in October/November 2017. Pisa study 2015 went through significant changes in testing as the countries could join the electronic way of measurement. The total number of countries that participated in the last measurement cycle was 72 countries and 25 regions of the world (35 OECD countries and 62 so called partner countries and regions) with a total number of test-takers – 540,000 students. In Slovakia, 292 schools holding 6,350 students (3,035 girls and 3,315 boys) took part in PISA measurements in 2015.

Countries	Science	Mathematics	Reading
OECD countries	493	490	493
Portugal	501	492	498
Slovakia	461	475	453

Table 3 Mean Scores in PISA 2015

Despite the fact that the average performance of the OECD countries in scientific literacy decreases on the value of 493 points, Slovakia achieved the average score that is below the average of the participated countries of the OECD. The performance of Slovak students reached the level of 461 points. On the other hand, the average score of Portuguese students is higher than the average score of the OECD countries. Very similar conclusions can be made about other literacies. In mathematic literacy, Slovakia reached 475 points that is significantly lower than the average of the OECD countries (490 points). As for reading literacy, Slovak students achieved the average performance at the level of 453 points that is 40 points lower than the OECD average (Table 3). In all literacies, Portuguese students reached above-average scores. Comparing surveys PISA from 2012 and 2015, Portugal achieved plus scored differences, while Slovak students achieved minus score differences.

## CONCLUSIONS

Both external evaluations presented above (PIAAC and PISA) might be a basis for several conclusions for presenting strengths and weaknesses of the system of education in Slovakia, using the data from assessed

literacies of its population. The strength of Slovakia is an ability to ensure an average level of reading and mathematical literacies of those who have completed a secondary level of education. Weaknesses include a long-term stagnation of developing reading literacy, long-term decrease of supporting to increase mathematical literacy and a lack of ensuring an average level of inhabitants' ICT literacy – the ability to solve problems in a technically-developed environment.

In this piece of research that examines literacies, it was not possible to compare the adults' competences in Portugal and Slovakia as the former did not take part in the PIAAC the survey of which gathers a lot of information about reading and mathematical literacies, and strategies related to using information communication technologies at work and in everyday life, as well as general competencies such as an ability to co-operate with others. Respondents were expected to answer the questions concerning the matching of their skills and qualifications to working requirements, their autonomy to carry out key activities of their work.

On the other hand, both compared countries participated in PISA surveys that try to find the ways of better educational conditions to enable students to learn better, teachers to teach better and schools to become more effective in activities they provide (OECD, 2014). Despite the fact that external evaluation in Portugal is not introduced, their system of self-evaluation seems to work effectively as the results of their 15-year-old students from two different measurements (PISA 2012 and PISA 2015) proved that they had been better prepared for using their strategies and could better develop reading, mathematical and scientific literacies during their years of schooling.

Despite the fact that PIAAC surveys confirmed a quite satisfactory level of reading and mathematical literacies in Slovakia, it revealed big problems with using ICT by current working power in the country. On the other hand, PISA surveys confirmed stagnation of the effectiveness of the educational system. The unsatisfactory results of Slovak 15-year-olds are a challenge for the country to change education in order to improve literacies of their students. The previously conducted changes such as prolonging formal education or increasing the number of secondary-school leavers and university graduates did not improve learning outcomes of students and a current system of education in Slovakia is not able to meet the requirements of modern societies.

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## A Comparison of Self-Evaluation and Evaluation of Using ICT in Home Learning

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### ABSTRACT

The paper deals with using ICT in home learning while preparing for any class at school. Within the project related to self-evaluation processes, the article focuses on a comparison of students' self-evaluation, measured by a questionnaire, and real data achieved in practical tasks. The indicators are based on the national educational programme for ICT learning outcomes to get objective measurement of learners' skills. The data will be analysed and discussed, providing a set of recommendations.

### INTRODUCTION

Each process of human activity is closely related to evaluation, more precisely, assessment. Nowadays there is a profound belief that the process of learning as such depends on the ways and forms of evaluation. The aim of evaluation is to contribute to the success of education as well as the development of pupils' knowledge, skills and competences during their years of schooling. The ultimate user of assessment information that is elicited in order to improve learning is the pupil as assessment information can affect the motivation and self-esteem of pupils (Black & Wiliam, 1998). Many successful innovations have developed self-assessment by pupils as ways of enhancing formative assessment. The pupils can assess themselves when they have a sufficiently clear picture of objectives their learning is meant to attain. Their assessments should be discussed with their teachers and peers as it promotes the reflection on their own thinking that is important for good learning. According to Black and Wiliam (1998), it seems to be important for learners to be able to recognise the desired goal, to be aware of evidence about present situation, and to understand, to some degree, a way to close the gap between the two in order to improve learning.

Life in modern society is based on the use of ICT tools. The ICT tools are omnipresent and their users face significant demands. With the rise of the so-called information society, the views on the contemporary education system and its significance are changing. ICT tools contributing to effective education represent innovation trends. Their proper use and implementation contribute to the whole process of education. As a result of this, the users of ICT tools, e. g. computers, face higher and higher requirements. This was the main motivation to carry out a study, based on a comparison of real computer skills of students with the skills assessed by themselves in their self-evaluation sheets. These sheets contained the criteria relevant for competent computer users. For the purposes of this study, secondary-school students were addressed and asked to participate.



Picture 1 Success and self-evaluation

### SELF-EVALUATION

Each human activity leads towards achieving a specific goal. The way to achieve the goals consists of several mutually conditioned stages. It is necessary to set the desired goal correctly, be it a need, a wish, an idea or a formulation of a goal, followed by the recognition of its state. A crucial stage in the achieving of the goal is

design of activities necessary to the most effective achievement of the goal, followed by the stage of achieving the plan, evaluation of the results and, above all, the comparison of the achieved goal with the initial idea. As a conclusion, evaluation is an organic part of all human activities.

Evaluation is closely related to self-evaluation, which is one of the most important competences for life. Knowing the weaknesses and strengths moves an individual forwards. The main reason for self-evaluation is to learn, which skills and knowledge an individual has in a specific area.

The foundation of self-evaluation is the complete acceptance of the self-evaluation results. Self-evaluation becomes successful primarily when an individual can set realistic goals, putting a maximum effort to their completion, followed by setting new goals. Speaking of self-evaluation, a specific feedback is the crucial factor. Self-evaluation can lead the students to the ability to judge the quality of their own work and consequently they can determine and plan the ways of their own self-improvement. It leads to students' independence and autonomy that allow them to recognize their own knowledge and skills, their strengths and weaknesses, and create the space for making a real picture of the self. Self-evaluation can have several forms and in educational context, its orientation depends on the decision of the school, or the teacher.

It is inappropriate to reduce self-evaluation to bipolar scales, e. g. I know – I don't know or I can – I can't. Such self-evaluation is not sufficiently holistic; it is simplistic and leads to schematization in evaluation, and finally, to typecasting. That is not the purpose of self-evaluation. It is always necessary to analyse the causes, to accept development strategies and to highlight the positives. The areas of students' assessment should be as varied as possible to make enough room for expressing their strengths and to allow them to experience success and the feel of personal freedom.

## **INFORMATION AND COMMUNICATION TECHNOLOGY**

For the purposes of this study, it is necessary to distinguish technologies from information and communication technology. The term "technologies" refers to technical tools, procedures and skills used for achieving specific goals that should bring practical results. The expression "information and communication technology" refers to computer and communication technology that supports, in their unique way, teaching, learning and other education activities. These technologies are used for collecting, retrieving and exchanging information. For these purposes, traditional media, such as television, radio, personal computers with multimedia support, input and output devices are used (Suchý, 2007). Using ICT tools in education brings directly various positive aspects, such as the **individualisation** of education process, the development of **self-reliance** and **creativity** of students or individual tempo of learning of the students themselves.

## **THE IMPACT OF STUDENTS' HOME PREPARATION FOR USING ICT TOOLS**

The process of home preparation of students has its meaning and purpose. While practising at home, students are expected to learn new material to be able achieve goals stated in the curriculum. Teachers perceive home preparation and homework as a natural part of students' preparation for school (Petlák & Komora, 2003).

## **RESEARCH**

The aim of this study was to compare the real competence of students using the ICT with the answers the students provided in the presented self-evaluation sheets. Each sheet contained 10 evaluation criteria, resulted from basic to more complex tasks. Consequently, students were given tasks, based on the criteria from the sheet, and were expected to solve them using a personal computer. The gathered data were analysed and evaluated. The study sample consisted of 55 selected secondary-school students who have achieved varied results so far. The aim of the presented study was to identify the differences in self-evaluation of students in a common secondary-school class and their ability to use ICT tools.

## **CRITERIA OF RESEARCH**

The presented self-evaluation sheet contained the criteria listed below and the participating students were expected to assess their knowledge on the 1–5 rating scale in Table 1 below, which corresponds to the marking schemes used by their teachers. The formulation of the criteria was based on the required knowledge of the students. As it has been already written, the tasks were ranging from basic to more complex.

Self-evaluation sheet criteria:

- 1) **To look up specific information on the Internet** – the task was to search for information on the Internet and process it appropriately. This task focused on the use of the Internet, searching engines as well as applying logical thinking when formulating the search command.

- 2) **To edit a picture according to the instructions** – the task was to edit a picture in a software product of students' choice (to resize, to cut, to add an object, a text, etc.).
- 3) **To connect a computer with a specific output device** – the task was to connect a personal computer with an output device, e. g. a printer, a projector, a scanner, etc. The criterion for completing this task was the functionality of the devices.
- 4) **To edit a text document according to the instructions** – the task was to edit the given text document in a selected software tool (to resize the font, to change its size, colour; text margins, spacing, heading, paragraphs).
- 5) **To edit a table** – the task was to make a table according to the given variables with specific values. Then the students had to use different software functions to calculate the average scores, total scores, and the maximum and minimum scores. The achieved results were supposed to be expressed in graphs.
- 6) **To edit a presentation** – the task was to edit the given presentation according to the instructions (to change the layout, size and colour of headings, to add a picture, a video, and a graph).
- 7) **To edit a video file** – the task was to cut out the required sequence, to add subtitles, a sound signal and to save the new file in a required format in software of their choice.
- 8) **To identify individual hardware elements of ICT tools** – the task was to identify the presented hardware elements and to match them with the relevant descriptions of their functions.
- 9) **To install and uninstall a specific software product** – the task was to install and uninstall the given software products correctly.
- 10) **To identify the IP address of a computer** – the task was to identify the correct IP address of a personal computer.

Table 1 presents the rating scale designed for students' self-evaluation of their knowledge and skills. These criteria were presented to the respondents with self-evaluation sheets.

	<b>Levels of proficiency</b>	<b>Skills</b>
<b>1</b>	Excellent knowledge	The level of knowledge is excellent. Students can use theoretical knowledge in practical tasks promptly, independently and creatively; they can apply knowledge practically and accomplish practical tasks promptly. They can follow procedures.
<b>2</b>	Very good knowledge (above average)	The knowledge is of a very good quality, with small gaps. Students use theoretical knowledge, but with less creativity and less certainty in practical tasks that they accomplish independently. The results of their work have small deficiencies, showing room for partial improvement of their knowledge.
<b>3</b>	Good knowledge	The knowledge is of a lesser quality with some deficiencies. Students apply theoretical knowledge in practical tasks with problems. They cannot always complete the task. There is more room for improvement and it is necessary to build up strengths and to minimize weaknesses.
<b>4</b>	Satisfactory knowledge (below average)	There are significant gaps in the complexity of theoretical knowledge. Students make bigger mistakes in accomplishing tasks and the results of their work show significant deficiencies. It is necessary to systematically support the acquisition of necessary knowledge.
<b>5</b>	Unsatisfactory knowledge (a minimum of knowledge)	None or unsatisfactory, minimal knowledge at hand. Students cannot apply their theoretical knowledge in practical tasks. The results show unacceptable deficiencies as they are incomplete, inaccurate. Students do not reach the lowest score of required indicators.

Table 1 Self-evaluation rating scale

After filling out the self-evaluation sheets the respondents were given ten tasks based on the self-evaluation criteria on the form. The total time for the tasks was 50 minutes. The tasks were assessed by the students' teachers and the performances were compared with self-evaluation sheets that the students filled out before accomplishing the tasks. These results are presented in Table 2 below and two graphs.

## RESULTS OF THE RESEARCH

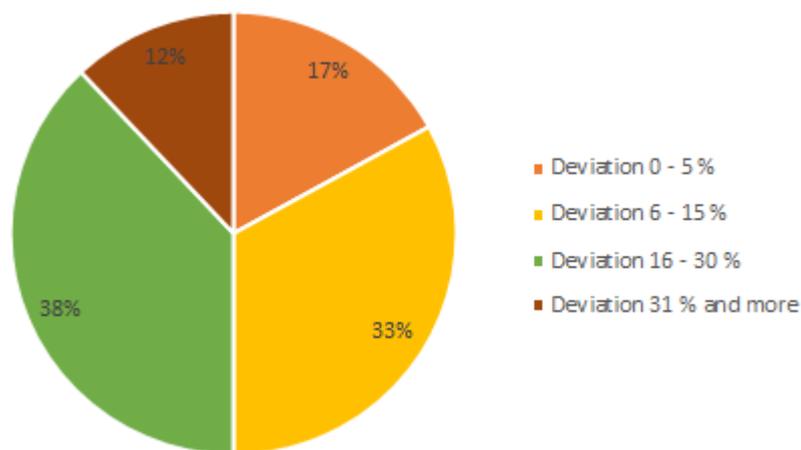
Table 2 presents the achieved scores of students with their self-evaluation indicated in the self-evaluation sheets. The final column contains the difference between these two values in percentage. The overestimated answers of students are in red, the underestimated answers are in green. The final line in the table summarizes the average

scores of individual columns. The table confirms that the students overestimated their knowledge and skills in eight tasks and underestimated their knowledge and skills only twice. The conclusion of this part of the study is that students exude a great degree of self-confidence.

	<b>Self-evaluation criteria</b>	<b>Students' self-evaluation</b>	<b>Achieved scores</b>	<b>The difference in percentage</b>
1	To look up specific information on the Internet	58	40	23,2 %
2	To edit a picture according to the instructions	62	49	30,38 %
3	To connect a computer with a specific output device	60	48	28,8 %
4	To edit a text document according to the instructions	35	39	13,65 %
5	To edit a table	78	54	42,12 %
6	To edit a presentation	55	46	25,3 %
7	To edit a video file	64	52	33,28 %
8	To identify individual hardware elements of ICT tools	42	46	19,32 %
9	To install and uninstall a specific software product	55	45	24,75 %
10	To identify the IP address of a computer	72	52	37,44 %
	<b>The average scores</b>	<b>58,1</b>	<b>47,1</b>	<b>27,82</b>

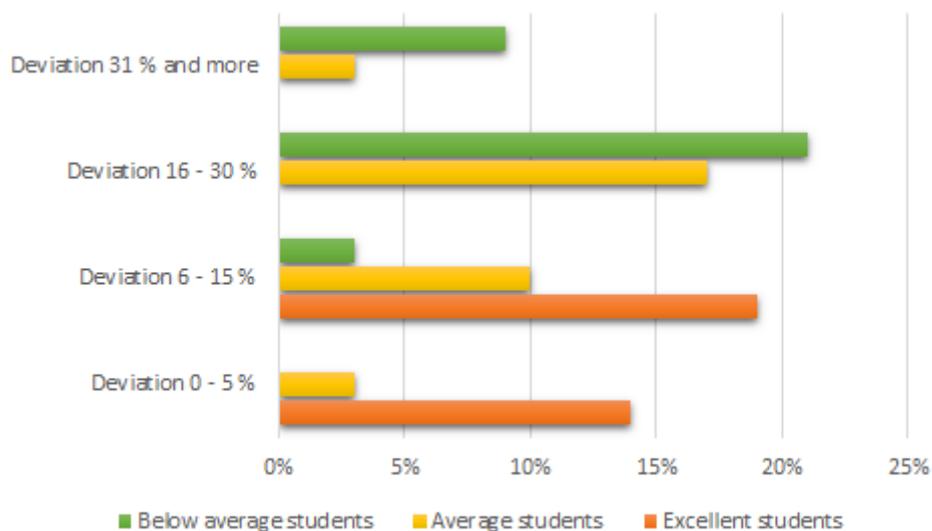
Table 2 Result of research

Graph 1 depicts the results of students' self-evaluation of knowledge. The first group consists of students who assessed their knowledge as excellent with the deviation of 0-5%. The graph shows that 17% of respondents assessed their knowledge correctly. One third of respondents assessed their knowledge with a deviation of 6 to 15%. It can be concluded that these students assessed their knowledge at an appropriate level. Thirty-eight percent of students assessed their knowledge with a deviation 15-30%. In most cases, the students overestimated their knowledge and skills. These students cannot assess their knowledge objectively. The last group consists of the students who assessed their knowledge with a deviation of more than 30%. This group makes up only 12% of all respondents.



Picture 2 Assessment of students' knowledge with specific deviations

The following graph depicts students' self-evaluation distributed to groups according to their scores: students with excellent study results, students with average study mean and students with results below and above the average.



Picture 3 Self-evaluation according to individual groups of students

The results presented in the graphs above definitely prove, that self-evaluation is an important part of life. A fair assessment of skills and abilities enables the people to achieve the best results in all spheres of life.

## CONCLUSIONS

The submitted paper presents the results of a study in secondary-school students' of their knowledge and skills. This study was aimed at the use of the ICT tools because nowadays they are an inseparable part of the educational process. These modern devices are used by students in their home preparation for lessons. The study revealed that the students cannot assess their knowledge at the desired level. In most cases these students overestimated their skills. The students with excellent study results were able to evaluate their ICT knowledge and skills best. The students with the average results and results below the average proved their inability to assess their knowledge and skills objectively. The study revealed the importance of self-assessment, because if individuals are able to assess themselves objectively, they can reach their goals and move forwards, whether in their career or personal life.

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## PICTURES ADOPTED FROM

- <http://glowing-global.co.uk/glowing-global-reveal-the-missing-link-between-drive-and-success/>
- <https://toslandvoice.com/self-evaluation/>

# **A Comparison of Writing Skills Between the Students Frequently and Rarely Using the Programs Such as Whatsapp and Messenger**

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## **ABSTRACT**

The main aim of the writing education is to reveal the individual's feelings and thoughts. In other words, writing is one of ways to communicate with others and to express oneself. In today's education system, writing studies have a very important place. When the writing studies in the learning and teaching process are supported by the activities of interpretation and evaluation, it seems that the targeted achievement is reached much earlier. Technology is an indispensable fact of life in almost every field in the 21st century. Almost every student has a tablet, a smart phone and a computer depending on the fact we are talking about in this century called technology age. The students constantly communicate with their friends through messages thanks to the programs such as WhatsApp and Messenger that they downloaded with the technological tools. In the study, it is aimed to compare the writing skills between the students frequently and rarely using the programs such as WhatsApp and Messenger. Our study group consists of 60 students receiving education in the secondary education institutions under the Ministry of Education in TRNC. The students were assigned to write a composition for the purpose of data collection. The content analysis, percentage and frequencies were used in the analysis of the data.

**Keywords:** Technology, Education, Messenger, WhatsApp, Writing.

## **INTRODUCTION**

Writing is the process of transferring the feelings, thoughts and dreams in our mind to the paper in accordance with certain rules. Writing that emerges from various needs is an effective and lasting communication way. Today, it is possible to see the patriotism of Turkish people symbolized by the flag in the Turkish national anthem of Akif and the life of Anatolian people in the past in the works of Yakup Kadri and Halide Edip. Therefore, we can say that writing has played an important role in transferring the intergenerational culture. The skills of reading, writing, speaking and listening involved in the basic language skills are based on four basic activities. Among these activities that show complementary qualities each other, the writing skill is the most challenging field for the students compared to the others: "Writing skill is one of the language skills students have the most difficulty due to the psychological, grammatical and cognitive problems faced by the students in writing process (Byrne, 1988, refer Maltepe, 2006)."

Because writing skill is not acquired innately, good education is needed to be able to write effectively and successfully. "Everyone who speaks a natural language gets the first language, or mother tongue, in the first five years after coming into the world. S/he can speak in that language even if s/he does not receive a private or regular education. However, s/he may not learn to write. Even in a language we can speak, we learn how the language is shown in writing, what it is written in a school (Keçik&Uzun, 2001: 63)." As it is known, the students were instructed to make writing studies from the beginning of primary education in order to avoid difficulties in this regard. Thanks to the texts in the Turkish and literature lessons taught in our schools, it is aimed both to be improved the writing skills of the students and to be enjoyed the works of art value due to the perfection of the narration in these works.

In our country, it is observed that the students are insensitive to composition studies. Unfortunately, the insensitivity we are talking about is also accompanied by failure. The fact that examinations in our country, especially university entrance examinations are performed in a test form are one of the main factors affecting this insensitivity. "One of the most important elements affecting the development of writing skills in Turkey is the student selection examination. This examination that is based on the test method and aims to measure whether students understand the text or not dulls the students' ability to write and deprives them of thinking and producing by restricting them into five options. Educating the students with test logic starting from primary

school until the end of high school directs them to a test technique rather than thinking and producing, so that it constitutes the greatest obstacle to the development of writing (Ungan, 2007: 468)." Nevertheless, one of the main factors affecting failure in written narration studies is the restriction of the students by teachers in terms of subject and time. The teacher should carefully adjust the time according to the subject and guide the students during the writing studies. Almost half (46.6%) of the Turkish teachers want students to explain a proverb or saying in their composition studies according to a study conducted by Zorbaz in 2005 (Zorbaz, 2005, refer Ungan, 2007). Because of this situation, the creative writing skills of the students are also damaged. The students should be given freedom, especially in the selection of subjects, and they should be allowed to set their goals. "Determining the goals ensures that students are willing to write. Determination of the written expression must take place in the direction of the student's own request and more than one subject option that will work their imagination and reveal their creativity should be offered to the students (Aktan, 2013: 708)."

The development of information technologies has directly affected the educational life as it is in almost every field. It is an undeniable fact that technology will positively affect education and training if used correctly and on the spot. Today, thanks to technology and the excellent use of technology by the teachers and students, it is known that the educational environments are made more efficient. Today, almost every student has smartphones and tablets and these make it easier for students to access information. However, it is worth noting that which point the students using frequently and careless the programs such as WhatsApp and Messenger installed on computers, tablets and smartphones can be at especially in terms of writing skills. Because it was observed that people using these programs installed on phones and tablets intensively and uncontrollably do not pay any attention to the rules of writing especially when they message each other.

### **THE PURPOSE OF THE STUDY**

The purpose of this study is to identify and compare the mistakes done in the writing studies by students receiving the education in the twelfth grade of high school and frequently and rarely using the programs such as WhatsApp and Messenger. For this purpose, the students receiving the education in the twelfth grade of high school were instructed to write composition.

### **METHOD**

#### **The Universe and The Sampling**

The study's universe consists of twelfth grade students studying in high schools and colleges in the TRNC. The sampling is composed of 60 twelfth grade students studying in high school and college in 2016-2017 academic year. We preferred twelfth grade students because we thought they were at a certain level of writing skills. However, we chose students from both colleges and high schools in order to obtain healthy results.

#### **Data Collection Tools**

A Data Form and Written Expression Assessment Scale were used as data collection tool. The Written Expression Assessment Scale was prepared by using the studies of Ağca (Ağca, 1999) and Demirel and Şahinel (Demirel & Şahinel, 2006), Turkish Program, Ministry of Education. Writing subjects are usually left to students. The composition papers collected from the students were examined and evaluated. In the "Data Form" we mentioned, the students were asked how many hours a day they use the programs such as WhatsApp and Messenger.

#### **Analysis of Data**

The compositions were classified considering how many hours a day students use the programs such as WhatsApp and Messenger. In this direction, 3 headings including "The Compositions Written By Those Who Use The Programs Such As WhatsApp And Messenger For 1-3 Hours A Day", "The Compositions Written By Those Who Use The Programs Such As WhatsApp And Messenger For 4-6 Hours A Day", "The Compositions Written By Those Who Use The Programs Such As WhatsApp And Messenger Over 7 Hours A Day" were created and 20 composition studies were collected under each heading. The data were analyzed by descriptive statistics and content analysis. The collected data in this process were evaluated by spelling mistake, word, main idea, sentence, punctuation, page layout and title.

#### **Findings and Comments**

The results of this study to identify the mistakes in the composition writing by those who frequently and rarely use the programs such as WhatsApp and Messenger are present below:

**Table-I**

Distribution of mistakes by those who use the programs such as WhatsApp and Messenger for 1-3 hours a day	F	%	Mistake Number
Title	7	35	7
Page Layout	5	25	5
Main Idea	6	30	6
Sentence	9	45	26
Word	10	50	39
Punctuation Mistakes	10	50	45
Spelling Mistakes	14	70	105

When we examine Table-I, it is seen that the most spelling mistakes made by the students who use the programs such as WhatsApp and Messenger for 1-3 hours a day. It was observed that the 14 of the 20 students made 105 spelling mistakes in total. It was seen that the students had a great difficulty in writing the words "something (bir şey), everything (her şey), nothing (hiçbir) etc.". Nevertheless, it was observed that the mistakes were substantially made especially in the writing of "ki" conjunction in Turkish. It is possible to link the fact that students made so many spelling mistakes to the inadequacy of their composition studies in the past. Apart from this, we observed that half of the students (50%) made punctuation and word mistakes, and 45% made sentence mistakes. While 30% of the students could not gather up what they wrote around a main idea, 25% of them did not care about the page layout and 35% of them did not put a title in the composition or preferred the meaningless title. It is possible to link the fact that students had difficulty in putting a title in the composition and the other mistakes they made to their lack of information on this subject and not doing enough writing study. Apart from this, individuals who want to succeed in their writing activities should pay great attention to each writing study without exception and make it a habit. Unfortunately, it was observed that people were often careless in internet correspondence and made especially similar spelling mistakes.

**Table-II**

Distribution of mistakes by those who use the programs such as WhatsApp and Messenger for 4-6 hours a day	F	%	Mistake Number
Title	3	15	3
Page Layout	7	35	7
Main Idea	6	30	6
Sentence	12	60	38
Word	11	55	42
Punctuation Mistakes	16	80	65
Spelling Mistakes	18	90	145

It was seen that there are too many spelling and punctuation mistakes in the compositions of the students who use the programs such as WhatsApp and Messenger for minimum 4 and maximum 6 hours a day. While the 18 of 20 students made spelling mistakes, the 16 students made punctuation mistakes. When we examined the composition papers, we observed that the spelling mistakes were mostly related to the conjunctions. The students had difficulty in writing separate "de" and "ki" conjunctions in Turkish and made 145 mistakes in total. It was found that they confused especially comma with semicolon in terms of punctuation marks or that they failed to use these in the suitable place. A total of 65 punctuation mistakes were detected in the students' composition papers. Although the lack of a good educational background is effective in the given mistakes of the students, we also think that using the programs such as WhatsApp and Messenger intensively triggers these kinds of mistakes. Especially, when we look at the writing of students who send messages to each other continuously, we think that the above mentioned spelling and punctuation mistakes will be seen intensely.

It was also seen that the 11 of the students in this group made word mistakes and 12 of them made sentence mistakes. When all of the papers were examined 42 word mistakes and 38 sentence mistakes in total were found. Especially, we think that the lack of letters made while writing the words can be explained by the intensive use of such programs. The fact that meaningful and meaningless abbreviations are used intensively in the written messages is remarkable. The 6 of the students in the same group could not succeed in forming their writings around a certain main idea. We observed that 3 students did not put a title in the composition, and 7 students did not have a page layout. It was seen that the students did not keep their papers clean and they had difficulty in

writing on a paper without lines. It is possible to link the fact that students did not pay attention to page layout to not paying enough attention when writing. As mentioned above, students usually do not take care to write in their correspondence with the programs they use, and they make it a habit in time.

**Table-III**

Distribution of mistakes by those who use the programs such as WhatsApp and Messenger for 7 hours and over a day	F	%	Mistake Number
Title	11	55	11
Page Layout	11	55	11
Main Idea	15	75	15
Sentence	14	70	48
Word	19	95	103
Punctuation Mistakes	19	95	94
Spelling Mistakes	19	95	152

When we looked at Table 3, we observed that there were a lot of mistakes in the compositions written by the students who use the programs such as WhatsApp and Messenger for 7 hours and over a day. We can say that especially spelling, punctuation and word mistakes were very common in the compositions. When we carefully examined the papers, we observed that the students had difficulty in noticing "de" and "ki" conjunctions in Turkish, could not write "mi" interrogative particle in Turkish correctly, misspelled the words such as "something (bir şey), everything (her şey)" especially, experienced difficulty with capitalization, did not know how to write some words (Maalesef-Malesef-unfortunately / Hastane-Hastahane-hospital / Çiçekçi-Çicekci-florist / Ücret-Üçret-fee etc.) and did not use even dot, the simplest punctuation mark, in many places.

Additionally, while 70% of the students were found to make the wrong sentences, 75% of them were found to experience difficulty in forming the main idea. These students who stated that they used the programs such as WhatsApp and Messenger very frequently and intensely were found to experience difficulties in keeping a certain level in composition writing (55%) and in putting a title (55%).

## CONCLUSIONS AND RECOMMENDATIONS

Interesting results obtained in this study aimed to compare the mistakes made in written narration by the students frequently and rarely using the programs such as WhatsApp and Messenger. In this study conducted on 60 students, the students were divided into the groups of 20 people according to the frequency of use of such programs and their mistakes were evaluated. Although it was observed that those who use less the programs such as WhatsApp and Messenger made also too many mistakes, it was seen that the writing mistakes of the students generally increase according to the frequency of use of such programs. According to this evaluation, we can say that the mistakes made by those who use the program for 7 hours and over a day among the students reached the 12th grade by receiving a similar education program were more than the others.

Based on this study we conducted, it is possible to say that the intensive and careless use of the technological tools and the programs which we talked about is also effective in the case of especially the spelling, punctuation and word mistakes. In order to minimize these writing mistakes which we mentioned above, it is possible to list what to do as follows:

- The writing studies should be given great importance starting from primary education and feedbacks should be given to students by checking the texts of the students in detail.
- A particular emphasis should be placed on the subject that students usually made the mistakes and similar mistakes should be avoided.
- Writing and reading exercises should be carried out together. One of the most important problems in our country is that the rate of reading books is low. It is known that even the students who came from the departments of Turkish Language Teaching and Turkish Language and Literature of universities did not read enough in the past and that even some of them finished secondary education without reading any books. It is clear that it is not possible to expect an message without a mistake from the students in this situation.
- The examination system should be reviewed. It can be said that the composition studies that will be given during the entrance exams to the university especially will increase the motivation of the students in this sense.
- The students can be helped more by doing writing exercises on special courses to be opened outside the classroom particularly in primary and secondary education.

- Families and teachers should constantly monitor children's writing and ensure that they write everywhere in a beautiful and proper manner. It is an indisputable fact that technology will benefit if it is used correctly. It is clear that these mistakes will be diminished or even lost over time if the mistakes in the correspondences on the internet are constantly corrected and ensure that the students are able to write properly.
- Correcting the said writing mistakes should not only be the task of teachers of Turkish or Turkish Language and Literature. Teachers who work in other fields should also warn students in this context and correct their mistakes.
- Unfortunately, educated adults also make similar mistakes when writing messages using the programs such as WhatsApp and Messenger because they do not care. Writing on the internet should not mean that we will not comply with the rules. Especially we should pay attention to what we write on this platform and be an example to children.

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# A Conceptual Model to Educate Open Access for Improving the Quality of Research

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## **ABSTRACT**

Open access grows fast in higher education and becomes a new trend in scholarly communication. Open access is indicated to give several benefits among other to disseminate research outputs, promote researcher and institution, preserve the intellectual property as well as encouraged innovations. The primary barrier to the success of open access is the low of knowledge, awareness and participation of faculty as both the author and user of the scientific articles. The aim of this study is to analyze and propose a conceptual model to educate faculty about open access to improve the quality of research in higher education. The model consists of concept, syllabus as well as teaching methods and target participants. Education concept adopts knowledge sharing model that involves all stakeholders related, i.e. researcher, academics, student, library/librarian, donor, policy maker and publisher. Knowledge sharing is chosen as two-way learning for stakeholders to share their knowledge and perception then build collective understanding and action. The knowledge sharing model is realized through some teaching methods, i.e. class, focus group discussion, workshop, seminar, social media network and consultation services. The syllabus focus on the OA concept, self-archiving in the repository, publishing process in OA journal, digital copyright, open access licensing, and the usage of open access resources in teaching and research. The proposed model expected can be endorsed by higher education especially in developing countries which still in a new stage of developing open access.

**Keyword:** open access; knowledge sharing; teaching method; higher education

## **INTRODUCTION**

Open access (OA) becomes a trend of scholarly communication for higher educations and research institutions. Almost all universities develop an open-access institutional repository (IR) to collect and disseminate their scientific outputs. They also publish some number of open access journals (OAJ) replacing subscribed journal. This condition is affected by the increasing of awareness of institution leaders and faculty about the benefits of open access. Open access in many studies proves to have some advantages include promoting institutions and authors, disseminating and preserving the intellectual property as well as evaluating the development of science and technology (Cheng & Ren, 2008)(Xia, 2008)(Krishnamurthy & Kemparaju, 2011)(McCabe & Snyder, 2014).

Although the number of IR and OAJ continues to increase, this number is still far from the OA potential based on the number of higher education in many countries. Several efforts to increasing knowledge and awareness of OA are still needed among others through the education of open access in higher educations. In some developing countries like Indonesia, the teaching of OA is crucial because Indonesia is still far behind compared to other nations, especially in Southeast Asia in the number of scientific publications in various global indexes. The existence of OA is expected to increase the visibility of publications and the amount of its utilization seen from the number of citations. Moreover, OA also can help scientific works that are only stored in libraries with limited access becoming accessible to anyone, anytime and anywhere. Thus, the increase of OA in Indonesia is necessary to increase the visibility and citation as one of the global indicators of science and technology.

Study about the appropriate model to improve the education of OA to various stakeholders has not been widely reviewed. Since being echoed in the early 2000s, there have been many studies on OA, but most of them discuss the concept of OA and the development related to technologies for OA. The topic of how the teaching of the technical knowledge that must be owned by the relevant stakeholders in the implementation of OA is still rarely discussed (Osswald, Schoepfel, & Jacquemin, 2016). This paper focuses on the open access teaching model in higher education to improve the quality of research. The problem question in this article is how to educate OA to various stakeholders in higher education in Indonesia. The objective of the paper is to develop conceptual models in teaching open access not only to students but also to all relevant parties. The limitation of this article

is that the model has not been tested yet so that a more in-depth research is needed to understand the OA in the context of higher education in Indonesia. This concept may also be reviewed for application in other developing countries where OA is not yet well developed and has conditions such as Indonesia.

### **THE STUDY**

In Indonesia, the study of OA is more about aspects of the system. Though there are three variables in OA namely human cooperation, repository process and technological functions. But the human dimension has not been much discussed (Farida, Tjakraatmadja, Firman, & Sulisty-Basuki, 2015). The process of teaching about open access includes a part of the social aspects (human cooperation) that need to be studied. This paper uses several methods of data collection to study and formulate an appropriate open access teaching model for higher education in Indonesia. The method used is as follows:

- Study documents about policy and regulation related to OA in national level as well as at institutional level in some higher education in Indonesia
- Observation to some leading IR website in some higher education in Indonesia
- Literature review about OA concept worldwide and OA practice in Indonesia

Based on data collected, I argue a conceptual model to educate OA in higher education particularly in Indonesia, which is also enabled to be implemented in other developing countries.

### **FINDINGS**

Indonesia as one of the most populous countries in the world (population of 2016 was 257,912,349), has a large number of universities. There are currently 4,445 higher educations in Indonesia. Associated with open access, Indonesia keeps the potential of producing scientific works as well as a huge user of OA resources. However, the number of repositories and open access journals is still small. There are 55 institutional repositories (IR) in Indonesia. The number of open access journals (OAJ) is 368 title. Most of those IR and OAJ are developed by universities in the major cities. The condition reveals that the knowledge of OA is not evenly distributed in higher education in the vast territory of Indonesia.

In Indonesia, the increase of OA content in IR is more from students because there is an obligation to deposit final assignment as a graduation requirement. But the work of lecturers for example publication in international journals cannot be collected all in the IR. There are also some institutions that already have policies that encourage staff to deposit works in the IR and publish in OAJ, but there is no penalty for them who do not engage with the policy. Raising awareness is crucial because it may not rely on policy alone to increase the amount of participation in OA.

Education about OA can be one of the solutions. Nowadays, education of OA is divided into classroom teaching given to LIS students and promotional activities through seminars and other events with more general targets such as faculty and students at all levels and majors. In some countries the material on OA has been included in the curriculum but is still part of other topics such as acquisitions and collections, IT related OAI-PMH, etc. OA content is invisible in the bachelor as well as master curriculum or hidden in topics such as scientific information, information tracking, information legislation (Osswald et al., 2016). Similar in Indonesia, very rare specialized curriculum about OA is made thoroughly and integrated so as students can easily understand and implement it. Therefore it is necessary to refresh the library school curriculum by incorporating material on the principles of OA, repository, copyright (Mercer, 2011). In general, some existing model to educate and promote OA were listed below:

- OA has become a part of other course topics in LIS program.
- OA training for IT staff and librarian. Topics given are more about OA software and management.
- Provide manual/guideline of OA: poster, flowchart, infographic
- OA event: OA week, seminar, workshop, training to specific target (PhD student)
- Online promotion: information in library website and social media.

### **Propose new model to educate OA using knowledge sharing**

The open access movement involves many stakeholders, among others, the government and donor agencies as research grants; universities/research institutes as affiliates of authors; publishers who have distribution rights;

and libraries as units for managing and promoting OA. All parties have a significant role and shall collaborate in open access movement (Johnson, 2014). The role of each stakeholder in open access is presented in Table 1. About the number of stakeholders involved, the teaching model shall be able to provide knowledge to each stakeholder regarding their respective roles. Teaching is also expected not only to occur one transfer of information from teachers to participants but also to exchange ideas and experiences related to OA by all stakeholders. The proposed model is knowledge sharing. Knowledge sharing is broad, and the process is more interactive than the one-way knowledge transfer process (Edwards, 2016). In this model, knowledge sharing became substantial because teaching objectives are not only to increase knowledge and awareness, but there is a more important goal in building consensus from all stakeholders to participate in open access (Emmett, Stratton, Peterson, Church-Duran, & Haricombe, 2011).

Table 1. Stakeholder and their roles in open access

Method	Participant
Higher education/research institution	Develop OA policies Build IR and OAJ Provide open access funds
Faculty/researcher	Deposit in IR Publish in OAJ Use OA resources
Government	Establish policies that strengthen OA Provide open access funds
Donor	Provide research funding and OA policies
Publisher	Provide publishing policies that support OA
Library	Develop library content Manage IR Promote OA

### Syllabus in the open access teaching modules

The accuracy of syllabus selection becomes an important component in educating open access. The syllabus organization intend participants not only understand the theory/concept but also learn how to engage and actively participate in the success of open access in their institution. Some studies of faculty behavior in OA in some countries showed that faculty were still unfamiliar and asked about why and what open access, what about legal aspects such as copyright and licenses, and how to archive in repositories and publish in OAJ. Misconception on above matters became an obstacle for academics to participate in open access (Kim, 2011)(Yaniasih, Ardiansyah, & Sulisty-Basuki, 2015) (Yang & Li, 2015). Thus, the syllabus shall be able to answer faculty's queries about know-what, know-why and know-how of OA.

The material in the syllabus which is also very important to be taught is policies at the institutional level as well as the national policies. Institutional policy, whether mandatory or voluntary in open access affects academic behavior (Xia, 2007). Understanding of the policy becomes crucial so that the policy should be thoroughly socialized and implemented by scholars (Keane, 2012). Furthermore, the syllabus shall also pay attention to the process in research so that education can improve the quality of research in higher education. Mamtora (2013) argued four elements in research cycle: idea discovery, funding/approval, experimentation, results dissemination (Figure 1). Each part of the cycle required knowledge of open access. Idea discover will increase its quality with the knowledge of how to utilize OA resources in preparation of literature for both research and writing purposes. Funding elements require knowledge of open access policies by donors so that the research team understand the copyright of their research outputs. The experimentation and result dissemination components require knowledge of copyright and publishing of data and publication. Below is the content of the syllabus in the open access teaching curriculum:

- OA concept
- National and institutional policy

- Copyright and intellectual property
- OA in Library and HE
- Self-archiving in the repositories
- Publishing in OA journals
- Usage of OA resources

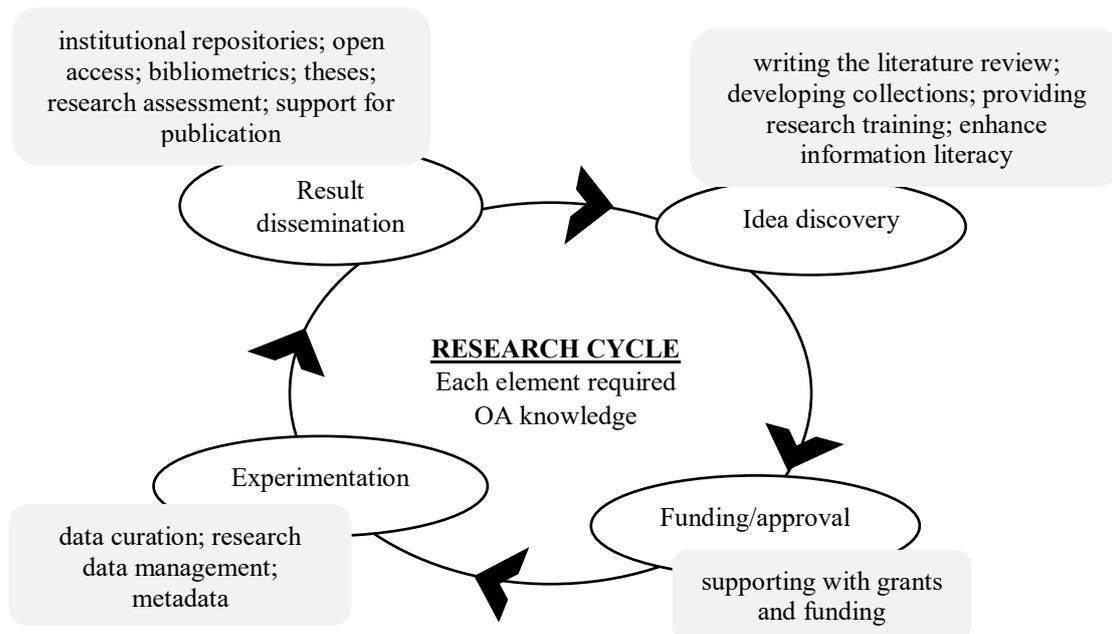


Figure 1. Elements in research cycle  
[illustrated from Momtara (2013)]

### Teaching methods

Efforts to improve knowledge and awareness of open access may be made through education in the classroom and outside the classroom. Events such as seminars, workshops, exhibitions, provision of information via the Internet as well as supporting activities, such as the system in college that encourages academics to participate in open access may be held (Keane, 2012). The selection of teaching method needs to be tailored to the target participants. For example, students will be better suited for education in the classroom. Meanwhile, another user such as leader is more appropriate when using the teaching through workshops and focus group discussion. Students participant who becomes the primary target OA teaching is library and information science (LIS) students. LIS students shall have access to OA syllabus as they will become librarians and information managers who are the primary professions that have been the most active promoting OA. In addition to student, teaching OA needs to be done to the leaders of the higher education. The leader's role is essential for the success of OA both in approving the policy as well as a role model with an active role in OA such as in archiving their work in the IR (Mercer, 2011). Likewise, other users need to be made teaching methods that suit their needs and roles in open access. Table 2 shows the OA teaching methods and its particular target participants.

Table 2. OA teaching methods and its particular target participants

Method	Participant
Class	Student
Seminar, workshop	Manager, leader Faculty
Focus group discussion	Involved different sector: faculty member, HE-government, HE-publisher-library, etc.
Exhibition	All stakeholders
Consultation services	All stakeholders
Website and social media network	All stakeholders

## CONCLUSIONS

OA has potential to increase the quality of research if OA stakeholders know how to take the benefits. There are many stakeholders involved in open access including faculty, leaders, librarians, donor agencies and publishers. Stakeholders in HE institutions, especially in developing countries where the number of OA still low, need to be educated about OA to increase their knowledge and awareness. Knowledge sharing can be chosen as the education concept because knowledge sharing will build consensus and active participation among stakeholders. The model also consists of syllabus and teaching methods for sharing knowledge. This model needs to be further studied by the context of higher education in developing countries so that it can be used and evaluated its usefulness.

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## **A Cooperative Learning Experience Through Life Stories Linked With Emotions: The ‘Poliedric Life Stories’ Experience**

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### **ABSTRACT**

‘*Historias de vida poliédricas*’ (‘Poliedric Life Stories’) is a cross-disciplinary and collaborative learning project between the UIB and the EASDIB. Disciplines involved in this collaborative project were Music, Visual & Plastic Arts, Literature, Graphic Design, and participants studied Childhood Education, Primary Education and Graphic Design. The main aims of this experience were to promote the teaching-learning aspects of emotions through intergenerational life stories, and to develop students’ creativity by using project-based methodology. Students translated research into practice through life story experiences linked with emotions. This is a GRAiE educational innovation project is funded by the IRIE-UIB. The EASDIB participation is 50% co-funded by the European Union within the ERDF Operational Program 2014-2020 at the Balearic Islands.

### **INTRODUCTION**

‘*Historias de vida poliédricas*’ (‘Poliedric Life Stories’) is a cross-disciplinary and collaborative learning project between two higher education institution at the Balearic Islands: the Universitat de les Illes Balears (UIB) and the Escola d’Art i Superior de Disseny de les Illes Balears (EASDIB). The main aims of this experience were to promote the teaching-learning aspects of emotions through intergenerational Life Stories, and to develop students’ creativity by using project-based methodology.

Life Stories allows researchers to work with a symbolic reconstruction of reality by narratives, and focus on narrators’ emotions, that is, what is behind the told story. It is also necessary to say that the Narrated Life Stories approach is a particular procedure based on Biographical Research, which is a wide field of different approaches and research strategies with blurred borders and overlapping areas, situated under a general umbrella of Narrative Research (Zinn, 2004: 3-4).

When it comes to emotion, Strongman (2003: 296) canvassed about 150 theories of emotion, inside and outside psychology, but he didn’t conclude with any emotion list. On the other hand, according to Ekman findings (2016: 32), there is high agreement about five emotions (all of which were described in Darwin works): anger, fear, disgust, sadness and happiness. These were emotions used to develop the Life Stories Experience.

The project was developed during the first semester of the 2016-2017 academic year, and disciplines involved in this collaborative project were:

- a) Music Education (third year students of Primary Education),
- b) Language Resources (third year students of Graphic Design),
- c) Artistic and Aesthetic Education (second year students in Early Childhood Education), and
- d) Universal and Catalan Literature (fourth year students of Early Childhood Education).

The project focused on emotions that the person interviewed felt but not really told.

### **THE LIFE STORIES EXPERIENCE**

Working emotions is important for a number of professions such as teacher or graphic designer, and developing different activities while studying to identify emotions is important too. In this project, professors from different background worked with emotions with students, to better understand their own feelings and to approach them to

other people's emotions, but also to separate themselves from the individuality and to better understand what is going on in collective situations.

The first aim of this experience were to promote the teaching-learning aspects of emotions through intergenerational Life Stories. So, for the purpose of this project, anonymous participants (from 4 years to 85 years) were asked to record a one-minute Life Story (only audio). It could be an Experienced Life History (past experiences) or a Narrated Life Story (life from the current point of view) (Zinn, 2004: 37).

After that, students from both institutions interpreted Life Stories with regard to the whole interview, trying to identify the emotion under the surface of each Life Story. Proposed basic emotions to work with were: anger, fear, disgust, sadness and happiness.

Despite the majority of emotion's researches focus on facial expression, the added difficult was to identify emotions from participant's voice. If you know how to identify emotions it will be much easier to understand a situation and promote communication through nonverbal language, because emotions are a tool that enhances students' future career (Childhood Education, Primary Education and Graphic Design).

The second aim of this experience were to develop students' creativity by using project-based methodology, so during the project, students translated research into practice, under the close supervision of professors involved in the project: Noemy Berbel-Gómez (*Music Education*), Pilar Rovira (*Language Resources*), Magdalena Jaume (*Artistic and Aesthetic Education*) and Antoni Artigues (*Universal and Catalan Literature*).

- a) *Music Education*. About 68 third year students of Primary Education recorded a number of one-minute Life Stories, from anonymous people of different age groups (4 to 85 years). After that, students had to identify the emotions that each Life Story transmitted. During the second part of the project, professor encourage students to compose original music in groups, related to each recorded life history. They had to use emotions previously identified from recorded experience to create a soundtrack. Some technological skills were required as students had to use 'SoundCool' (<http://soundcool.org/>), an open source software to develop the task. Technology allowed students to compose music in real-time through a mobile device (cell phone or tablet), in a collaborative way.
- b) *Language Resources*. About 22 Graphic Design students worked in team with Primary Education Students, and basically they were in touch on-line (Facebook, email and else). As mates from the UIB did, third year students of Graphic Design also identified emotions, prepared a video from a selection of recorded life stories using 'Adobe Premiere' (<http://www.adobe.com/es/products/premiere.html>), and included the musical composition inspired by the emotion identified.
- c) *Artistic and Aesthetic Education*. About 63 second year students in Early Childhood Education developed artistic productions based on recorded life histories. These art work reinterpreted the works of Kurt Schwitters (German artist, 1887-1948), well known for his Dadaism collages made by waste materials, and Joseph Cornell (American artist and experimental film maker, 1903-1972), influenced by the Surrealists and well known for his boxed assemblages made by found discarded objects. Students interpreted emotions from recorded Life Stories by creating their own boxed assemblages filled with reused and waste material.
- d) *Universal and Catalan Literature*. About 63 fourth year students of Early Childhood Education wrote poems ('*dècimes*', 10 verses of 7 syllables that rhyme ABBAACCDDC) from recorded Life Stories. After that, students sang poems by using folkloric tunes from Majorca (Balearic Islands, Spain), transmitting the identified emotions.

## RESULTS AND CONCLUSIONS

In order to assess results of the project, there has been a qualitative evaluation of the cross-disciplinary and collaborative learning project based on the observation the experience and during the public expositions of the final works. No major incidents were reported, just some initial communications problems between UIB students and EASDIB students. Despite students showed great social media skills, they were very selective with their virtual contacts, so a first face-to-face contact will be needed in future experiences. Then, on December 21st, 2016 music were played, artworks were exhibited and poems were sung at the UIB events hall. Later, on January 19th, 2017 videos were played at the EASDIB conference hall. Both events were fully booked with students, family and friends.

On the other hand, there has been a quantitative-qualitative evaluation of the students' experience based on an anonymous on-line survey, in order to get some students' feedback. Data showed that students gave a medium score to the questions related to the interest of the activity for their academic future (6.7/10.0) and for their

professional future (6.8/10.0). However, the degree of overall satisfaction is remarkable (7.2/10.0) and a one hundred per cent of the students would repeat the experience. It is necessary to say that students are not aware of its importance as they are not used to work with project-based methodology which includes a reflexive practice.

Last but not least, students were asked to write down a micro-narrative such as highlighted below:

- ‘It has been interesting to make visual the experiences of other people’ (Graphic Design).
- ‘It has been very interesting to be able to work on this project that involved different points of view, based on creativity as an important issue in education’ (Primary Education).
- ‘Getting into the everyday life of a stranger (...). Learning to value a moment, an interest and a passion. Facing my own weaknesses and finding resources to get out of a difficulty, and asking for help and get the project through. Why not trusting from the beginning? Why not trusting in the creative capacity that maybe every human being has because of being a 'human being'?’ (Early Childhood Education).
- ‘The word that defines my personal experience is enrichment. Although difficulties faced, it is possible to work in a team and compose a melody without being musicians. Listening to an audio, thinking about the music that fits the best and composing is a long process, sometimes complex but very rewarding’ (Primary Education).
- ‘It was nice to meet the people who had made the music and to be able to communicate with them to create a better video’ (Graphic Design).

To sum up, ‘*Historias de vida poliédricas*’ (‘Poliedric Life Stories’) has been developed as cross-disciplinary and collaborative learning project between the UIB and the EASDIB in order to promote the teaching-learning aspects of emotions through intergenerational Life Stories, and to develop students creativity by using project-based methodology. According to experience observation, artworks, data and students’ feedback, both objectives have been fulfilled.

Life Stories Experiences took into account that future teachers applied knowledge in real projects and acquire a specialized knowledge of the discipline they are enrolled. Also, students developed other skills that professors considered useful, such as research skills, problem resolutions skills, design thinking, and team working.

Working emotions in class by using project-based methodology is an original and innovative way to provide useful tools for students’ academic and professional future, especially in those professions involving people from different ages, different sociocultural background and different interests, such as teacher or graphic designer.

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# **A Development of 3D Animation Learning on The Traffic Laws and Driver's License**

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## **ABSTRACT**

This research aims to develop 3D animation learning on the traffic laws and driver's license. The objective of this research is to advice and support user to learn and test traffic laws and driving rules in Thailand based on web application. Learner can learn and take the exams on the traffic laws and driver's license test. In this project, it was divided the result by the research purposes into 2 parts; the first was presented the result of developing the web application for learning and testing the traffic laws and driver's license and the last was described the result of evaluating the satisfaction of the system. Questionnaires and Black box approaches were used to measure user satisfaction and system performance of the application. Participants consisted of 5 specialists and 30 users. The results were satisfactory as followed: Means for specialists and users were 4.15 and 4.37, and standard deviation for specialists and users were 0.583 and 0.644 respectively.

## **INTRODUCTION**

A traffic accident is one of the significant public problems in Thailand and there are many potential dangers affected to loss a large amount of life and property. Even though there are many organizations cooperate with promoting the campaign to protect car accident, the problem is still increasing. Thailand is ranked the second dangerous country on road and the report of Bureau of Non Communicable Disease, Ministry of Public Health, Thailand, from 2010 to 2012, road accident killed 41,858 people. Hence, the better way to reduce the cost of accident problem is to educate and improve the skills and attitudes of drivers. In recent years, initiatives have been taken from Thai Government to provide and promote the knowledge of safety driving by taking use of Information and communication technologies.

Recently, with no longer barrier by space and time, a web-based educational system plays the important rule to support students and teachers. There are many advantages for information sharing and collaboration between students and teachers in a course because students can study their interested courses though a web-based class so as to enhance their knowledge at any time and any place. According to department of land transport, the driver's license is adjusted the new assessment on January 2017. To apply for a driver license in Thailand, examiner also must clear and comprehensive information on the Thai traffic laws, the Thai driving rules & regulations, the license requirements in Thailand. However, the related media is not in the up-to-date forms. This research aims to develop 3D animation learning on the traffic laws and driver's license application to provide knowledge of safety driving and traffic signs and driving rules in Thailand.

The rest of this paper is organized as follows. Section 2 reviews the related methodologies used in this work. Section 3 presents the implementation based on the purposed data mining techniques. In section 4 the result and discussion is presented. Finally, we conclude the paper with future research issues in section 5.

## **OBJECTIVE**

The research aims to develop 3D animation learning on the traffic laws and driver's license application to provide knowledge of safety driving and traffic signs and driving rules in Thailand.

## **RESEARCH METHODOLOGIES**

In this section, we illustrate the literature search and the research methodologies used in this project. The 3D animation learning on the traffic laws and driver's license application was designed to provide knowledge in how to driving safety and advice user to learn and test traffic signs and driving rules in Thailand. To implement the project, user's requirements were applied in the design and development of this application to meet the user's requirement. The information was used as a source of significant information for implement 3D animation learning application and database management and internet network technology were applied in order to make the system fast and easily work. A study of related knowledge (K Kularbphettong, N Limphoemsuk, 2017) and theories was conducted and the system contains three following components as shown in Fig.1.

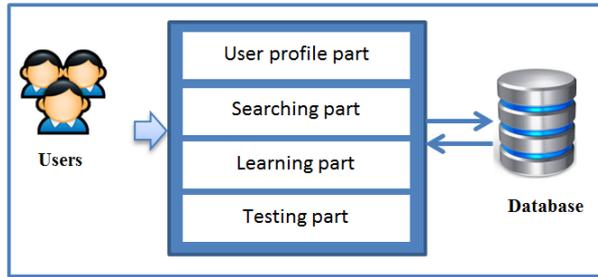


Fig.1 The system framework

In the user profile module, user registers and edits his/her profile like personnel information, email address, username and password, and etc. In searching part, users can search what information and knowledge about traffic sign and driving rules in Thailand he/she needs to learn. Users can learn the means of traffic signs and how to drive correctly in Thailand in learning part. The contents of learning part include 7 lessons from introduction to driving situation and the presentation is a 3D animation with voice and subtitles and after finished learning each lesson. Also, in testing part, users can take driving exams and know results from the testing module of this application and the application provide post- tests and score results. To test and evaluate the performance of this application, the processes were divided into two sections: Black box testing technique was used to assess the performance of the system (Laurie Williams, 2006) and the satisfaction of this system was evaluated by questionnaires. To evaluate the quality assessment system, Mean (x) and standard deviation (SD) were used to evaluate the abilities of the project.

**EXPERIMENTAL RESULTS**

The results of this research are separated by the research objectives into 2 parts: Developing the 3D animation learning on traffic sign knowledge application and testing and evaluating the system.

**Developing the 3D animation learning on traffic sign knowledge application**

The experiment of this research was conduct to explore the effectiveness of the traffic laws and driver's license knowledge application. Fig 2 and Fig 4 were shown the results of the example pages.



Fig.2 the first page of application

Figure 2 was shown the first page of this application and the pretest page and the case study in other driving situations was displayed in figure 3.

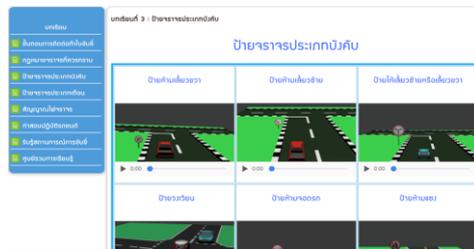


Fig.3 The case study in other driving situations

Also, figure 4 was presented the results of score test after user finished the exam.

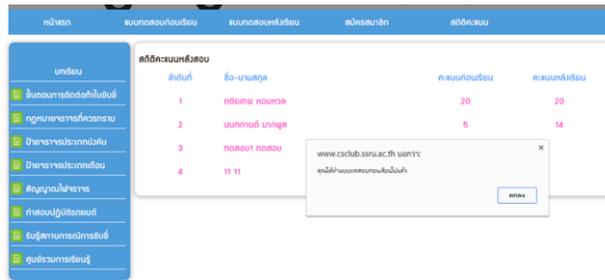


Fig.4 the result page of score test

### Testing and evaluating the system

Questionnaires were assessed in this project. Black box testing was used to test the performances of the system and the errors of the system. To evaluate the quality assessment system, Mean ( $\bar{x}$ ) and standard deviation (SD) were used to evaluate the abilities of the project.

TABLE I THE EXPERIMENT RESULTS OF BLACK BOX TESTING APPROACH

	Users		Rank
	$\bar{x}$	SD	
1.Function Requirement Test	4.12	0.33	5
2. Functional Test	4.45	0.42	1
3. Usability Test	4.35	0.39	3
4. Performance Test	4.26	0.35	4
5. Security Test	4.41	0.4	2

Black box testing focuses on determining whether or not a program does what it is supposed to do based on its functional requirements. Black box testing attempts to assess in four areas: Functional Requirement Test; Functional Test; Usability Test; and Security Test. The findings of this study revealed that the most importance factor for evaluation the performance of this application was functional test section.

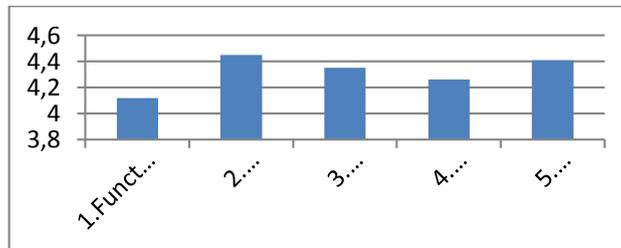


Fig 5. The results of Black Box Testing

The mean for functional test was 4.45 with 0.42 SD, the mean for security test was 4.41 with 0.40 SD, and the mean usability test was 4.35 with 0.39 SD. The overall results of the research showed that the efficiency ratio of the 3D animation on the traffic law and driver's license was at very good level of the learning achievement of the experimental group. The results were satisfactory as followed: Means was 4.31 and standard deviation was 0.38 respectively.

TABLE 2 THE EXPERIMENT RESULTS OF SATISFACTORY BY QUESTIONNAIRE

	Average	Level
1. Appropriate form of this application	4.45	Good
2. Easy usage of the program	4.35	Good
3. Display of the screen	4.25	Good
4. Compatible match between pictures	4.3	Good
5. Practical application of knowledge	4.25	Good
6. Easy to understand context in the web site	4.4	Good
7. Suitable size of context quantity on the screen	4.12	Good

The finding of the user's satisfaction was at good level in appropriate form of this application with 4.45 and the second was easy usage of the program with 4.35. Compatible match between pictures was 4.3 in average score and display of the screen and practical application of knowledge was the same score with 4.25 as well.

### **CONCLUSION AND FUTURE WORK**

In conclusion, the significant objective of this study was to present the preliminary result for the ongoing improvement project of the 3D animation traffic-sign knowledge application. Also this project can be beneficial to support and suggest user for driving safety information. Nevertheless, the main limitation of this research came from sampling of 30 respondents, not included the population who are interested in learning traffic law knowledge. Therefore, the future experiments will be required other new media techniques to enhance this project.

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# A Hystorical-Didactic Introduction to the Key Concepts of Mathematical Analysis

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## ABSTRACT

Mathematical analysis is the branch of mathematics that deals with the properties emerging from the infinite partition of a dense object. It is based on the infinitesimal calculus, which studies the local behavior of functions by using the tools of differential and integral calculus. During years mathematical analysis has become fundamental in almost all fields of mathematics, physics and science, from natural sciences to engineering, from computer science to economy. In this paper I consider a historical path (concepts and people) on the development of the key concepts related to analysis; starting with the fundamental concept of limit, I look at the birth of the concepts of derivative and integral.

**Keywords:** Mathematical analysis, Infinitesimal calculus, Limit, Derivative, Integral, Infinite, Infinitesimal, History of mathematics, History of logic, Education.

## INTRODUCTION

One of the most important periods of the history of mathematics has been the centuries during which the basics of infinitesimal calculus were created, i.e. from the end of 1500 (with the first attempts to continue the Archimede's work) to the editing of the independent writings of Newton and Leibniz (17<sup>th</sup> and 18<sup>th</sup> centuries). The infinitesimal calculus is a fundamental part of mathematical analysis, which studies the local behavior of a function through the concepts of continuity and limit; it is used in almost all fields of mathematics, physics and science.

The 17<sup>th</sup> century has marked the beginning of scientific research according to a new method, i.e. the study of Nature in a systematic way, using mathematics and its progress. The development of mathematics was closely linked to some unresolved problems, considered to be of great cultural and economic interest. Mathematical advances provided answers to problems, but at the same time the open problems stimulated the emergence and development of new computing techniques and new mathematical concepts.

In every field of natural philosophy it began an accurate analysis of phenomena, so as an attempt to bring them back to general mathematical models, as simple as possible. The best results were obtained in the field of mechanical and astronomical phenomena, considering the relative simplicity of their observation and the reproducibility in laboratory.

In the same way scientists of 17<sup>th</sup> century tried to explain the problem of earthly motions, in particular “why objects thrown in the air fell on the earth”, if it was no longer the center of the universe. Another big problem was “the motion of bullets”; in particular the bullets trajectories, their range, heights they could reach, the effect of the initial speed. Wealthy people were willing to spend large sums of money for finding the solutions, because in such a way they could have benefits for navigation and improve military techniques. In this context mathematical analysis is progressively born.

## THE CONCEPT OF LIMIT

The concept of limit is already present, though not explicitly, in Greek mathematics, because many results on the calculations of areas and volumes derived by Greek mathematicians (such as Eudoxus of Cnidus and Archimedes) were essentially based on the use of limit. However, many centuries passed for arriving to Euler, who in 1755 gave a fairly definitive definition of limit, even if he did not use that and did not develop the theory of limits.

Also D'Alembert (1717-1783), French mathematician, physicist, philosopher and astronomer, gave a formulation of the concept of limit (D'Alembert, 1995). In the article “*Limit*”, written for the Encyclopédie (Diderot, & D'Alembert, 1994) (Fig. 1), he called a particular quantity the “limit” of a second quantity, the “variable”, if this second quantity approached the former “so much” that the difference was “less” than any given quantity, “without coinciding” on fact with it. The apparent inaccuracy of this definition made it unacceptable to contemporaries, because the authors of continental European mathematical manuals still used at that time the Euler's language and concepts.

A rigorous definition of limit and, through this, a rigorous construction of mathematical analysis has been work of Augustin-Louis Cauchy (1789-1857), French mathematician and engineer (Grabiner, 2011; Belhoste, 1991), and to the subsequent formalization of Karl Theodor Wilhelm Weierstrass (1815-1897), German mathematician, also called “the father of modern analysis” (Weierstrass, & Hettner, 2016).

Cauchy assumed as fundamental the limit concept of D'Alembert, but gave to it more precision. He formulated a relatively precise definition of limit:

“When the successive values attributed to a variable approach indefinitely to a fixed value, so that they end up with a deviation from this for a small difference as desired, this latter is called the limit of all other”.

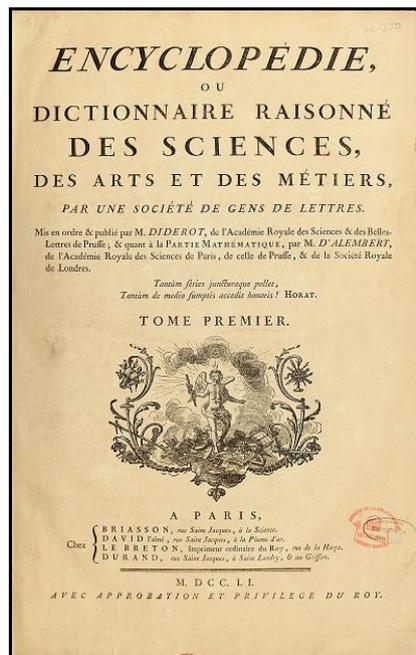


Figure 1. The first page of the “Encyclopédie” of D’Alembert and Diderot ((a) [wikimedia.org](https://commons.wikimedia.org/wiki/File:Encyclopédie_Tome_1.jpg)).

As we read, Cauchy's definition uses expressions like “successive values”, “approaching indefinitely”, “small as desired”, which, though suggestive, they still lack the precision required in mathematics.

Weierstrass defined the limit of a function  $f(x)$  in the point  $x_0$  practically in the same way as currently used. It is often considered as birth date of the concept of limit the year 1821, because in that year Cauchy published the work “*Cours d'Analyse*”, work that collects his lessons of analysis held at the École Polytechnique in Paris. He also defined the notion of “infinitesimal”: “a variable that has zero as *limit*”, and that of “infinity”: “a variable whose successive numeric values *grow more and more*, so that to exceed each given number”.

He also considered the limit of “successions”, especially for the succession of the partial sums of “series”. Cauchy undoubtedly deserves to have rigorously accommodated a concept that has been long since dealt with and used by mathematicians. D'Alembert supported the need to put *the limit theory at the basis of differential calculus*. The so-called “first and last reasons” of Newton's work “*Philosophiæ naturalis Principia mathematica*” (1687) are de facto a somewhat smoky way of expressing that two ratios tend to the same limit.

The Italian mathematician Pietro Mengoli (1626-1686), who studied with Bonaventura Cavalieri and then took up the teaching of mathematics at the University of Bologna, in his work “*Geometriae speciosae elementa*” (1659) devoted a chapter to the theory of limits, providing many properties and theorems, showing to have a clear idea of a quantity that tends to infinity (*almost infinite*), that tends to zero (*almost null*), and of two quantities that tend to the same limit (*almost “aequales”*).

Let us not forget that Greeks had already calculated some limits of successions using a process that is now termed *exhaustion method*. This method, conceived by Eudoxus, consists in the construction of a succession of polygons converging to a given figure; the area of the figure is therefore the limit of the polygons areas (Smith, 1958). Thanks to this method, Eudoxus showed that a pyramid is the third part of the prism having the same basis and the same height, as well as a cone with respect to the cylinder with the same basis and the same height.

Euclides used it to show that the ratio between the circle area and the square of the diameter is constant, as well as between the volume of the sphere and the cube of diameter.

Archimedes, with the same method, obtained the current formulas for determining the circle area, the surface and the volume of a sphere, as well as other interesting results, approximating the circle with “regular inscribed and circumscribed polygons”, starting from the square and doubling away the number of sides. In doing that, he proved that the areas of such polygons (those circumscribed by *excess* and those inscribed by *defect*) tend to the same quantity, which is the circle area.

It is therefore possible to state that the first applications of the limit concept were used to calculate areas and volumes. But the limit is also the only tool with which *it is possible to safely handle both infinitesimals and infinites*. To date, it is the *foundation of all differential and integral calculus*, whose applications are a lot, not only in mathematics and physics, but in all scientific disciplines.

## THE CONCEPT OF DERIVATIVE

Galileo Galilei (1564-1642) (Kline, 1999), Italian physicist, philosopher, astronomer and mathematician, is considered the *father of modern science*. He described the Nature as simple and well-ordered, with regular behavior, acting in accordance with “perfect and immutable mathematical laws”. Science must therefore follow the example of mathematics, i.e. it must proceed by identifying axioms and fundamental principles, then proceeding in a deductive way to establish new truths (Geymonat, 1981). The Galileo's radical innovation was dictated by the fact that, contrarily to what was done for mathematics, the basic principles of physics had to derive from “experience and experimentation”, and that axioms should be of a quantitative nature, giving values of quantities without worrying about the latest causes, as happened in ancient time.

Galileo obtained important results by studying the motion of metal balls along inclined planes and freely falling objects; this field of research continued to affect men of science even in the following decades. He provided the “general basis of the method”, but limited himself to the analysis of straight and parabolic motion, however without being able to build a general model.

One of the main open problems was the explanation of the motion of planets, in order to improve the calculation of their positions. The interest in astronomical problems was also linked to the need of navigation along routes far from coasts, in sea areas where precise determination of latitude and longitude was of fundamental importance and could occur only through astronomical observation.

At that time one of the used methods was to observe the moon's position with respect to the stars at a given time, and comparing the result with measured values in a known reference location. The problem was delicate, because of the need of a watch on board and a good knowledge of the moon's motion. Even a small mistake in determining the position could lead to a mistake of several degrees of longitude; it was therefore essential to have a better understanding of the moon's orbit.

Also the interest in determining *the tangent line to a curve* is born both as a purely geometric problem and for applications in the field of optics. Optics was one of the main interests of 17<sup>th</sup> century and the design of lenses of direct interest for the most important thinkers of the time, from Fermat to Descartes, from Huygens to Newton. To study the passage of light through a lens, it is necessary to know the angle of incidence between the beam and the perpendicular to the surface of the lens, in order to apply the laws of refraction. Some ancient methods were already known to determine the tangents to some particular curves, but there was no general method.

A further general problem was the determination of the *maximum and minimum value of a function*, with a lot of applications, for example the determination of the angle at which the output of a gun is maximum; this problem could in fact bring military benefits. In addition to that, there were other debated problems, that required the calculation of the *maximum of a function*, such as the determination of the maximum and minimum distance of a planet by the Sun.

## THE WORK OF NEWTON

Starting from the fundamental problems of kinematics, Isaac Newton (1642-1727) (Fig. 2), English mathematician, physicist, natural philosopher, astronomer, theologian and alchemist, introduced a *calculation method valid in general for all curves*, that over time found various applications, even in very different fields with respect to the study of motion.



Figure 2. Isaac Newton ((a) wikipedia.org).

In the study of motion, the first major difficulty was the fact that the speed of objects varies every moment and is not easy to calculate; if one calculates the instantaneous speed, he cannot divide the space for the time (as you do for an

“average” speed), since at a given time both quantities will be zero, giving therefore the 0/0 ratio. However, it is also true that moving objects have a speed at any moment, otherwise they will be stopped. Galileo determined a law that expresses the instantaneous speed as a function of time for moving objects on an inclined plane and for those in free fall, but not a general method valid for any trajectory and motion. In his treatise “*Methodus fluxionum serie infinitarum*” Newton summarizes the fundamental problems in these terms (Newton, 1999; Newton, 2017):

“All difficulties can be reduced only to two problems that I will propose regarding the space described by the local motion, however it is accelerated or delayed: continuously giving the length of the described space (i.e. at every time), to find the speed of the motion at any given time. Continuously giving the speed of the motion, to find the length of the described space at any given time. In the following I consider quantities as generated by a continuous increase in the same way of the space by a moving object”.

The first of the two proposed problems could be expressed today in the following terms: “Having the relation that links the travelled space and the used time to travel it, determine the speed at any moment”.

In the general treatment, Newton said “flowings” the quantities that vary over time and “fluxions” the respective speeds of variation:

”From now on, these quantities that I consider to grow gradually and indefinitely, I will call flowing quantities, and I will represent them with the last letters  $u, y, x,$  and  $z,$  in order to distinguish them from the other quantities that in the equations are considered known and determined, and that therefore will be indicated with the first letters of the alphabet  $a, b, c,$  etc. The speeds with which the flowings increase for the movement that generates them (speeds that I call fluxions or simply speeds) I will represent with the same letters with a dot above, then  $\dot{v}, \dot{y}, \dot{x}$  and  $\dot{z}$ ”.

So in the considered problem the flowing is the *travelled space*, while its fluxion is the *instantaneous velocity*. Newton considered an infinitely small quantity of time and called it “ $o$ ”. Then also the quantities  $x$  and  $y$  will have *infinitesimal increments*, that Newton called *moments*; therefore, after a moment, the quantities  $x$  and  $y$  will have a new value, given by the initial value plus the increment.

Summarizing:

$x, y$  : variables in time (*flowings*);

$\dot{x}, \dot{y}$  : speeds of variation (*fluxions*);

$\alpha x, \alpha y$  : increments after a time  $o$ .

Then:  $y \rightarrow y + \alpha y$ .

“*Fluxions are speeds of evanescent increments*”; he wrote the relation:

$$\dot{y} = \frac{f(x+\alpha) - f(x)}{\alpha} \quad (1)$$

which is the *ancestor of the current definition of derivative*. All the properties by him analyzed for the fluxions are valid also for the derivative, defined by Cauchy in 1821.

## MAXIMUM AND MINIMUM OF A FUNCTION AND TANGENT TO A CURVE

About the problem of the maximum and minimum of a function, in the work “*Methodus fluxionum serie infinitarum*” he wrote:

“When a quantity assumes the greatest value it can have at a given moment, it will not flow either backwards or forwards. Flowing forward or, in other words, increasing its value, it would prove that it had not reached the maximum value and that it would be greater immediately afterwards. On the contrary, if it was flowing back or decreasing; if this happens, it means that at a given time before to that given, it would have higher value, proving that it is not the maximum value. So it is only to find its fluxion and assume that it is nothing”.

Newton proposed examples of calculation for some functions and some problems that can be solved with his method. The method was appreciated by most of the scientific community, even if criticisms were not lacking, because it had some dark points. Newton gave several versions of such method in successive works, always trying to clarify his concepts and to express them in a theory without defects. To get that, he tried to get back as much as possible to the geometry, on a hand because demonstrations could be more comprehensible to his contemporaries, on the other one because at that time the value of *geometry* was considered clearly superior to that of *algebra*.

In the 3<sup>rd</sup> edition of “*Principia Mathematica*” this process of appealing to geometry is evident; Newton eliminated even fluxions for working with the “*first and last rapports*” between curves and segments (when they are generated or vanished) but, despite the made efforts, the dark sides of the method remained. Various mathematicians tried to give answers and justifications, but they did not fully succeed in their intent; the fundamental concept of limit was missing, that is “*the evanescent quantities are not null, but they tend to decrease continuously in infinitely way*”.

Despite all the criticisms, the results produced by the differential calculus encouraged its use and stimulated the research of a complete and rigorous theory that justified its validity.

The problem of drawing *the tangent to a curve* had been considered and solved by Archimedes *for some particular curves*; however, each curve provided a *different procedure* for calculating the tangent and a *general method was totally missing*.

Descartes, Fermat, Newton and Leibniz (Fig. 3) elaborated different methods to solve this problem; the *most general and effective methods* were those of Newton and Leibniz. Their work had very different points of view, but at the same time presented similar traits; a diatribe on the priority of the method was born with the consequent division of mathematicians of the time.



**Figure 3. Gottfried Wilhelm von Leibniz ((b) wikipedia.org).**

The interesting aspect of the Newtonian point of view is that he uses again the fluxions method; this computational system, born to solve kinematic problems, was also applied to solve purely mathematical problems such as that of tangents. The starting idea is that *a curve can be thought as the result of the motion of a point, i.e. a trajectory*. In this way the mechanical curves, as the spiral of Archimedes, were introduced. Galileo had shown that the parabola was the trajectory of a bullet, fired in the air with some inclination with respect to the ground.

Through the work of Gilles Personne de Roberval (1602-1675), French mathematician and physicist, Isaac Barrow (1630-1677), English mathematician and theologian, and Newton (who was a Barrow's pupil), the concept of *curve as trajectory of a moving point* has been accepted and consistently used; thinking to a curve in kinematic terms became thus a valid artifice. In Newton's "*Methodus fluxionum et serierum infinitarum*" it is written:

*"The fluxions method assumes that quantities are generated by local motion, but this generation does not necessarily have to be tied to the nature of the generated things. They may have an existence independent by these motions and can be produced in many other ways and will still have the same properties. However this conception, that quantities are generated by local motion, is a very fertile notion and an excellent artifice to discover their properties"*.

### THE CONCEPT OF INTEGRAL

The origins of the integral calculus date back to the Greek geometers that, in the search for determining *areas* and *volumes*, achieved remarkable results. Now we *integrate functions*, but in ancient times functions did not exist and integrating problems were *purely geometric problems*.

*Archimedes of Syracuse* (287 BC - 212 BC) (Fig. 4) was among the first ones to consider geometric problems by applying notions of mechanics and statics, even succeeding in building a *method* that anticipated for eighteen centuries the integral calculus (Archimedes, 1974; Heiberg, 1972).

The procedure adopted in ancient time started by an infinitesimal analysis system called *exhaustion method*. This method was invented by Eudoxus and consisted of covering an area with known figures so that their sum approximated the sought area in the best possible way.

Archimedes perfected the method by inserting the concept of static moment of figures, and applied it for determining the area to the circle. In modern terms, this method consists in showing that two quantities (whether they are lengths, areas or volumes) are the same because it is absurd that their difference is different from zero. This result is not obtained by direct comparison of the two quantities, but by the comparison between two classes of quantities (said *contiguous classes*) that are separate, i.e. each quantity belonging to the first class is less than each one belonging to the second class. It is always possible to find two quantities, one in the first and one in the second class, which have a smaller difference than any small number chosen at will. The method of exhaustion is on fact the method of contiguous classes.

The idea of limit of two converging successions was replaced by the similar idea of limit to fill with known quantities. The area of the parabolic segment, for example, was calculated by Archimedes filling it with ever smaller triangles, until to cover the disposal space.

The Greek mathematicians before Eudoxus had suggested the idea of *inscribing* and *circumscribing* figures inside and around the curved figure, continuing to *increase indefinitely* the number of sides of these figures, but failed to conclude reasoning because the *concept of limit* was unknown (Kline, 1999). It is attributed to Eudoxus the *lemma* (currently having the name of *lemma of Archimedes-Eudoxus*), which served as basis for the exhaustion method.



**Figure 4. Archimedes of Syracuse ((b) [wikimedia.org](#)).**

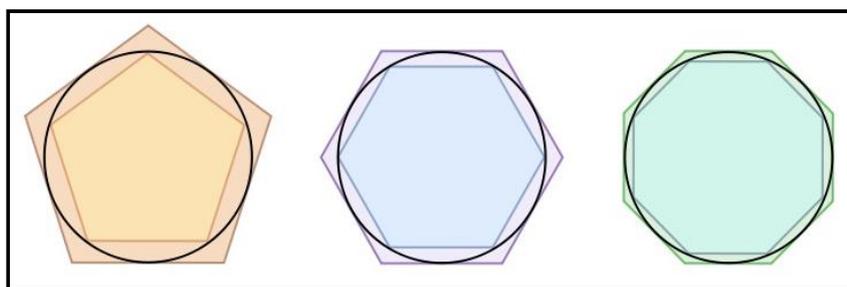
Such lemma is given in the work “*Elements*” of Euclides as a definition (definition 4, book V) (Euclides, 2002) and tells:

“*It is said that have rapport between them those quantites that are capable, if multiplied, to overcome each other*”, i.e. in equivalent terms: “Given two quantities with some ratio, it is possible to find a multiple of one that exceeds the other”.

Starting by this axiom, Euclides demonstrated a proposition (proposition 1, book X) that forms the *basis* of the exhaustion method:

“*Given two unequal quantities, if from the major it is removed a part which is greater than its half, and from what remains a greater part than its half, and if this procedure is repeated continuously, then at end it will remain a quantity that will be less than the smaller of the given quantities*”.

Euclides observed that this reasoning scheme continued to be valid even if “the subtracted parts are the half”. He used it to show that a circle can be *exhausted* by inscribed regular polygons, with a growing number of sides (Fig. 5).



**Figure 5. The exhaustion method ((c) [wikipedia.org](#)).**

From what said, we see the *power of this method* and the importance of Eudoxus. The ancient geometers suggested the idea that a curved figure can be filled with regular inscribed polygons, only intuiting the concept of “limit”; Eudoxus, for the first time, *made the procedure rigorous*, avoiding to apply the concept of limit itself. In modern terms, the exhaustion method is still used in integral calculus, although today is no longer called “exhaustion method of Eudoxus”, but “calculation of a simple integral”. The infinitesimal calculus moved the field of action *from geometry to analysis*, enriching it in *precision and rapidity*. Eudoxus was the first to develop a calculus that can be defined as *the key* of modern infinitesimal analysis.

The exhaustion method represents a *method of approximation from the bottom to the top*. The same idea will be used later in various areas:

- a) the *introduction of real numbers (Dedekind's method)*, introducing the separate and contiguous sets and the separation elements;
- b) the *Riemann's integral* (upper and lower sums);
- c) the *Perron's method* for the Dirichlet's problem (harmonic functions as separation's elements among sub-harmonic and super-harmonic functions).

## FROM THE EXHAUSTION METHOD TO THE INTEGRAL CALCULUS

The birth of infinitesimal analysis and of integral calculus is related to *geometry* and *ancient mechanics*. Greeks used the method of exhaustion, but without the conceptual pillars of modern infinitesimal calculus, such as the concept of limit, of infinity, etc., then unknown in their deeper meaning. The method was intuitively convenient and clear, but it could work only as *empirical method*, not as a *rigorous proof*.

In the time interval between the death of Archimedes (212 BC) and the fall of Alexandria under Caesar (48-47 BC), the western mathematical progress began a deceleration period up to about year 470. In the 17<sup>th</sup> century there was a scientific rebirth; together with mathematics, it grew also the logic and rigorous reasoning, that led to the criticism of empirical principles and to their rigorous proof. Thanks to the new concepts of “limit” and “series”, it was possible to understand the method of Eudoxus and to interpret it in strictly logic way.

Bonaventura Cavalieri (1598-1647), Italian mathematician, one of the greatest mathematicians of his time, elaborated the “indivisibles method”, used to determine areas and volumes, a fundamental method for the future elaboration of “infinitesimal calculus” (Smith, 1958).

## THE METHOD OF INDIVISIBLES

Cavalieri developed his method starting from 1627 (Fig. 6). The work “*Geometry of the indivisibles*” was published in 1635 after rewrites and various obstacles, in particular the fact that an “area could be considered as being formed by an indefinite number of parallel, equidistant and very thin (“indivisible”) segments”, and that a “volume could be considered as being composed of an indefinite number of parallel flat areas”, the “indivisibles of area” and “indivisibles of volume” respectively. Cavalieri realized that the number of indivisibles constituting an area or a volume had to be *indefinitely big*, but did not deepen this fact, nor did try to give a precise explanation.



Figure 6. Bonaventura Cavalieri ((d) wikipedia.org).

About the surfaces, Cavalieri speaks of them as being formed of the “totality of all lines” and about solids as formed by the “totality of all planes”. This allowed him to introduce a principle known today as the “Principle of Cavalieri”, with which he developed a powerful and new tool for the determination of areas and volumes. The principle states that:

“If two solids have equal height and if the sections cutted by parallel planes and equally distant from them are always in a given ratio, even the volumes of solids are in this ratio”.

In the first two books of the work, he showed the lemmas on which his method is based; he introduced the concept of “all the lines” of a flat figure and “all the planes” of a solid figure, establishing that “all lines of flat figures” (and likewise “all planes of solid figures”) are *quantities that have a ratio between them*, fundamental result to be able to work with them. In following books he showed results about flat and solid figures originated from *conic sections and spirals*.

The principle of Cavalieri is easy to demonstrate *using the tools of the current integral calculus*; on fact, it is equal to say that: “Two defined integrals, among the same extremes of integration, having same integrating functions, are the same”.

Cavalieri knew the method of exhaustion, but he was convinced of the *superiority of the indivisibles method* in comparison to it. There were also *logical reasons*: the exhaustion essentially uses the “demonstration by reducing to absurd”, while the indivisibles method leads to “constructive proofs”. The method of exhaustion cannot be used for the search of a result, but only for the proof of a thesis; this was a heavy, non-sustainable limitation for a scientific community always more oriented towards the “clarification of new procedures” and the “mathematization” of the areas of human knowledge (Baron, 1969).

Cavalieri introduced the indivisibles into two different treatises; in 1635 they appear as “actual infinitesimals”, in 1647 as “potential infinitesimals”. However they are not the potential infinitesimals on which the infinitesimal calculus is based, but they are invariable, very small but not null to be regarded as actual infinitesimals.

Cavalieri has had however the great merit of bravely examining *in a strictly logic and mathematical way the concept of infinity and infinitesimal* and for this reason he must be considered one of the initiators of infinitesimal calculus.

His work was not accepted with good favor, but with criticisms, in particular by Paolo Guldino (1577-1643), Swiss mathematician and astronomer, and by geometers supporting the thought and work of Archimedes. One of the most recurring objection of the supporters of Archimedes was the structure of continuous geometric quantities (lines, surfaces, solids), about which they sustained the impossibility that they could be constructed by unifying quantities having different dimensions.

Guldino, in his critique to Cavalieri, wrote:

“... *that such surface may be, and in the geometric language can be called all lines of that figure, in my opinion will be granted by nobody; never many lines, or all the lines, can be called “surface”, since the multitude of lines, no matter how great it is, can compose neither the smallest surface”.*

The Guldino's thesis connects to the *problem of infinity in the geometric thought*:

“... *I say that the continuous is endlessly divisible, but it does not consist of infinite parts in act, but only in power, which can never be exhausted”.*

His conclusions on each single Cavalieri's theorem were always the same:

“... *let us conclude, therefore, from the things we have argued, that this proposition on the flat figures has in no way validly proved”.*

The target of geometers criticism is precisely *the concept of endless proximity*, that escapes by any attempt of serious geometric definition, and overall it *goes in the opposite direction* to the Archimedes exhaustion method.

The long controversy ended up focusing on philosophical issues and it is significant that to the Cavalieri's method is opposed by Guldino just the method of exhaustion, indicated as a strictness method. The practical applications of Cavalieri's intuitions on indivisibles exceed however the limited potentialities of the exhaustion method; however, having been not supported by an appropriate conceptual and formal framework, it ended up forming an intuitive and not entirely rigorous theory.

The method of indivisibles spread in Italy and Europe and welcomed by the most important mathematicians of time. In addition to criticism, there were further developments, especially thanks to Evangelista Torricelli (1608-1647), Italian mathematician and physicist. With the application of the indivisibles method he calculated the *volume of the hyperbolic solid*, a problem that the geometers of time considered extremely difficult or impossible.

Torricelli spoke of the “*Geometry of the indivisibles*” as of “a true scientific way to demonstrate, direct and natural”; and still:

“*I am compassionate about the old geometry which, not knowing or not admitting the indivisibles, in the study of solids discovered so few truths that a painful poverty of ideas is perpetuated until our age. In fact, the theorems of ancients that compose the doctrine of solids represent only a part of the speculations that, in our age, the admirable Cavalieri, for not mentioning others, made around a number of solids, abundant in large numbers”.*

In 1653, however, the method was considered aged and hard, and was abandoned following the spread of new and powerful computing tools.

Leibniz and Newton were the first mathematicians to introduce differential and integral calculus. The use of mathematical symbols introduced by Leibniz led to more modern theories and inspired the development of the theory of infinitesimals and infinities. Newton had addressed the problem of the calculation of the “primitives” of a given function (*indefinite integral*), linking it to the problem of areas, considering particular classes of functions (power functions and polynomials).

About notation and terminology, the *integral symbol* was introduced by Leibniz as a stretched “S” (abbreviation of the word *sum*) (Fig. 7).

$$\int f(x) dx$$

**Figure 7. The current symbol of (indefinite) integral of a function  $f(x)$ .**

The term “integral” was introduced later by Daniel Bernoulli (1700-1782), a Swiss mathematician, one of the most important mathematicians of the Bernoulli's family, which also contributed greatly to mechanics, particularly to fluid dynamics, probability, statistics, and whose works are still being studied world-wide (Rouse Ball, 2003).

The subsequent formulation of the theory of integration by Georg Friedrich Bernhard Riemann (1826-1866), German mathematician and physicist, is based on a hand on the work of Leibniz and Newton, on the other one by the method of exhaustion; this last was also used in the same period for the *construction of real numbers* by Julius Wilhelm Richard Dedekind (1831-1916), German mathematician, and for the *measure theory* by Camille Jordan (1838-1922), French mathematician (Ewald, 1996; *britannica.com*).

Together with the development of integral calculus, the study of *quadrature formulas*, which provide *approximate values* (useful for the *numerical approximation*) of a defined integral, was also developed (Di Sia, 2013; Di Sia, 2014).

## CONCLUSIONS

The history of mathematical analysis is a fascinating adventure born over time, in particular by the contributions of the ancient Greeks and not yet completed. His “official birth” is considered during the second half of the 17<sup>th</sup> century, thanks to the work of Isaac Newton and Gottfried Leibniz, who independently introduced the fundamental concepts of infinitesimal calculus.

Initially it was based on geometric aspects in an attempt to answer questions about the calculus of areas and geometric features of a curve. Its development was strongly motivated by physics, leading to the development and elaboration of rational mechanics.

The concept of function is crucial for the purposes of mathematical analysis. Through advanced operations, a number of fundamental properties of considerable utility are identified in theoretical developments and practical applications: the continuity, the derivability, the differentiation.

The concept of limit, fundamental in analysis, was intuitively understood by mathematicians of the importance of Wallis, Euler, Bernoulli, Newton, Leibniz, and also Archimedes had intuitively understood it. The concepts of derivative and integral occupy a fundamental role in infinitesimal calculus and in all mathematical analysis; they are fundamental tools for studying a function.

The infinitesimal calculus, foundation of mathematical analysis, defines and studies the notions of convergence of a succession or series, continuity, derivation, and integration. It is a powerful instrument used in almost all fields of mathematics, physics and science.

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# A Linear Structural Relationship of Ethical Leadership and Good Governance

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## ABSTRACT

This research aimed to investigate linear structural relationship model of ethical leadership and good governance of administrators under the Secondary Educational Service Area 30, Thailand. Researchers utilized quantitative survey design using questionnaire as instrument. A total of 450 samples including 79 school administrators and 336 teachers were selected from a population of 1,907. Result showed that the linear structural relationship model between ethical leadership and good governance found to be consistent with empirical data, with  $\beta = 0.760$ ,  $\chi^2 = 40.220$ ,  $df = 29$ ,  $\chi^2/df = 1.387$ ,  $CFI = 0.998$ ,  $TLI = 0.995$ ,  $RMSEA = 0.031$ ,  $SRMR = 0.016$ .

**Key Words:** Ethic, Leadership, Governance

## INTRODUCTION

Since the 1997 Financial Crisis, the concept of good corporate governance has gained popularity in Thailand. Good governance means that an organization has efficient, transparent, and auditable management structures and processes in place that promote trust and confidence between stakeholders. These structures and processes also stimulate competitiveness, boost long-term stakeholder value, and present excellent opportunities for sustainable growth. Therefore good governance contributes significantly to an organizational value, stakeholder confidence and overall sustainable growth. The moral and ethics of the society are deteriorating to a critical situation whereby dishonesty and corruptions in the workplace had become a common issue (Government Public Relations Department, 2014). Population growth has brought about competition for limited resources in the society thus people become more attached to materials than goodness. Ethics is a concept about moral values and rules. The school administrators' ethical leadership is of great importance regarding the educational organizations. The most important responsibility of school administrators is to have an ethical perception of school administration.

Today many professional communities have developed a code of ethics to make more specific the moral code that specifically applies to their situation. Currently, ethical leadership is essential to every organization of all types and in all corners of society. School administrators particularly play a significant role in society as leaders and role models for today's students but future's leaders. An ethical leader not only endeavors to do the right things but also to do things right. Therefore school administrator whose behavior is consistent acts morally and he or she values social justice (Glanz, 2006). Ethics is part of the administrators' job. Indeed, it is an essential part of the job. School administrators have to deal with fairness, equality, justice and democracy as much as they deal with test scores, teachers' work performance, parents, and budgets (Strike, Emil, Jonas, 2005). School administrators have a key role in managing schools because they are main decision makers, they are school leaders, and they have more responsibilities than the other staffs have. Hence school administrators' ethical behaviors and decisions directly affect school climate positively. In such an ethical school environment success is a definite success is a definite outcome of the educational process.

In 2003, Thai government issued the Royal decree on Principles and Methods of Good Governance to all governmental organizations. Therefore education reform has to follow the good governance or good administration so as to meet the existing problems and requirements of the globalized world. As a result educational institutions will be expected to be efficient and effective by ensuring the success of management and administration (Runcharoen, 2007).

The past national development in Thailand showed several significant and rapid changes in the local economic, social and political systems, thereby overwhelming the existing management system. The management system evidently was unfit for such changes. Moreover social changes are taking place on the global front as a result of

globalization and the advent of the new economy, thanks to modern information technology and communications, trade liberalization, regionalization, localization, as well as democratic movements and more calls for human rights. These have led to changes in ways of living, values, and culture in the global community. A major objective of the Ninth Plan (Thailand's National Economic and Social Development Board, NESDB, n.d.), there are six key factors of good governance will be pursued. First is the principle of accountability, which emphasizes recognizing legitimate duties, public awareness, political awareness, and the courage to accept the consequences of actions. Ethic is the second key factor. Attention will be given to righteousness, honesty, diligence, tolerance, and discipline. Popular participation will encourage people from all walks of life to take part in the decision making processes for national development. Fourthly, attention will be given to efficiency, particularly in terms of the optimization and prudent management of limited resources of the country, based on a sustainable development approach. Transparency will provide people with easy access to information, so that they can effectively participate in monitoring the fairness and effectiveness of operations. The Rule of Law will also be important, as laws will need to be continuously updated, to be fair and socially acceptable. The development of good governance in Thai society is seen as a vital condition for success of the Ninth Plan implementation (Thailand's National Economic and Social Development Board, NESDB, n.d.). It will be a key driving force for all other development strategies. These six key factors, based on the Philosophy of Sufficiency Economy, will become fundamental elements for all levels of management, from the family and community to the government, in order to immediately restore economic and social health and lay down solid foundations for long-term, sustainable economic and social development.

School leaders may often be faced with choices that require them to make decisions. All these decisions may not have any clear cut resolution and are likely to be problematic. That is why school administrators may frequently face with ethical dilemmas. In other word, an ethical dilemma comes out from a situation that requires a choice among competing sets of principles, values, beliefs, perspectives (Cranston, Ehrich, Kimber, 2003). At ethical dilemma is not a choice between wrong and right. It is a choice between two rights as it was stated by Rushworth Kidder (1995 in Ibrahim & Turgut, 2009). For example, deciding whether scarce resources should go to a gifted curriculum or a dropout-prevention program would constitute a dilemma and this is very challenging for school administrators (Lashway, 1996).

Thai educational administration faces the similar problem as they should not seek benefits for themselves and overlook moral and ethics which will lead the organization to sustainable success and growth (Watcharamethee, 2006). As such, school administrators must be knowledgeable, capable, skillful, having expertise, experiences, broad vision, ethics and moral, and are respectful and trustworthy to administer their organizations. Moral and ethics are the major qualities that enhance school administrators to possess the self-ruling, people-ruling, and task-ruling characteristic (Pongsriwat, 2007).

## LITERATURE REVIEWS

Michael and Linda (2006) reviewed the emerging construct of ethical leadership and compared this construct with related concepts that share a common concern for a moral dimension of leadership namely spiritual, authentic, and transformational leadership. Drawing broadly from the intersection of the ethics and leadership literatures, Michael and Linda offer propositions about the antecedents and outcomes of ethical leadership. In addition, they also identify issues and questions to be addressed in the future and discuss their implications for research and practice. Their review indicates that ethical leadership remains largely unexplored offering researches opportunities for new discoveries and leaders opportunities to improve their effectiveness.

Poohongthong, Surat, and Sutipan (2014) studied on the relationship between ethical leadership, work-life balance, organizational socialization, and organizational citizenship of teachers in Northern Thailand. The results showed that work-life balance and organizational socialization had significant positive correlations with the organizational citizenship behavior ( $r = 0.187, p < .05$  and  $r = 0.353, p < .01$ ) respectively. Moreover, ethical leadership, work-life balance, and organizational socialization together, could account for 14.3 percent predictive power of teachers' organizational citizenship behavior. Only organizational socialization had a significant and positive effect on the organizational citizenship behavior ( $\beta = 0.378, t = 3.81, p < .01$ ). Thus ethical leadership was proved to be able to strengthen organizational socialization and morality. Consequently, processing of organizational socialization in ethical way will promote being a good citizenship and work effectiveness in the organizations. In short, if employees are happy and success at their work, their work-life balance can be positively and effectively managed as well.

Karakose (2007) carried out a study to determine to what extent principals demonstrate ethical leadership behavior in Turkey. Karakose utilized Ethical Leadership Scale (ELS) developed by Yilmaz (2006) to evaluate

teachers' perceptions. Findings of Karakose's study revealed that principals adequately perform their ethical responsibilities like treating their staff justly and encouraging them, being fair, understanding, patient and humble, traits which all exist in the communicative ethics, climate ethics, and ethics in decision making levels at the state high schools in the city of Kutahya, Turkey. Moreover respondents have clearly admitted that their principals engaged in such ethical behavioral ethics level as self-evaluation, not lying and protecting individual rights poorly. Aliyu (2013) overviewed and highlighted the basic concepts and contemporary issues of ethical leadership and good governance. According to Aliyu, leadership is a means of direction, but when it exists without ethics it is absolutely directionless and worthless. Aliyu also seeks to find out the relationship between ethical leadership and good governance, using some selected public and private organizations as case study. On top of that, a conclusion has made that leaders in both public and private sectors should embrace in totality ethics in discharging their responsibilities.

## RESEARCH OBJECTIVES

The main objective was to study the linear structural relationship model of the ethical leadership and good governance of the school administrators under the Secondary Educational Service Area 30.

## METHOD

Researchers employed survey questionnaire as a method to collect quantitative data. Target group were 1,907 school administrators and teachers who worked in the schools under the Office of Secondary Educational Service Area 30. Multistage sampling technique followed by stratified random sampling technique was administered to select samples according to school size. The required sample size was 415 samples according to Krejcie and Morgan's Table at 95 percent confident level. These 97 secondary schools consisted of 10 small sized schools, 47 medium sized schools, 17 large sized schools and 23 extra-large sized schools. A total of 415 samples were comprised of 336 teachers and 79 school administrators. Table 1 shows the distribution of samples.

**Table 1.** Distribution of samples

Types of schools	Administrators		Teachers		Total	
	N	n	N	n	N	n
Small size	10	8	307	57	317	65
Medium size	47	38	679	126	726	164
Large size	17	14	264	49	281	63
Extra-large size	23	19	560	104	583	123
	97	79	1810	336	1907	415

Rules of thumb for determining adequate sample size (N) are known to be of limited use in achieving an acceptable likelihood for desirable empirical outcomes (e.g., model convergence, statistical precision, statistical power) for a particular application of confirmatory factor analysis (CFA) with real data (Marsh, Hau, Balla, & Grayson, 1998). Common rules of thumb for determining adequate N for a particular application of CFA include, but are not limited to:  $N \geq 200$ , ratio of N to the number of variables in a model (p),  $N/p \geq 10$ ; the ratio of N to the number of model parameters (q),  $N/q \geq 5$ ; and an inverse relationship between construct reliability and adequate N. Even when model-data assumptions are made that are rarely observed in practice and simulated data are analyzed, the performance of these rules of thumb has limited the ability of methodologists to offer definitive guidelines for adequate N across the myriad of model-data conditions observed in practice (Gagné & Hancock, 2006; Jackson 2001). The core problem with these rules of thumb is that adequate N for CFA depends on many factors that typically vary across any two studies using real data and inexact theoretical models (e.g., distribution of variables, reliability of indicators, size of the model, degree of model misspecification).

Structural Equation Modelling (SEM) is utilized in this study in order to fit the Model. SEM is a combination of factor analysis and regression or path analysis. The interest in SEM is often on theoretical constructs, which are represented by the latent factor. The relationships between the theoretical construct are represented by regression or path coefficients between the factors. The structural equation model implies a structure for the covariance between the observed variables. Nowadays structural equation models need not be linear, and possibilities of SEM extend well beyond the original LISREL program or Mplus program. SEM provides a very general and convenient framework for statistical analysis that includes several traditional multivariate procedures, for example factor analysis, regression analysis, discriminant analysis, and canonical correlation, as special case. Structural equation models are often visualized by a graphical path diagram. The statistical model is usually represented in a set of matrix equation. Mplus which is utilized in this study allows the model to be specified in a

graphical way, by letting the user draw the path diagram directly in an interactive command window.

Confirmatory factor analysis (CFA) is a powerful statistical tool for examining the nature and relations among latent construct. CFA explicitly tests a prior hypothesis about relations between observed variables and latent variables or factors. CFA is part of SEM and plays an essential role in measurement model validation in path or structural analyses (Brown, 2006; MacCallum & Austin, 2000). Researchers evaluate the measurement model first whether the measured variables accurately reflect the desired constructs or factors before assessing the structural model. In this study, the purpose of SEM is twofold. Firstly, it aims to obtain estimates of the parameters of the model, for example, the factor loading, the variances and covariance of the factor, and the residual error variances of the observed variables. The second purpose is to assess the fit of model, for example to assess whether the model itself provides a good fit to the data.

Absolute fit indices determine how well a prior model fits the sample data (McDonald & Ho, 2002) and demonstrates which proposed model has the most superior fit. These measures provide the most fundamental indication of how well the proposed theory fits the data. Unlike incremental fit indices, their calculation does not rely on comparison with a baseline model but is instead a measure of how well the model fits in comparison to no model at all (Jöreskog & Sörbom, 1993). Included in this category are the Chi-Squared test, RMSEA, GFI, AGFI, the RMR and the SRMR. The Chi-Square value is the traditional measure for evaluating overall model fit and, 'assesses the magnitude of discrepancy between the sample and fitted co-variances matrices' (Hu and Bentler, 1999: 2). A good model fit would provide an insignificant result at a 0.05 threshold (Barrett, 2007). While the Chi-Squared test retains its popularity as a fit statistic, there exist a number of severe limitations in its use. Firstly, this test assumes multivariate normality and severe deviations from normality may result in model rejections even when the model is properly specified (McIntosh, 2006). Secondly, because the Chi-Square statistic is in essence a statistical significance test it is sensitive to sample size which means that the Chi-Square statistic nearly always rejects the model when large samples are used (Bentler and Bonnet, 1980; Jöreskog and Sörbom, 1993).

On the other hand, where small samples are used, the Chi-Square statistic lacks power and because of this may not discriminate between good fitting models and poor fitting models (Kenny & McCoach, 2003). Due to the restrictiveness of the Model Chi-Square, researchers have sought alternative indices to assess model fit. One example of a statistic that minimizes the impact of sample size on the Model Chi-Square is Wheaton, Muthen, Alwin and Summers's (1977) relative/normed chi-square ( $\chi^2/df$ ). Although there is no consensus regarding an acceptable ratio for this statistic, recommendations range from as high as 5.0 (Wheaton et al., 1977) to as low as 2.0 (Tabachnick & Fidell, 2007). The Root Mean Square Error of Approximation (RMSEA) is the second fit statistic reported in the LISREL and Mplus program and was first developed by Steiger and Lind (1980, cited in Steiger, 1990). The RMSEA tells us how well the model, with unknown but optimally chosen parameter estimates would fit the population covariance matrix (Byrne, 1998). Recommendations for RMSEA cut-off points have been reduced considerably in the last fifteen years. Up until the early nineties, an RMSEA in the range of 0.05 to 0.10 was considered an indication of fair fit and values above 0.10 indicated poor fit (MacCallum, Browne, & Sugawara, 1996). It was then thought that an RMSEA of between 0.08 to 0.10 provides a mediocre fit and below 0.08 shows a good fit (MacCallum et al, 1996).

However, more recently, a cut-off value close to .06 (Hu and Bentler, 1999) or a stringent upper limit of 0.07 (Steiger, 2007) seems to be the general consensus amongst authorities in this area. One of the greatest advantages of the RMSEA is its ability for a confidence interval to be calculated around its value (MacCallum et al, 1996). This is possible due to the known distribution values of the statistic and subsequently allows for the null hypothesis (poor fit) to be tested more precisely (McQuitty, 2004). It is generally reported in conjunction with the RMSEA and in a well-fitting model the lower limit is close to 0 while the upper limit should be less than 0.08. The Goodness-of-Fit statistic (GFI) was created by Jöreskog and Sorbom as an alternative to the Chi-Square test and calculates the proportion of variance that is accounted for by the estimated population covariance (Tabachnick & Fidell, 2007). This statistic ranges from 0 to 1 with larger samples increasing its value. When there are a large number of degrees of freedom in comparison to sample size, the GFI has a downward bias (Sharma, Mukherjee, Kumar, & Dillon, 2005). Related to the GFI is the Adjust Goodness-of-Fit statistic (AGFI) which adjusts the GFI based upon degrees of freedom, with more saturated models reducing fit (Tabachnick & Fidell, 2007). In addition to this, AGFI tends to increase with sample size. As with the GFI, values for the AGFI also range between 0 and 1 and it is generally accepted that values of 0.90 or greater indicate well-fitting models. Given the often detrimental effect of sample size on these two fit indices they are not relied upon as a stand-alone index, however given their historical importance they are often reported in covariance structure analyses.

The Root Mean square Residual (RMR) and the Standardized root mean square residual (SRMR) are the square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model. The range of the RMR is calculated based upon the scales of each indicator. The standardized RMR (SRMR) resolves this problem and is therefore much more meaningful to interpret. Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05 (Byrne, 1998; Diamantopoulos & Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu & Bentler, 1999). The Comparative Fit Index (CFI: Bentler, 1990) is introduced by Bentler (1992) and subsequently included as part of the fit indices in his EQS program (Kline, 2005). This statistic assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model. A cut-off criterion of CFI  $\geq 0.90$  was initially advanced however, recent studies have shown that a value greater than 0.90 is needed in order to ensure that miss-specified models are not accepted (Hu & Bentler, 1999). From this, a value of CFI  $\geq 0.95$  is presently recognized as indicative of good fit (Hu & Bentler, 1999).

This questionnaire was then sent to a panel of three experts for comments and feedbacks. The panel of experts was selected using the criteria based on their expertise. Validate the quality of the instrument based on the content validity by finding the index of item according to objective congruence (IOC)  $\geq 0.6$ . From the feedbacks returned by the panel, some modifications were made to the original instrument. Pilot testing of the instrument was carried out to 5 school administrators and 25 teachers in the Secondary Educational Service Area Office 25 but they were not the samples of the actual study. They were chosen as their structure and population are the same as the actual study. To improve the quality of the items in the instrument, they were also asked to give suggestions and comments on the items in the instrument. Revisions were made based on the suggestions and feedback from the 30 participants. It could be concluded that the instruments were reliable and good to use as the Cronbach alpha value indicated that all the research variables had higher Cronbach alpha values ranging from 0.992 to 0.991 for ethical leadership and good governance respectively.

## RESULTS

### *Factor loading and validity of observable variables in the relationship model*

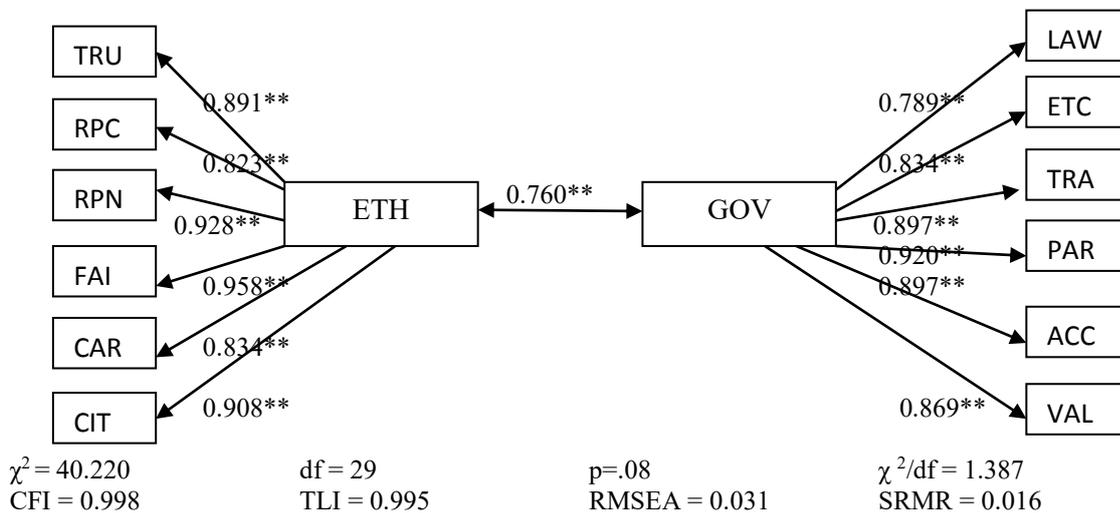
As indicated in Table 2 below, factor loading values of all ethical leadership attributes ranged from 0.823 to 0.958 are statistically significant at 0.01. Factor loading is the importance of standard factors of each attribute in the relationship model of ethical leadership and good governance of the school administrators that had been taken into consideration. The co-variance with ethical leadership was from 66.70 to 91.80 percent. The attribute with the highest factor loading was fairness. This is followed by responsibility, good citizenship, trust, and caring respectively. The attribute that had the lowest factor loading was respect. As a result all the factors are found to be important construct of ethical leadership. On the other hand, as for constructs of good governance showed the factor loading values from 0.789 to 0.920 and are statistically significant at 0.01. The co-variance with good governance was from 62.20 to 84.60 percent. The attribute with the highest factor loading was participation, followed by responsibility, worthiness, and ethics respectively. The attribute receiving the lowest factor loading was the principle of laws. All constructs were important as the attributes of good governance of the school administrators.

**Table 2.** Factor loading and validity of observable variable in the relationship model

Components of measuring model	Factor loading			
	$\beta$	SE	t	R <sup>2</sup>
ETH Trust (TRU)	0.891**	0.023	38.117	0.793
ETH Respect (RPC)	0.823**	0.019	44.044	0.667
ETH Responsibility (RPN)	0.928**	0.017	56.150	0.862
ETH Fairness (FAI)	0.958**	0.013	71.028	0.918
ETH Caring (CAR)	0.834**	0.018	45.741	0.695
ETH Citizenship (CIT)	0.908**	0.019	48.690	0.825
GOV Law (LAW)	0.789**	0.024	33.191	0.622
GOV Ethics (ETC)	0.834**	0.019	42.892	0.695
GOV Transparency (TRA)	0.897**	0.012	74.987	0.804
GOV Participation (PAR)	0.920**	0.010	90.971	0.846
GOV Accountability (ACC)	0.897**	0.012	75.840	0.805
GOV Value worthiness (VAL)	0.869**	0.014	60.540	0.756
Ethical Leadership (ETH)	0.760**	0.024	31.951	

\*\*p<.01

Based on Figure 1 below, the correlations between ethical leadership and good governance can be assessed in the standard component score ( $\beta$ ) as 0.760 which shows significantly high and positive correlations at 0.01. This means that if ethical leadership is high, good governance value will be high too. Besides, it was found that the relationship model of ethical leadership and good governance has goodness fit with evident data, with  $\chi^2 = 40.220$ ,  $df = 29$ ,  $\chi^2/df = 1.387$ , CFI = 0.998, TLI = 0.995, RMSEA = 0.031, and SRMR = 0.016 as illustrated in Figure 1. Figure 1 shows the degree of correlation between ethical leadership and good governance can be indicated by standard factor loading ( $\beta$ ) = 0.760 which is statistically significant at 0.01. In addition it was found that the relationship model of ethical leadership and good governance agreed with empirical data.



**Figure 1.** Coefficient of standard factor loading of the relationship model

## DISCUSSION

The major focus of this study was on the importance of standard factor loading of each variable in the relationship model of ethical leadership and good governance of the school administrators under the Secondary Educational Service Area 30. Findings revealed that all the attributes of ethical leadership show the factor loading values from 0.823 to 0.958, with statistically significant at 0.01. The co-variance with ethical leadership was from 66.70 to 91.80 percent. This shows that all of the synthesized factors of ethical leadership correlate well with the empirical data with statistical significance (Tuksino, 2009). Hence findings also indicated that all the six attributes of ethical leadership namely fairness, responsibility, citizenship, trust, caring, and respect are important for ethical leadership practiced by school administrators. As a result, finding seems to be in accordance with theories and previous research studies.

On the other hand, all the attributes of good governance had the factor loading values from 0.789 to 0.920, with statistical significance at 0.01 ( $p < 0.01$ ). The co-variance with good governance was from 62.20 to 84.60 percent, showing that all of the synthesized factors of good governance correlate very well with the empirical data (Tuksino, 2009). As a result, researchers obtained all the six attributes of good governance namely participation, responsibility, transparency, value worthiness, ethics, and law respectively and considered as important variables of good governance. As a conclusion this finding is in line with concepts, theories and past research works to the attributes of good governance.

The degree of correlation between ethical leadership and good governance was indicated by the standard factor loading ( $\beta = 0.760$ ), which was high and positive with statistical significance at 0.01. Moreover, it was found that the relationship model of ethical leadership and good governance correlated very well with the empirical data with statistical significance. This shows that the ethical leadership and good governance of the school administrators under the Secondary Educational Service Area 30 correlated in the same direction. If school administrators have high ethical leadership, their good governance degree will be high. Nevertheless finding revealed that this model of relationship between ethical leadership and good governance was found to be consistent with empirical data with  $\beta = 0.760$ ,  $\chi^2 = 40.220$ ,  $df = 29$ ,  $\chi^2/df = 1.387$ , CFI = 0.998, TLI = 0.995, RMSEA = 0.031, SRMR = 0.016 as what has been proposed by researchers. As a result, this means that ethical leadership and good governance relationship model may explain the relationship between ethical leadership and good governance.

Result of this study is parallel with the assumption, concepts, theories, and the past research studies. For example, Pawawong, Pamsupawachara and Pengsawat (2012) stated that efficient school administration and their success do not depend on any best theory or principle that can be applied in all schools. However, if school administrators are professional and able to use good governance, knowledge, and expertise in integrating various techniques, theories and principles as appropriate to situations, places, time, and the environmental factors; then they will be successful and efficient. Another study which was conducted by Wachiramethee (2009) found that ethical leadership of school administrators is important since it will link towards ethics in the institution and a good example for teachers, students, and educators. It will bring about good culture and moral which lead to happiness of people in the society and hence the expectation of the Education Act will be met. The finding also agrees with the research work of Okechukwu (2012), who studied ethical leadership and good governance in a local government in Nigeria and found that the potential pattern of ethical leadership would help control the situations in developing socio-economic resources in Nigeria, and will improve the quality of administration. Similarly, Othman (2014), conducted a study on characteristics of leaders with good governance, using businessmen in Malaysia as the sample group. This study shows that ethical leadership is necessary for organizational good governance.

## CONCLUSION

This study found to have the above mentioned attributes of ethical leadership supported the proposition that ethical leadership associated with good governance practices. Ethical leadership attributes emerged as supporting the process of good governance practices in the context of this study. The overall findings of this study are useful for the policy maker, educational administrators, educators and practitioners. Empirical development in the school organizations largely neglects to recognize ethics as an element of good governance. This study provides empirical justification that ethics particularly ethical leadership is crucial in the construction of good governance practices. Such findings establish school organization as a social process rather than as economic logic. The richness and justification of data reveals its valuable contribution of knowledge from an academic perspective. This study also contributes to the work of school administrators in several ways. The findings highlighted the important of ethics, and thus acknowledge the managerial implications of incorporating ethical based governance into the educational administration system. There were several limitations noted. The general limitation is the scope of the study. As ethics is a sensitive issue, an in depth description of practice, through case research, was impossible. However, in order to enrich the findings, a case study as well as comparative study would be recommended for future research. Researchers would like to recommend an objective view of the research that would provide a causal effect of the attributes of ethical leadership and good governance practices. In addition, researchers predict future research could build an insight into explaining the relationship between ethical leadership and good governance.

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# A Linear Structural Relationship of Organizational Factors and Learning Innovation of Teachers in Thailand

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## ABSTRACT

The aim of this research was to investigate the linear structural relationship model between organizational factors and teachers' learning innovation. Quantitative survey design and multi-stage sampling were employed and data was analyzed using structural equation modeling. Results revealed that the relationship model was found to be consistent with empirical data, with  $\chi^2 = 123.540$ ,  $df = 76$ ,  $\chi^2/df = 1.625$ , CFI = .989, TLI = .976, RMSEA = .001, SRMR = .017. The overall effect of organizational factors were school leadership ( $\beta = .729$ , .683), school policy ( $\beta = .233$ ) and professional learning community ( $\beta = .166$ ) on teachers' learning innovation.

**Keywords:** Learning innovation; organizational factors; professional learning community; school leadership

## INTRODUCTION

Teachers are supposed to be experts in learning and the most important agents in shaping education for students in regard to bring about change and innovation in educational practices (Bakkenes, Vermunt & Wubbels, 2010). Educational innovations have regularly failed because they did not recognize the need for teachers' learning innovation (Lieberman & Pointer Mace, 2008). Currently, there is a growing awareness of the necessity of assisting teachers in their professional development particularly in Thailand whereby the country is directed to reform innovatively in order to cope with the opportunities and threats in the 21 century. Shalley and Zhuo (2008) emphasized the key success factors of an innovative and creative educational system are focusing on learners' learning skills and their creativity to promote innovation for future sustainable economic growth.

With regard to organizational factors, Jurasaitė-Harbišon (2009) who had carried out a study in the United States and Lithuania, found that there are three features of the school culture providing or failing to provide opportunities for teachers' innovative learning in informal contexts namely school leadership, teachers' professional relationships, and their individual stances as learners. School leadership is one of the major components of organizational factors because school leader must instill passion in teachers and provide effective leadership to motivate teachers' learning to engage and energize students (Barret & Breyer, 2014). Barret and Breyer primarily determined on how school leadership is able to modelling instructional strategies to influence teachers' learning innovation that promote greater students' engagement and learning. They further suggested that sustaining teachers' passion for innovative learning and providing teachers with motivation to engage students in lessons through effective leadership and modelling.

School policy is another component of organizational factors that hypothesized to influence teachers' learning innovation. This is because the patterns of teaching practices and participation in professional practice are strongly influenced by the specific interaction between traditions, culture, and educational policy in an educational system (Vieluf, Kaplan, Klieme & Bayer, 2012). It is clear that high quality teaching must exceed teachers' learning innovation in order to stimulate and challenge students. Vieluf et al. further highlighted that student motivation is enhanced by autonomy and social relatedness, as well as structured teaching and good classroom management. They reported that the main driver for advancement in teachers' learning innovation lies with developing a large range of school policy and granting autonomy and isolation to co-operatively reflect pedagogical practice.

Thailand's basic education depends on a growing number of effective organizational factors to promote professional learning community as one of the shared responsibilities and collaborative actions for both teachers and students according to the report made by the Office of National Education Commission of Thailand (2002). According to Somprach, Tang and Popoonsak (2017), the rolling adoption across schools and teachers offer the potential to observe variation in schools' and teachers' adoption of the professional learning community approach in Thailand. Somprach et al. found that school leaders should utilize suitable leadership styles to foster and manage school cultures that develop collaborative working relationships and support ongoing learning innovation for teachers.

## RESEARCH OBJECTIVES

The main objective was to study the linear structural relationship model of the organizational factors consisted of school policy, school leadership, and professional learning community toward learning innovation of the teachers.

## METHOD

A survey quantitative method was employed as a single method to collect data. Sample size was determined based on Thompson (2004) and Meyers, Gamst, and Guarino (2006)'s rules of thumb. Thompson proposed that at least 200 respondents must be tested in order to achieve an established solution through factor analysis. Likewise, Meyers et al. proposed that suitable sample sizes depend upon the numbers of items available for factor analysis. On this line of reasoning, target group were school directors and teachers from 780 schools under the Office of Basic Education Commission, with the ratio 1 to 1. The unit of analysis of this study was school. A multi-stage sampling was employed and teachers and school directors were randomly selected. A 108-items questionnaire was used as mode of data collection.

Structural Equation Modelling (SEM) was utilized in this study in order to fit the model with empirical data. According to Hoyle (1995), SEM is a comprehensive statistical modeling tool for analyzing multivariate data involving complex relationships between and among variables. Besides, SEM is a powerful technique that can combine complex path models with latent variables (factors). Using SEM can specify the relationships between variables using two main sets of equations namely measurement equations and structural equations. Measurement equations are used to examine the accuracy of proposed measurement by considering relationships between latent variables and their respective indicators. The structural equations are used to drive the assessment of the hypothesized relationships between the latent variables, which permit testing the statistical hypotheses of the study (Byrne, 2010). In addition, SEM considers the modeling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms, and multiple latent independents each measured by multiple indicators.

SEM was found to be suitable to use in this study because of this two reasons. Firstly, SEM validates the measurement model in terms of assessing the relationship between hypothetic latent constructs and clusters of observed variables underlying each construct. Therefore, Confirmatory Factor Analysis (CFA) is used to validate the measurement model. Secondly, SEM directs around fitting the structural model by measuring the significance of the relationship between latent variables, which is accomplished through path analysis (Hoyle, 1995; Kaplan, 2000). CFA was used as a desirable validation stage preliminary to the main use of SEM to identify the causal relations among latent variables (Schumacker & Lomax, 2004)

Absolute fit indices attain how well a preceding model fits the sample data (McDonald and Ho, 2002) and creates which proposed model has the greatest fit. These measures offer the most dynamic suggestion of how well the proposed theory fits the data. Unlike incremental fit indices, their intention does not depend on comparison with a baseline model but is instead a measure of how well the model fits in comparison to no model at all (Jöreskog & Sörbom, 1993). Included in this category are the Chi-Squared test, RMSEA, GFI, AGFI, the RMR and the SRMR.

When the sample size is small, the Chi-Square statistic lack of power because it may not be able to discriminate between good fitting models and poor fitting models (Kenny & McCoach, 2003). As a result, the relative/normal chi-square ( $\chi^2/df$ ) will be used to minimize the impact of sample size (Wheaton, Muthen, Alwin, & Summers, 1977). The Root Mean Square Error of Approximation (RMSEA) is the second fit statistic used to identify how well the model with unknown but optimally chosen parameter estimates would fit the population covariance matrix (Byrne, 1998).

The Root Mean square Residual (RMR) and the Standardized root mean square residual (SRMR) are the square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model. The standardized RMR (SRMR) resolves this problem and is therefore much more meaningful to interpret. Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05 (Byrne, 1998; Diamantopoulos & Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu & Bentler, 1999). The Comparative Fit Index (CFI: Bentler, 1990) is introduced by Bentler (1992) and subsequently included as part of the fit indices in his EQS program (Kline, 2005). This statistic assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model. A cut-off criterion of  $CFI \geq 0.90$  was initially advanced however, recent studies have shown that a value greater than 0.90 is needed in order to ensure that miss-specified models are not accepted (Hu & Bentler, 1999). From this, a value of  $CFI \geq 0.95$  is presently recognized as indicative of good fit (Hu & Bentler, 1999).

## RESULTS

### *Factor loading and validity of teachers' learning innovation (observable variable) in the relationship model*

Based on the linear structural relationship of learning innovation model, there were four primary factors: innovation novelty, innovation value, innovation development process, and innovative application; 15 secondary factors including level of newness, creative, problem-solving or learning quality, professional value, cost benefit, value creation for learning and well-being, and 48 indicators. CFA was used to validate at the preliminary stage to identify the causal relationships among the latent variables.

As indicated in Table 1 below, factor loading values of all learning innovation ranged from 0.787 to 0.948 are statistically significant at 0.01. Factor loading is the importance of standard factors of each observable variable in the relationship model of organizational factors and learning innovation of the teachers that had been taken into consideration. The co-variance with learning innovations was from 66.10 to 83.60 percent. The factor with the highest factor loading was media. This is followed by design, strategies or techniques, instrument or tool, implement and evaluation, creating and construction, creative, professional value, cost benefit, value creation for learning and well-being, problem-solving or learning quality, level of newness, can be utilizing, and objectives respectively. The indicator that had the lowest factor loading was distribution and acceptance. As a result all the factors are found to be important construct of learning innovations.

**Table 1.** Factor loading and validity of observable variable in the measurement model of teachers' learning innovations

Factors	Matrix of Factor loading				
	$\beta$	SE	t	Factor score	R <sup>2</sup>
<b>Innovation novelty</b>					
-Level of newness	.821**	.011	72.213	.248	.673
-Creative	.886**	.010	87.557	.401	.785
<b>Innovation value</b>					
-Problem-solving or learning quality	.838**	.009	97.495	.157	.702
-Professional value	.877**	.007	123.772	.198	.769
-Cost benefit	.862**	.008	113.215	.172	.743
-Value creation for learning & well-being	.844**	.008	101.033	.144	.712
<b>Innovation development process</b>					
-Objectives	.813**	.009	88.770	.090	.661
-Design	.915**	.005	182.619	.221	.836
-Creating & construction	.889**	.006	148.138	.154	.791
-Implement & evaluation	.897**	.006	157.706	.184	.805
-Distribution & acceptance	.787**	.010	77.142	.068	.619
<b>Innovation application</b>					
-Can be utilizing	.815**	.012	65.932	.154	.749
-Instrument or tool	.906**	.008	120.671	.171	.765
-Media	.948**	.006	168.173	.259	.836
-Strategies or techniques	.913**	.007	137.778	.211	.798

\*\*p<.01

Results from Table 1 shows that the correction between the factors of learning innovations can be assessed in the standard component score ( $\beta$ ) which indicated significantly high and positive correlations at 0.01. Besides, it was found that the measurement model of teachers' learning innovations factors has goodness fit with evident data, with  $\chi^2 = 56.567$ ,  $df = 39$ ,  $p = .008$ ,  $\chi^2/df = 1.450$ ,  $CFI = .996$ ,  $TLI = .989$ ,  $RMSEA = .012$ , and  $SRMR = 0.006$ . Result show that not only the degree of correlation between the learning innovations factors was statistically high at significant level of 0.01 but also the relationship model of learning innovation factors agreed with empirical data.

### *Factor loading and validity of school policy (observable variable) in the relationship model*

School policy acts as one of the components of organizational factors. According to the linear structural relationship of school policy model, there were three primary factors: policy objectives, policy means and policy mechanisms as well as eight secondary factors including vision, mission, goals, strategic issue, strategies, indicators, mechanisms, and monitoring and assessment. CFA was used to validate at the preliminary stage to identify the causal relationships among the latent variables.

As indicated in Table 2 below, factor loading values of all school policy ranged from 0.849 to 0.946 were statistically significant at 0.01. Factor loading is the importance of standard factors of each observable variable in the relationship model of organizational factors and learning innovation of the teachers that had been taken into consideration. The co-variance with school policy was from 72.10 to 89.50 percent. The factor with the highest factor loading was mechanism. This is followed by mission, strategies, vision, monitoring and assessment, strategic issue, and goals respectively. The factor that had the lowest factor loading was indicators. Results indicate that all the factors were found to be important construct of school policy.

**Table 2.** Factor loading and validity of observable variable in the measurement model of school policy

Factors	Matrix of Factor loading				
	$\beta$	SE	t	Factor score	R <sup>2</sup>
<b>Policy objectives</b>					
-Vision	.880**	.009	96.671	.218	.775
-Mission	.907**	.008	107.853	.279	.823
-Goals	.860**	.014	61.639	.184	.739
<b>Policy means</b>					
-Strategic issue	.871**	.011	80.505	.148	.759
-Strategies	.907**	.008	109.188	.213	.823
-Indicators	.849**	.011	78.344	.123	.721
<b>Policy mechanism</b>					
-Mechanism	.946**	.007	126.400	.505	.895
-Monitoring & assessment	.879**	.009	102.386	.199	.772

\*\*p<.01

Results from Table 2 reveals that the correlation between the factors of school policy could be assessed in the standard component score ( $\beta$ ) which indicated significantly high and positive correlations at 0.01. Besides, it was found that the measurement model of school policy factors has goodness fit with evident data, with  $\chi^2 = 23.524$ ,  $df = 15$ ,  $p = .009$ ,  $\chi^2/df = 1.568$ , CFI = .995, TLI = .985, RMSEA = .011, and SRMR = 0.003. Result show that not only the degree of correlation between the school policy factors was statistically high at significant level of 0.01 but also the relationship model of school policy factors agreed with empirical data.

***Factor loading and validity of school leadership (observable variable) in the relationship model***

The next organizational factor that researcher studied is school leadership. Correspond to the linear structural relationship of school leadership model, researcher found four primary factors namely learning leadership, learning-centered leadership, constructivist leadership, and creative leadership. Out of these four primary factors, there were 17 secondary factors which were powerful environment, creativity and courage, self-directed learning, transformation process and tailor making, research and development, high standard for student learning, rigorous curriculum, quality instruction, culture of learning and professional behavior, connections to external community, vision for learning, knowledge management, culture creating to exchange the knowledge, networking for learning, creative opened environment, imagination, and flexibility. CFA was used to validate at the preliminary stage to identify the causal relationships among the latent variables.

As shown in Table 3 below, factor loading values of all school leadership varied from 0.783 to 0.920 were statistically significant at 0.01. Factor loading is the importance of standard factors of each observable variable in the relationship model of organizational factors and learning innovation of the teachers that had been taken into consideration. The co-variance with school leadership was from 61.30 to 84.60 percent. The factor with the highest factor loading was creating opened environment. This is followed by self-directed learning, imagination, creating culture to exchange the knowledge, powerful environment, transformation process and tailor making, knowledge management, flexibility, vision for learning, connections to external community, networking for learning, culture of learning and professional behavior, high standard for student learning, quality instruction, and rigorous curriculum respectively. The factor that had the lowest factor loading was research and development. Results indicate that all the factors were found to be important construct of school leadership.

**Table 3.** Factor loading and validity of observable variable in the measurement model of school leadership

Factors	Matrix of Factor loading				
	$\beta$	SE	t	Factor score	R <sup>2</sup>
<b>Learning leadership</b>					
-Powerful environment	.839**	.012	70.860	.110	.703
-Creativity & courage	.891**	.007	122.061	.169	.795
-Self-directed learning	.901**	.007	139.362	.191	.812
-Transformation process & tailor making	.890**	.009	95.930	.167	.793
-Research & development	.783**	.041	19.178	.074	.613
<b>Learning-centered leadership</b>					
-High standard for student learning	.854**	.010	87.279	.118	.729
-Rigorous curriculum	.802**	.013	62.695	.079	.643
-Quality instruction	.846**	.012	69.150	.109	.716
-Culture of learning & professional behavior	.867**	.009	93.761	.135	.752
-Connections to external community	.874**	.009	93.454	.137	.764
<b>Constructivist leadership</b>					
-Vision for learning	.881**	.009	98.384	.176	.776
-Knowledge management	.889**	.009	99.982	.182	.791
-Creating culture to exchange the knowledge	.892**	.009	104.174	.190	.795
-Networking for learning	.868**	.012	74.367	.157	.753
<b>Creative leadership</b>					
-Creating opened environment	.920**	.007	136.393	.318	.846
-Imagination	.898**	.009	102.650	.243	.807
-Flexibility	.888**	.012	75.330	.220	.789

\*\*p<.01

Results from Table 3 indicates that the correlation between the factors of school leadership could be assessed in the standard component score ( $\beta$ ) which indicated significantly high and positive correlations at 0.01. Besides, it was found that the measurement model of school leadership factors has goodness fit with evident data, with  $\chi^2 = 40.423$ ,  $df = 25$ ,  $p = .007$ ,  $\chi^2/df = 1.617$  CFI = .995, TLI = .983, RMSEA = .018, and SRMR = 0.013. Result show that not only the degree of correlation between the school leadership factors was statistically high at significant level of 0.01 but also the relationship model of school leadership factors was consistent with empirical data.

#### ***Factor loading and validity of professional learning community (observable variable) in the relationship model***

The final component of organizational factors in this study was professional learning community. In accordance to the linear structural relationship of professional learning community model, there were four primary factors covered shared value and vision, exchange practice, support and shared leadership, and collaborative while the eight secondary factors encompassing shared value and vision of student learning, shared value and vision for personnel collaboration, exchange good practice and research, reflection for professional development, distributed power and shared decision making, contribution and supporting leadership, working as a team, and foster and friendly community. CFA was used to validate at the preliminary stage to identify the causal relationships among the latent variables.

The following Table 4 shows that factor loading values of all professional learning community varied from 0.877 to 0.948 were statistically significant at 0.01. Factor loading is the importance of standard factors of each observable variable in the relationship model of organizational factors and learning innovation of the teachers that had been taken into consideration. The co-variance with professional learning community was from 76.90 to 89.80 percent. The factor with the highest factor loading was contribution and supporting leadership. This is followed by shared value and vision for personnel collaboration, working as a team, distributed power and shared decision making, foster and friendly community, shared value and vision of student learning, and exchange good practice and research, in that order. The factor that had the lowest factor loading was reflection for professional development. Results indicate that all the factors were found to be important construct of professional learning community.

**Table 4.** Factor loading and validity of observable variable in the measurement model of professional learning community

Factors	Matrix of Factor loading				
	$\beta$	SE	t	Factor score	R <sup>2</sup>
<b>Shared value and vision</b>					
-Shared value & vision of student learning	.901**	.009	103.143	.266	.811
-Shared value & vision for personnel collaboration	.937**	.007	125.615	.430	.878
<b>Exchange practice</b>					
-Exchange good practice and research	.886**	.009	95.103	.207	.784
-Reflection for professional development	.877**	.011	76.918	.195	.769
<b>Support and shared leadership</b>					
-Distributed power & shared decision making	.911**	.007	138.605	.219	.831
-Contribution & supporting leadership	.948**	.006	166.545	.402	.898
<b>Collaboration team</b>					
-Working as a team	.934**	.007	127.539	.388	.872
-Foster & friendly community	.903**	.010	90.235	.249	.816

\*\*p<.01

Findings from Table 4 reveals that the correlation between the factors of professional learning community could be assessed in the standard component score ( $\beta$ ) which indicated significantly high and positive correlations at 0.01. Besides, it was found that the measurement model of professional learning community factors has goodness fit with evident data, with  $\chi^2 = 22.323$ ,  $df = 14$ ,  $p = .009$ ,  $\chi^2/df = 1.595$  CFI = .992, TLI = .974, RMSEA = .012, and SRMR = 0.007. Result show that not only the degree of correlation between the professional learning community factors was statistically high at significant level of 0.01 but also the relationship model of professional learning community factors were consistent with empirical data.

**Results of assessing of model fit**

Results of assessment of model fit indexes would be used to explain the relationship among the latent variables which were the defined variables from the measurement models as correlations, means, and standard deviations among the latent variables. Subsequently, predicted correlations or covariances were compared to the observed correlations or covariances and if fit statistics are poor the model should be re-specified and modification indices should be followed. The final modified model with acceptable model fit statistics should be used for testing the hypotheses related to the statistical significance of the structure coefficient or path in the model. A careful assessment of the structure coefficient, standard error, t-value, and p-value will indicate if the null hypotheses should be rejected or not (Carvalho & Chima, 2014).

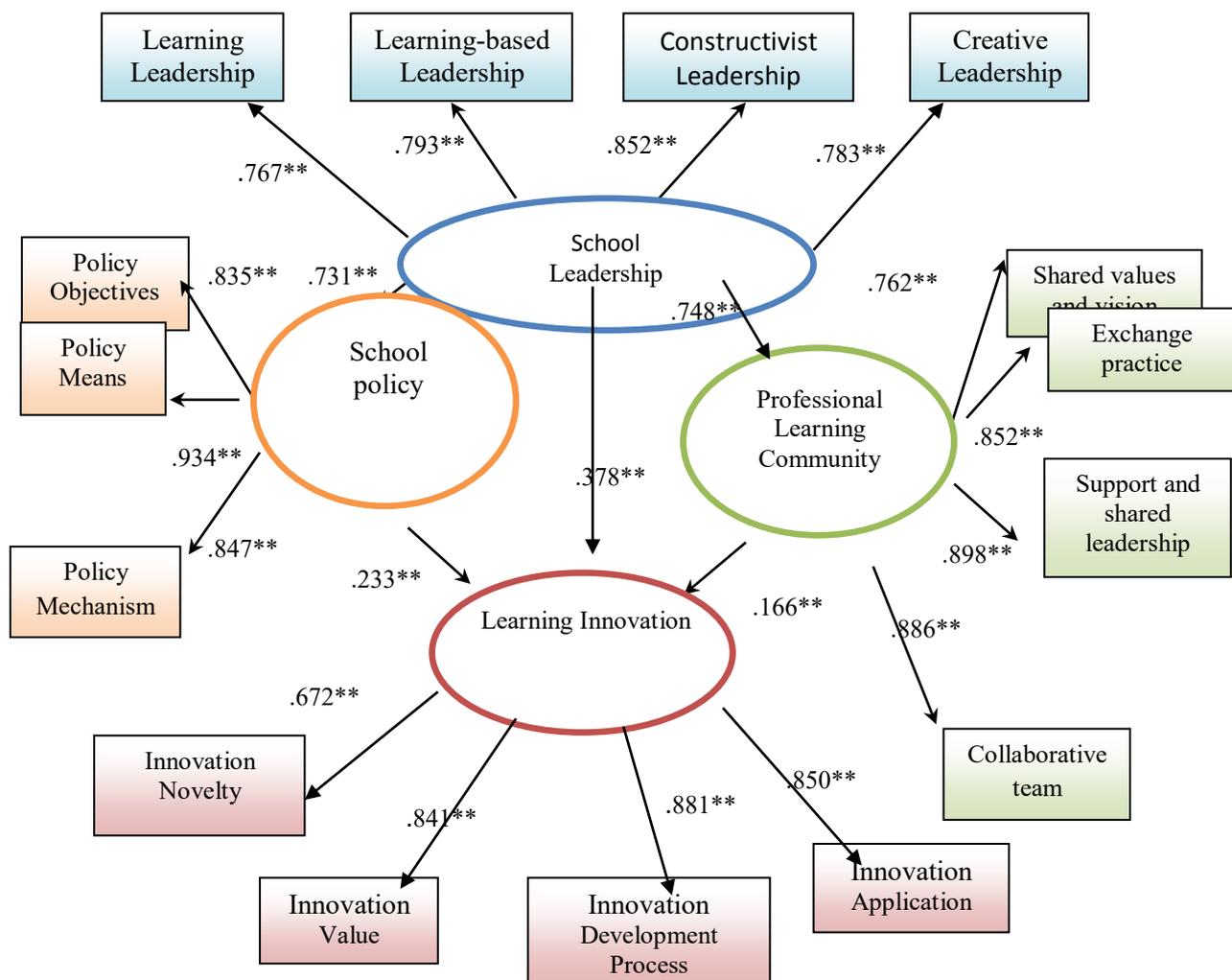
Table 5 below shows the causal relationship of examined variables. Results showed that the linear structural relationship of organizational factors and learning innovations model of teachers under the Office of Basic Education Commission in Thailand were fit with empirical data and in relation with structure as  $\chi^2 = 123.540$ ,  $df = 76$ ,  $p = .008$ ,  $\chi^2/df = 1.625$  CFI = .989, TLI = .976, RMSEA = .001, and SRMR = 0.017. It is concluded the null hypotheses should be significantly rejected at significant level as 0.01. Figure 1 below shows the results of the linear structural relationship model has goodness of fit with evident data.

**Table 5.** Factor loading and reliability of observable variable in the SEM of teachers' learning innovations

Key factors	Matrix of Factor loading			
	B	SE	t	R <sup>2</sup>
<b>Learning Innovation</b>				
-Innovation novelty	.672**	.021	31.637	.452
-Innovation value	.841**	.013	66.615	.707
-Innovation development process	.881**	.010	84.018	.775
-Innovation application	.850**	.012	70.714	.743
<b>School policy</b>				
-Policy objectives	.835**	.013	64.760	.697
-Policy means	.934**	.008	110.302	.872
-Policy mechanism	.847**	.012	69.669	.717
<b>School leadership</b>				
-Learning leadership	.767**	.017	45.064	.589

-Learning-centered leadership	.793**	.016	50.774	.628
-Constructivist leadership	.852**	.012	68.226	.726
-Creative leadership	.783**	.016	48.725	.613
<b>Professional learning community</b>				
-Shared value & vision	.762	.017	45.550	.581
-Exchange practice	.852	.012	71.911	.726
-Support & shared leadership	.898	.009	96.665	.806
-Collaborative team	.886	.010	89.437	.784

\*\*p<.01



**Figure 1.** A Linear Structural Relationship Model of Organizational Factors and Teachers' Learning Innovation

Referring to causal relationship as shown in Table 6, results show that latent variables of school leadership were affecting the latent variables of teachers' learning innovations in two ways. Firstly, school leadership affected teachers' learning innovations through school policy as the total effect, direct effect, and indirect effect were at .729, .559, and .170 respectively at significant level of 0.01. Secondly, school leadership also affected teachers' learning innovation through professional learning community as the total effect, direct effect, and indirect effect were at .683, .559, and .124, in that order and statistically significant at 0.01. In addition, these latent variables had only direct effect as a total effect between each other as follows. Firstly, school policy was found affecting teachers' learning innovation had a direct effect as .233 at significant level of 0.01. Secondly, school leadership affected professional learning community directly as .748 statistically significant at 0.01. Finally, school leadership affected school policy as .731 and statistically significant at 0.01.

**Table 6.** Effect of the linear structural relationship model

Variables	Learning innovation			School policy			Professional learning Community		
	TE	DE	IE	TE	DE	IE	TE	DE	IE
School leadership	.729**	.559**	.170**	.731**	.731**	-	-	-	-
School policy	.683**	.559**	.124**	-	-	-	.748**	.748**	-
Professional learning Community	.233**	.233**	-	-	-	-	-	-	-

\*\*p<.01

## DISCUSSION

The results of the current study have significant implication of educational practice. They contribute to our understanding of how teachers learn and this knowledge can be crucial for designing powerful environments to foster teacher learning with the support of the organizational factors namely school policy, school leadership, and professional learning community. As in the field of teacher learning innovation, researcher is convinced that this linear structural relationship model of fostering teacher learning and professional development should be based on research evidence on how teachers learn.

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# **A Multiple Intelligence Scale for Investigating the Multiple Intelligence Profiles of Students in the Faculties of Education and Engineering**

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## **ABSTRACT**

In order to choose the right area of study, high school students should know about their potentials and also know the requirements of the areas of study they are planning to enroll. In this respect, Multiple Intelligences can be used to guide learners to choose the suitable area of study which will in turn lead them to their career. School counsellors and teachers should not only be aware of the MI principles but also encourage learners to explore their intelligence strengths to better understand themselves. This current study aims to develop a Multiple Intelligence Scale (MIS) which can be administered to Turkish high school senior students for specifying their multiple intelligence profiles. Another aim is to use the MIS and find out the Multiple Intelligence strengths of students studying in the Faculty of Education and in the Faculty of Engineering at Eastern Mediterranean University.

**Key words:** Intelligence, multiple intelligence profile, career.

## **INTRODUCTION**

To choose the right area of study, high school students should be aware of their potentials and know the requirements of the areas of study they are planning to enroll. However, many high school students face difficulty of choosing an area or field to study (Yorke, 2004) and obtaining a university diploma and having a successful transition to a career is a problem for many young students (Shearer,2009). Students with no clear career goals will be unclear about their career choices and will probably display low confidence, and poor academic performance and will likely drop out of schools (Hull-Banks, et al., 2005; Shearer & Luzzo, 2009). A study by Akıntuğ and Birol (2011) in North Cyprus has revealed that taking responsibility is not at the desired level for high school students and their low maturity level can be considered as an important negative factor in choosing the right area of study and choosing the right career.

According to Germeijs and Verschueren (2006), students' low maturity level can raise three items to consider: (1) whether or not students registered to an area of study which they intended to choose, (2) commitment to the area of study they are registered to, and (3) academic adjustment which includes learner motivation, effort, and efficacy.

Shearer (2009) recommends to use students Multiple Intelligences profiles for academic and career counseling to guide them into suitable career tracks which will in turn lessen career confused students resulting a decrease in school drop-out rates. Similarly, Wu (2004) advices teachers and counselors to use a process approach which uses a Multiple Intelligence inspired career assessment not only for undecided students but also for the indecisive students for more intensive and personalized assistance. Wu (2004) also suggests school counsellors and instructors to use students MI strengths both to increase academic performance and help students select an area of study, in terms of higher education, which will in turn lead to a successful shift into the career of student preference.

## **PURPOSE OF THE STUDY**

There were two aims of this study. The first one was to develop a Multiple Intelligence Scale for Adult Students. Although there are Several Multiple Intelligence Developers of Instruments like Teele Inventory of Multiple Intelligences (TIMI) and Multiple Intelligence Development Assessment Scales (MIDAS) which can be purchased online, still validity and reliability control of these instruments are needed if they are to be used in different settings. Instead of assuring validity and reliability for some other instruments, this current study aimed to develop a Multiple Intelligence Scale (MIS) which can be administered to high school students for eliciting their multiple intelligence profiles. The second aim was to use the MIS to find out the dominant intelligence types of students studying in the Faculty of Education and in the Faculty Engineering at Eastern Mediterranean University.

## **DEVELOPING THE MULTIPLE INTELLIGENCE SCALE**

The Multiple Intelligence Scale for the student participants consisted of two parts. The first part aimed to gather demographic data about the student participants and included questions about participants' faculty/department, student number, gender, age, the semester they were studying, and nationality.

For the second part of the inventory, items from a Multiple Intelligence Inventory prepared by McKenzie (2005) was used to identify the dominant intelligence profiles of student participants. McKenzie's instrument was also used by some other researchers (Hashemian & Adibpour, 2012; Oskooei & Salahshoor, 2014; Ramadan, 2014; & Razmjoo, Sahragard & Sadri, 2009) and it was found to be reliable. There were ten items for each intelligence type, total 90 items within the inventory. The original inventory was in English and because it was going to be used in a Turkish setting, Translation-Back-Translation method was used and first the questionnaire was translated into Turkish. Then it was translated back to English from Turkish and the final translated version was compared with the original version to see whether or not the items in both versions had the same meaning. For the content and face validity of the inventory, several checks and modifications were made. First, three English Language Teachers whose native language was Turkish were asked to examine whether there were any unclear items for the Turkish version of the inventory. Then two experts in the area of Multiple Intelligences were asked to examine the items for each intelligence area. Following the review of the experts, some rewording was made. At the next stage, 47 students were asked to examine the understandability of the scale and based on their feedback, final modifications were made. The original version of the Multiple Intelligence Inventory consisted of ten items for each intelligence area, total 90 items. However, after validity and reliability analyses and after exploratory and confirmatory factor analyses, some items were deleted and the final version of the Multiple Intelligence Inventory remained with 40 items. The items in the inventory were presented on a 5 point Likert scale ranging as (a) totally agree, (b) agree, (c) undecided, (d) disagree, and (e) totally disagree.

## **METHODOLOGY AND PARTICIPANTS**

The research design of this study is quantitative and cross-sectional survey method was used to collect the data so that some conclusions could be drawn from the sample and later some generalizations for the populations could be made (Cohen, et al., 2007). In this current study, there were two different populations from which the samples were drawn:

- 1) all students studying at the Faculty of Education at EMU,
- 2) all students studying at the Faculty of Engineering at EMU.

For the student participants, a subset of probability sampling which is a random sampling procedure was employed. Out of 965 participants, 909 student participant's records were found to be valid and 513 student participants were from the Faculty of Education and 396 student participants were from the Faculty of Engineering. The characteristics of the student sample studying at the Faculty of Education are shown in Table 1. and the characteristics of the student sample studying at the Faculty of Engineering are shown in Table. 2.

Table 1. Characteristics of the student participants studying at the Faculty of Education (N=513)

<b>Faculty of Education</b>		<b>N</b>	<b>%</b>
Gender	Male	203	39.6
	Female	310	60.4
Semester Studying	1-2	241	47.0
	3-4	123	24.0
	5-6	59	11.5
	7-8	86	16.8
	9 and above	4	0.8
Age	17-18	18	3.5
	19-20	212	41.3
	21-22	189	36.6
	23-24	70	13.6
	25 and above	24	4.7

As can be seen in Table 2, 203 (%39.6) of the student participants studying at the Faculty of Education were male and 310 (%60.4) of the participants were female. Regarding the semester they were studying, 241 (%47.0) of them were in their 1-2, 123 (%24.0) of them were in their 3-4, 59 (%11.5) of them were in their 5-6, 86 (%16.8) of them were in their 7-8 and 4 (%0.8) of them were in their 9 and above semesters.

Table 2. Characteristics of the student participants studying at the Faculty of Engineering (N=396)

<b>Faculty of Engineering</b>		<b>N</b>	<b>%</b>
Gender	Male	345	87.1
	Female	51	12.9
Semester Studying	1-2	149	37.6
	3-4	87	22.0
	5-6	83	21.0
	7-8	68	17.2
	9 and above	9	2.3
Age	17-18	109	27.5
	19-20	120	30.3
	21-22	71	17.9
	23-24	59	14.9
	25 and above	37	9.3

As can be seen in Table 2, 345 (%87.1) of the student participants studying at the Faculty of Engineering were male and 51 (%12.9) of the participants were female. Regarding the semester they were studying, 149 (%37.6) of them were in their 1-2, 87 (%22.0) of them were in their 3-4, 83 (%21.0) of them were in their 5-6, 68 (%17.2) of them were in their 7-8 and 9 (%2.3) of them were in their 9 and above semesters.

## RESULTS

To find out the dominant intelligence types of students studying in the Faculty of Education and in the Faculty Engineering at Eastern Mediterranean University, data analysis was done using the SPSS. For the analysis of the data, first the arithmetic mean of the respondents' data was computed for each of the Multiple Intelligence area. Next, the mean for each of the intelligence area was calculated for the respondents from both faculties separately. For each of the Multiple Intelligence areas Mean, Mode, Median and Standard Deviation were calculated.

### **The Multiple Intelligence profiles of the students studying at the Faculty of Education**

For the analysis of the data, the mean of each intelligence area for each respondent was calculated. Next, the mean of each intelligence area was calculated for all the respondents from the Faculty of Education. Analysis was done to obtain descriptive statistics for the data. For each of the Multiple Intelligence areas Mean, Mode, Median, and Standard Deviation were calculated. Descriptive statistics, as a result of the analyses can be seen in Table 3.

Table 3. Faculty of Education Descriptive Statistics for Each Intelligence Area (N=513)

<b>Faculty of Education</b>	Mean	Mode	Median	Std. Deviation
Intrapersonal	4.52	5.00	4.60	.486
Bodily/Kinesthetic	4.35	4.75	4.50	.559
Naturalistic	4.17	4.60	4.20	.616
Logical/Mathematical	4.16	5.00	4.25	.720
Existential	3.96	4.00	4.00	.666
Musical	3.88	4.00	4.00	.787
Visual/Spatial	3.68	3.67	3.67	.811
Interpersonal	3.05	3.00	3.00	.785
Verbal/Linguistic	2.99	3.67	3.00	.930

As can be seen from the Table 3, the mean of the intrapersonal intelligence is 4.52, bodily/kinesthetic intelligence is 4.35, naturalistic intelligence is 4.17, logical/mathematical intelligence is 4.16, existential intelligence is 3.96, musical intelligence is 3.88, visual/spatial is 3.68, interpersonal intelligence is 3.05, and verbal/linguistic intelligence is 2.99. Considering the results, intrapersonal, bodily/kinesthetic, naturalistic and logical/mathematic intelligences of students who are studying at the Faculty of Education are the most developed areas. Existential, musical, visual/spatial, and interpersonal intelligences students from the faculty of education are moderately developed. As a surprising result it is found that verbal/linguistic intelligence area is not so developed.

### **Multiple Intelligence profiles of the students studying at the Faculty of Engineering**

For the analysis of the data, the mean of each intelligence area for each respondents was computed. Next, the mean of each of the intelligence area was calculated for all the respondents from the Faculty of Engineering. Analysis was done to obtain descriptive statistics for the data. For each of the Multiple Intelligence areas Mean, Mode, Median, and Standard Deviation were computed. Descriptive statistics as a result of these analyses can be seen in Table 4.

Table4. Faculty of Engineering Descriptive Statistics for Each Intelligence Area (N=396)

Faculty of Engineering	Mean	Mode	Median	Std. Deviation
Intrapersonal	4.16	3.80	4.20	.537
Logical/Mathematical	4.03	4.00	4.00	.588
Bodily/Kinesthetic	3.97	4.00	4.00	.543
Existential	3.95	3.86	3.86	.571
Naturalistic	3.93	4.40	4.00	.581
Musical	3.72	3.75	3.75	.661
Visual/Spatial	3.67	3.00	3.67	.659
Interpersonal	3.17	3.00	3.00	.633
Verbal/Linguistic	3.14	2.33	3.00	.889

As can be seen from the Table 4, the mean of the intrapersonal intelligence is 4.16, logical/mathematical intelligence is 4.03, bodily/kinesthetic intelligence is 3.97, existential intelligence is 3.95, naturalistic intelligence is 3.93, musical intelligence is 3.72, visual/spatial is 3.67, interpersonal intelligence is 3.17, and verbal/linguistic intelligence is 3.14. Considering the results, it can be seen that intrapersonal and logical/mathematic intelligence of students who are studying at the Faculty of Engineering are the most developed intelligence areas. Bodily/kinesthetic, existential, naturalistic, musical, and visual/spatial intelligences of the engineering students are moderately developed. Interpersonal and verbal/linguistic intelligence areas are not so developed.

## CONCLUSION

As a result of the study it can be depicted that students from both faculties have intrapersonal intelligence as their dominant intelligence. As it is expected engineering students have logical/mathematical intelligence as their second highest intelligence. On the other hand, verbal/linguistic intelligence of teacher candidates of the faculty of education is expected to be high but however the results show that it is not so developed. Interpersonal intelligences of students from the faculty of education is also expected to be high but turned out to be only moderately high. Visual/spatial intelligences of the engineering students was also expected to be high but it turned out to be only moderately developed.

Shearer (2009) suggested to do research on how universities can develop intrapersonal understanding, thereby enabling students to select a major course of study that leads naturally into a career that is well-matched to students' unique strengths. Shearer and Luzzo (2009) also invited researchers, counsellors, and teachers to do studies on the usefulness of the MI theory to design a framework for career counseling and educational planning.

The Multiple Intelligence Scale will be a tool for Turkish adult students that they can use to increase their internal understanding for the Multiple Intelligence strengths.

As some researchers have already associated some intelligence areas with some professions (Armstrong, 2000; Demirel, et al., 2006; Gardner, 1999; Fogarty & Stoehr, 2008; McKenzie, 2005), students internal understanding for their Multiple Intelligence strengths may help them to choose the right area of study and also their counsellors might guide them according to their Multiple Intelligence strengths.

Finally, it can be concluded that the Multiple Intelligence Scale is a valid and reliable tool for senior students of high school and can be used as a self-check tool to find out their multiple intelligence profiles. Alternatively, teachers and counsellors can use it for their senior students in high school to find out their multiple intelligence profiles.

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# **A Paradox in the Cognitive Space**

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## **ABSTRACT**

The present education system is faced with the following dilemma: We inherited a school system which teachers were able to control but the one we are in now is primarily about teachers try to understand it and get familiar with. Let us start with the common knowledge that the aim and the meaning of teaching are the children.

The paradox of the situation is that those whose responsibility is to prepare the students for the digital future, they are rather drift with the current instead of being the ones who change its course. The key to this is the institute of the school, which is a very conservative formation, in general, they think and work in a subject based 'cast system', only renewed on paper, primarily holding on to the methods and approaches of the past. The aims of the teaching contents and the teaching materials are rather l'art pour l'art, mainly focusing on cognitive knowledge, they hardly allow entry to fundamentally different approaches, and do not concentrate on developable strategies. However, it is proudly announced that they prepare their students for Life Long Learning and its importance is continuously emphasized.

Following the stream of my thought, in the consideration of the paradox of the cognitive space, my intention is to present classroom practices, proved efficient and effective through the years, that provide examples on how this paradox can be solved and how the teachers of the future can be transformed being competent with the requirements of the digital world.

## **INTRODUCTION**

As humans, we are all part of larger communities, in which we evolve into a socialized human being, and as such we live our everyday lives. An important feature of our present and future social life is what the future generations become. All these, throughout the previous centuries, had not caused serious problems: the teachers taught and their students learned what they were meant to, and when students learned in a more slave like way the better acceptance and grades they got. However, when their everyday life experiences and what they learnt in school did not match, fundamental changes were undertaken in education and in the school system. Such intersections come into existence when new ideas and/or technologies influence our lives in ways which are more promising and would follow the changes more consequently.

## **CHANGES AND CHANGE MANAGEMENT**

Nowadays, the ever biggest gap exists between the participants of education. The education systems, the schools, and the education policy are the slaves of the old rules and organizations, and mostly project the reality according to their norms, believes, and intentions, by giving direct instructions on that to whom and what should be taught. In the previous centuries this approach worked accordingly to the aims of the active participants and was widely accepted.

However, the most demanding challenge of the 21st century, the information boom– the handling of huge amount of data and information and even their retrieval –, does not respect the clearly distinguished sciences, defined in the previous centuries, but declared new sciences and the knowledge-networks of the already existing ones. This integration process – both as phenomenon and approach –, is adapted and clearly present in the novel curricula. The surveying of the new teaching-learning methods also indicates the intention for changes, which cannot be separated from the fact that due to the high amount of available information the concept of knowledge should also be reevaluated and redefined (Bárdossy, 2011). This need for change in concept is clear and various attempts have been made for its acceptance in the teachers' community (Grotlüschen, 2005; Ausubel, 1963).

However, the problem arises that this change cannot be applied, directed, and handled with the old methods and approaches. On the one hand, although students spend a considerable time in school, even during this period, they step outside as they communicate through the Internet or collect information that concerns them. They live in the cyberspace by continuously connected to it. They communicate through these networks, use it for data and

information retrieval, however, hardly use it for sharing real, non-duplicated contents. The mobile phone is like one of their extended neurons, which keep them chained to the community of knowledge and of information. It substitutes their laptops and workstations while they are away from home. Their concept of community-self is fundamentally different from any of the previously known forms of relations and connections and, in a similar way, from the forms of knowledge, which are required in this conception.

### **TAUGHT AND ACQUIRED KNOWLEDGE**

One of the consequences of this paradox is that we have to change our point of view if we want to pass knowledge on to the students and we also have to rethink the content of this knowledge.

Let us give a thought of the classical concept of planned and scheduled teaching materials and contents, which, according to Bárdossy's definition, "consists the knowledge and activities (along with the skills and abilities connected to the activities) and their order of presentation in the specific curriculum at the different levels of the teaching-learning process." (Bárdossy, 2011; Holzkamp, 1992, 1996).

In the acquisition of the teaching materials most of the schools still firmly stick to coursebooks, which form well defined frames to the teaching-learning process. In better cases the leaders of the schools and the education policy give teachers the liberty to use the coursebook of their choice, while in others the selection of coursebooks are highly centralized and influenced by outer decisions, which concern is however beyond the scope of the present paper.

The obligatory use of coursebooks and of centralized teaching materials, however, in the long term do not support the novel concepts of teaching, since these printed materials are difficult to change, the content is presented through the view point of the authors, through which the presented content is double forced on the students. Beyond this, the expectations of the 'coursebooks' and the students and/or their community can also be different. This gap is usually filled in either by the teachers or the students.

If these are teachers who fill in this gap, as it is expected from the expert teachers (Hattie, 2012), they focus on the needs of their students, and the content is formed to their demands and expectations. In the meantime, more often than before they use digital teaching materials and profit from the possibilities of the digital era in general. Let us use the example when students start studying a foreign language in an environment where there is no direct connection to native speakers of the language in question, there is a 'sterile' second language classroom, the students have to gain the real life communication skills and abilities in an isolated environment. In these cases, even the most well written coursebooks cannot fully serve their purposes and cannot be used effectively, even in those cases when the intended and the target students match. The worst scenario takes places when the two groups do not have anything in common. In these cases the use of the authentic materials, such as videos, songs, texts, pictures, emails, chatrooms, blogs, oral messages, etc., function as virtual substitutes for real world situations, as if they were part of it. Through these data retrieval and communication forms the students can consequently not only acquire the lexical items but the context as well, which helps the students (Prensky, 2001) in storing these pieces in the long term memory, and also in their retrieval.

### **THE DIRECT LINK IS THE TEACHER**

The ultimate goal of the teaching-learning process is to help students to learn, and guide them to do it effectively. In institutionalized teaching this link for the students is represented by the teacher. It is the teacher's responsibility to consider and decide on the methods and approaches which lead to long term stored and extensible knowledge which can serve as bases to build up further concepts (Skemp, 1971). At this stage, we face several fundamental questions and concerns from the point of view of new pedagogy (Fullan, 2013).

Based on the effectiveness of the teachers, Hattie came to the conclusion that all the teachers have to have a well-defined goal- and tool-map accompanied with a mind-net of plans, based on which the teaching process is carried out. Hattie declared that this approach is highly affected by the teachers' way of thinking (Hattie, 2012). An expert teacher continuously evaluates their roles as a teacher, using both inert and outer evaluation methods, to be aware of how they influence their students and considering the results of the students whether they have the necessary tools for changes and for selecting and applying more effective methods. Whether they have the necessary theoretical background and whether they would be able to transform this knowledge to everyday practice. As a criterion of being successful we must mention the maximization of the effectiveness of the learning process, where not only the knowledge gained and stored is exclusively matters, but the development of the

personality and the character of the students, their problem solving skills and abilities, their approaches to the surrounding world, and their self-contained way of thinking. These abilities would help the students become responsible citizens and ambitious and self-demanding adults (Life Long Learning).

However, within the scope of this paper, we do not have the opportunity to go into details either considering the teachers' involvement in the motivation or evaluating the conditions and the circumstances which would tell apart teachers. Let us focus on those who want and know how to use IT tools – both hardware and software tools are meant here – of the digital era.

### **DIGITAL TEACHING MATERIALS AND THE TEACHERS' APPROACHES**

According to the depths of teachers' approaches to digital tools, different groups can be defined.

- 'Integrated usage' is when the teacher consciously uses IT tools for explaining certain contents and concepts, for supporting better understanding, for developing certain skills, for increasing students' activities. Teachers are able to select the proper tools, find the suitable forms of activities, and integrate the IT-usage into certain classes.
- 'Developing or value-added usage' is when the teacher uses IT tools as an innovative presentation to help students with the understanding of new topics.
- 'Accessory usage' is when with motivational purposes or in order to increase effectiveness, students are asked to prepare e-notes, to send emails to their teachers with their completed assignments, or to prepare their home works using word processors (Kárpáti & Hunya, 2009).

All the three usages support the understanding, consequently the efficiency of the learning process, however, the integrated usage is the most challenging and demanding on the one hand, on the other this is the most value-added form of IT tool usage (Kárpáti & Hunya, 2009).

- 'Cooperative usage' can be added to the list, as it is found recently, since the technical support is sufficient enough to create virtual communities and contents in these groups.

The different usage of IT tools would allow us concluding that it is not only the 'usage' of these tools that matter, but whether or not in the process of the usage of these digital tools, the schools, the class is transformed into another world. Until now the school meant the place to learn and the afternoon spent on preparing home works and getting ready for the class of the following day(s). However, in the digital era, the cooperative work would be in the focus, when the students play the role of the 'teacher', someone in leading position, someone who can decide on the learning material, content, if they and the educational community fulfill the following requirements:

- the system is open to novel contents, materials, and forms which suit the interest of the students,
- students would help and teach each other through the Internet, using shared platforms, emails, virtual communities, blogs, etc.,
- there is place and openness for 'reciprocate-teaching', when students introduce their teachers to new subject matters, contents, and forms with which they are more familiar, for short, students teach their teachers. This change of roles, even if it may seem so, does not weaken the principium of knowledge. Being ignorant does not mean not knowing something, but rather that the person does not show any intention for accepting and revealing their lack of knowledge and does not do anything for changing this shameful state (Kruger & Dunning, 1999).

### **STUDENTS AS KNOWLEDGE MANAGERS**

Another option is that the students suggest and force changes. This is the case of non-realized necessity. There are several examples of teachers' reaction to this which are annoying and disturbing. Teachers in these cases, instead of integrating the suggestions and ideas of the students, they sanction and punish them. Teachers often use tests, most of which they prepare themselves. Both students and teachers often lose these paper based tests, however, if these tests were available on mobile phones, then they could be retrieved regardless of space and time. (On further advantage of online testing is the protection of environment). The same is true, if students in a language class use online dictionaries. Along the application, teachers can help students understand the critical usage of online tools and the proper and legal usage of software.

Along the collective building of knowledge, students willingly present novel ideas, thoughts, subjects, contents which they are interested in. If students learn in CS/IT (Computer Sciences and/or Informatics) classes and within the frame of subject oriented classes how to build and how to handle digital schemata with real world contents (Csernoch, 2017), they would gain the core of concept based computer problem solving. By the time they leave schools they would learn openness and critical thinking, and the belief in the 'incremental' nature of science would be obvious for them. The knowledge can never be a constant state, but a station in a long process, where the closer

we think the terminus, the further we are (Chen, 2015; Gombos & Biró, 2016).

### THE NECESSITY OF COMPLEX APPROACHES

Along with the positive effects of the digital world, we cannot forget dangers within its frame. The digitally shaped learning processes influence the students' physical conditions, their certain motoric skills, their concentration, their attention, etc., and most importantly, their shared attention (Dani, 2016). To reveal these negative effects of the digital world and the digital tools, along with their positive effects, certainly, further researches and analyses are required.

### IN A DECISION MAKING SITUATIONS

As a feature, the effectiveness can allow teachers to utilize specific methods, approaches, and tools, including digital ones, after having taken into consideration their advantages and disadvantages – considered both the direct and the indirect consequences. The teachers' evaluation value of Hattie seems to be a reliable measurement, which can be accepted and used in the process of evaluating the effectiveness of the teaching-learning process (Prensky, 2001) in (Gombos et al., 2015). Since this value can be predicted, based on the decisions of teachers, it is worth applying.

Example: It should be the decision of the teachers which methods they apply, and which is the most efficient and effective. One of the most important practices is that teaching becomes limitless, both in time and space. This phenomenon can be exemplified by the reality based language teaching, where the teaching-learning process is based on the different levels of the everyday lives of students – their reality, through what they advance on every abstraction level. Starting with the oral reality of the very early childhood, where all the experiences are based on the events of the close environment then knowing more and more about the surrounding reality, each and every level has its own higher level of language abstraction (Skemp, 1971). In the meanwhile, influenced by both the existing and the oral world, students experience the expansive concentric levels and understand more and more of the substantial processes and their rules, which lead them to continuously enjoyable achievements, so their motivation is sustainable. During this process there is need for a better understanding of the different cultures, the dialog between the participants of these cultures, for which the teacher have to have Internet and/or digital network based curricula, teaching materials, and contents.

### CONCLUSIONS

In education the ever largest scale of different approaches is invented which all point in the same direction and try to answer the same question. However, the formulated hypothesis requires different paths and answers. Being familiar with the methods and approaches of others has a great advantage of adapting ideas, concepts arisen which can lead to the recognition that teachers are one of the greatest innovators.

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# **A Research Intended For Perceiving and Developing The Basic Computer Skills Module at Undergraduate and Postgraduate Level by Students and Computer Teaching Staff**

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## **ABSTRACT**

It can be considered that the success in the field of education only remaining in theory and literature, the situation that produced information is not being shared and not being realized and/or the situation that it just benefits the progress in the field of science pragmatically would be wrong for a scientist.

Here, it can be said that the lack to turn technical, electrical, physical and experimental progress processes of our age, which never stop and whose progress cannot be stopped, into a utilitarian structure is not logical. İşman (2001), in this context, insists in his study that it is necessary for education institutions to make use of computer technologies widely and teaching-learning techniques should be cleaned up from memorized learning.

*“As education level improves, the usage percentage of Information and Communication Technologies (ICT) increases. People who benefit the most from the ICT are individuals who are at the level of college, faculty and the more advanced education level.”* (Alaca & Yılmaz, 2016). As said, ICT is a course which includes important achievements of the age, which is being used by colleges and more advanced educational units. According to this, it is evaluated that the importance of Basic Computer Skills Modules (BCSM) given at universities is too high to be debated.

In the light of these data, the formation of a common perspective among all BCSM teaching staff and students and the formation of a realistic education system with a high functionality can be which is in life and cooperation is high is common denominator, within the light of these information. Overcoming the problem where BCSM is considered only as a module by students, teaching it in correlation with all curriculum modules, integrating it into the content of other modules and making it multidisciplinary can be set as objectives. It is believed that the usage of technology and computers should not be limited to only certain modules but also integrating it into other modules would be beneficial. It can be also considered that taking education out of amphitheatres and concentrating in laboratories will bring together significant gains.

Observation and interview technique, as qualitative research methods, were used in this research. The study was conducted on 30 students, who took modules, and on 5 instructors, who taught, in Near East University in the 2016-2017 education year.

**Keywords:** Computer, Education, Computer education, Student, Information society.

## **INTRODUCTION**

In present day expressed as the information age, very quick developments take place in the field of technology, information technologies and education due to information and consequently science. Universities stand out as institutions which closely follow and contribute to these developments. Universities hold heavy responsibilities in order to render this mission sustainable in the field of education.

Both improvement of education quality and using knowledge in creating new information as well as transfer of information to future generations have a great importance at this point. Keser (1995, p.249) expresses this situation as *“While information quantity to be given to individuals increases day by day, content becomes more complex. The demand for education rises and individuals want to benefit more from education opportunities”*. In this context, information emerges as the most basic requirement at universities in order to provide education. The concept of information arises from the Latin word *“informatio”* (Öğüt, 2001, p.9). Baruçugil (2002, p.10) defines the concept of information as *“Personalized information which allows people to comprehend and understand what happens around them completely and correctly”*. Turan and Çolakoğlu (2008) express the

current status of information as “*Nowadays, information is the basic key of economic, cultural and social progression.*”

“*The incredible developments in information and communication technologies result in having a large amount of information produced and ready for human usage. Another field in which information technologies are being used is higher education and information technologies in higher education currently change the way and content of education and teaching highly.*” Turan and Çolakoğlu (2008). From this point of view, education sociology, which is always in an evolving state, should know how to integrate itself into the fast development. Otherwise, it is obligated to stay away from technological developments and changing and evolving education world.

Education on accessing information should be considered as one of the primary duties of universities as much as information transfer, which must be seen among the basic missions of universities. The basic computer skills are considered to be the fact in order to enable the use of computers during the transfer of information, the interactivity of information for information to be widespread and utile. “*One of the purposes of education is to raise individuals in line with the demands of the society; based on this perspective, the requirement to raise students convenient with the age of communication arises by taking into the features of the characteristics of information society. It is a necessity for this individuals to be equipped with the skills of accessing information, organizing information, presenting information and communication.*” (Şimşek, 2002, p.9, Arat, 2011). It can be said that the position of universities and computers in education and teaching is unquestionable in terms of obtaining information, using information, sharing information and producing information in this content based on the book of Şimşek and doctoral dissertation of Arat. Barutçugil (2002, p.58) expresses the production process of information as “*Flow of information among people by communication provides the production of information*”. Universities should work in order to make this information sharing and integration accessible to students in a more widespread and massive way in the basic content.

It has been expressed that universities in Turkey and the Ministry of Education were integrated to the computer technology in the 1960s (Keser, 1995). After this date, for computers with a usage growing at a high pace each year compared to the previous year among teaching- education programs, Keser (1995, p.250) used the expression “*Knowing how to use computers which are used as both tool and purpose in the education is considered as basic knowledge and skill that every individual should acquire.*” Societies consisting of individuals who have the skills mentioned by Keser are called Information Society. Alaca and Yılmaz (2016, p.514) explain this case as follows: “*The way to become an information society would be possible by using information and communication technologies effectively and by dominating on information.*” In the light of these information, it is clearly expressed why BCSM provided at foundation and undergraduate levels at academic education institutions today. BCSM provided to students in all faculties and programs of university is at the position of being one of the basic modules in curriculums of every faculty and department. The content of the module aims that students acquire the basics in computer usage while being “*Information Literate*” and “*Computer Literate*” (Murray, 2008). Seferoğlu and Şenel (2009) contribute as follows: “*There are compulsory information modules particularly at first year level undergraduate programs in many universities in our country. While the modules are named differently, their content consists of basic computer skills.*” Based on these, it can be said that universities intend to improve the rate of computer literates and to form the aims of creating an information society with the BCSM.

The content of BCSM consists of some basic topics. In this context, basic concepts of information technology, structure of computer, basic parts, the purpose of these parts, how and why computer is used in the daily life, how information safety is provided, hardware and software qualities, description of the information webs and the way how computer affects health are covered. As the other main topic, Windows and its practical application are covered as the most common operating system. Microsoft Word program, a word processor program which helps with the homework, thesis and article needs of individuals, is handled comprehensively as the next topic. Microsoft Excel is one of the basic computer education. Here, the usage of chart of accounts, formulas and calculations are handled with graphics topics and it is reinforced with the example implementations. Microsoft PowerPoint program, which is one of the main topics in order to perform effective and interactive presentations, is expressed to individuals. After the basic computer usage doctrines, the information and communication topic is seen as the topic which improves the motivation of students the most. In terms of the information part, points that should be considered while searching, protection from the detrimental content are provided while topics such as the usage of e-mail, etc. are provided in the communication part practically.

Having said that, individuals who acquire the skills mentioned above are considered as computer literates (Korkmaz & Mahiroğlu, 2009). However, it has been observed that the knowledge and skills acquired in these modules are not sufficient in order for the internalization and acceptance of implementations such as the usage of

information in research and performing presentations accordingly and in a functioning way with the course content. From this point of the view, it is thought that the content in the lecturing may be deficient but the deficiency and/or inadequacy in practice does not allow the computer use and its implementation into different fields.

Some of the students, who recently start higher education programs, start to use computer at early ages while there are students who have less experience in computer usage and there are students who do not even know how to use a computer. The most explicit reason of this situation can be expressed as deprivation of computer usage, socio-economic and socio-cultural life conditions. Dinçer (2011), studies this situation in his study and describes it as follows: “Students who have no knowledge or less knowledge in computer usage have defined that they faced serious problems while writing reports or doing homework and they fell behind compared to their friends in the first year computer modules, they faced serious problems at the lesson due to situation that they had no knowledge for the most easiest commands.” However, it is aimed to provide students with basic computer skills by reducing and eliminating the level difference among students as a result of the BCSM provided at foundation and undergraduate levels.

In line with these goals and achievements, it should be referred to the importance of adding not only the basic information but also the way how information is obtained, how they should be used in the daily life and in other models, how to benefit from existing knowledge and produce new information and how to share them in line with which purposes to the BCSM module curriculum in the context of individual education both in the formation of information society and in the information society in the rapidly developing and developing world. İşman (2001, p.2) says that there are important changes in education and individuals can learn more information in a short time. İşman (2001, p.2) makes the following expression for the made contributions: “Due to these contributions, computed education forms the centre of scientific researches, information productivity, cultural interaction among individuals, evolutions, trade and education. All roles have changed in the centre of this new education. In addition, individuals have started to use computers effectively.”

It should not be forgotten that the usage of technology tools has become a part of daily life. It is very clearly seen that computer, informatics and interaction as the most important accelerators of the rapidly developing are among the locomotive functions of universities and form the primary building blocks of changing education and changing world. In other terms, it can be discussed whether it is for the primary benefits of human beings to have what they learn stay in books, magazines and articles have benefits or not. It is believed that information centred formation and innovations which can be formed physically and provided to the benefits of humanity will bring humanity to the future.

It is also thought that the internet, which effects the age we are in, and computer and mobile communication tools used as the technological tools to access the internet provide important contributions to the information accumulation of individuals. Korkmaz and Mahiroğlu (2009) express this situation as “Computer literacy skills are not only behaviours acquired in school but at the same time they are the behaviours which can be acquired in the present life at different environments.” In this context, it is thought that information literates contribute to the education-teaching in private life and individuals in the work life and computer literates contribute to the success of individuals in achieving targets and thus to the society success by being an information society.

### **BCSM EDUCATION FROM STUDENTS’ POINT OF VIEW**

It is seen as general and common situation both at the interviews with the students and BCSM instructors that computer skills modules are perceived by students as a module which should be completed at the finishing stage of the faculty or department.

“I do not think BCSM will be beneficial for us. I would not attend the class if it was not compulsory. I am already a competent computer user.” (G:S(6)). One of the conclusions which was obtained from the interviews with students is the idea that BCSM is one of the compulsory lessons to be taken is dominant. It is thought that, students with this view will be devoid of important subjects inside lesson, from implementations and benefits which is predicted for them to acquire. Alaca and Yılmaz (2016, p.514) verifies that the view that students do not consider BCSM as a compulsory module is not true as follows: “Individuals should be willing to use computer technologies to make life easy and they should be skilled at this topic. Besides, lagging behind the developing society will be inevitable.”

In addition, the view that students attending the classes and following the education program are aware of the benefits and context of the course is dominant. It is an expected consequence for individuals who aim to learn and experience all learnings in reality to be successful.

It has been observed that the majority of students, who consider themselves as competent in computer usage, use the internet effectively and demonstrate success in terms of social media relationships as an example to this. However, information, photograph, document and images cover the majority of the information accessed by students when students' usage of the internet is observed and they are usually found to be passive. Nevertheless, the internet age of the present day is seen as a tool leading individuals to success as long as it includes activeness rather than passiveness. (G:S(29)) shared his/her views by saying *"I consider this module unnecessary because I use the internet and computers well and I have the ability to create programs for some small tasks."*

In the one-to-one interviews conducted with BCSM students, it has been stated that the taken modules have a negative effect on student success and/or learning, useless information to be implemented in real life is imposed on students and the lessons are taught in a didactic way. It is observed that students with these views do not perform activities such as being interested in the lesson, asking questions during the lecturing, taking notes for misunderstood parts and revising them later, doing given practical homework within the scope of the module and visiting lecturers during office hours and asking them questions.

Based on the interviews, it has also been concluded that the students cannot use computers actively. It has been stated that it is not possible for students to have personal computer due to various reasons and therefore cannot perform sufficient work and studies before lecture. As a result, it has been learnt that the mentioned students cannot revise the lessons taught during lectures at home. In the light of this information, it is clearly seen that students move away from the learning outcome of being computer literates targeted within the scope of the module. *"We cannot repeat the practices we do at school. In this context, it would be very good to open computer laboratories to us while there are no lectures."* (G:S(9)).

Another result obtained from the interviews is that some students are diligent and willing during lecture hours. It has also been observed that students with these views are aware of the content and significance of the module, they participate in practices at the laboratory, they ask questions and they even prepare for the next lesson by analysing the content of the next practice in advance with the purpose of being one step ahead from other classmates. Students with high motivation, who are not satisfied with this, expressed that they aim to visit lecturers during office hours, ask questions for the misunderstood parts and obtain information regarding the next lecture so that they prepare for the next.

### **BCSM AND THE INTERNET**

It should be noted that the name of the current age and the effects in the foreground are not very important but the main significance is the human factor and what people can do. In short, it should not be forgotten that it is the human beings who experience and develop the new technology. In this context, having all our surroundings covered by technology does not make it a necessity to use these tools in a healthy and effective way. Using tools and technology is directly related with education, information, sustainability and research.

It has been observed in the interviews that students evaluate the content of BCSM same as surfing on the internet. The correctness of the research results are confirmed by Alaca and Yılmaz (2016, p.521) as follows: *"The internet is particularly used for purposes of joining social groups, creating profiles on the social media, sending messages or sharing photographs etc., reading online news, newspaper or magazines and downloading news."* (G:S(12)) also stated that *"It would be better if we were provided with information which we would benefit on the internet instead of BCSM. The future is on the social media websites."*

The social media and internet platforms on which computers and the internet are considered as a whole are encountered as the most effective medium where students consider themselves as masters. The mobile communication tools which are at an indispensable position in our lives is heading the most obvious reasons. Individuals live together with the internet thanks to these tools. The situation creates self-reliance in individuals and awakens the feeling that they know how to use a computer by surfing on the internet and staying live on the social networks.

It has been observed that the students lack the information on the dominance on the operating system and the problems experienced while using the word processor program Microsoft Word in preparing homework, formulas used on Microsoft Excel and performing effective presentations on Microsoft Power Point despite the individuals' high level of internet usage. (G:S(18)) stated the views as follows: *"We do not know how to adapt and use the BCSM to our professional life in the future. I think we should learn things which will be more useful and which we will use more such as social media management."*

The case that certain part of the students cannot understand the significance of the module means that they will not be able to practice the BCSM content in their future professional lives, this also refers to the view that they will not become computer literates to become dominant. Seferoğlu and Şenel (2009) explain this situation as follows: *“Individuals who are not computer literates in the age of information technologies stops being the human of the age and cannot participate in the social life effectively.”*

It has been observed that the information provided for the human life by BCSM creates awareness regarding being computer literates in the future. It is considered as inevitable fact that, this awareness will have a positive feedback for people and this will carry them to higher positions in their profession lives in the universal content.

### **BCSM EDUCATION FROM LECTURERS' POINT OF VIEW**

One of the results obtained from the interviews conducted with the lecturers is that BCSM is considered as one of the ordinary courses due to the insufficient feedback obtained from the students during the lecturing despite the importance given to the BCSM in terms of teaching.

The lecturers with this view agree on the view that the motivation decreases during lectures. However, the dominant view is that lecturers, who consider negative feedbacks in the classroom and who can provide motivation to students without compromising from the quality of education, have important roles on the students' success. Turan and Çolakoğlu (2008) describe this situation as follows: *“The lecturers' usage of information technologies are directly affected by their decisions, experiences, approaches and attitudes.”* In this sense, the fact that expanding the lectures from the classroom only seen as modules, which means research in the real life and education and trainings in the academic world or professional business life, would make great benefits and differences for students should be conveyed well by the lecturers. The business world and/or academic life necessities and even compulsory requirements of individuals who have not completed the age of development yet, should be explained adequately by lecturers.

In one-to-one interviews conducted with lecturers, a lecturer stated one of the main factors considered to have negative effects on the lecturer's success and/or teaching in the classroom is the inadequacy of computers in the laboratories during the lectures but made no attempts in order to provide better conditions. (G:L(3)), a lecturer of the module, shared his/her views as follows: *“It is important to have updated computers, hardware and software in the laboratories where the lectures are held. There should be no expectation for efficient classes if this is not performed.”* In terms of the practices made in line with the lectures in laboratories, some lecturers expressed that they do not use interactive lesson contents in order to attract the students' interest and to motivate them. In terms of another result obtained from the interviews, the view is dominant that students experiencing this situation have difficulties in learning the subjects, lose their motivation in learning after a certain period of time and their lecture participation and level of success are correspondingly affected in a negative way.

This situation existing in the education-teaching cycle (Turan & Çolakoğlu, 2008) will only be provided by following the new technologies and by the cooperation of lecturers both in education and teaching. Achievements made through the cooperation will strengthen communication as well as improving the flexibility and facility in lecture implementations.

### **PERSONAL DEVELOPMENT PROCESSES OF BCSM LECTURERS**

BCSM lecturers should be up-to-date as a necessity for their professions after graduation. One student shared his/her views for development of lecturers as follows: *“I believe that some of our lecturers teaching BCSM should improve themselves in order to become more efficient for us. They should follow the technology and developments closely.”* (G:S(11)). Dinçer (2011) explained the reason why self-development of lecturers is important as follows: *“The computer literacy levels of lecturers at educational institutions should be high for the efficient and active computer usage at these institutions, which is among the most important skills of information societies”.*

It is known by everyone that an individual, who does not develop himself/herself will not be at the position to perform his/her profession in the right way. Having taken into account the significance of BCSM from the technological perspective, it is believed that it is necessary to keep both the correct and reliable information to be provided by lecturers to give the lecture and the curriculum updated.

(G:L(1)) expressed his/her views as follows: *“I think in-service trainings should be conducted every term in order to follow the innovations in the field and this should be repeated on a regular basis”.* Attending conferences, in-service trainings and workshops and actively participating in these environments are considered

as a necessity for lecturers to stay up-to-date. Lecturers should also monitor the literature and should put an effort in order to contribute.

Lecturers should be able to transfer the new developments in technology obtained from in-service trainings to be arranged at their institution and conferences with their colleagues of BCSM. The fact that the contribution of this education to students in terms of being computer literates would also make significant contribution to the higher education institution in having an active role in creating an information society should not be ignored.

BCSM lecturers stated that their academic success have been affected positively through the positive feedback from the students by students and they made an attempt in order to provide more updated information to students with new and effective alternative resources in lectures. The mentioned alternative resources refer to the follow-up of the new developments related with the field and benefitting from online databases, services on the internet which provide e-book services and educational contents. (G:L(3)) referred to the significance of the innovation and content issues as follows: *“Following all the innovations and developments in the field of computer education as well as adapting to the country conditions are highly significant.”*

## **METHOD**

*“Observation and interview techniques among qualitative research methods were implemented in the research. It is possible to classify the interview technique as self-configured, semi-structured and non-structured interviews. Questions are determined in advance and data are intended to be collected at semi-structured interviews.”* (Karasar, 1998). Semi-structured interview method was implemented in the research.

This method is not as strict as structured interviews and is not as flexible as unstructured interviews, this method is between these two points. Semi-structured interview method was implemented as it provided this flexibility to the researchers. Observation which is one of the most common qualitative research methods was used along with the interview method in this research (Yıldırım & Şimşek, 2006).

One-to-one interviews were conducted at the computer laboratories and in the lecturers' offices with the BCSM lecturers and BCSM students without any time limitation during the semi-structured interview process.

The lecturers' and students' attitudes, views and actions on the way how computer education is, how it should be and change process as well as their possible solution suggestions were focused was focused on lecturers of institution about implementation, how is computer educations of students, how should it be, examination of actions behaviour and thoughts about change process and possible solve suggestions.

In this research, (G:S(x)) refers to the interviewed students and (G:L(y)) refers to the interviewed lecturers.

## **CONCLUSION AND RECOMMENDATIONS**

In case the issue regarding information research, acquisition and sharing are added to the BCSM education programs, it is believed that learning will be more efficient for students, the acquisition of lifelong learning will be enabled and it will be more suitable to present day conditions.

The consolidation of the student-lecturer relationship can be evaluated at the level of foundation and undergraduate students in accessing the right data, evaluating the accessed data and how to use the data for expected results. From this point of view, it is thought that lecturers may play a significant role in encouraging students to internet-based research and computer-aided guidance in accessing the right data.

This research may serve as an example in analysing different ideas of students and lecturers regarding the approaches of students and lecturers while carrying out new research in the field of computer education and it may demonstrate the sample lecturer and student behaviours in improving the motivation in education or regarding negative feedback.

It is believed that integrating the usage of technology and computer at foundation and undergraduate degrees to all modules available in the programs rather than limiting it to certain modules will be beneficial. As a result, it is thought that an important contribution will be made to the student in acquiring creativity and thinking skills while improving them as well as getting away from the memorization system. *“In-class and extracurricular practice opportunities should be provided to students where the information and knowledge obtained during the computer modules can be implemented in real life effectively.”* (Korkmaz & Mahiroğlu, 2009). A student who supports this view made a statement as follows: *“We want this module to have an effect on other module. I think*

*it would be inevitable for us to become more fully-equipped people in terms of profession if our other field lecturers implement the content we learn in BCSM to their modules (G:S(2)).*

As a result of the conducted interviews and observations, a certain part of the students think that this module is one of the ordinary modules which should be taken and passed. In order for the students to change their points of view towards this module, explaining that the module curriculum is sustainable both in the field of education as well as the real life is sustainable and supporting it with exemplary studies can be seen as an important stage. In this context, it can be considered that having students met with the sample people who are dominant in computer usage in their professions or businesses and who are successful in their field and accessible will help them to improve the student interest in course and motivation.

According to the data obtained from the conducted interviews and observations, it has been determined that some students attended the classes only for the obligation to attend. Willingly participation of students can be provided by practical homework given regularly every week.

It has been found out that lecturers stated that they wanted to receive in-service training in order to develop themselves in the field and to follow the developments and innovations closely. In fact, it is believed that this situation is an appropriate finding and it is a step in improving the efficiency and success of lecturers as well as facilitating the creation of an information society with the updated information and formation.

Based on the data obtained from the conducted interviews and observations, it has been determined that certain lecturers do not think that the computers and programs used in the laboratories are up-to-date. The importance to be given to the personal development of lecturers as well as their participation in congresses, in-service trainings and symposiums should be provided in order for them to closely follow the vocational education and new technological developments. As a result of this, lecturers will be able to determine deficiencies in laboratories on time and will be able to express the situation in the best way through a report which will be prepared by lecturer. In the context of management, institution will be able to take more efficient result by determining how to better canalize the investments in forming the information society by analysing this report.

Other data obtained from the conducted interviews and observations, it can be said that some students do not have personal computers and they cannot revise the practices conducted in laboratories at home and they cannot develop themselves. It can be thought that this problem will be overcome by opening laboratories to students outside the BCSM hours and allowing them to use computer during those hours.

Other obtained data from the conducted interviews and observations with the BCSM lecturers, lecturers teaching the module should be in communication and should be enabled to keep the course curriculum updated and to improve it. It has been thought that students will be able to join to target of information society by becoming more equipped computer literates by expanding the importance to multidisciplinary studies to all branches.

It is believed that designing the necessary transfers and implementations covering both the curriculum and the changing and developing innovations is highly crucial in terms of catching the era. In this way, the inclusion of individuals to formation of information society as information literates and computer literates by adjusting their behaviours towards the lectures and enabling the participation to the practices in the laboratories should not be ignored. Besides, evaluation and determination of individual characteristic and capacities of students receiving education and developing suitable education conditions to feasibility level can be suggested. (G:S(14)) stated that *“Some students have little knowledge about computers. We feel bored as we cannot finish topics early and we cannot progress. I think individuals who know how to use computers and individuals who do not know should be in different groups.”* From this truth, it can be suggested that student-centred education system can be adopted and improved rather than a general education system. Alpar, Batdal and Avcı (2007) stated that *“Teachers focus on systematic planning for active usage of education technology and tools, concentrating on plans which include active usage of education tools in the classroom and they guide the designing of the learning process.”* On the basis of the above mentioned data, it is believed that the BCSM makes a positive contribution to the academic success of students as well as their motivation and it is recommended to the lecturers to develop the course content. (G:S(2)) expressed his/her views as follows: *“Information sharing should be performed among lecturers teaching BCSM in order to enrich the module content and curriculum by resources and by lecturers.”* Determining the needs for the necessities and student-centred education and the education level can be put forth in order to improve the module content.

Auditability of lecturers should be done with the purpose of providing the BCSM at the same level in all faculties of the higher education. However, it can be only suggested in line with suitability with curriculum and with the content of periodic or year academic lesson schedule.

The appeal towards the BCSM will be improved by developing the social media and new media platform programs usually used by the new generation and providing lessons to create new programs in terms of developing and expanding the computer education.

Dinçer (2011) stated the results of his study as follows: “Having researched the dissatisfaction in the university education, it has been concluded that some students learn the lecture topics in advance and they get bored during the lecture, other students state topics are very difficult, they cannot reach the speed of the lecture and they are not satisfied with the course due to misunderstanding topics.” Having combined the results from Dinçer’s research and the conducted observations, the subjection of students, who recently start education programs and about to start the first year, to an exemption exam for BCSM is suggested. It is believed that the exemption exam will reduce the number of students in the class and contribute to a more efficient course for other students.

Providing the participation of lecturers to in-service training programs in necessary situations will make an important contribution for improving the quality of education. These trainings will have a meaningful contributions to improving the motivation of lecturers, to improving their awareness for new technologies and at the same time to rendering the information to be conveyed to students up-to-date.

Following the latest developments in the field will contribute to adopting the habit to conduct research and for the self-development of individuals, provide the development of lifelong and learning-oriented habits and have an important contribution at transferring these to students. It is thought that triggering of lifelong learning and habits for social learning will come together with them.

The fact that knowing students are prone to using mobile devices, which are one of the ICT and a part of our lives, does not mean that they do not need BCSM. In other words, the situation that the widespread usage of the social media in circulation does not suppress the need for the BCSM.

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## **A Social Project Model: Our Epic Veterans**

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### **ABSTRACT**

The purpose of this study is to investigate the opinions of pre-service social sciences teachers on the project they applied- “Our Epic Veterans”. Activities were held by pre-service teachers for 10 weeks in an association related to the veterans in the city center where the university is located. With the aim of the study, the action research method from qualitative research methods was used. The study was conducted on five pre-service teachers in the third class of the Department of Social Studies Education of the Faculty of Education of a state university affiliated to the Republic of Turkey in the fall semester of 2017- 2018 academic year. Selection of teacher candidates was determined according to criterion sampling from purposive sampling methods. The data were gathered through document reviews (posters, reports) and interviews (semi-structured and focus group interview) in the study. The data obtained from the interviews were analyzed by content analysis method. The result of the study revealed that the project was viewed as a problem and this is why it was selected, the primary problem of the veterans was awareness and that it was concentrated on the activities aiming at this problem, that the project had many contributions, in particular awareness, that there were many problems mainly regarding finding activities, that pre-service teachers generally made suggestions for raising awareness, and that they thought that the project was associated with community service practices. Based on these results, it was suggested to carry out activities related to the awareness of the veterans themselves and their problems and to carry out studies related to the relationship of this project and the content and outcomes of Community Service Practices course.

**Key Words:** Service-learning, Community Service Practices, Social Project, Pre-service Social Studies Teachers, Veterans

### **INTRODUCTION**

Veterans are divided into two as disabled veterans and warrior veterans. Disabled veterans include those who are the members of the Turkish Armed Forces who was injured in the war or in the domestic and international struggles against the terrorist organizations aiming at the survival of the state, by the effect of all kinds of enemy or terrorist weapons used or by the operations and services in the war zone, by the causes and effects of these operations and services and also were determined as a disabled with a report after their treatment. The warrior veteran refers to those from members of the Turkish Armed Forces who actually participated in the war (<http://muharipgaziler.org.tr/gazi-tanimi/>). Studies on veterans revealed that the legal regulations were sufficient but they were inadequate in practice (Kara 2010), they had psychological problems (Murthy ve Lakshminarayana, 2006; Byrne, 2009; Duran ve Ünsal, 2014); in the studies directly on warrior veterans showed that they encountered a number of problems, especially inattention and disrespect (Aydın ve Aykırı, 2013), and most of them did not take any invitation from anywhere and were not considered to be important (Aydın, Aykırı ve Köse, 2013). Our veterans, who are among those who need special protection, should be seen as one of the target groups within the scope of community service practices. To find a solution to these problems of our nationality's honorable friends, a community service practices project aimed at warrior veterans was carried out.

#### **The Purpose of the study**

The purpose of this study is to investigate the opinions of pre-service social sciences teachers on the project they applied- “Our Epic Veterans”.

#### **The importance of the study**

The result of the study is believed to be significant for the pre-service teachers who will implement a project on our veterans in the community service practices course by shedding lights on the activities carried out, problems faced, and the solutions to these problems. Moreover, no scientific work has been found in the literature on this topic.

#### **The sub-objectives of the study**

Within the context of general objectives of the study, the sub-objectives of the study are as follows:  
What are the opinions of pre-service teachers on the topic of “Our Epic Veterans” project?

What are the activities carried out by our pre-service teachers in the scope of “Our Epic Veterans” project?  
What are the contributions of “Our Epic Veterans” project on pre-service Social Studies teachers?  
What are the problems faced by the pre-service teachers during the “Our Epic Veterans” project and their solutions to these problems?  
What are the suggestions of pre-service teachers on “Our Epic Veterans” project?  
According to our pre-service teachers, is “Our Epic Veterans” project related to Community Service Practices course?

## **METHODOLOGY**

### **The Design of the study**

With the aim of the study, the action research method from qualitative research methods was used. The action research, according to Berg and Lune (2015), is "a research approach in which individuals act as collaborators to solve certain problems with systematic activities". The reason for choosing this method is that the pre-service social studies teachers in this study did regular activities in the form of groups for the solution of certain social problems. Action plans are as follows:

- Subject selection and group competence
- Identifying project name and objectives
- Setting group members and target group meeting times
- Need analysis method and planning activities
- Organizing a conference
- Using social media
- Poster design

### **The Study Group**

The study was conducted on pre-service teachers in the third class of the Department of Social Studies Education of the Faculty of Education of a state university affiliated to the Republic of Turkey in 2017- 2018 academic year. Activities were conducted by pre-service teachers for 10 weeks in an association related to the veterans in the city center where the university is located. A total of five teacher candidates were interviewed about the implementations. Selection of teacher candidates was determined according to criterion sampling from purposive sampling methods. According to Yıldırım and Şimşek (2013), purposive sampling allows for comprehensive study of situations that are thought to have a rich seam of information. In the criterion sample, a kind of purposive sampling, the "voluntary participation in the project" criterion was used. The group regularly went to the clubs on Saturdays every week and conducted activities for 10 weeks, from an average of 3 hours a day. Working with a group of five was deemed appropriate because the size of the sample was a single case considering the focus of the study. In addition, when weekly reports and studies were examined, it was found out that the concepts and processes recurred and that the saturation point was reached with a single group.

### **The role of the researchers**

Researchers were not in the role of participation in the study. They followed the process, conducted the focus group interviews and examined the relevant documents and reports. The first researcher has taught social project and community service practices course for undergraduate and graduate level for about ten years. The second researcher has been closely following the courses of social project and community service practices for nearly four years. Both researchers have certificate of appreciation within the scope of community service practices, and they are working on social projects.

### **Data Collection Tools**

In the study, the data were gathered through document reviews (reports, photographs, posters, magazine articles) and interviews (semi-structured and focus group interview).

Focus group interviews and semi-structured interviews were conducted in the social sciences seminar room. The meeting room consisted of a "u" shaped table and adjustable comfortable chairs. Every week, focus group meetings were held and action plans were set. The semi-structured interview form was created to take the views of each participant separately. In the semi-structured interview, six questions in total, appropriate for conversation and daily language use, were prepared. Depth interviews were attempted to be performed by the six probes arose during the interviews. In the preparation phase of the interview questions, the related literature was reviewed and after the items were firstly prepared, the expert opinion was taken. Pilot implementation was conducted on pre-service teachers who had already carried out a project in the course of collective service practices. The interviews were conducted by researchers.

Weekly photo-reports: Each week, a proven weekly report with the photographs was taken from the group to allow the pre-service teacher to provide evidence for working in the “Epic Veterans” project, and to take the pre-service teacher’s opinion before the impact of the activity vanished. The reports are written to not exceed 500 words. Incidents influenced by, emotions experienced, problems encountered and solutions proposed were asked to be included in the reports.

Magazine articles: Teacher candidates were asked to write a magazine article that will not exceed two pages. The reason for this was the wish for learning the feelings and experiences of the pre-service teachers in different ways as well. The required spelling rules were explained in detail and that the content should include the data about the target audience, incidents influenced by, problems encountered and solutions proposed was specified.

Poster: The pre-service teachers were asked to prepare a poster including the summary of all of their experiences appropriate to the poster format. The reason for this was the wish for learning the feelings and experiences of the pre-service teachers in different ways as well.

### **Data Analysis**

Data obtained from the interviews were analyzed with content analysis method. The purpose of using this method is to reach the concepts and relations that can explain the collected data (Yıldırım and Şimşek, 2013). In the context of this method, the data will be encoded, the themes will be found and the data will be arranged and defined according to the codes and themes.

### **Credibility, Transferability and Consistency**

Long-term interaction was maintained within the scope of credibility in the study, depth-oriented data were attempted to be collected, expert review was used and member checking was taken. In this context, “Our Epic Veterans” project lasted for 10 weeks, and thanks to the reports that came out every week, long-term interaction was ensured. The participants who were in dialogue with researchers for 10 weeks were in comfort and confidence that could contribute to the study. In order to gather depth-oriented data, ten probes were included during the interviews. In the preparation of the focus group interview questions, opinions were received from field expert and Turkish education expert. After the whole study was done, the field expert examined it. After the interviews, the member checking was obtained by showing the final version of the research, and by asking whether there are parts that needed to be corrected or added. The confirmation was obtained by holding a confirmation meeting as a group. The confirmation meeting was photographed with the permission of the participants. This evidence will be kept in the archive for a while.

In the scope of transferability, detailed description was made and purposive sampling method was used. The data gathered from the interviews were described in detail and direct quotations were often included. For purposive sampling, criterion sampling was used. To ensure consistency in the study, it was paid attention to the consistency in conceptualization during the encoding of the data obtained from the interviews. For the confirmation in the study, the coding and the result of the study were examined by the field expert.

### **Ethical Issues**

Participants in the study voluntarily participated in “Our Epic Veterans” project. Their consent was taken to have interviews with them. After the study finished, the results were confirmed by them. Symbolic codes were used in the quotations. The data obtained from the interviews will be kept in the archive for a while.

## **FINDINGS AND INTERPRETATIONS**

Findings related to the first sub-problem

Pre-service teachers’ “reasons for choosing the project” are as follows:

To raise awareness by informing us of that they served for us / that they sacrificed their all / that we owe to them / that they deserve / that they should not be forgotten

To do a similar work in teaching life and therefore to learn the process

Since it is seen as an important issue in terms of a social studies teacher

Since the news about the negative events experienced by veterans were witnessed in the media

Because of being military affinity and having military affection

To understand the veterans better and to meet their material and spiritual needs

Since it was known that similar projects had been conducted in the previous years

To understand the value of the country better

In the reports, the concepts of “martyr” and “veteran” are used together, and it is thought that there are some problems about these subjects. There is also a belief that even though the study group cannot find solutions to the problems that are predicted, even the visits can have positive effects (R1).

Here are some statements by the pre-service teachers supporting these judgments included in the reports: S5 *'we chose this project as we wanted these values to be remembered'*. S1 *'I want to create interaction and dialogue with the children of veterans martyrs' families. That's way I am in this project'*. S3 *'when I looked at the news about our veterans, I usually watched the news about that they had been forgotten. They really are! I participated in this project to show that our veterans have not been ...forgotten'*. S4 *'I chose this project not only because my close relatives are soldiers but also because I love soldiers.'* R *'they are the reason for our existence'*. R *'this subject should not be considered as a course but can be defined as showing our gratitude as a citizen of this country'*.

Findings related to the second sub-problem

“Activities implemented” by the pre-service teachers within the scope of the project are:

Greeting and needs analysis

- Making an interview
- Preparation of magazine articles
- Pre-conference preparations
- Organizing a conference
- Creating awareness on social media
- Poster for awareness
- Opinions about activities and farewell

It was seen that the targeted activities were carried out except for the conference which was meant to be held in a secondary school due to the fact that it was thought that the bureaucratic obstacles would be difficult and there was not enough time.

Here are some statements included in the reports supporting these judgments: R. *'One of the biggest problems of our veterans is that those people who does not know the meaning of the word “warrior veterans” ask them –if they are really veterans- as they do not have any scars of wound and bruise in their body. And we can say that this deeply hurts them'*. R *'In our society where homeland comes first, we should say that they think this conscious should be earned”*.

Findings related to the third sub-problem

The contributions of the project to the pre-service teachers are as follows:

Contributions estimated before the activities:

To gain a project experience related to veteran subject

Having information on the problems of the veterans

Contributing to sensitivity value

After the activities:

They reached the predicted contributions. Except for these:

Being aware of the veterans and understanding their values

Witnessing the negative psychological consequences of the war in person

Having oral history experience and excitement

Contribution to patriotic value

Understanding the value of soldiers

Some of the statements of the pre-service teachers supporting these judgments and included in the reports are as follows: R. *'we witnessed in the interviews the information and life stories that we did not know, which were not written in books, which could not be found on the Net by searching. In this regard, we can say that it is a very useful study for us as a group to develop ourselves.'* R. *'in the conversations we had with veterans, we understood better what loving the homeland means or, to be more precise, what loving the homeland unrequitedly means.'* S3. *»yes, we realized that our veterans are lonely and uninterested, and that we, student, do not know the value/concept of veterans.*

Findings related to the fourth sub-problem

According to pre-service teachers “problems encountered in the project and the solutions for these problems” are as follows:

The only problem predicted before the activities was being unable to make the prepared awareness video reach large masses. The proposed solutions include "using effective YouTube channels, posting to morning news, using the local newspapers and channels»

When we look at the action plans, the first problem: to decide on a common time for the meeting event. Because of the workload of the pre-service teachers, and the overlap of their lessons due to retaking failed courses/taking courses from the upper classes, and the veterans' showing up between 12.00 - 16.00 on weekdays in the afternoon at the association, setting time was a problem. This problem was solved owing to the fact that the pre-service teachers do not have any lessons at 11.00 on Fridays, the necessary sacrifices were made, and the association's representatives found this time appropriate and agreed to come early that day.

Second problem: the first meeting excitement and the fear of how the attitudes would be. This problem was resolved with the agreement on communicating with the group that made the project last year and initiating conversation only to establish a friendly environment without any analysis in the first meeting. After they met, they would realize that the responsibilities of the associations are very understanding, very sincere and ready for any kind of help.

After the meeting, the problem was having interviews and asking questions for needs analysis. This problem was solved by taking the opinions of field experts and preparing a semi-structured questionnaire. After the needs analysis, it was found out that they needed moral support rather than financial support and wanted to raise awareness.

Another problem was determining activities for awareness and ordering them. Opinions were exchanged on this, and similar samples on the internet and in the previous years were examined. As a result, activities were chosen and they were ordered logically.

Another problem was the issue of having interviews to write memories down and finding media to share that. Interview questions were reviewed by the field expert and videotaped. Although it took a long time to decipher memories from the videos, the interview was decoded, and it was decided to publish the interviews in the magazine which is published annually, belongs to the departments, and consists of articles by pre-service teachers.

Another problem was arranging the hall and the time for the conference. As the primary aim was to increase the awareness of pre-service teachers, the conference room of Faculty of Education was selected. It was thought that it would be difficult to determine the length of time that the veterans were available, but there was no problem as the plan was made 20 days earlier. The bureaucratic process was sorted out through the Social Studies Community, one of the university student clubs.

Another problem was preparing the content of the conference. General conference texts were examined, and it was decided to allot certain time for each veteran to give more time for their speeches by keeping the introduction short.

The other problem was getting a plaque or poster prepared. The first of these two problems here was that as our veterans were generally old and had health problems, it was not clear who would attend. For that reason, the plaque was made for the association, not for the individual. The plaque budget was met by the Social Studies Community budget. Only the name of the person who would attend the conference for sure was written on the posters. As they carry a community emblem, the posters were signed easily and hung on the faculty panels.

Another problem was about the issue of how our veterans would get to the university. Group members received help from a family friend thanks to close relations.

Another problem was welcoming our veterans before and after the conference. The supervisor's room and the meeting room were used for this. Various refreshments were bought on the Social Sciences Community budget.

Another problem was increasing the number of followers of the social media account of the association. For this problem, everybody sent a request through their own account, and the number of followers was increased.

Another problem was sharing the lengthy interview video on social media by shortening.

The final problem was the preparation of posters. Thanks to field experts, a suitable poster was prepared.

Apart from these, the point emphasized was that these were only minor troubles, not very big problems.

Some statements of the pre-service teachers supporting these judgments are as follows: S4. *"While starting the project, we experienced some troubles due to the overlapping time when setting up the interviews with our veterans. While organizing the conferences, we had some problems with the vehicles that would bring our veterans to the university.* S5. *"Frankly, I could not say that we faced so many problems, we usually run into minor problems. We solved them as a group. "*

Findings related to the fifth sub-problem

According to pre-service teachers, "suggestions for the project" are as follows:

- Giving lectures at secondary and high schools
- Participating in the project voluntarily rather than compulsorily and first embracing it
- Good selection of group members and having good communication with them
- Knowing that the attitudes of the veterans are positive and that they are willing to take part in similar projects
- Establishing sincere relationships rather than formal ones with the veterans
- Being in constant contact with the veterans during the project
- Effective use of social media. Preparing appropriate videos for this environment and allocating specific time in these projects for the videos

Some expressions of pre-service teachers supporting these judgments are as follows: *S5 "first of all, different from what we did, veterans can be hosted not only to the university environment but also at secondary schools and high schools with permission from the authorities, and by that future generations can become conscious about the concept of veterans and veteran title "*.

Findings related to the sixth sub-problem

All teachers stressed that the projects about veterans are related to Community Service Practices course. According to the pre-service teachers, the relationship between the project and Community Service Practices course is as follows: Relating those who do important work on behalf of «society», important members / heroines of the «community» to the other individuals of the «society», and raising awareness, listening to their problems and getting to know them closely, and thus showing our gratitude as a country.

Our pre-service teachers want the projects about veterans to be continued within the Community Service Practices course. They believe that they will reach the outcomes of the course with this project. In this context, they stated that society should know what being a veteran means by listening to the primary source, when it is not possible to do so, at least some studies should be carried out to raise awareness, and these studies should be enriched with additional activities, and this project contribute to the benefit of society and individual awareness.

Some statements of the pre-service teachers supporting these judgments are as follows: *S5 "the project should be absolutely done, believe me we as a group misknow even the concept of veterans. So what I mean is that making our society listening to the veterans from the first person at least can make our society sensitive about this issue. As I mentioned above, I think it is appropriate for the course content and outcomes."*

## **CONCLUSION AND DISCUSSION**

This project was chosen because it was really seen as a problem and responsibility. Given that the main problem of social aid is the inability to reach the people in actual needs (Yıldırım, 2010), the study group seems to have taken this fundamental problem into account. At the end of the project, pre-service teachers indicated that they find the project related to the contents and outcomes of community service practices course and they want the project to continue in the scope of the Community Service Practices course.

It was realized that the main problem of the veterans is awareness so the activities were generally planned for this problem. This judgment coincides with the results of some studies (Aydın, Aykırı ve Köse, 2013). In addition, awareness is mostly mentioned in the studies on veterans, which also supports this judgment.

It is seen that more contributions were gained with the veterans project than the expected. It is parallel to the findings of other studies (Çetin ve Sonmez, 2009; Tanrıseven, Öredi, and Yanpar Yelken 2010; Yılmaz, 2011), where community service practices are beneficial to pre-service teachers.

It is seen that they met certain problems in each activity and solve these problems. Facing various problems in collective service practices is also seen in the findings of other studies (Gürol ve Özercan, 2010; Tanrıseven et al., 2010).

## **SUGGESTIONS**

- It is suggested that the activities to be carried out in the projects aimed at veterans should be done by taking into account the sample activities, the problems and solutions in this study.
- It appears that the project has significant contributions. It is recommended that pre-service teachers should participate in similar projects, at least even once.
- Pre-service teachers stated that the project contributed to the values of sensitivity and patriotism. It is suggested that studies on the contribution of this project to the values of sensitivity and patriotism be carried out.
- It is suggested to carry out studies on the relationship between the community service practices on veterans and the content and outcomes of Community Service Practices course.
- This study was conducted on undergraduate pre-service teachers. It is recommended that similar studies should also be carried out with other levels of education.

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# **A Study on Adaptation Strategies of Korean Language and Culture by International Students**

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## **ABSTRACT**

During the stay in Korea, besides language programs, there is a necessity of various practical, cultural and educational programs for international students to adapt to the specific characteristics of Korean culture and particular society, known as University. In particular, the purpose of this study is to make it possible for international students enrolled in graduate schools to pursue more specialized study and become experts in their respective fields. In this study, we examined the problems experienced by international students and adaptation strategy for them as well.

In this study, 113 international students, studying in graduate school at INHA University, were surveyed and analyzed for a total of two times. The first survey was conducted among 70 people from 16 countries (with beginner Korean language proficiency of 27 students, 20 intermediate, and 23 Korean advanced level students) from 5th of March to 5th of April, in 2012. The second survey was conducted among 43 people from 15 countries (18 beginners, 12 intermediate and 13 advanced proficiency levels) from 5th of March to 5th of April, in 2017. There was a 5-year difference between the primary and secondary investigations, but similar results were obtained.

The results of the main survey are as follows. First, the highest indicator among the factors of feeling sad after coming to study abroad was given as 'loneliness.' The latter played a significant role as international students left their home and pursued their studies in another country with different culture. Therefore, it is necessary to have a meeting, a school organization or a counselor to share their loneliness and to be advised. The next highest stress is related to academic work. International students study in a non-native language. Moreover, there is a lot of stress in submitting research results. There is a necessity for an institutional organization that can solve this problem.

Second, while analyzing the question of 'Listing difficulties in coming to study abroad,' it was found out that the most problematic point was 'language.' Especially in the beginner's classes, they felt the great difficulty of Korean language. If the Korean language ability is weak, it will lead to the burden of stress and academic work, so a solution strategy for language proficiency is needed. The next difficulty was economic and cultural differences. The financial aspects such as tuition fee or living expenses should be considered. Otherwise, the difficulty of studying can be great. Also, the biggest problem in cultural differences is food; especially international students from Islamic cultures have had difficulties because they do not eat food containing pork.

As a result of the comprehensive analysis of the research problems, international students were experiencing the difficulties in language as well as in coming into contact with other cultures while studying abroad. Especially, it was not only difficult to adapt to other cultures, but also it was challenging to adapt to a new education process and teaching methods. For solving problem, in this study, we propose language adaptation strategies, diverse cultural event strategy, sisterhood tactics, and economic problem-solving strategies based on organization and support of international student self-governing organization through practical experience and experiment as a teacher. This study is expected to help international students to succeed in their studies.

**Keywords:** Korean language and culture, international student, university culture, adaptation strategy, language adaptation strategy, culture event strategy

## **I. INTRODUCTION**

During the stay in Korea, besides language programs, there is a necessity of various practical, cultural and educational programs for international students to adapt to the specific characteristics of Korean culture and particular society, known as University. In particular, the purpose of this study is to make it possible for international students enrolled in graduate schools to pursue more specialized study and become experts in their respective fields. In this study, we examined the problems experienced by international students and adaptation strategy for them as well.

In this study, 113 international students, studying in graduate school at INHA University, were surveyed and

analyzed for a total of two times to find out what problems and difficulties they experienced while living in Korea. Based on these analyses, we will describe the strategy and practice of language and culture adaptation for international students.

## II. STATUS OF INTERNATIONAL STUDENTS' STAY AND ADAPTATION

### 1. Current Status of International Students

In the 21st century, the number of international students studying in Korea increased from 12,314 in 2003 to 104,262 as of February 2016, as Korea's economic development and K-pop popped up. Moreover, the number of international students according to their nationality is mainly Asian students such as China, Vietnam, Mongolia, Japan and Taiwan. European students such as North America, France, and Germany are the next place.

<Table 1> Current Status of International Students

Year	2010	2011	2012	2013	2014	2015	2016
Total	87,480	88,468	84,711	81,847	86,410	92,076	104,262
Degree course	69,600	68,039	64,030	60,466	61,257	69,061	63,104
Language training	17,880	20,429	20,681	21,381	25,138	23,001	41,158

<Table 2> Number of International Students by Nationality (2016)

Nationality	Total	Degree course	Language training
China	60,136	38,958	21,178
Vietnam	7,459	3,466	3,993
Mongolia	4,456	2,279	2,177
Japan	3,676	1,568	2,108
USA	2,826	1,591	1,235
Taiwan	2,024	1,032	992
Uzbekistan	1,588	1,083	505
Indonesia	1,353	952	401
France	1,088	101	987
Malaysia	1,088	683	405
Russia	973	428	545
Canada	932	728	204
India	888	765	123
Pakistan	962	878	84
Hong Kong	789	234	555
Germany	737	94	643
Bangladesh	656	616	40
Saudi Arabia	508	424	84

Singapore	417	86	331
England	286	92	194
Australia	230	110	120
Sweden	189	20	169
Italy	173	43	130
Others	10,828	6,873	3,955
Total	104,262	63,104	41,158

## 2. University Adaptation of International Students

When international students come to Korea, problems arise in coming into contact with other cultures of Korean culture and adapting to university society. Therefore, first of all, adaptation to other cultures is necessary. In this regard, the four stages of emotional reaction experienced by Oberg (1960) in touching other cultures summarized as follows.

- (1) Step 1 (Expectation and Passion): Expectation, ecstasy, admiration, enthusiasm to encounter a new culture
- (2) Step 2 (Culture Shock stage): Feeling anxiety, frustration, anger, etc. due to differences and maladjustment coming from new cultural contacts
- (3) Step 3 (Recovery Phase): Steps to solve the problems of cultural differences and learn a new culture
- (4) Stage 4 (Adaptation, assimilation stage): Accepting new culture and enjoying new culture by assimilation and adaptation

Bennett (1993) also argues that the process of acceptance of multiculturalism is, at first, self-culture centered, with boundaries and antipathy toward other cultures, but gradually progresses through adaptation and assimilation to an opponent's culture.<sup>1</sup> Ensari & Miller (2002) found that they could be more intimate through discovering commonalities in the process of contact between groups of different cultures. It may lead to a decrease in prejudice and change in attitudes toward other cultures through various group communication and interaction. Therefore, it is necessary for students who have studied abroad to reduce cultural differences and broaden their understanding through Korean cultural visits.

International students should adapt to another culture of living. They have to adjust to the new college life and adapt to the new curriculum and teaching methods. Baker & Siryk (1984) presented four types of adaptation factors for international students' college life.<sup>2</sup>

- (1) Academic adaptation: academic needs of the university, cognitive learning ability.
- (2) Social Adaptation: The degree of social adaptation of the university, capacity to manage new social relations, and the smooth communication with professors and students
- (3) Personal and emotional adjustment: self-value and personality formation, the role of the nature and position of self-existence, self-discovery process
- (4) General adaptation: commitment to college, satisfaction with college and commitment to academic goals

In the end, international students should pursue a hard academic life by adapting to the university, the educational needs of the curriculum required by the university, the adaptation and satisfaction of other cultures and college life, and their commitment to individual studies. Therefore, we examined the current status and actual status of international students at INHA University and explored the adaptation strategies of Korean language and culture.

## III. ANALYSIS OF THE CURRENT STATUS OF INTERNATIONAL STUDENTS AT INHA UNIVERSITY

### 1. Survey Period and Subject

It is necessary to investigate the main actual status of international students to present policy on adaptation of language culture of international students staying in Korea. Based on the res

<sup>1</sup> All six steps move from "denial → defense → minimization → acceptance → adaption → integration".

<sup>2</sup> See Yoon Kyung Kyung (2014: 259-260).

ults of the questionnaire and analysis of the students studying at INHA University, we presented the strategies and practice for the adaptation of Korean language and culture.<sup>3</sup>

- (1) Survey period: March 5, 2012 - April 5, 2012 (primary)  
March 5, 2017 - April 5, 2017 (Secondary)
- (2) Survey Method: Questionnaire survey
- (3) Subjects: 1st Graduate School of INHA University <Korean Language for Foreigners> 70 students (16 countries)  
Korean Beginner 27, Intermediate 20, Advanced 23  
2nd Graduate School of INHA University <Korean Language for Foreigners> 40 students (15 countries)  
Korean Beginner 18, Intermediate 12, Advanced 10.

## 2. Current Status and Life Analysis of International Students at INHA University

### 1) Current Status of International Students at INHA University

Currently (as of December 2016), there are 664 international undergraduate and 368 graduate students are studying at INHA University. <Table 3> shows the number of international undergraduate and graduate students by nationality for the last four years.

<Table 3> Nationality and Number of International Students at INHA University

Year	2013		2014		2015		2016	
	Undergraduate	Graduate	Undergraduate	Graduate	Undergraduate	Graduate	Undergraduate	Graduate
Chinese (Han Chinese)	347	148	309	170	297	172	403	161
Chinese (Korean)	34	43	16	40	13	44	8	31
Malaysia	42	1	37	1	47	2	68	2
Vietnam	4	22	2	25	4	29	3	35
Mongolia	18	16	23	15	26	17	25	17
Bangladesh	1	14	3	18	4	13	1	11
India	2	14	1	11	1	10	0	10
Indonesia	11	6	6	7	5	8	5	10
Taiwan	8	0	7	0	9	0	10	2
Japan	6	5	7	6	11	5	6	3
Nepal	1	7	1	6	1	4	0	5
Myanmar	6	1	3	0	0	3	0	2
Pakistan	1	12	1	14	2	18	0	17
Cambodia	10	8	7	6	9	5	9	6
USA	6	4	3	2	9	5	5	5
Germany	13	0	7	0	9	0	4	2
Singapore	5	0	5	0	6	0	8	0
Philippines	2	3	2	3	3	4	0	3
France	10	10	20	11	19	9	22	7

<sup>3</sup> The second reason why we surveyed the same questionnaire is to obtain the universality of the results of the questionnaire survey and to see the difference.

Austria	6	1	1	0	2	1	2	0
Uzbekistan	3	4	10	5	12	10	29	12
Iran	0	1	0	4	1	3	0	5
Sri Lanka	1	1	1	1	1	2	0	1
Finland	1	0	9	0	13	0	2	2
Canada	1	0	3	0	1	0	3	1
Kyrgyzstan	1	0	4	1	4	4	2	3
Panama	1	0	0	1	0	1	0	0
Bulgaria	1	0	1	0	0	0	0	1
Thailand	15	1	2	1	3	2	0	1
Kazakhstan	2	0	2	0	1	2	1	2
Afghanistan	0	0	0	1	0	0	0	0
Senegal	0	0	2	0	0	0	0	0
Gambia	0	0	1	0	0	0	0	0
Russia	2	0	2	0	2	1	1	2
Lebanon	2	0	1	1	1	1	0	1
Italy	0	0	0	0	2	0	1	0
Nigeria	1	0	2	0	0	0	0	1
El Salvador	3	0	2	0	1	0	0	0
Ukraine	1	0	0	0	1	0	0	1
Ethiopia	3	0	2	0	2	1	0	1
Chile	1	0	0	0	0	0	0	0
Cameroon	0	0	1	0	0	0	0	0
Laos	0	0	1	1	0	1	0	0
Denmark	0	0	1	0	0	0	1	0
Sweden	3	0	4	0	5	0	1	0
Romania	2	0	0	0	0	0	0	0
Spain	5	0	4	0	0	0	1	1
Hong Kong	1	0	4	0	3	0	9	0
Saudi Arabia	0	0	0	1	11	2	7	1
Brunei	7	0	4	0	7	0	3	0
Brazil	1	0	7	0	6	0	7	0
Czech Republic	0	0	2	0	4	1	4	0
Australia	0	0	2	0	1	0	1	0
Peru	0	0	2	0	0	0	0	0

Hungary	1	0	1	0	0	0	0	0
Democratic Republic of the Congo	0	0	1	0	0	0	0	0
Colombia	1	0	0	0	0	0	0	0
Yemen	2	0	1	0	3	0	2	0
Turkey	2	1	1	1	1	1	0	0
Kenya	4	0	1	0	2	0	0	0
Mexico	1	0	1	0	2	0	1	0
Rwanda	0	0	3	0	2	0	1	0
Iraq	0	0	0	0	2	0	0	0
Egypt	0	0	0	0	1	0	0	1
Jordan	0	0	1	0	1	0	0	0
Ecuador	0	0	0	0	1	0	0	0
Azerbaijan	1	0	0	0	1	0	0	1
Lithuania	0	0	0	0	1	0	1	0
Norway	0	0	0	0	1	0	0	0
Ghana	2	0	1	0	1	0	0	0
Morocco	1	0	0	0	1	0	0	0
Mozambique	0	0	0	0	1	0	1	0
Belgium	2	0	3	0	1	0	2	0
Republic of Botswana	0	0	0	0	1	0	0	0
Sudan	1	0	1	0	1	0	0	0
Cote D'Ivoire	0	0	0	0	1	0	0	0
Togo	0	0	0	0	1	0	0	0
Turkmenistan	0	0	0	0	1	0	0	0
Tunisia	0	0	1	0	1	0	0	0
Tanzania	1	0	0	0	1	0	0	0
Poland	1	0	1	0	0	1	0	0
Portugal	0	0	0	0	0	0	1	0
Palestine	0	0	0	0	0	0	0	1
Madagascar	0	0	0	1	0	0	0	0
Macau	1	0	0	0	0	0	0	0
Mauritius	0	0	0	0	0	0	1	0
Algeria	0	0	1	0	0	0	0	0

Uganda	1	0	1	0	0	0	0	0
Israel	1	0	0	0	0	0	0	0
Georgia	1	0	0	0	0	0	0	0
Congo	1	0	2	0	1	0	1	0
Jamaica	0	0	1	0	0	0	0	0
Total	616	323	559	354	589	382	664	368

In 2016, 603 Chinese students (411 undergraduate, 192 graduate), 70 Malaysian students (68 undergraduate, 2 graduate), 42 Mongolia (25 undergraduate, 17 graduate), 38 Vietnam students (3 undergraduate, 35 graduate), 15 Indonesian students (5 undergraduate, 10 graduate), 17 Pakistani students (0 undergraduate, 17 graduate), 12 Bangladesh students (1 undergraduate, 11 graduate), 10 Indian students (0 undergraduate, 10 graduate), 9 Japanese students (6 undergraduate, 3 graduate), 15 Cambodian students (9 undergraduate, 6 graduate), 41 Uzbekistan (29 undergraduate, 12 graduate), 5 Kyrgyzstan students (2 undergraduate, 3 graduate), 29 France students (22 undergraduate, 7 graduate), 6 Germany students (4 undergraduate, 2 graduate), 10 American students (5 undergraduate, 5 graduate), 4 Canadian students (3 undergraduate, 1 graduate). There are many students from Southeast Asia, and 1,032 students (664 undergraduate, 368 graduate) from 55 countries including Europe, USA, and Central Asia.<sup>4</sup>

## 2) Survey and Analysis of International Students at INHA University

The questionnaire survey of 113(70/43) graduate students among international students at INHA University divided into basic research (nationality, degree course), best and sad things, and understanding of studying abroad.

### 1. Basic Survey (nationality, degree course)

#### (1) Nationality

Nationality	Beginner		Intermediate		Advanced		Total	
	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>
China	11	5	8	5	17	6	36	16
Bangladesh	2	4	2	1			4	5
Pakistan	2	2	2	1			4	3
Vietnam	2	1	1	1	1	1	4	3
Uzbekistan	2				1	4	3	4
India			3				3	
Cambodia	1		2				3	
France	2		1				3	
Kyrgyzstan					2		2	
Sweden	2						2	
Philippines	1						1	
Mongolia	1					1	1	1
Indonesia			1				1	
Kazakhstan					1		1	
Sri Lanka					1		1	
Australia	1						1	
Nepal				1				3

<sup>4</sup> In the past four years, the number of international students studying at INHA University is 92 countries, with 3,855 students (2,428 undergraduates and 1,427 graduate students).

Germany		1						1
Turkey		1						1
Egypt		1						1
Azerbaijan						1		1
Ghana				1				1
Gabon				1				1
Finland				1				1
Kenya		1						1
Total	27	18	20	12	23	13	70	43

We conducted the questionnaire among students with beginner Korean language proficiency of 45 students (27/18), 32 intermediate (20/12) and 36 Korean advanced level students (23/13). There are 52 Chinese (36/16), 9 Bangladesh (4/5), 7 Pakistani (4/3), 7 Vietnam (4/3), 3 France, 3 Indian, 3 Cambodian and 3 Nepal (70/43). International students who come to the school every semester are required to take the entrance Korean exam at the same time as the entrance. If the score is greater than 80, it means that the student passed the Korean exam. The Korean classes of intermediate and beginner levels are required for scores in the interval of 40~79 and less than 40 accordingly. Applicants who have completed Level 3 or above of the TOPIK will be exempted from this examination. Students who want to take advanced Korean classes can apply for enrollment regardless of their pass or fail status. Most of the advanced students take TOPIK. The following process of catching up with the corresponding level in Korean language along with taking major classes can be considered as vital both in college and social lives of international students.

(2) Degree courses

Degree courses	Beginner		Intermediate		Advanced		Total	
	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>
Master	22	6	11	6	18	10	51	22
Master and Ph.D. Integration	1		9		2		12	
Doctor	4	12		6	3	3	7	21
Total	27	18	20	12	23	13	70	43

There are 28 (22 / 6) students of masters' degree, one student of master and Ph.D. integration degree, and 16 (4 / 12) Ph.D. students in the beginner's class. Intermediate classes consist of 17 (11 / 6) students of masters' degree, 9 students of master and Ph.D. integration degree, and 6 Ph.D. students. In the advanced level, there are 28 (18 / 10) students of masters' degree, two students of master and Ph.D. integration degree, and 6 (3 / 3) Ph.D. students. Most of the reasons for the doctoral course in the beginner's class are students who graduated from the Graduate School of Engineering or Computer Information Graduate School and who have entered the school without studying Korean because they will write their theses in English. They are taught their major classes in English, but if basic communication will not be in Korean, they can have difficulties in their relationship with their professors or department students since they don't learn Korean.

2. The best thing or the saddest thing

(1) The best or glad thing

The best or glad thing	Beginner		Intermediate		Advanced		Total	
	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>

Come to study at INHA University in Korea	10	7	3	3	6	4	19	14
Friendship with Korean friends	6	1	4		3	2	13	3
Korean culture tour	3	2	5	2	2	2	10	6
Eating Korean food	2				2	1	4	1
Good results	2	4	2	1	2	1	6	6
Learning the Korean language	2	1	2	1	2		6	2
Family visit or call			1	1	2	2	3	3
Good relationship with Professor		1	1	1	1		2	2
Receive gifts				2	1		1	2
Attend party invitation or concert		1		1	1		1	2
Eating home countries' food with friends				1	1	1	1	2
Others		1						1
Total	25	18	18	12	23	13	70	43

Participants argued that best and glad thing was come to study at INHA University in Korea. INHA University is ranked 10 to 12 out of all universities in Korea by the 4-year university evaluation. One of the reasons why international students prefer the INHA University graduate school is that they can receive a full scholarship until graduation. Currently, 90% of Ph.D. students are studying with the full scholarship, and most of the master's program students receive about 70% of the tuition fee. Also, to visiting the INHA University, they also interacted with their Korean friends and helped them explore Korean culture. Especially, beginner class was in INHA University, followed by friendship with Korean friends, and research results. In the middle class, there were Korean cultural tour and INHA University. The advanced course was followed by studying at INHA University, friendship with Korean friends, and visiting Korean culture. When international students came to Korea and studied at university and social life with difficulties, they often solved it with the help of a Korean friend or a helper. Moreover, international students interested in Korean culture, so they were interested in Korean cultural sites such as historical sites and tourist sites.

(1) Sad or hurting thing

Sad or hurting thing	Beginner		Intermediate		Advanced		Total	
	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>
Loneliness	6	4	7	3	9	5	22	12
When something difficult happened	3	2	1	1	3	3	7	6
Difficulties such as study (language), research (experiment)	5	6	7	3	5		17	9
Ignored	3		1		3	1	7	1
Food is not right	2	1			1		3	1
When have a sick	2			3	2	1	4	4
When a family in their homeland is sick	1	1		1			1	2
When there is no money	1	2	2				3	2
Cultural difference	2	2		1			2	3
When misunderstood as communication difficulty						3		3
Total	25	18	18	12	23	13	70	43

The saddest or hurting thing to come to study abroad is loneliness (perfume). When students leave their homeland and come to strange land to study, their biggest difficulty was lonely. Therefore, it is necessary to have an organization or a counselor to meet and act for their loneliness. Next, challenges such as study (language), research (experiment), etc. were arising.<sup>5</sup> In another case, there will be a difficulty in learning because the language problem is accompanied and the research result is good. Moreover, when they were sick or ignored, they feel loneliness a lot. In the beginner's class, the loneliness, difficulties such as study (language) and research (experiment) were the biggest problems. After the loneliness, the challenges such as study (language) and research (experiment) were the most significant problems in the intermediate class. In the advanced class, loneliness and challenging things happened when they are sick, etc.

### 3. Understanding of studying abroad

#### (1) Difficulties in studying abroad

Rating		1 <sup>st</sup> place	2 <sup>nd</sup> place	3 <sup>rd</sup> place	4 <sup>th</sup> place	5 <sup>th</sup> place	6 <sup>th</sup> place
Beginner	1 <sup>st</sup>	language	loneliness	food cultural difference	finance	study	
	2 <sup>nd</sup>	language	food loneliness	finance	cultural difference	study	
Intermediate	1 <sup>st</sup>	language	study	finance	loneliness	cultural difference	food
	2 <sup>nd</sup>	language	study	cultural difference	finance loneliness	food	
Advanced	1 <sup>st</sup>	study	language	finance	loneliness	cultural difference	food
	2 <sup>nd</sup>	study	language	finance	loneliness	cultural difference	food

The most difficult thing of international students' study life was the language in the beginner and intermediate classes. To live in Korea, it needs to speak Korean well. In another case, it will be a lot of stress. In the beginner class, loneliness, food, and cultural difference were the next place after language. Study and finance were in the next place in the intermediate classes. Moreover, the study was the biggest problem in the advanced classes. It seems that there is a burden related to the dissertation and the research results. There were many responses to the food, which appears to be due to Muslim culture students (mainly Bangladesh, Pakistan, Uzbekistan, India, Indonesia, Egypt, etc.) and vegetarian students who do not eat pork.

#### (2) How do you overcome the difficulties?

Rating		Overcoming difficulties
Beginner	1 <sup>st</sup>	friendship and help with Korean friends (7), study hard (5), overcome oneself (5), adapt to Korean culture (2), exercise (1)
	2 <sup>nd</sup>	overcome with positively and patiently (6), friendship with Korean friends (5), study hard or research (4), professor's help (3)
Intermediate	1 <sup>st</sup>	friendship and help with Korean friends (9), study hard (5), overcome oneself (1), exercise (1)
	2 <sup>nd</sup>	positive and patience (3), study hard or research (3), exercise and hobby, music (2), professor's help (2)

<sup>5</sup> Students who answered that they were neglected while studying abroad came from students from countries with lower GDP than Korea.

Advanced	1 <sup>st</sup>	friendship and help with Korean friends (7), overcome oneself(2), study hard(6), tolerance(1), adaptation to Korean culture (1)
	2 <sup>nd</sup>	positive and patience (5), hard study or research (3), adaptation to Korean culture (2), friends or family (2), professor's help (2)

As a result of the questionnaire survey on how they to overcome difficulties, it was found that the students were helped through friendship with their Korean friends. The students were found to be in the beginner, intermediate, and advanced classes. The reason why the international students overcome themselves is that they cannot solve the problem even if they talk to their friends who are studying abroad. Therefore, if the organizations and personnel who can discuss the anxieties and difficulties of international students are satisfied, they will be able to listen to and solve their severe problems.

(3) What do you want to say to those who are going to study abroad?

Rating		What do you want to say to those who are going to study abroad?
Beginner	1 <sup>st</sup>	Korean hard work (14), recommendation for studying in Korea (4), Korean food (1)
	2 <sup>nd</sup>	recommendation for studying in Korea (13), Korean hard work (3), adaptation to Korean culture and life (5)
Intermediate	1 <sup>st</sup>	Korean hard work (14), adaptation to Korean culture and life (2)
	2 <sup>nd</sup>	Korean hard work (5), adaptation to Korean culture and life (6), compromise and determination (2)
Advanced	1 <sup>st</sup>	set goals and commit (5), adaptation to Korean culture and life (9), Korean study (8), recognition of the importance of human relationship (1)
	2 <sup>nd</sup>	Korean hard work(5), Korean culture and life adaptation (4), good affection and enthusiasm for everything (4) good planning for studying abroad (2)

The participants argued that they would like to say to those who are coming to come to study abroad in the future is to study Korean hard. It is consistent with the fact that the most severe problem with studying abroad is 'language.' Next, they answered that they are well adapted to Korean culture and life. If somebody wants to come to Korea, he/she needs to understand Korean culture and adapt well. Also, they were encouraged to study in Korea because they learned Korean education system and much kindness of Korean people.

#### IV. ADAPTATION STRATEGIES AND PRACTICES OF LANGUAGE AND CULTURE FOR INTERNATIONAL STUDENTS<sup>6</sup>

In the 21st century, the number of foreign workers has increased, and the number of immigrant women has also increased. In this situation, the number of international students has begun to increase at the University, and a strategy of adaptation of language and culture has become necessary. In order to adapt to college culture based on the questionnaire analysis of international students at INHA University, students should adapt to the new culture which is called Korean culture and education system according to the specificity of society which is called the University. For this purpose, we would like to suggest the organization of international student self-governing organization, language adaptation strategy, event strategy, sisterhood relationship strategy, and financial problem-solving strategy.

##### 1. Organization and Practice of International Student Self-governing Organizations

<sup>6</sup> The language and culture adaptation strategy and practice of international students have been carried out before the first survey in 2012, but they are based on the results of the study analysis.

### (1) Organization for International Students

Adaptation to international students more systematic and efficient, it is necessary to establish an autonomous institution for international students. It is necessary to form a consensus by organizing national representatives for each country and holding regular meetings. INHA University organized the INHA Overseas Students Society in May 2003.

### (2) Organization for International Student Support

It is necessary to organize the International Students' Association and to have an event that can maintain consensus. For that, of course, finances are needed. Also, to the welfare system for international students supported by the school, a sponsoring organization supported by a faculty or a private organization is needed. In case of INHA University, we organized a support program for foreign students in March 2005 to support various events.

### (3) Acquisition and consultation of international student self-government office

Space is needed to activate the sense of belonging and meeting of international students. It is necessary for international students' staff meeting, each country meeting, national representative meeting. In addition, there is a need for environment and environment to consult about severe problems of international students. It's nice to arrange a Korean counselor who will be able to consult international students by recruiting linguistically qualified counselors.

## **2. Adaptation Strategies and Practices for International Students**

### (1) Opening Korean language courses for foreigners

One of the most challenging aspects of international students is language problems. Particularly, since graduate students are mostly in laboratories, they are more necessary because they lack the opportunity to learn Korean. So it must be reasonable for anyone to come to Korea to study Korean and Korean culture. I met with the president of the graduate school and the working group and talked about the necessity of Korean and opened the Korean language class. Since most of the graduate schools are taught in English and the thesis is also allowed to be written in English, many students do not have to learn the Korean. However, they decided to establish a Korean language class for foreigners and set up operating rules for effective learning. I made graduate school regulations (bylaws). This lecture teaches basic Korean to international students of graduate schools. If they take the Korean Language Proficiency Test regardless of their major, they will give lectures to beginners and intermediate students according to their grades. In the classroom, students will utilize both textbooks and online (this class), and each student will be instructed to review their study online. The advanced courses are selected by the students voluntarily, and they give lectures on the essentials such as report writing, presentation class, media language class, and discussion class.

### (2) Weekend Korean language classes

For the students who are not enough with the Korean language course of the graduate school, the <Weekly Korean Language Class> will be operated from May 2012 and divided into beginner, intermediate, and advanced classes from 3 pm to 3:30 pm every Sunday. And it is organized to conduct Korean language education using the hall and seminar room.

## **3. International Student Cultural Events Strategy and Practice**

Since international students come to Korea and have difficulties such as cultural differences and loneliness, it is necessary to have a strategy to encourage each other through cultural exchanges and fellowship. It is a good idea to have a place to communicate with international students through the welcome party for first-year students, picnic for international students, Korean cultural tour, physical education, cultural festivals, love festivals and Christmas celebrations. There is a public way to organize national events, but it will be efficient to hold them by the school.<sup>7</sup>

### (1) Welcoming freshmen

The seminar provides variously information such as an introduction of the university with welcoming first-year students for new students who came to INHA University in March and September. It is a time to bring a lot of information and warmth to students who do not know what to do and how to come to Korea.

### (2) International student family outings

In May of each year, we will go to family picnic centered on a couple of students studying at INHA University by

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<sup>7</sup> For reference, Vietnamese international students hold the National Vietnamese International Student Athletic Conference in July every year, and about 600 people gather for cultural events in October.

Incheon Grand Park and Songdo Amusement Park. Meals, refreshments and entertainment programs are conducted in nature.

(3) Local culture tour

Every July, we are going to visit local culture for 1 night and 2 days. By visiting Korea's traditional cultural areas, we will have more practical and concrete cultural experiences. I have been attending Daewallyeong, Chiak Mountain, Seorak Mountain, Gangneung, Taean, Ganghwa, Buyeo, Gongju, and Gyeongju for about 40-50 students each time.

(4) Athletic Competition

Every October, we hold an athletic meet for all international students. Every year about 250 people participate in various events such as soccer, basketball, dodge ball, tug of war, cricket, relay, etc. Through the athletic events, international students are able to eliminate stress and form a common consensus by leaping at the playground.

(5) Culture Festival

Cultural festivals are held every November. It is a place for celebrations to introduce the cultures of various countries, and it has received many students' response as an opportunity to exchange diverse cultures. Each of them aims to promote traditional culture of their own countries, such as singing, dancing, and classic play, by wearing traditional costumes of their own countries.

(6) Chuseok holiday performances

At Chuseok holidays, there will be many students who think of their homeland and feel lonely and nostalgic. Moreover, students in the dormitories are not provided with meals, so there are various inconveniences. We will have a great time sharing traditional Korean food such as Korean traditional play and Songpyeon and sharing delicious Korean food.

(7) Christmas and Year-end party

Christmas and year-end party celebrations are held every year in the week of December. Carols songs, magic shows, dances, and so on.

(8) Outdoor Meeting

We have outdoor meetings in May and October every year. In May, we take a broad range of places including Songdo Amusement Park and Incheon Grand Park. After worship, we freely relax in the open space in recreation, meals, rides, bicycle rides, treasure hunting and so on. Moreover, in October, when the leaves are around, they have time to heal in nature through the surrounding mountains, such as Wolmi Mountain.

(9) Sisterhood Relationship

It is necessary to solve the difficulties of language and cultural difference by linking with Korean university assistants. Since 2012, the Korean Language Assistance System has been regularly used by the School Language Education Center for first-year students. Also, it will be able to understand the real Korean culture such as home visits in connection with a Korean family. It is not a one-time event, but it maintains a constant relationship after returning home so that mutual visits can be made. Since October 2007, we have been promoting a 1: 1 sisterhood relationship with the City Hall, ward offices, or in conjunction with CBMC (Christian Business Association) or volunteer organizations.

#### **4. Strategies and Solutions for Financial Problems of International Students**

One of the difficulties for international students to come to study abroad is economic problems. This issue can be a great challenge for international students because there are not enough resources to cover tuition fees and living expenses. Therefore, it is necessary for international students to utilize various systems that can secure financial resources without any significant hindrance to their study. There is a limit to the need for macro support such as the expansion of the government student invitation system or provision of dormitory through the International Education Promotion Agency or the International Education Exchange Center. It is also necessary to establish strategies such as expanding scholarship support and financial assistance for each school. We will use foreign language translation and interpretation system in cooperation with the regional information and communication promotion institute. International exchange center and multicultural support center introduce international students to married immigrants and multicultural family children by country and teach the Korean. Using active TA system

such as TA assistant is necessary.

## V. CONCLUSION

When international students come to Korea, it is necessary to have diverse and practical cultural and educational programs to adapt to the specificity of Korean culture and society. To find out what the problems of international students are and what the adaptation plan is, we surveyed the international students who are enrolled in the graduate school of INHA University. According to the questionnaire analysis students have to adjust to the new culture which is called Korean culture, and it is education system to adapt to college life culture. For this purpose, the organization of international student self-governing organizations, language adaptation strategy, culture event strategy, sisterhood relationship strategy and economic problem-solving strategy are presented. In this study, 113 international students, studying in graduate school at INHA University, were surveyed and analyzed for a total of two times. The first survey was conducted among 70 people from 16 countries (with beginner Korean language proficiency of 27 students, 20 intermediate, and 23 Korean advanced level students) from 5th of March to 5th of April, in 2012. The second survey was conducted among 43 people from 15 countries (18 beginners, 12 intermediate and 13 advanced proficiency levels) from 5th of March to 5th of April, in 2017. There was a 5-year difference between the primary and secondary investigations, but similar results were obtained. The results of the main survey analysis are as follows. First, the result of the item analysis of 'the saddest or hurting thing in studying abroad,' the loneliness was the highest. Isolation played a significant role as international students left their homeland and conducted their studies in other countries with different cultures. Therefore, it is necessary to meet, counselors and organizations to share their loneliness and counsel. The next highest stress is academic. International students are stressed to study in languages other than their mother tongue and to submit their research results. Institutional devices are needed to solve these problems.

Second, it is the result of analyzing the items of 'List difficulties in coming to study abroad.' The most severe are 'language.' Especially, in the beginner's class. If the Korean language ability is weak, it will lead to a burden of stress and academic work, so a solution strategy for language proficiency is needed. The next difficulty was economic and cultural differences. The economic aspects such as the tuition fee and living expenses should be solved. Otherwise, the difficulty of studying was great. Besides, the biggest problem regarding cultural differences is food, and international students in the Islamic cultures have had difficulties because they do not eat food containing pork.

As a result of the comprehensive analysis of research problems, international students were experiencing the difficulties of language difficulties as well as difficulties in coming into contact with other cultures while studying abroad. Especially, it is hard to adaptation to the other cultures of Korea, such as new education courses and teaching methods.

In this paper, we propose language adaptation strategy, diverse cultural event strategy, sisterhood tie-up strategy, and economic problem-solving strategy based on organization and support of foreign student self-governing organization through experience and experiment as a teacher. The purpose of this study is to provide international students with the opportunity to study abroad successfully.

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# **A Study on the Factors Affecting the Effective Blended Learning in University: Focused on the Perspectives of Professor**

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## **ABSTRACT**

Even though e-learning may increase access flexibility, eliminate geographical barriers, improve convenience and effectiveness for learning environments, it suffers from some drawbacks such as lack of social interaction, experience feelings of isolation. With the concerns and dissatisfaction with e-learning, Blended learning (BL) has been presented as a promising alternative learning method. BL is defined as a learning approach that combines e-learning and face-to-face classroom learning. Considered as the “new normal” mode of learning, BL has become popular in recent years especially in University education. University has more flexible learning environment to adopt BL. As the interest and expectation of BL have been growing in University, the effect of BL on student performance has been researched in different contexts. However, literature review reveals that effect of BL has been analyzed mainly in terms of students and contents area. A role of professor is more important than any other factors, because BL is a mixture of on-line and off-line teaching methods. This study, therefore, proposes a research model to investigate the primary factors affecting the student learning satisfaction and intention to re-use BL in terms of professor's perspectives. This study empirically validate the proposed model and examine the relationships among those variables.

**Keyword:** Blended learning, Learner's satisfaction, Course design, Course management, Professor's attitude

## **INTRODUCTION**

With the proliferation of information communication technology (ICT), e-learning has been emerged as an effective tool for enhancing learner-directed learning (Wu et al., 2008). Even though e-learning may increase access flexibility, eliminate geographical barriers, improve convenience and effectiveness for learning environment, it suffers from some drawbacks such as lack of social interaction, experience feelings of isolation (Kinshuk & Yang, 2003; Wu et al., 2008; Yang & Liu, 2007).

With the concerns and dissatisfaction with e-learning, Blended learning (BL) has been presented as a promising alternative learning method. BL is defined as a learning approach that combines e-learning and face-to-face classroom learning (Graham, 2006). Considered as the “new normal” mode of learning (Norberg et al., 2010), BL has become popular in recent years especially in University education. University has more flexible learning environment to adopt BL (Lim, 2007). As the interest and expectation of BL have been growing in University, the effect of BL on student performance has been researched in different contexts. However, literature review reveals that effect of BL has been analyzed mainly in terms of students and contents area. It is necessary to focus on the perspectives of professor for effective BL in university, because BL is a mixture of on-line and off-line teaching methods.

The primary purpose of this study is to investigate the factors affecting the learner's satisfaction and intention to re-use BL in terms of professor's perspectives.

## **THEORETICAL BACKGROUND**

### **Blended learning (BL)**

Blended learning is described as a learning approach that combines different delivery methods and styles of learning (Wu and Hisa, 2010). Graham (2006) defined BL as a combination of traditional face-to-face instruction and online learning. BL is not simply about applying new software or developing online learning modules, but rather it is about assisting learners to take advantage of web technology and community resources and to facilitate increasingly effective learning strategies (Barbara, 2014).

Higher education institutions have long recognized that holding onto past learning and teaching practices is not congruent with the needs of our knowledge society. BL allows for more interactive and reflective knowledge construction. Frequent online interaction and feedback makes class more student-centered than traditional class. It is believed that BL can enhance the quality of face-to-face meetings (seat time) provided that students can benefit from the online learning activities and resources (Köse, 2010). For that reason, the adoption of BL is increasing especially in higher education around the world (Charles, 2013).

As the interest and expectation of BL have been growing in University, the effect of BL on student performance has been researched in different contexts. However, literature review reveals that effect of BL has been analyzed mainly in terms of learners and contents area. Usually learner's satisfaction has been examined as an effect of BL

in University. In terms of learner’s perspectives motivation (Seo et al., 2015; Victoria et al., 2011; Lim, 2009), self-efficacy (Seo et al., 2015; Wu and Hisa, 2010), performance expectation (Nikolaos et al., 2011; Wu and Hisa, 2010) etc. have been used as affecting factors of learner’s satisfaction in BL. As for the contents area, ease of use (Nikolaos et al., 2011; Wu and Hisa, 2010), contents accuracy, diversity, and contents quality (Wu and Hisa, 2010) etc. have been examined for learner’s satisfaction in BL.

**Professor’s factors of learner’s satisfaction in BL**

A role of professor is more important than any other factors, because BL is a mixture of on-line and off-line teaching methods. There is need for more in-depth research to understand what determines student learning satisfaction in a BL environment focusing on the perspectives of professor.

As for all educational endeavor, the instructor plays a central role in the effectiveness and success of e-learning based courses. Collis (1995) and Willis (1994) believed that it is not the information technology but the instructional implementation of the IT that determines the effectiveness of e-learning. Instructors should adopt interactive teaching style, encourage student–student interaction. It is so important that instructors have good control over IT and is capable of performing basic troubleshooting tasks. The most important skills of instructor for BL are the ability to moderate or facilitate learning and the ability to develop or plan for high-quality online courses (Selim, 2007). Instructor’s roles such as course designer, profession-inspire, feedback-giver, and interaction-facilitator are key contributor to the success of learner’s satisfaction in BL (Liu et al., 2005). Hong and Lee (2016) identified teaching preparation, teaching operation, and attitude of professors as important teaching competency in BL. Hung and Chou (2015) validated five constructs of instructor’s roles in BL; course designer and organizer, discussion facilitator, social supporter, technology facilitator, and assessment designer. Those instructor’s role and competency can be categorized into formal roles and informal roles (Arbaugh, 2010). Informal roles refer to immediacy behaviors and formal roles include course design and organization, facilitating discourse, direct instruction.

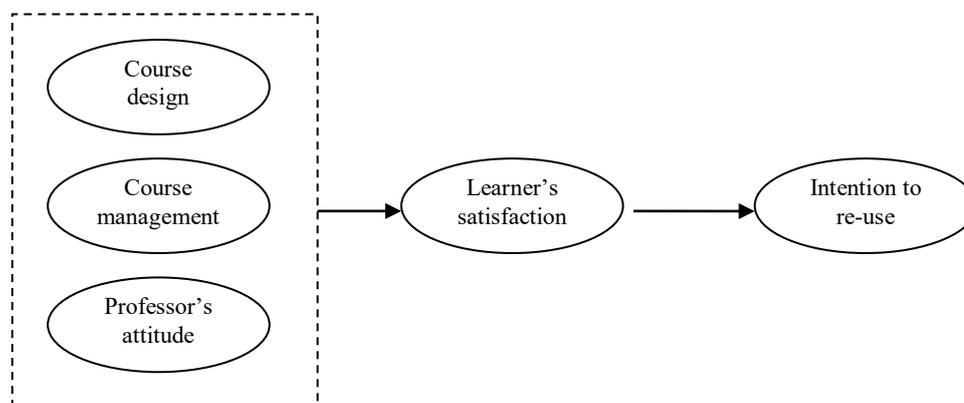
In this study course design, course management, and professor’s attitude are used as affecting factors of learner’s satisfaction in BL.

**Table 1: Affecting factors of learner’s satisfaction in BL**

Factor	Definition	References
Course design	coordinating learning contents and materials	Selim(2007), Hong and Lee (2016), Hung and Chou (2015), Arbaugh (2010)
Course management	facilitating learning activities	
Professor’s attitude	professor’s passion, image, hospitality	

**RESEARCH MODEL AND HYPOTHESES**

The primary purpose of this study is to investigate the factors affecting the student learning satisfaction and re-intention to use in BL environment in terms of professors perspectives as Figure 1.



model

**Figure 1:**  
Research

Based on prior studies which are mentioned in theoretical background section course design, course management, and professor's attitude are identified as affecting factors and following hypotheses are established as Table 2.

**Table 2: Hypotheses**

Hypothesis	Content
H1	Course design in BL will have a positive effect on learner's satisfaction.
H2	Course management in BL will have a positive effect on learner's satisfaction.
H3	Professor's attitude in BL will have a positive effect on learner's satisfaction.
H4	Learner's satisfaction in BL will have a positive effect on the intention to re-use

## EMPIRICAL ANALYSIS

### Data collection and measurement

A questionnaire was used to collect data for this study targeting the people who take the class which use BL in S university. The instruments measuring the constructs were adapted from the extant literature. The items were measured on a 5-point Likert scale using from 1 ('strongly disagree') to 5 ('strongly agree').

322 responses were used as a basis for the findings of this study. 71 respondents were freshmen, 102 respondents were sophomore, 90 respondents were junior, and 59 respondents were senior.

SEM (Structural Equation Model) was used for empirical test using SmartPLS. PLS is an extremely powerful multivariate analysis technique that is ideal for testing structural models with latent variables. This is a convenient and powerful statistical technique considered appropriate for many research situations (Henseler et al., 2009), suitable for studying complex models with numerous constructs (Chin, 1998).

The measurement model was assessed for construct reliability, indicator reliability, convergence validity, and discriminant validity. Table 3, 4 lists the average variance extracted (AVE), composite reliability (CR), Cronbach's alpha values, loadings. As shown in the table, the measurement model results indicate that the model has good construct reliability (Straub, 1989), indicator reliability (Churchhill, 1979), convergence validity (Chin, 1998; Fornell & Lacker, 1981), and discriminant validity (Fornell & Lacker, 1981), ensuring that the constructs are statistically distinct and can be used to test the structural model.

**Table 3: Confirmatory factor analysis**

Construct	Factor loadings	Composite Reliability	AVE	Cronbach's $\alpha$
Course design	0.865	0.925	0.755	0.755
	0.862			
	0.863			
	0.884			
Course management	0.856	0.917	0.736	0.736
	0.838			
	0.896			
	0.840			
Professor's attitude	0.887	0.946	0.813	0.813
	0.922			
	0.907			
	0.890			
Learner's satisfaction	0.919	0.965	0.848	0.848
	0.924			
	0.936			
	0.921			
	0.905			
Intention to re-use	0.936	0.957	0.882	0.882
	0.942			
	0.940			

**Table 4:** Discriminate validity

Factor	Course design	Course management	Professor's attitude	Learner's satisfaction	Intention to re-use
Course design	<b>(0.755)</b>				
Course management	0.811	<b>(0.736)</b>			
Professor's attitude	0.688	0.746	<b>(0.813)</b>		
Learner's satisfaction	0.603	0.619	0.480	<b>(0.848)</b>	
Intention to re-use	0.521	0.571	0.400	0.858	<b>(0.882)</b>

\* Numbers in parenthesis are AVE

### Hypotheses testing

The analysis of hypotheses and constructs' relationships were based on the examination of standardized paths using the bootstrap resampling method [21, 22]. The results are summarized in Table 5.

Course design ( $\beta = 0.297$ , t-value = 2.106) and course management ( $\beta = 0.390$ , t-value = 2.428) were found to be significantly related to learner's satisfaction, but professor's attitude ( $\beta = -0.015$ , t-value = 0.104) are not. Learner's satisfaction also has positive effect on the intention to re-use ( $\beta = 0.858$ , t-value = 22.068). According to the values given in Table 4, hypotheses 1, 2 are supported but hypotheses 3 are not supported.

**Table 5:** Result of hypotheses testing

	Path	Estimate	t-value	Result
H1	Course design → learner's satisfaction	0.297	2.106**	Accept
H2	Course management → learner's satisfaction	0.390	2.428**	Accept
H3	Professor's attitude → learner's satisfaction	-0.015	0.104	Reject
H4	Learner's satisfaction → Intention to re-use	0.858	22.068***	Accept

\*\*\* p < 0.001, \*\* p < 0.05

### CONCLUSION

Around the turn of the twenty-first century, BL emerged as a new trend in teaching models and learning styles (Hien et al., 2017). Considered as the new normal mode of training, the effect of BL on student performance has been researched in different contexts, especially in university. However, prior studies have focused on the learner's and contents aspects in analyzing the learner's satisfaction in BL.

BL is a mixture of on-line and off-line teaching methods, professor's role and competency is, therefore, more important than any other factors. This study examined the learner's satisfaction in BL in terms of professor's perspectives such as course design, course management, and professor's attitude. The result provide strong evidence for the validity of each construct and the effects on learner's satisfaction. The estimates of 0.413 ( $R^2 = 41.3\%$ ) for the learner's satisfaction and 0.736 ( $R^2 = 73.6\%$ ) for the intention to re-use provide good support for the hypothesized impact of course design, course management, and professor's attitude. Therefore, as a whole, the model has strong explanatory power for the learner's satisfaction in BL.

The empirical results indicate that course design and course management are two strong determinants of learner's satisfaction in BL. Professor should provide well organized online course and essential materials in both online and offline. Professor also should inform students about class policy and schedule. T-value of the path between course management and learner's satisfaction is the highest. It implicates that Interaction is very important for effective BL. Therefore professor should provide timely feedback and encourage class participation and motivation. Using SNSs is very useful for enhancing interaction. University authority should provide several teaching promotion programs for effective BL as well.

This paper has the originality and value in that it examines the learner's satisfaction in BL in terms professor's perspectives rather than other factors. If further study targets several universities for generalization and considers the difference of media, class types, more sophisticated analysis can be done.

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# **A Study on the Relationship between Free Play in the Forest and Happiness for Young Children**

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## **ABSTRACT**

This paper is a report on the results of a study on the relationship between free play in the forest and the happiness of young children. Experimental group that play freely in the forest twice a week and control group young children who free play in the indoor were compared. To examine the difference in happiness according to pre-experiment group the results of the t-test there was a significant difference in mean score difference, for post-test, covariance analysis was performed. The t-test was performed to calculate the average value and standard deviation of the criterion of happiness points in the pre-test of the experimental group and the control group, and to determine whether there is a difference in the average of the pre-test of the two groups. If there are no difference in the sub-factors, the t-test was used for verification. If not, the ANCOVA analysis was used. A t-test was conducted to determine whether the difference between the average scores of the two groups was statistically significant or not. As a result, commitment, peer relationship, teacher relationship, cognition and achievement, and parent relationship, which are sub-factors of the young children's happiness, were confirmed in homogeneous groups. However, health, spirituality, emotional and life satisfaction were confirmed in heterogeneous groups. In the sub-factors of happiness as a result of the t test there was no significant difference, commitment, peer relationship, teacher relationship, cognition and achievement, parent relationship was t-tested. As a result, there was a significant difference. Covariance analysis was conducted on the health, spirituality, emotions, and life satisfaction of young children presented with heterogeneous groups. As a result, there was a significant difference. According to the analysis of the sub-factors of young children happiness such commitment, health, spirituality, peer relationship, teacher relationship, cognition and achievement, emotion, parent relationship, life satisfaction before and after the Free Play in the forest, It was found that Free Play in the forest was effective and statistically significant. Therefore, in this research, it is shown that Free Play by young children's interests and needs in a natural forest environment positively affects the happiness of young children. As seen from the study results, through the Free Play in the forest, the young children is able to improve the emotions of immersion, health, spirituality, peer relationship, teacher relationship, cognition and achievement, parental relations and life satisfaction. It can be said that it gives freedom and a feeling of happiness to them.

## **INTRODUCTION**

Today, due to industrialization and informatization, society has rapidly advanced and culture and living standards have been greatly improved, but there have been many problems due to rapid economic development. In particular, the natural space that is familiar and helpful to us is getting narrower and becoming an artificial world where it is hard to feel the sense of seeing, hearing, touching, and feeling. Thus, young children are increasingly distant from nature, living in an artificial structure, Physical and mental stress and psychological disorders from infancy due to various problems such as high intellectual needs of parents, change of family members. Playing in these forests gives children the opportunity to overcome various difficulties and large and small difficulties through free play and movement, and they have the opportunity to mobilize all the senses and experience new experiences. Because young children instinctively pursue freedom, play in free forests leads to feelings of happiness through naturally

communicating with nature. Also, because of the developmental characteristics of infancy, we are curious about the world around, and we learn knowledge and laws about nature through interaction with nature through curiosity. This knowledge and laws of nature have many effects on adulthood. In addition, play in the forest is very important for infancy because it can be strengthened physically and mentally by eliminating aggression and tension while playing through all the senses of the whole body in nature. Therefore, the forest is very suitable as an educational place where children can have a good educational experience to interact and communicate with nature in infancy. The study of free play in the forest, recently, various studies have been introduced. It was suggested that free play in the forest had a positive effect on the sociality and creativity of young children and that the nature-friendly educational activities positively affected the euphoria and self-concept of young children (Kim, 2011; Boo, 2012; Soo, 2012). In this research, I will study what influence the free playing by choosing and playing with young children themselves in the forest affects the development of happiness for young children.

### THE STUDY

In order to investigate the influence of free play in the forest on the feelings of happiness of young children, we set up the research questions as follows. How is the effect of free play in the forest on the feeling of happiness for young children? How is the effect of free play in the forest on the feeling of happiness for sub-factors of young children?

This research was divided into two groups of 30 young children each, 30 young children in J Childcare Center (Experimental group) and G Childcare Center (Control group) in Bucheon City, Gyeonggi-do.

The gender distribution and the month distribution of the research are shown in Table 1 below. The average age of 30 children in the experimental group was 52 months. The average age of 30 children in the control group was 50.7 months.

**Table 1:** Distribution of age and sex of young children for each group (N = 60)

Section	Sex		Total	Average Age (Month)
	Male young children	Female young children		
Experimental group	13	17	30	52.0
Control group	15	15	30	50.7

The research tool used the "Evaluation scale of happiness for young children" of Lee, E. J. (2009). Table 2 summarizes the results of analysis of the components, questionnaires, and reliability (Cronbach's  $\alpha$ ), which are the sub-factors of the scale measurement tool for young children. As shown in the table, the reliability of happiness was higher than the level of 85, and the reliability of the young children happiness inspection tool was relatively high. "The scale of evaluation of the happiness of the young children" is composed of nine areas of 36 questions. Young children's commitment (4 questions), health (4 questions), spirituality (5 questions), and peer relationship (4 questions), teacher relationship (5 questions), cognition and achievement (5 questions), emotions (4 questions),

parent relationship (3 questions), and life satisfaction (2 questions).  
Each question has a score of 1 to 5 and high score means that there is a high sense of well-being]

**Table 2:** Subcomponent elements and Question Composition of Early Childhood Evaluation Scale

Sub factors	Composition contents	Question number	Count	Cronbach's $\alpha$
Commitment	Attention concentration, Continuation of concentration	18, 19, 20, 21	4	.85
Health	Health . Nutrition . Sanitary life, Safety life	31, 32, 33, 34	4	.95
Spirituality	Art experience , Expression	22, 23, 24, 25, 26	5	.91
Peer relationship	Support from the same age	9, 10, 11, 12	4	.90
Teacher relationship	Support from teachers	4, 5, 6, 7, 8	5	.88
Cognition and achievement	Cognitive characteristics, Adaptability, Problem solving	13, 14, 15, 16, 17	5	.93
Emotions	Positive emotions, Self-regulation	27, 28, 29, 30	4	.86
Parent relationship	Support from parents	1, 2, 3	3	.89
Life satisfaction	Overall life in early childhood educational institutions	35, 36	2	.98
Overall			36	.91

The research have proceed as follows. First, Training the teachers in each groups experimental groups and control groups. Second, Pre-test, teacher test young children directly and scoring (April 2017). Third, Teacher's control and playing in each groups according to programs. Fourth, Post-test, 3 month later teacher test each group and scoring (June 2017). Finally, processing the data.

The treatment period for the two group trials is 16 times, twice a week for 8 weeks from April 24, 2017 until June 17, 2017. And, the free time for the two groups is from 10:00 am to 12:00 am. The experimental group decided to play freely on the basis of the interests and needs of the children who were not selected programs. The children of the control group carried out free play in the classroom mainly in the Nuri Curriculum with various educational tool and course.

In this study, the collected data were analyzed using SPSS 18.0 and processed by the following statistical methods. To verify the reliability of the research tool, we used a method of verifying internal consistency using the Cronbach's alpha coefficient. The t-test was performed to calculate the average value and standard deviation of the criterion of happiness points in the pre-test of the experimental group and the control group, and to determine whether there is a difference in the average of the pre-test of the two groups. If there are no difference in the sub-factors, the t-test was used for verification. If not, the ANCOVA analysis was used. Statistical significance level of  $p < .05$  was set.

## FINDINGS

The results of the pre-test are shown in Table 3. The average score of the experimental group was 2.65 (SD = .41), and the average score of happiness in the control group was 3.73 (SD = .38). The t-test was conducted to determine

whether the difference between the average scores of the two groups was statistically significant or not. As a result, there was a significant difference between the average scores of the groups at  $t = -3.33$   $p < .001$ . The two groups were confirmed in heterogeneous groups.

**Table 3:** Verification of differences in average score of happiness sensed by group before experiment

group	Experimental group (N=30) M(SD)	Control group (N=30) M(SD)	t
Entire happiness	2.65(.41)	3.73(.38)	-3.33***

\*\*\* $p < .001$

Table 4 shows the results of the covariance analysis (ANCOVA) of the children's happiness scorecard after the pre-test revealed that there was a significant difference between the two groups. The main effect was 305.08,  $p < .001$ . It was found that there was a significant difference in the happiness feeling score of the young children between the groups. Therefore, it was found that Free Play in the forest influenced the happiness of the young children.

**Table 4:** Young Children Happiness Sense Covariance Analysis (ANCOVA)

Variable	Variable source	Sum squares	of Degree freedom	of Mean square	F
Entire happiness	Covariance (Pre-test)	3.05	1	3.05	13.36**
	Main effect(Free play in the forest)	69.64	1	69.64	305.08***
	error	12.33	54	0.23	
	total	15.38	55		

\*\*\* $p < .001$ , \*\* $p < .01$

The results of the pre-test of the experimental group and the control group are shown in Table 5 in order to know how the free play in the forest affects the young child's happiness sub-factors. A t-test was conducted to determine whether the difference between the average scores of the two groups was statistically significant or not. As a result, commitment, peer relationship, teacher relationship, cognition and achievement, and parent relationship, which are sub-factors of the young children's happiness, were confirmed in homogeneous groups. However, health, spirituality, emotions and life satisfaction were confirmed in heterogeneous groups.

**Table 5:** Verification of young children's commitment, health, spirituality, peer relationship, teacher relationship, cognition and achievement, emotions, Parent relationship, life satisfaction average score by group before experiment

Group	Experimental group (N=30) M(SD)	Control group (N=30) M(SD)	t
Commitment	2.76(.49)	2.76(.51)	-.01
Health	2.79(.35)	3.77(.57)	5.23***
Spirituality	2.63(.36)	3.66(.62)	-3.55***
Peer relationship	2.46(.45)	2.45(.83)	.10
Teacher relationship	2.84(1.39)	2.68(.56)	.96
Cognition and Achievement	2.35(.71)	2.36(.89)	-.69
Emotions	2.38(.56)	3.43(.56)	-4.98***
Parent relationship	2.74(.39)	2.96(.56)	-1.50
Life satisfaction	2.86(.33)	3.29(.55)	-2.07***

\*\*\*p<.001

The results of the t-test on the post-test of the homogeneous group are shown in Table 6. It is found that there is a significant difference between commitment, peer relationship, teacher relationship, cognition and achievement, parent relationship, which are sub-factor of young children's happiness. Therefore, it was found that free play in the forest affects commitment, peer relationship, teacher relationship, cognition and achievement, parent relationship of sub-factor of young children's happiness.

**Table 6:** After the experiment by group commitment, peer relationship, teacher relationship, cognition and achievement, parent relationship verification of difference in average score

Group	Experimental group (N=30) M(SD)	Control group (N=30) M(SD)	t
Commitment	4.88(.21)	3.96(.58)	7.81***
Peer relations	4.80(.28)	3.88(.67)	6.80***
Teacher relations	4.66(.39)	3.71(.52)	7.74***
Cognition and achievement	4.74(.30)	3.76(.77)	6.24***
Parent relationship	4.41(.55)	4.05(.65)	2.22*

\*\*\*p<.001, \*p<.05

Covariance analysis was conducted on the health, spirituality, emotions, and life satisfaction of young children

presented with heterogeneous groups. The results of the pre-test score, post-test score, and adjusted score are shown in Table 7.

**Table 7:** After the experiment by group health, spirituality, emotions, life satisfaction verification of difference in average score

Group			Pre-test score M(SD)	Post-test score M(SD)	Adjusted score M(SD)	post-test
Health	Experimental (N=30)	group	2.79(.35)	4.81(.32)	4.54(.11)	
	Control group (N=30)		3.77(.57)	3.26(.45)	3.43(.11)	
Spirituality	Experimental (N=30)	group	2.63(.36)	4.69(.37)	4.34(.09)	
	Control group (N=30)		3.66(.62)	3.99(.74)	3.14(.09)	
Emotions	Experimental (N=30)	group	2.38(.56)	4.77(.25)	4.35(.10)	
	Control group (N=30)		3.43(.56)	3.93(.79)	2.91(.10)	
Life satisfaction	Experimental (N=30)	group	2.86(.33)	4.50(.51)	4.45(.07)	
	Control group (N=30)		3.29(.55)	3.39(.48)	3.57(.07)	

In Table 8, the covariance analysis of young children health showed that the main effect was 364.03,  $p < .001$ , indicating that there was a significant difference in the health scales of the young children between the groups. It was found that the Free Play in the forest influenced the health of the sub - factors of the young children's happiness.

**Table 8:** Young Children Health Covariance analysis (ANCOVA)

Variable	Variable source	Square sum	Degree freedom	Mean square	F
	Covariance (Pre-test)	1.17	1	1.17	5.59*
Health	Main effect (Free play in the forest)	75.92	1	75.92	364.03***
	error	11.26	54	0.21	
	sum	12.43	55		

\*\*\* $p < .001$ , \* $p < .05$

In Table 9, the covariance analysis of young children spirituality showed that the main effect was 121.51,  $p < .001$ , indicating that there was a significant difference in the health scales of the young children between the groups. It was found that the Free Play in the forest influenced the spirituality of the sub - factors of the young children's happiness.

**Table 9:** Young Children Spirituality Covariance analysis (ANCOVA)

Variable	Variable source	Square sum	Degree of freedom	Mean square	F
	Covariance (Pre-test)	0.09	1	Variable	0.20
Spirituality	Main effect (Free play in the forest)	56.66	1	56.66	121.51***
	error	25.18	54	0.47	
	sum	25.27	55		

\*\*\* $p < .001$

In Table 10, the covariance analysis of young children emotions showed that the main effect was 155.25,  $p < .001$ , indicating that there was a significant difference in the health scales of the young children between the groups. It was found that the Free Play in the forest influenced the emotions of the sub - factors of the young children's happiness.

**Table 10:** Young Children Emotions Covariance analysis (ANCOVA)

Variable	Variable source	Square sum	Degree of freedom	Mean square	F
	Covariance (Pre-test)	0.61	1	0.61	1.17
Emotions	Main effect (Free play in the forest)	80.43	1	80.43	155.25***
	error	27.98	54	0.52	
	sum	28.59	55		

\*\*\* $p < .001$

In Table 11, the covariance analysis of young children life satisfaction showed that the main effect was 225.25,  $p < .001$ , indicating that there was a significant difference in the health scales of the young children between the groups. It was found that the Free Play in the forest influenced the life satisfaction of the sub - factors of the young children's happiness.

**Table 11:** Young Children Life satisfaction Covariance analysis (ANCOVA)

Variable	Variable source	Square sum	Degree of freedom	Mean square	F
	Covariance (Pre-test)	0.04	1	0.04	0.15
Life satisfaction	Main effect (Free play in the forest)	55.49	1	55.49	225.25***
	error	13.30	54	0.25	
	sum	13.34	55		

\*\*\*p<.001

The results obtained through this study are as follows. First of all, as a result of analyzing the feeling of happiness of young children before and after Free Play in the forest, Free Play in the forest appeared to be effective for the feeling of Happiness and was statistically significant. Secondly, according to the analysis of the sub-factors of young children happiness such commitment, health, spirituality, peer relationship, teacher relationship, cognition and achievement, emotions, parent relationship, life satisfaction before and after the Free Play in the forest, It was found that Free Play in the forest was effective and statistically significant.

## CONCLUSIONS

In this study, I tried to examine the influence of free play in the forest on the feelings of young children's happiness. As seen from the previous result, there was a significant difference between the group free play in the forest twice a week and the group freely played indoors. Therefore, we were able to learn that free play in the forest had a positive influence on the feelings of happiness of young children. Such results will give the infant more opportunities to have frequent resonance gradually and intimately with the familiar nature through the exchange with nature through free play in the forest. I think that this gave me a chance to feel the joy of nature with the nature in the forest. This supports the research results (Park, 2011) that it affected infant's forest experience activities and natural affinity development. It was found that there was a significant difference also in the sub - factors of the young children's happiness. Therefore, I was able to learn that positive impacts on infant immersion, health, spirituality, peer relations, teacher relations, cognition and accomplishment, feelings, parents' relationships, and living satisfaction have been exerted. The results of this study, Free Play in the forest of young children an important role in promoting emotions about parenting, immersion, health, spirituality, cognition and achievement, This is consistent with previous studies of Choi and Park(2012). In addition, an emotional sense of stability is promoted through nature-friendly educational activities, and in order to raise intimacy with family peers, the study of Jung and Kim(2011).

I share the argument and context of Kim(2013) that it is shown that Free Play by young children's interests and needs in a natural forest environment positively affects the happiness of young children. When we look at the results of these studies and the discussion of previous research, Free Play in the forests can enhance the emotional stability and participation of young children. Also, they can explore and understand their feelings, attitudes, and thoughts through activities that enhance intimacy with their peers and dynamic interaction with them. Therefore, it can be concluded that free play in the forest is effective in improving the happiness of young children.

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# A Study on the Relationship Between Six-Year-Olds' Experience with Gugak (Traditional Korean Music) Activities and Their Self-Efficacy

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## ABSTRACT

The purpose of this study is to observe the process of six-year-olds' experience with *gugak* (traditional Korean music) activities and examine the relationship between such experience with the children's self-efficacy. The study was conducted on a total of six six-year-olds (three boys and three girls) for a period of 15 weeks through direct classroom observations in combination with qualitative analysis on a wide range of data including photographs, video footage, daily research logs and instructors' daily observation logs. The key findings of the study are as follows: First, the pre-schoolers became more engaged and voluntarily involved in the *gugak* activities classes over the course of time. Second, the children learned to teach their peers and keep each other's pace. Third, the kids started to become much more animated and spirited in their everyday life, playing the beats with their hands, feet and voices even when they were outside the *gugak* activities class. All of these findings confirmed that six-year-olds' experience with *gugak* activities helps contribute to building their sense of self-efficacy. This is corroborated by the following three arguments: First, the children in the study gaining confidence in their own ability to achieve intended results pertain to the cognitive domain of self-efficacy. Second, the pre-schoolers rising up to the challenges relate to the physical domain of self-efficacy. Third, the six-year-olds feeling *sinmyeong* (excitement) are associated with the socio-emotional domain of self-efficacy.

## INTRODUCTION

### 1. Background and Purpose of Research

Music is a mixture of different sound waves. When frequently exposed to music, a child becomes highly sensitive to human voice and grows into an emotionally stable and well-rounded individual (Jeong, 2005). Therefore, music plays a crucial role in providing children with enriching art experiences which help the sound and balanced development of their body and mind. If the kindergarten curriculum in Korea fails to offer pre-schoolers diverse art experiences as intended, it risks ending up being a half-baked education (No, 2005). The late Zoltan Kodaly, one of the most respected Hungarian music pedagogues, highlighted the significance of ethnic music and argued that the music education of children should center on ethnic music (Byeon, 2000). Besides Kodaly, numerous scholars claimed that the most desirable way to teach music to children is through exposing them to traditional music such as *gugak* activities (No, 2001; Park, Kim & Kim, 2006; Lee, 2003; Jeong, 2000; Jo, 2004). Against this backdrop, a series of studies have been performed to facilitate the growth and development of children through *gugak* activities. One of the studies include the on-going research by Kim Min-jeong and Oh Han-suk which delves into the relationship between the elementary school students' involvement in *gugak* classroom activities and the children's self-efficacy.

Self-efficacy is a positive sense of self-confidence in one's own ability to complete a certain task or a positive expectation for the improvement in one's own ability in the future. It is a concept incorporated into the notion of competence which refers to an overall belief in one's own ability. Children with a positive belief in their ability are easily able to overcome challenges and hardships they may face in the course of learning and maintain a strong motivation to learn by expecting a successful outcome even if they fail at the first couple of attempts. Accordingly, pre-schoolers with higher self-efficacy exhibit a greater motivation to learn which will eventually lead to a better scholastic achievement.

Based on the 18-year experience of operating an educational institution for children, one of the authors has found out that a significant number of pre-schoolers and their parents expressed satisfaction with *gugak* sessions where kids learned how to play the *janggu* (double-headed hourglass-shaped drum) or *sogo* (small hand-held drum). Such exposure to *gugak* activities transformed the children into confident and outgoing individuals over the

course of time. In this study, the authors seek to build on these insights and further investigate into the impact of children's exposure to *gugak* activities on their development while focusing on the relationship between such exposure and self-efficacy based on six six-year-olds consisting of three boys and three girls.

## 2. Research Question

In this study, the authors delved into whether six-year-olds' experience with *gugak* activities affects their self-efficacy.

### Early Childhood *Gugak* Activities and Self-Efficacy

#### 1. *Gugak* Activities

##### A. Scope

In this study, the *gugak* activities are limited to listening to and singing *gugak*, playing *gugak* instruments, expressing *gugak* with body movements and dance, and performing traditional musical plays during art experience classes based on Traditional Korean Music Education for Pre-schoolers on Everyday Life Topics of the Nuri Curriculum (Ko, Kwon, Lee & Lee, 2014).

##### B. Details

In this study, the *gugak* activities include the followings.

##### 1) Listening to *gugak*

*Gugak* instruments create a reverberating, long-lasting sound which greatly help pre-schoolers develop senses when they are exposed to *gugak* activities. When listening to *gugak*, it is best to engage children in a number of related activities such as playing a wide variety of *gugak* to children, discussing feelings and talking about differences (Jeon & Lee, 2014).

##### 2) Playing *gugak* instruments



Young children start to develop interest in the physical appearances, playing techniques and unique timbres of *gugak* instruments by touching and playing them first-hand. When playing *gugak* instruments, it is recommended to allow pre-schoolers to have fun with touching and playing the popular instruments including *sogo* (small hand-held drum), *janggu* (double-headed hourglass-shaped drum), *buk* (double-headed shallow barrel drum), *jing* (large gong), *kkwaenggwari* (small gong), *gayageum* (long zither with 12 strings) and *piri* (cylindrical bamboo oboe). It is more important to allow kids to freely try their hands at different instruments and express themselves in their own ways, rather than emphasizing the proper techniques or rhythms of each instrument

**Figure 1:** *Gugak* instruments

(Lee, 2003). *Gugak* instruments used in this study are shown at **Figure 1**.

##### 3) Expressing *gugak* with body movements and dance

Since *gugak* activities consist of body movements, dance, languages and songs, it enables pre-schoolers to learn basic movement techniques which help them to better control their body. When expressing *gugak* with body movements and dance, it is advised to offer children ample opportunities to watch, listen to and express *gugak*

through which they can learn to sincerely feel *sinmyeong* and enjoy fun and thrilling traditional dance (Ko, Kwon, Lee & Lee, 2014).

#### 4) Performing *gugak* plays

Pre-schoolers' *gugak* plays should be carried out in the form of a role playing game where the story is carefully analyzed and restructured into a simple, straightforward plot. While performing *gugak* plays, children can learn the effects and characteristics of various musical instruments and familiarize themselves with the instruments by playing different instruments for different sounds according to the plot; for example, *buk*, *kkwaenggwari* and *jing* for the loud sound or the *janggu* for the sound of horse hooves. The role playing also helps young kids unleash their creative expression and build confidence (Jeong, 2015).

#### C. *Sinmyeong* (Excitement)

As a logically inexplicable emotional energy, *sinbaram* or *sinmyeong* (excitement) which lies at the center of Korean culture is often expressed in the form of joy and delight or sometimes even accompanied by tears (Lee, 1991). From the business perspective, one unit of labor plus one unit of labor totals two for a regular person while one plus one can add up to three for a person feeling *sinmyeong*. Such *sinmyeong* is predominantly understood as one of the most indispensable forces in tapping into full potential of Korean people. From the cultural and artistic perspective, Koreans say that they feel *sinmyeong* or *sinbaram* when they feel most positive in the context of their culture and custom. In Korea, *sinmyeong* or *sinbaram* refers to experience that generates the most positive feeling as well as the feeling itself. To Koreans, it means a state of perfect satisfaction and joy where you simply cannot ask for more. In the context of this study, *sinmyeong* originates from a sense of pleasure arising from finding self-worth. If the situation was worse just before feeling *sinmyeong*, one may experience a greater feeling of *sinmyeong*. In this way, the level of pleasure is adjusted depending on external factors affecting the occurrence of *sinmyeong* (Han & Han, 2007b). For pre-schoolers, *sinmyeong* can represent a feeling of pleasure that they discover in the process of becoming adept at playing a new instrument. When introduced to an unfamiliar musical instrument, children may find themselves engulfed in a negative feeling of fear at first which damages their self-worth, but as they get used to the new instrument and start to understand how to play it, the negative feeling is transformed into a positive one.

## 2. Self-Efficacy in Early Childhood

### A. Concept

Pre-schoolers' sense of self-efficacy is largely influenced by interactions with peers. Therefore, it is crucial to offer vast opportunities to children to play with their peers as they gradually develop self-efficacy as they interact with each other while repeating the same task. High self-efficacy enables individuals to put greater effort into the given task as it helps view oneself more positively and raise expectation for one's own ability to achieve the goal (Wu, 1993). According to Heo, self-efficacy refers to competence, efficacy and confidence about oneself or how much one believes he or she is competent, efficacious and capable (1991). While a high degree of self-efficacy represents an unwavering belief that one is competent to perform a special task, a low degree of self-efficacy proves otherwise (No & Kang, 2003).

### B. Components

For the purpose of this study, self-efficacy consists of the socio-emotional, physical and cognitive domains. While the socio-emotional domain refers to self-efficacy regarding how one perceives human relationships in the social context, the physical domain represents self-efficacy associated with perceived confidence on one's own appearance, and the cognitive domain pertains to self-efficacy towards one's own ability perceived through interactions with objects or other people in one's daily life (Jeon, 2014).

## METHOD OF RESEARCH

### 1. Research Participants

The study was conducted on six six-year-olds attending Nursery C located in Gyeyang-gu, Incheon. The details of their family relations and environment are shown in **Table 1**.

**Table 1:** Family Relations and Environment for Children at Nursery C

Participant	Birthdate(Age)	Description
Child A (F)	Feb. 13, 2011 (six-year-old)	- Double-income household - Grandmother is a main caregiver - Has a younger sister

<b>Child B (F)</b>	Apr. 9, 2011 (six-year-old)	- Double-income household - Parents & an elder brother - The elder brother thinks her dearly and takes good care of her.
<b>Child C (F)</b>	Apr. 19, 2011 (six-year-old)	- Only child - Mother is Vietnamese - Parents with big age difference - Double-income household - Parents come home from work at 11 p.m.
<b>Child D (M)</b>	Sep. 5, 2011 (six-year-old)	- Parents & a younger sister - Attends Nursery C with her younger sister - Father only comes home only in the weekends
<b>Child E (M)</b>	Sep. 19, 2011 (six-year-old)	- Parents & a twin younger sister (with a developmental disorder) - Attends Nursery C with her twin sister - Loved and adored by parents
<b>Child F (M)</b>	May 30, 2011 (six-year-old)	- Single-parent household - Lives with grandparents and a mother - Mother has a job but does her best in childrearing and travels with F a lot.

## 2. Research Process

### A. Preliminary Research

Before performing the main research, a preliminary research was conducted to ensure the appropriateness of the intended *gugak* activities, measure the level of children's interest and the time taken for these activities, and make the children accustomed to observation and video recording sessions. The preliminary research was carried out on six-year-olds attending Nursery C, who is the subjects of the main research, by observing them twice on every Thursday from March 16 to 23, 2017.

The preliminary research found out that the pre-schoolers showed keen interest in *gugak* activities and actively participated in playing the musical instruments and singing folk songs and *pansori* (musical storytelling). For effective video recording, the direction of movements was taken into consideration in advance to set the position of the cameras. For accurate transcription, audio recording was conducted to supplement video recording where necessary. During the free play activities, the authors and the homeroom teachers recorded videos from different directions so as not to miss any movements of the children.

### B. Main Research

In the main research, we observed a total of fifteen 50-minute group activity sessions, one session per week, between May 30 and July 6, 2017, where the young children participated in *gugak* activities. In the classroom, the children were engaged in *gugak* activities according to *Traditional Korean Music Education for Pre-schoolers on Everyday Life Topics of the Nuri Curriculum* (Ko, Kwon, Lee & Lee, 2014). A brief overview of one of the sessions is shown in the following **Table 2**.

**Table 2:** An Example of the Research Sessions

<b>Date &amp; Time</b>	Thursday, June 8, 2017
<b>Name of Activity</b>	<i>Byeol Dalgeori</i>
<b>Goal of Activity</b>	- To experience <i>Hwi-mori</i> rhythm (fast tempo) with <i>Byeol Dalgeori</i> - To enjoy the exciting beats of <i>gugak</i> activities
<b>Previous Activities</b>	- Read the book titled <i>Dokkaebi</i> (goblins) and <i>Samulnori</i> Instruments - Listen to <i>Byeol Dalgeori</i> and tell children that the music was used to wish for good harvest. - Introduce vocal beats and <i>Hwi-mori</i> in <i>Byeol Dalgeori</i> .
<b>Beats and Rhythms</b>	- Discuss which instruments or tools to use. - Use body parts to play the beats before playing the instruments.
<b>Wrap-Up</b>	Discuss how children felt while playing the music with body parts and musical instruments.

### 3. Data Collection

The entire classroom activities were video-recorded by teachers and audio was recorded separately, where necessary, to ensure accurate transcription with a view to enhancing validity and reliability of the study. Additional data including teachers' daily observation logs and photographs of children's activities and the research results were accumulated.

The research was carried out for a period of 15 weeks from March 30 to July 6, with a focus on the participation of pre-schoolers in *gugak* activities, the progress of such activities and the children's interactions with peers.

#### A. Classroom Observation

Classroom observations were conducted over a 15-week period from March 30 to July 6 to take a closer look at interactions among the children during group activity, preparation activity, follow-up activity and free play activity sessions. The video and audio recordings for the free play activities amounted to 135 files and 69.9 gigabytes (GB). The transcription of the observation logs totaled 140 A4 pages written in 10-point *BatangChe* with 160% line spacing.

#### B. Instructors' Daily Observation Logs

Instructors' daily observation logs were prepared by the authors on how they felt about the program and how children responded to the activities from the perspective of the instructors for *gugak* activities and observers as well as by two homeroom teachers from the perspective of assistants to the instructors. On top of the instructor's daily observation log, a daily research log containing a brief description of the experience and researcher's special comments was developed after the completion of transcription of each session. In addition, a simple journal was recorded after each session, which totaled 31 A4 pages.

### 4. Data Analysis

Audio and video recordings were accurately transcribed and a concise interpretation of the situation, questions and comments were added to the full transcription. Data analysis was performed according to the following steps.

First, the transcription of data collected was reviewed multiple times to extract meaningful concepts and characteristics. Second, a preliminary list of categories was created in the process of examining and analyzing the pre-schoolers' specific languages, play behaviors and social environment of the activities. Third, a list of themes was completed based on the preliminary list of categories and the data collected were explored in-depth and classified into separate groups after a thorough review. Fourth, the categorized data were carefully examined, interpreted and associated with the sub-components of self-efficacy.

A Ph.D. student in early childhood education at Inha University Graduate School conducted an extensive review of the comprehensive analysis of transcriptions, daily research logs, instructor's daily observation logs and teaching plans for *gugak* activities to ensure the transcriptions are true to the original recordings. The student's analysis and interpretation were scrutinized by another Ph.D student in order to reduce the chance of distorting the situation and fully grasp the context of the on-site observations.

## RESULTS AND INTERPRETATION

The results of the analysis in terms of different domains of self-efficacy based on a highly relevant tool to assess children's self-efficacy (Jeon, 1996), are shown in the following **Table 3**.

**Table 3:** Qualitative Analysis Results of Children's Self-Efficacy

Domain	Theme	Sub-theme
Cognitive	Children gaining confidence in their own ability to achieve intended results	"This is what it is supposed to sound like." "I'm doing this the right way, right?"
Physical	Children rising up to challenges	"I also want to try the <i>kkwaengwari</i> and <i>jing</i> ." "Looks like you guys will beat the <i>buk</i> a hundred times."
Socio-emotional	Children feeling <i>sinmyeong</i>	"Let's do this again tomorrow." "This is so much fun, isn't it?"

In this study, an improvement in children's self-confidence was observed through an enhanced level of playing an instrument as well as of cooperation and consideration among peers over the course of ensemble playing, folk game or *gugak* play sessions. The results of the comprehensive analysis are as follows.

#### 1. Children gaining confidence in their own ability to achieve intended results

The participating children seemed to understand what *gugak* is in their own terms through hands-on experience with *gugak* including listening to the music in free play activity sessions, playing *gugak* instruments, performing ensembles and expressing *gugak* with body movements and dance in group activity sessions, and participating in *gugak* plays. The pre-schoolers understood how our ancestors enjoyed their music and showed keen interest in *gugak* by actively engaging in the body movements and dance sessions and freely expressing their feelings and thoughts in the musical plays. In this study, confidence is defined as a feeling of self-assurance that one is competent, efficacious and capable (Heo, 1991). For analysis, the following statements concerning the cognitive domain from the children's self-efficacy assessment tool (Jeon, 1996) were examined: "I can try my best to answer teacher's questions," "I know how to reconcile friends who are falling out with each other," "I can carefully listen to teacher's instructions and learn how to do things very quickly," "I am very curious about new things and want to know more about them," "I can do my best to complete challenging tasks," "I can excel in making things in art class," "I can listen attentively to a teacher to understand difficult questions."

A. "This is what it is supposed to sound like."

When we introduced *gugak* instruments one by one and explained how to hold sticks and play them, children approached the musical instruments with an excited look filled with curiosity and fear at the same time. Since it was the first time they were handling the instruments, they took a long time to explore them by beating, rolling and touching them.

B: (Covers ears) "Teacher, it is too loud. I don't want to hear it anymore."

Teacher: "I understand. It's your first time hearing such sound."

A: "It's too noisy. I don't like these kinds of sound."

B: (Uncovers ears) "But, maybe... maybe if you play it this way, it won't be too loud."

Teacher: "Oh, that is a good idea. If you get used to *janggu*, you might even want to keep hearing this sound. Until then, you can beat it as soft as you want." . . .

B: (Beats it more quickly by holding the round-edged and sharp-edged sticks halfway and shouts with an excited look) "Teacher, this is what it is supposed to sound like. I'm okay now." "Can I hold it like this? In any way I want?" [B, 2, Mar. 30, 2017]

Previously, the children had not much chance to listen to *gugak* ensembles or play *gugak* instruments for more than 20 minutes. They seemed to be curious and scared at the same time because they were unfamiliar with the new instruments. As the pre-schoolers started to explore the musical instruments by beating, rolling and touching them, they were able to cast away their fears and made a brave attempt to play them.

B. "I'm doing this the right way, right?"

F: (Rolls *janggu*, keeps tying and untying the sticks with *janggu* strings, and swinging the sticks in the air) "It's very difficult to hold them in between fingers." (Holds the round-edged stick in the opposite direction and makes circles in the air, entering his own world) "They are potatoes and sweet potatoes."

Teacher: "What made you think of potatoes and sweet potatoes?"

F: "Just take these potatoes and sweet potatoes and you can make the *daeng-daeng* sound."

C: "I do it this way..." (Shows the teacher how she grabs the sticks the right way) "Teacher, I'm doing this the right way, right?"

Teacher: "Yes, you're doing it right." . . .

F: "Teacher, I am done for the day." (Throws the round-edged stick and goes to play with stacking toys) [F, 2, Apr. 6, 2017]

To the children, the *gugak* sticks remained fairly difficult to control. However, as they learned the techniques, they started to notice the difference between various beats and familiarize themselves with new beats and rhythms.

In the classroom, we had a brainstorming session under the theme of 'my neighborhood.' D had no trouble giving out related words, which was quite different from how he had been before. When asked how he was able to come up with so many words, he answered that he could contribute a lot because he saw *gilnori* (circling around the village before folk games) during the village sports day which was pretty much the same with *gugak* that we learned in the class. In the craft class, D was confident in making the *gugak* instruments and explained the characteristics of the instruments after attentively listening to what the teacher had taught them. These days, he seemed very active when playing the instruments which contrasted to how he had been when he was first introduced to *gugak*. D changed a lot after learning *gugak*. [Instructor's daily observation log, 1, Jun. 13, 2017]

The children belonging to this category used to be shy and passive. However, as they started taking part in *gugak*

activities, they learned to associate these activities with other programs and begun to find what they can do best. Overall, *gugak* activities brought about positive changes from the children so that they can better adapt to new things in their daily lives.

## 2. Children rising up to challenges

As the children started to understand the meaning of *gugak*, traditional rituals designed to wish for health and prosperity and folk games to bring harmony, they begun to look brighter and more confident. The pre-schoolers belonging to this category mentioned that "I am confident that I can express new things with my body with no trouble," "I can do new dance routines that our teacher is teaching us very easily," or "I am very strong. I can carry heavy things and go very far." With a view to examining how much the children changed in terms of the physical domain of self-efficacy, the authors thoroughly analyzed the observation records and interviews with the pre-schoolers.

A. "I also want to try the *kkwaenggwari* and *jing*."

Teacher: "What did I tell you to do when you want to play the *janggu* easily?"

"How can we play the instruments well? Can you tell me how?"

C: "Vocal beats. You should try the vocal beats. Say gung and beat it with the stick to make the *ttak* sound."

Teacher: "Uh-hm, that could be one way to do it."

C: "Teacher, I also want to try the *kkwaenggwari* and *jing*. (Makes circles as if she is holding the *jing* stick) *Jing, jing, jing*." [C, 2, Jun. 22, 2017]

Except the class where the children were taught about *gugak* instruments, the pre-schoolers became more actively engaged in the activities instead of being passively led by instructors, exhibiting a high degree of expectation. They started to count the days till the next session and showed great enthusiasm on the day of *gugak* activities, telling themselves that they would do well in the class. While participating in a wide range of plays and hands-on sessions, the children developed interest in *gugak* activities, saying "I think I can do better the next time," "I want to do it again," or "Can we do it again?"

B. "Looks like you guys will beat the *buk* a hundred times."

Teacher: (Children sit in a circle) "Who wants to be the master singer and sing a song?"

A: "I want to be a *buk* player."

D: "No, you're a girl. I'm a man, so I'll do it all."

A: "Girls can do it, too. The teacher said so."

D: "No, go away!"

E: (Watches A and D arguing over who should play the *buk*)

"I want to be a *buk* player, too, but I'm waiting for my turn. After you, you and you, wow... Looks like you guys will beat the *buk* a hundred times."

Teacher: "A wants to play the *buk*, and so does D. But is there any way to go at this without fighting?"

E: "One by one... we can take turns. Oh, somebody tried it yesterday, so those who didn't can do today." [E, 2, Jun. 30, 2017]

As the pre-schoolers played *gugak* instruments to the rhythm they had become familiar with through *gugak* activities featuring games, dances and songs, they increasingly expressed their curiosity about something new. The sound each *gugak* instrument produced gave the children hope to play other instruments. In the event of a conflict involving the newly-introduced roles, they demonstrated confidence to resolve it on their own.

F has been pulling out all the stops lately. He whipped his shoes and socks off to volunteer for a *ssireum* match. Of the *ssireum* techniques we saw earlier, he almost pulled off a leg grab. The teacher asked him to take a break after winning one match, but he stubbornly insisted on taking on other challengers. The second match was neck and neck, and it was hard to predict a winner. Both sides sweated with their faces reddened, but neither gave up and kept pushing. Finally, F won. Someone said if F could do it, anyone could, which heated up the excited crowd. Old neighbors who were passing by stood behind the fence, rooting for the children. F dashed inside with a smile on his face saying, "I put all my energy and now I'm hungry. I need a big meal." [Instructor's daily observation log, May 11, 2017]

The children's participation in physical activities, ranging from performing *gugak* plays, expressing the music in the form of body movements and dance to playing *gugak* instruments, gave them more confidence in their physical skills. Such confidence empowered them to try *ssireum*, a sport which requires push and pull while standing firmly with two feet on the ground. The change marks a positive step.

## 3. Children feeling *sinmyeong*

Historically, *gugak* has served a communal function of bringing together a community of people. Therefore, *gugak* activities largely involve the participation of a group of young children and help foster a sense of community and interaction. The children expressed *gugak* through their body movements and dance, shared their

feelings after listening to *gugak*, performed *gugak* plays and played *gugak* instruments with their peers. These activities allowed the children to experience the culture of patience and consideration that is deeply rooted in Korea's history. The children who fall into this category are identified as those who "get along well with anybody," "initiate a conversation with new friends in the nursery," "easily make friends," "have a heart to help those in need," "control their emotions and avoid crying when frustrated" and "are generous enough to control their feelings in unpleasant situations."

A: "Let's do this again tomorrow."

E: "Why don't we play *gugak* for the farmers?"

(E and F bring toy blocks to build *gugak* instruments.)

F: "Wow, we made it."

D: "Let's try these one by one."

E: "But we need one more person."

(Makes eye contact with B) "B, come here. Play the instrument with us."

D: "Let's put this in here. Now, you look like a real working man."

E: "Whoa! This is fun."

F: "I know!"

D: (Unwillingly finishes the activity and starts cleaning up) "Let's do this again tomorrow." [Free play session, May 11, 2017]

A group of children gathered for cooperative play, as suggested by D. They made *gugak* instruments after a discussion and went on to play the beats. E brought B to join the team, and together they played the instruments, singing the vocal beats out loud, "The *janggu* goes *gung-dda*, the *jing* goes *jing*, the *buk* goes *dung-dung* and the *kkwaenggwari* goes *kkaegaeng-kkaegaeng*." The excited look on their faces reminded the teacher of a sun-tanned farmer full of *sinmyeong*.

B: "This is so much fun, isn't it?"

Teacher: "A, why aren't you giving it a shot? Is everything okay?"

A: "I'm fine. I just can't remember how it went."

B: "Look what I'm doing. *Jing*. This is how you do it. Just *jing*."

Very simple, isn't it? Now, you try.

A: (Grabs the *jing* stick after a moment of hesitation.)

B: "Strike it now. Do it once and wait for a while with your eyes closed. See?"

B: (Plays the instrument facing A) "This is so much fun, isn't it?" (B, 2, Jun. 16, 2017)

When a group of people play *gugak* instruments together, individual performance matters. However, what is paramount is taking a liking to one another and finding a harmony. The beauty and purpose of a group performance is that members can motivate each other and work together as a harmonious whole.

The group practice began after the children learned how to play individual instruments. They each picked the instrument they wanted to play. Individual practice sessions went well, but once the four instruments came together, the *buk* players began following *janggu's* smaller beats. The two sounds were virtually indistinguishable. There were also sliding and dragging sounds, which made me feel like they were simply striking their own instruments without thinking about playing in tune. In particular, E, the *jing* player, kept forgetting about hitting the instrument loud only once at the beginning of the rhythm and came half a beat late, which created confusion for the *janggu* players, who were supposed to tap their sticks lightly alongside the starting *jing* sound. With the performance turning into a mess, some children began to strike the *janggu* and *jing* on their own, completely off the beat. The homeroom teacher came in to help the *janggu* players get back on track. The author slash instructor who was conducting the group, asked the *buk* players and *jing* player to pay attention to her right hand and left hand, respectively for signals. The *kkwaenggwari* player, who should lead the other instruments, practiced individually whenever he had the time. A week later, we had another group practice. To my surprise, the ensemble hit it off under the lead of the increasingly confident sound of the *kkwaenggwari*. I watched as the children's faces light up with confidence. [Instructor's daily observation log, Jun. 22, 2017]

In the beginning, the children were unable to play *gugak* instruments properly, due to lack of knowledge. They initially played the same instrument as a whole but later split up by instrument. Then the whole group played together when the players were still unfamiliar with their new instruments. The children experienced great difficulty playing in tune with each other. When they practiced repeatedly with the same instrument, some wore a confident look on their faces. As the program progressed, they found playing as a group challenging. However, they carefully began to study how to play the instrument of their choice in tune, which allowed them to gain more insights into ensemble performance.

## CONCLUSION

This study identified six-year-olds' shift to active and confident learners after being exposed to *gugak* activities and established the link between such exposure and the children's development, especially in their self-efficacy. Based on these findings, the study intended to raise awareness of *gugak* as a tool to experience musical expressions and sentiments native to the Korean people in education institutions for young children. The key findings of the study are summarized below.

First, the young learners overcame their fears that *gugak* classes are challenging and listened attentively to the teachers' instructions to learn new skills. They explored possibilities on their own, saying "This is what it is supposed to sound like" and "I'm doing this the right way, right?" The activities had a positive impact on the cognitive domain of the children's self-efficacy.

Second, after exposure to *gugak*, the children began to understand its meaning, showed a strong desire to play other musical instruments and expressed confidence in their strength and body during activities such as *ssireum*. They responded, "I also want to try the *kkwaenggwari* and *jing*" and "Looks like you guys will beat the *buk* a hundred times," which demonstrates the lessons had positively affected the physical domain of the learners' self-efficacy.

Third, repeated rhythm activities helped the children move away from the perception that *gugak* is difficult. While creating a harmonious sound, they first-handedly learned how to be considerate of others and helpful to one another. They said, "Let's do this again tomorrow" and "This is so much fun, isn't it?", which is indicative of *gugak*'s positive influence on the socio-emotional domain of the children's self-efficacy.

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# Accessing the Academy: Scrutinizing Accessibility Problems of Disabled Students

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## **ABSTRACT**

In Australia and many other countries, it is an ethical and legal requirement that all public sector organizations make their online information and processes available to all disabled citizens. Given the aging population and the 8-10% percent of the world who are perceptually disabled, such requirements should be a mandatory feature set of all universities. This is not the case, with the large majority of institutions only paying lip service to accessibility. Visually, auditorily and cognitively impaired citizens constantly struggle to navigate both the offline and the online world. The situation is particularly challenging for disabled students whose educational requirements not only necessitate locating information, but also submitting assignments to constantly changing learning management systems and interacting online with instructors and fellow students. Various reasons for this situation are explored including ignorance, expense, difficulty, and imprudence of website authors and university administrators.

## **INTRODUCTION**

For the past 20 years, the author has taught able-bodied computer science, engineering and information science students the skills of writing reports about technology. When asked to consider the concept of accessibility to evaluate websites, students are always puzzled. Accessibility is a seemingly ordinary concept and the majority of students share the same view as most citizens (and some academics) of most countries – being able to view and use websites without hindrance from governments or censorship. Most of the students and the population do not imagine the fact that disabled people need to use the Internet. They seldom consider sight or hearing impaired users, and certainly never think about the cognitively impaired or those with learning difficulties. Why is this the case, when approximately 8-10 percent of the population suffers from some form of sensory or cognitive disability, with this figure set to increase as the baby boomers' health starts to deteriorate in their sixties and seventies (Vicente & Lopez. 2010)?

In Australia, the legislation derives from the 1992 Disability Discrimination Act. All government agencies are required to provide information and services in a non-discriminatory way. The website, [www.Australia.gov.au](http://www.Australia.gov.au) specifies the federal government's role and acts as a model for the rest of government and the nation. Australia is also party to the United Nations' Convention on the Rights of People with Disabilities (ratified in 2008) in which Article 21 states that: "... information intended for the general public to persons with disabilities in accessible formats and technologies appropriate to different kinds of disabilities in a timely manner and without additional cost." (see <http://www.accessiq.org/news/news/2014/03/website-accessibility-law-and-policy-guide>).

Many companies and educational institutions mistakenly believe that the accessibility laws only apply to government departments or medium to large sized organizations. The Australian Equal Opportunity Act of 2010 precludes all business owners from discriminating against a customer on the basis of ages, race, gender, religion or disability. If anyone is discriminated against, then that person may make a complaint to the Australian Human Rights Commission.

## **Sydney 2000 Olympics**

The first test case occurred in 2000, when Bruce Maguire, a blind person, sued the Sydney Organising Committee of the Olympic Games (SOCOG) because he could not choose a seat at one of the events using his computer. He asked SOCOG to make the website accessible, but was essentially refused. The case was ongoing, resulting in a damages award of AU\$20,000. Many people believe this sum was preferable to SOCOG since the website had a limited lifetime, and changing the entire website would have cost much more. Several other cases have subsequently occurred notably three women who in 2011, who sued the Disney Corporation for failure to cater for vision impairment on its websites and theme parks, and Donna Jodhan, who in 2010, filed a case in Toronto, Canada against the government because she could not apply for online government jobs. The first case was settled out of court, while the Canadian government was directed to make all its websites compliant by 2012.

The laws relating to many other countries are more or less the same as those in Australia, with some countries being quite explicit in specifying websites, and others being more general referring to disability discrimination in

general. Most of the Western world has legislation, which prohibits discrimination on the basis of disability. The exact penalties and recommendations do differ from country to country. The European Parliament recently accepted a ruling on 26 Oct, 2016, which requires websites and mobile apps of all public sector organizations and institutions be accessible to disabled persons. All EU member countries are expected to meet this obligation by 23 Sept, 2018. However, most EU profit-making businesses are seemingly exempt from this ruling.

### **Review of the Literature**

The SOCOG case made media headlines around the world. Up until the 2000 SOCOG incident, research that studied the discrimination surrounding accessibility of disabled students was limited (Williamson, Shnauder & Bow, 2000). This was paralleled by a corresponding lack of fundamental services available to disabled Australian students in their educational lives. While the potential democratization of information has been celebrated (Smith, Waby, Neville and Dalloway, 1999), nearly two decades later, the evolution of the Web into Web 2.0 has added greater complexity and extra obstacles for disabled students.

Prior to 2000 there were a relatively small number of empirical educational studies that studied the use of web-based resources for disabled students. Accessibility was a forgotten aspect of most technology-rich classrooms. The majority of the early research into disability focused on blindness and visual impairment and can be typified by three main groups: 1. research, which reviewed an array of assistive technologies for a range of disabilities (see Ashcroft, 1983; Bayha, 1998; Galvin & Scherer, 1996); 2. costs-benefits analyses of various assistive hardware or software (see Ely, 1989; Leventhal & Earl, 1998; Ruconich *et al*, 1986;); and 3. early studies, which made speculative claims about the potential benefits of multimedia and web-support materials (see Rosas *et al*, 1997; Rutkowski, 1998; Włodkowski, 1999). At this time, which predates social media software and smartphone hardware, the function of the Web was to store information for later retrieval. Very little research considered the interactive possibilities of computer-mediated communication in order to create discussions and hold online classes, which included disabled students.

As of 2017, the number of research studies that have identified accessibility as a major problem has markedly increased, with a continued interest in blind and visually-impaired users, as opposed to other kinds of problems. This focus has had the most attention, both in the media and by researchers because the Internet is so heavily graphical and aimed at people with normal vision. Some researchers believe that the Web is a mature medium now and that accessibility reform is imperative, with disabled citizens, estimated to exceed 1 billion people or 15% of the world (World Bank, 2011). The literature shows that disabled citizens are accessing online sources in a range of settings (Alper, 2016; Dobransky, and Hargittai, 2016) and using variety of devices (e.g. smartphones, games consoles, smart TVs and tablets). More optimistic studies have conceptualized disability as the acid test for universal usability, with the remediation of accessibility issues seen as a model for universal design (Preiser and Smith, 2011; Steinfeld, Maisel, and Levine, 2012). Such research implies that if the Web can be designed for people with disabilities - then surely it can be used by everyone.

These utopian ideals need to be weighed against research reports surrounding Web policy and accessibility, which are arguably ethnocentric since they tend to depict the European, American or UK, approaches as the worldwide standard (see Blanck, 2014; Scholz, Yalpin & Priestley, 2017). These discussions usually totally ignore the majority of the world – China, India, Russia and the third world - where disability, and resistance to accessibility measures are far more prevalent. A 2014 UN report found that only 45% of the 76 countries surveyed reported that any of their government websites were accessible (G3ICT, 2014). Including the missing countries in the discussions is a significant challenge to all educationists and policy makers.

Specific educational research that treats disability access of students in educational contexts has yielded mixed findings. Most educational research starts from the same question - are disabled students being assisted by their various institutions' websites given guidelines and laws that require equity and fairness? Post 2000 research began by surveying the implementation of accessibility measures (Dunn, 2004; Tinklin, Riddell & Wilson, 2004). Most often, research is hopeful about evolving technology and the skills of web authors by identifying a range of issues that need to be addressed (Badge, Dawson, Cann & Scott, 2008; Gollidge, 2005; Simonson, Glick & Nobe, 2013; Taylor, 2016) before disabled students can attain the same access as ordinary students. However, recent findings are more critical about the efficacy of accessibility guidelines (Brandt, 2011; Cooper, Sloan, Kelly & Lewthwaite, 2012; Liasodou, 2014) and the possibility of universal access. One major problem for universities (and students) is that special needs are not always disclosed – embarrassment, ignorance, and anxiety are accompanying characteristics of disability (Matthews, 2009) e.g. when a student suffers from undiagnosed dyslexia. An overlooked proportion of student populations are international students who speak the native tongue as a second language. A small number of studies have added cultural or cross-cultural problems to the W3C formal list of disabilities (Archee & Gurney, 2012; Archee & Gurney, 2007; Vitols, Arhipova, &

Hirata, 2011).

## THE W3C GUIDELINES

The Australian government and most other countries use the World Wide Web Consortium (W3C) standards and guidelines on accessibility, which originally dates from 1999. The 2008 Web Content Accessibility Guidelines (WCAG 2.0) (see <https://www.w3.org/TR/WCAG20/>) have succeeded the older recommendations by making the previous statements non-technology specific and by including a wider range of disabilities. The guidelines now encompass all kinds of computers, televisions, gaming consoles, tablets and phones, and refer to sight, hearing, learning difficulties, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of disabilities. The guidelines do not include language or cultural preferences. However, given these guidelines are nearly ten years old, and converging advances in technology, such as new devices, new apps and new ways to access Internet mediated content, the existing accessibility guidelines may not be an appropriate document to be the basis of national regulations, which usually allow transitional compliance time.

Both the first and second iterations of the guidelines do nothing to specify exactly what disability or accessibility means, even though various problems are spelt out. By not defining the exact meaning of accessibility and disability the task then falls to governments, legislation and other regulatory bodies to determine whether the situation falls under the policy definitions on a case by case basis, if a breach is detected or reported (Elcessor, 2015). In the Maguire vs SOCOG case, the Olympic body claimed that the 1999 standards were so new and that the website planning pre-dated the planning for the establishment of the website. This argument was not accepted and SOCOG was directed to change its website accordingly. After these changes were subsequently only partially performed, the Human Rights Commission awarded damages to Mr Maguire who was considered to have suffered feelings of hurt, humiliation and rejection. It is worth noting that the awarding of damages was not automatic, nor was there a mandatory fine, but a determination by the Commissioner about Mr Maguire's feelings, not his disability, per se.

The latest version of the W3C guidelines comprises 4 main principles, divided into 12 guidelines, and 61 sub-criteria. The problem with all the W3C guidelines would seem to be just that – they are guidelines and nothing more. While the latest version states that the “criteria are written as testable statements” (in Abstract) and supplies examples of bad practice for each of the criteria and sub-criteria, the language used is jargonistic and so generic that usability of the guidelines becomes a real issue for those seeking genuine compliance. It would be extremely challenging to identify accessibility problems in the design of a website using these guidelines as a design tool. It would also be challenging for any court to make realistic judgments without the assistance of an expert accessibility consultant.

Here is an example with respect to Guideline 3.2 Predictable: Make Web pages operate in predictable ways:

- 3.2.1 On Focus: When any component receives focus, it does not initiate a change of context. (Level A)
- 3.2.2 On Input: Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component. (Level A)

This is not plain English, nor can it be, because it is dealing with highly complex technical matters and written to encapsulate a variety of platforms, devices and disabilities. The words, “focus”, “context”, “interface” and “behavior” will be very different according to the assistive technology being used, and whether the user is blind, or deaf or cognitively impaired. For example, the user experience is totally changed if the screen is removed from the browsing process – a screen-based context disappears into a string of text. For hearing impaired students, video content is very different without the music and sound context that accompanies most clips.

Not only are the guidelines littered with jargon, and cluttered with links, but some of the previously useful guidelines have been deleted from the original version, e.g using CSS for layout, not tables; avoiding embedding text within images; and using clear and simple language, have been removed. Particularly worrying is the elimination of the last three guidelines from version 1.0, which related directly to accessibility. For this author, dead end links are a navigation problem for all web users (disabled or not), but where is the guideline for dead links? Ordinary people, including web authors and administrators are ill-equipped to decipher the W3C guidelines because they are simply not usable. Moreover, Power, Friere, Petrie & Swallow (2012) used 32 blind users to test 16 government websites and found that there were 1383 user problems, only half of which were covered by the success criteria of the WCAG 2.0. For the problems that were covered, implementation of the guidelines did not actually remedy the situation in 16% of cases. Results show that few web authors are implementing the guidelines, and for those who do, problems will still exist as to make the website inaccessible to blind users.

## ACCESSIBILITY AND BLENDED LEARNING

Blended learning, or the hybrid combination of traditional face-to-face teaching with e-learning has become the de facto standard for most universities in the western world. Most Australian universities use a learning management system (LMS) in order to 1. standardize the design, layout and navigation of individual units, and programs of study; and 2. house the online unit content of the weekly tutorials – information, resources, videos, links, and references; 3. support online interaction in the form of quizzes, chats, blogs, forums and wikis. Some of the popular brands include Canvas, Moodle, Sakai, Desire2Learn and Blackboard. Educational publishers have recently entered the market with McGraw-Hill and Cengage offering their own off-site, lookalike versions. While certainly helpful, these LMS's add an extra layer of complexity to accessibility issues for both students and developers alike. If the popular duplication detection software, Turnitin is also employed to prevent cheating, then even more complexity is created since Turnitin is an add-on module to the LMS that provides extra functionality, but also extra opportunities for accessibility issues.

Universities usually provide the bare basics of Alt-tag text labels for graphics, use of semantic headings for long documents, and sensible colour schemes. When it comes to their chosen LMS, universities tend to devolve responsibility to the vendors themselves and assume that the LMS accessibility credentials are tested and true. This assumption is the problem. Many LMS vendors maintain that their systems are W3C compliant, but they do not state how they have arrived at these conclusions. This author consulted a profoundly blind advisor, who used the JAWS assistive screen reader at the Australian Royal Blind Society in 2001 and discovered that the forerunner to Blackboard, WebCT was inaccessible at a Sydney university because of inadequate navigation assistance and many dead links. Similarly, Conway (2010) tested Blackboard with the most popular JAWS program and by using a range of automated and manual methods and found that Blackboard scored “better than average”, but that score was still a fail grade in terms of producing accessible content. Missing sitemaps, inability to grasp user location, inconsistent page layouts, missing META data elements, use of unreadable pdf files and missing html equivalents, and missing ALT text labels for graphics. To make matters worse, the university stated its aim was for WCAG 1.0 compliance, which was not met, with no mention of more difficult WCAG 2.0 guidelines. This situation is not much better at other universities or with most other LMS's.

The amount of competition for LMS market share is fierce with many companies now offering a LMS, and with traditional print publishers now entering the market. The commercial vendors are rushing to invent innovative features in order to distinguish themselves from the open-source vendors such as Moodle and Sakai. Thus, commercial vendors are always trying to push the boundaries of what a LMS can do. Such companies wish their concepts to be the first so that the institutions will identify with them and remain loyal. The problem is that old products like Blackboard rest on software code that was not originally designed to be accessible. By developing new features on older code, the legacy of inaccessibility remains and can only be changed by rewriting established processes. Companies like Blackboard are suffering from historical problems because it used to be so popular (76% in 2007) at a time when indifference to disability and accessibility was the norm. This indifference is also present in its basic code, and needs to change before the LMS can become more accessible.

One of the most recent innovations for upping the ante in terms of blended learning is to provide fully online courses replete with professionally produced video pods for domestic students, but to also on-sell those units and whole programs of study to other commercially oriented institutions both nationally and overseas. Universities can thus benefit by recording their academics' best practice and packaging these programs of study into a product that can be sold ostensibly to a global market. Apart from the blended learning content on a LMS, a key element in this commercialization of education is the accompanying video pod lectures that add the human touch to somewhat bland web pages. Unfortunately, video pod content usually using PowerPoint slides is entirely audio/visual and often unreadable by assistive devices or accessibility software. Such video pods necessitate textual translations of the spoken word and the PowerPoint text, and this is seldom considered in the haste for universities to sell their courses to the highest bidder.

An overlooked aspect of blended learning is that it extends beyond LMS information retrieval. Blended learning also comprises the student face-to-face and online interaction with instructors and peers, the writing of assignments, submitting assignments to online evaluation sites, sitting exams, tests and quizzes, and receiving feedback. Every one of these activities is a possible source of accessibility problems, rarely considered in the literature, and given scant recognition in the W3C guidelines. A good example is the common practice for universities to require a student signature on a pdf copy of the institutional cover sheet to accompany all electronically submitted assignments. This is an anachronistic obligation from the past, but still mandatory for many institutions. Acrobat files have always been a bugbear for accessibility software, and is still a problem depending on how the institution creates the files. The disabled student must download the pdf, open the file in Acrobat, add an already saved graphical file of their signature, save the file, convert to Word, and then add the

cover to the beginning of the essay, then upload to the LMS. This process is a tricky one for able-bodied students, but is very stressful and error-prone for disabled students. It involves the student in owning and using Acrobat, MS Word and Photoshop in order to accomplish a legacy task from when students simply signed the front cover of their assignments. A simple solution would be to offer disabled students the alternative of submitting hard copy.

Students are expected to use a variety of online and computer-based software in the performance of their assessment tasks. MS Word, Adobe Acrobat and Photoshop have been mentioned, but in an arts and humanities school, use of Excel and PowerPoint, statistics software such as SPSS, the Library's online scholarly databases, such as ProQuest and Ebsco-Host, and social media sites like Facebook and Twitter are all mandatory parts of the curriculum. Videoconferencing programs such as Skype, and Zoom are also prerequisites for some classes at some institutions. This is an added burden for disabled students, with many of these programs not designed with accessibility in mind. It does not seem possible that a disabled student would be able to compete with an able-bodied student in terms of these specialized program skills, nor would it be possible for disabled students to perform equally within teams in the execution of group assignments. Such skill deficits are usually unexpressed by most research into disability and accessibility.

### **WEBSITE REMEDIATION FOR DIFFERENT TYPES OF DISABILITY**

All types of disabilities are not identical in terms of the problems that arise from browsing the Web. Considering just hearing and sight impairment, it is only websites that depend upon speaking, audio effects or music that cause a problem for hearing impaired students, whereas the bulk of content and the majority of the world's websites are problematic for sight-impaired students. Hearing guidelines necessitate a relatively easy fix - a textual equivalent - but substitutes for sight-reliant processes are challenging because of the highly graphical nature of websites and navigation, in addition to computers themselves. The user-friendly, graphical nature of PC's and Macs developed originally from command line driven operating systems, and are certainly why personal computers have become universal tools in our current technology-rich society. Without the graphical computer, we would be using technology from about 25 years ago, when Windows 3.1 revolutionized computing. The opposite is essentially what is required to make the modern personal computer (and website) accessible to sight-impaired students. Developers seeking accessibility compliance need to re-invent the modern graphical interface into an effectively command line (or textual) driven one – in essence a 25-year retrograde step.

Hence, a key element of all accessible websites is the use of the markup language, HTML5, which allows for a range of customization without recourse to programming add-ons such as java or Flash. These latter programmed features are notoriously awkward because they do not allow for easy change, or user control. HTML5 is a mature language, not "code", with semantic-based terms that permit a great deal of user choice, if the need should arise (Peterson, 2012). However, HTML5 is not a Web standard at this particular period in time, and while most of the popular browsers accept HTML5 commands, there may be some occasional glitches due to incomplete recognition by browsers. An easy way to conceptualize HTML5 is to understand some of the tags, viz: <nav> for menu and sub-menu choices; <aside> for information that is not a part of the main page content; <article> for extra items such as blog posts, when users are not taken out of the current webpage, and thus losing their location.

It seems incongruous, but universities enrol many students whose disabilities are brain-related, or who may suffer from a learning difficulty such as dyslexia or memory problems. It is erroneous to think that intellectual ability is correlated with cognitive impairment. Thus, academics who create and edit websites related to their courses need to be aware of these requirements. The W3C guidelines are simply not clear enough to produce content for cognitive disability, with some recommendations surprisingly overlapping with sight and hearing fixes. Labeling, captioning and providing alternative content sources are identical to sight/hearing impairment. New recommendations include: allowing for mistakes in context changes by asking for confirmation; error announcements when a mistake is made; clear explanation on how to fix an error; allowing for extra time for users to perform a task; and being very clear when asking users to fill out forms. Media Access Australia has a Cognitive Disability Digital Accessibility Guide that spells out these recommendations in full detail (see <http://mediaaccess.org.au>).

Color-blindness or color-vision deficiency affects 1 in 12 males and 1 in 200 females around the world. It is another problems that is unfamiliar to website developers or academics who write content for their own pages (Collinge, 2017). While red-green color-blindness is the most common form, other color variations can also affect people - just red, or just green can be problematic, or blue and purple, or blue and yellow. Any of these combinations of colors can lead to confusion if the website relies on these colors for meaning, e.g. using bold red

text on a web page may not be seen as important by some students. Some of the recommendations include: do not only rely on color to convey messages; keep color palettes limited to 2 or 3 colors; use texture and patterns to show contrast; carefully select any contrasting colors and shades; and avoid using any known relevant color combinations.

While eye-tracking devices are more known in the latest games and the new world of virtual reality, assistive eye-tracking and head-tracking is the preferred method for assisting students who have limited movement. Such students include those suffering from Parkinson's disease, quadriplegia, multiple sclerosis, and dystonia. These students can now navigate the Web by simply looking at various parts of the screen, and then blinking in order to perform a mouse-click. The WCAG 2.0 guidelines make recommendations about the integration of websites and these eye-tracking assistive devices, mouth-stick pointers and head pointers. Obviously many of the error recovery recommendations apply to such disabilities because of the inevitable mistakes that will occur with headsets. Commonsense would decree that university websites need to be tested with a range of such assistive devices in order to discover any problems in their abilities to function (Moore, 2015).

## **DISCUSSION**

The entire logic behind universal accessibility seems to rest on the idea that websites are the norm and that students without equitable access to websites are disadvantaged and discriminated against. This is certainly the case when we think about locating information from websites and research databases in order for students to write essays and reports. Most researchers would not wish to go back to using incomplete holdings of university libraries. The e-catalogues and databases of libraries should be a priority in terms of educational accessibility. Yet, there are other processes that universities have implemented that are much more debatable in terms of their educational value, and this value is seldom considered once a process has become entrenched.

For example, many tertiary institutions have completely rejected the notion that paper provides a more tangible medium for students (and staff) to base their learning upon. Many students complain that every single aspect of their education is online. Most of my students have never received a paper handout from a tutor in their entire three-year degree. Every single aspect of their course is available on the website 24/7, but students do not always appreciate this availability, they do not view this information, or perhaps forget certain aspects (Archee, 2015). Textbooks, thankfully, are still a feature of many first year subjects, but textbooks are substantially decreasing in sales and numbers. The problem here is that students believe that textbooks are too expensive given the amount of information they can obtain from free web-based sources. Most of the educational research shows quite conclusively that paper-based materials are significantly more easily comprehended, recalled and learned than screen-based content (Hooper & Herath, 2012; Jabr, 2013, Mangan, Walgermo & Brønnick, 2013).

However, many universities have decided that this research is irrelevant and dismantled their print facilities and placed all student (and staff) related content on the institutional website. If an institution proclaims their information on paper should cease to exist, then hinders a disabled person from finding that information on the Web, this is certainly discrimination. If that information is available in a paper-based format, or audio-based or in Braille the institution should not be accused of wrongdoing. The real problem seems to be that the institution has placed all its faith in technology that has glaring flaws for a significant proportion of its student population. Educational institutions, especially universities have been more radical than most other societal institutions such as banks and retail shops, both of which have adopted online processes, but have not ceased using paper, or offering old-fashioned service. There exists online banking and traditional banking, ebay and bricks and mortar stores, but there is only online information in the form of web-based content at many universities in 2017.

Such reliance upon web-based content, interaction and service is a societal phenomenon that is having negative side effects for all people, not just disabled ones. The prodigious increase in computer crime, such as current ransom-ware attacks, and the wide-ranging potential of digital terrorism are a direct result of the folly that governments, organizations and institutions have created by building vulnerable computer systems that are obviously flawed. Accessibility issues are just one example of these imperfections.

The only solution for this accessibility problem is for universities to test their websites by using a variety of methods – using automatic tools, checking websites manually, and employing specialist consultants who operate a variety of assistive devices and technologies. This could be an inexpensive method to ensure accessibility compliance and would function as insurance against being sued in the future. To date, most universities have largely avoided this systematic testing of their own processes, websites and learning management systems.

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# Accidental Risk Factors of Cyclists in Khao Yai National Park, Thailand

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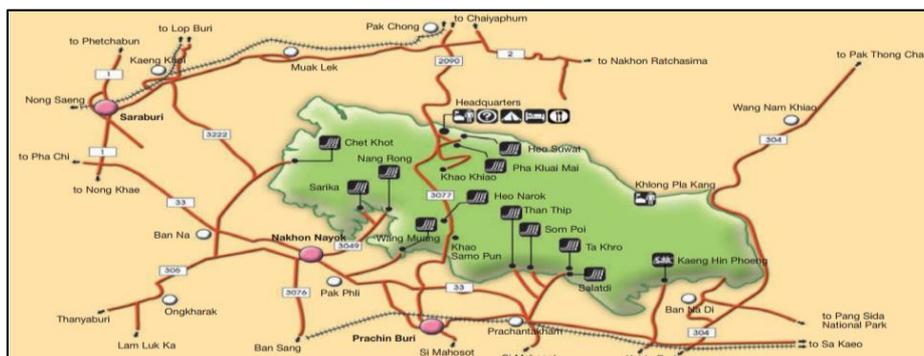
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## ABSTRACT

This research aimed to evaluate accidental risk factors of cyclists in Khao Yai National Park. Objectives are accidental risk factor analysis and to create accidental risk map for cyclists. Eighty five questionnaire, stakeholders, in-depth interviewed, and cumulative cyclist accidental statistics of Khao Yai National Park were investigated in this study during December 2016. The results found that majority 76.2% of the samples were male. 44% of sample group were using mountain bicycles, and 71.4% were amateur cyclists. 89.3% never experienced cycling accidents on the route between Prachin Buri to Khao Yai National Park headquarters. The results of the cyclists' opinion on factors affecting the risk of accidents found that the most effective factor was the curvature route downhill ( $\bar{X} = 3.88$ , S.D. = 0.93), the second factor was high slope in a high risky level ( $\bar{X} = 3.69$ , S.D. = 0.98), the third factor was climbing up route which was also in a high risky level ( $\bar{X} = 3.63$ , S.D. = 1.01). Cyclist's satisfaction level with facilities in Khao Yai National Park was found that the sign on the road surface was clear ( $\bar{X} = 3.61$ , S.D. = 1). Secondly, the road surface was suitable for cycling ( $\bar{X} = 3.54$ , S.D. = 1.05). Thirdly, sufficient sign/ label ( $\bar{X} = 3.31$ , S.D. = 0.91). While, the width of bike lane was the lowest satisfactory level ( $\bar{X} = 2.77$ , S.D. = 1.11). Consequently, cyclists suggested that Khao Yai National Park should increase the bike lane's width in order to reduce accidental risk for cyclist if possible.

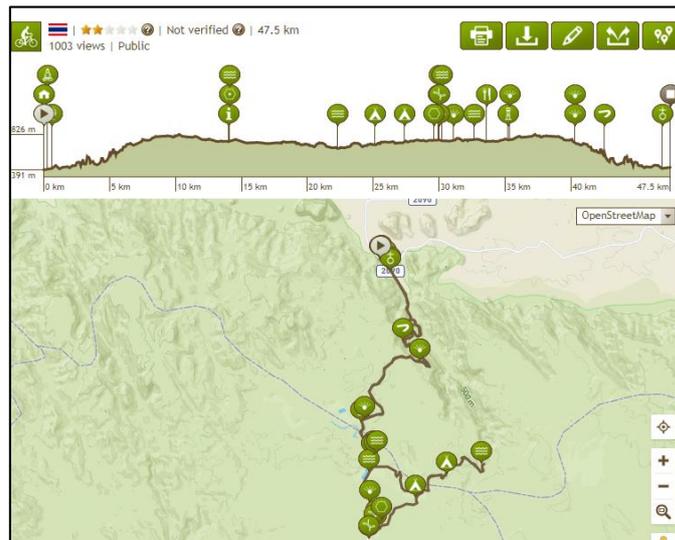
## INTRODUCTION

Khao Yai National Park (KYNP) was established as the first national park of Thailand in 1962. The national park covers an area of 2,165.55 square kilometers in the four provinces of Nakhon Nayok, Prachin Buri, Nakhon Ratchasima and Saraburi. Consisting of large forested areas, scenic beauty and biological diversity, Khao Yai National Park, together with other protected areas within the Dong Phrayayen mountain range, are listed as a UNESCO World Heritage Site. To reduce the effect of environmental degradation is an important issue for natural forest conservation (Popradit et al, 2015). Additionally, Khao Yai is represent as a home to a great diversity of flora and fauna, as well as pure beautiful nature. KYNP became a popular destination for both domestic and international tourists. The major activities for tourists are various such as trekking, bird watching, nature sightseeing, and camping (Utarasakul, 2014). Khao Yai National Park is a 3-hour drive from Bangkok. Tourists both motorists and cyclists can head north via Phahonyothin Highway to Saraburi onto Highway 305 and then left to Khao Yai. The route is 190 kilometers distance. Alternative route is Highway 305 to Nakhon Nayok. Drive to Highway 33 to the Noen Hom intersection, then turn left to Khao Yai. The route is total of 160 kilometers distance (Figure 1).



**Figure 1:** Map and route to Khao Yai National Park  
**Source:** DNP, 2017

As the convenience of transportation to Khao Yai, more cyclists also travel to Khao Yai to explore adventure along greenery scenic route. Information of biking adventure club described characteristics of the bike route in Khao Yai from Rachasima Province to Heo Suwat waterfall as follows. The tracks climbs from below 400 m up to more than 800 m over the first 10 Km. It continues up and down hill, passing the visitor center, toward the crossing at the training center. The bicycle track is about 50 Km long and is paved all the way. Biking takes about 4-5 hours. A few highlights on this itinerary have been listed more for the sake of smoother navigation and referencing, although they may also appeal to many cyclists as points of interest. Individual cyclists can choose where to stop according to their own tastes and time constraints. Cyclist route also represent in Figure 2.

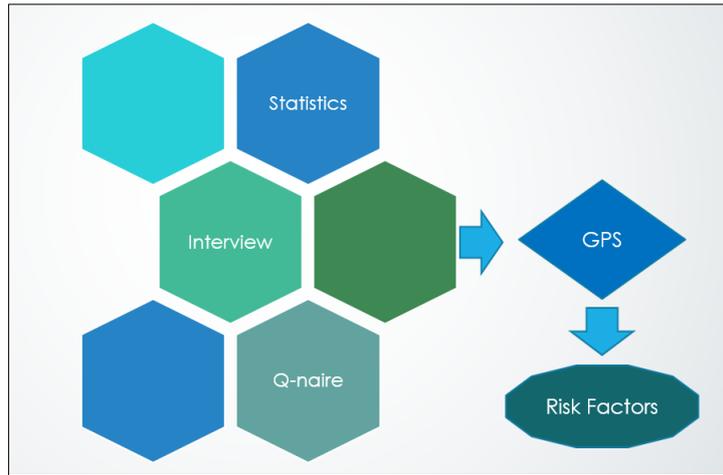


**Figure 2:** Khao Yai National Park bicycle track  
**Source:** Ayutthaya Biking Adventure (2017)

From last few years statistics of cyclist to Khao Yai National Park, many cyclists visited Khao Yai National Park increasingly especially during winter and holiday seasons. More accidental rate were increased in some areas, in case of any severe accidental happened will take time and has more lost and injured. Therefore this research aimed to analyzed risk factors and to created accidental risk map for cyclists in Khao Yai National Park to prevent future accidental rate for cyclists.

### THE STUDY

Eighty five questionnaire, stakeholders in depth interviewed, and cumulative accidental statistics of Khao Yai National Park were comprised in this study during December 2016. Framework of methodology was identified in Figure 3.



**Figure 3: Methodology framework**

Photos from field survey at Khao Yai National Park were presents in Figure 4-5. After integrated data of statistics, questionnaires, and in-depth interview, GPS data was also collected at risk points along the route of Khao Yai National Park (Fig. 6).



**Figure 4: In-depth interviewed of staff in Khao Yai National Park**



**Figure 5: Questionnaire collection of cyclists**



**Figure 6:** GPS data collection at risk points

### FINDINGS

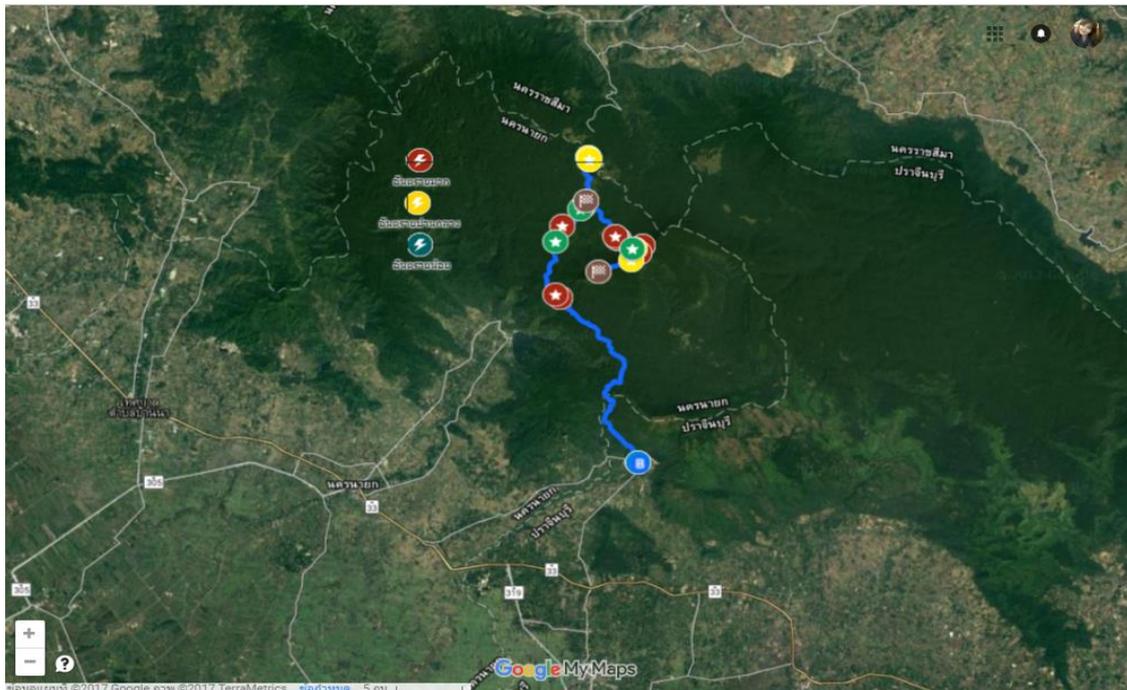
The results found that the majority 76.2% of the samples were male. 44% of sample group were using mountain bicycles, 71.4% were amateur cyclists. 89.3% never experienced cycling accidents on the route between Prachin Buri to Khao Yai National Park headquarters. The results of the cyclists' opinion on factors affecting the risk of accidents found that the most effective factor was the curvature route downhill ( $\bar{X} = (3.88, S.D = 0.93)$ ), The second factor was high slope in a high risky level ( $\bar{X} = 3.69, S.D. = 0.98$ ), the third factor was climbing up route which was also in a high risky level ( $\bar{X} = 3.63, S.D. = 1.01$ ). When focus on cyclist's satisfaction level with facilities in Khao Yai National Park was found that the sign on the road surface was clear ( $\bar{X} = 3.61, S.D. = 1$ ). Secondly, the road surface was suitable for cycling ( $\bar{X} = 3.54, S.D = 1.05$ ). Thirdly, sufficient sign/ label ( $\bar{X} = 3.31, S.D. = 0.91$ ). While, the width of bike lane was the lowest satisfactory level ( $\bar{X} = 2.77, S.D. = 1.11$ ). Consequently, cyclists suggested that Khao Yai National Park should increase the bike lane's width in order to reduce accidental risk for cyclist if possible.

Summarization of risk points for cyclists were divided into 3 categories base on the criteria of type and frequency of injury as presented in Table 1.

**Table 1:** Summarization of risk points for cyclist at Khao Yai National Park

Level level	Number (point)	Type of Injury
Red (High)	7	Dead, body broken
Yellow (Moderate)	5	Medium injury
Green (Low)	2	Hurt, painful

In addition, risk map for cyclist in Khao Yai National Park was also presented in Figure 7.



**Figure 7:** Risk map of cyclists at Khao Yai National Park.

## CONCLUSIONS

From this study can conclude that risk factors of cyclists were composed of various factors such as physical condition of road, skills of cyclists, and also appropriate signs along the route.

- Type/ condition of road especially in sharp curve downhill, high slope, and narrow lane.
- People: experience of cyclist and mindfulness
- Excess baggage for touring cyclist during downhill
- Lack of warning symbol
- Risk area: during Khao Kieo route (approximately 11 Kilometers)

## RECOMMENDATION

1. At sharp curve downhill, should set up sign or enlarge the width of the road to reduce future accidental rate.
2. Bike lane should not less than 1.5 meters.
3. Car speed limit in KYNP should be enforcement.
4. KYNP must develop safety guide for cyclists and add sign especially at curve downhill.
5. Digital risk map for cyclists is recommend to develop and share in social media in order to inform all type of cyclists.

## ACKNOWLEDGEMENTS

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# Accreditation in Education: An Architecture Department Experience

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## ABSTRACT

Accreditation is a subject recently on the agenda of university - vocational training in Turkey as it is in the rest of the world, and it is gaining importance each day. While holding an accreditation documents the quality of the education offered by an educational institution, increases its desirability and demonstrates that it meets national or international standards; it also ensures the recognition of the diploma issued by the institution. Moreover, with globalization has come the ability for architects to find work in other countries as well as their own. The diplomas being recognized in other countries, having a minimum knowledge and skill as a professional are of great importance today. For the first time this year, the Institute for Higher Education (YÖK) has included information regarding the accreditation of universities in its Student Selection and Placement System (ÖSYS) Higher Education Programs and Quotas Guide for students making their applications. At the top of accreditation requirements comes providing graduating students with specific knowledge and skills in accordance with the mission of the education program. Within the scope of this study, the accreditation process commencing in the 2000s at Uludağ University Architecture Department and continuing with a certain quality understanding, as well as its contribution to education is described. The Uludağ University Department of Architecture program accreditation process experiences, which commenced with the application to the American NAAB Accreditation institution, due to a lack of an institution offering accreditation to architecture departments in Turkey at that time; and continued with the establishment of MIAK in Turkey and an application and accreditation by MIAK will be described.

**Keywords:** Accreditation, architecture education, Turkey

## 1. INTRODUCTION

The path to individual and social development and progress is through education. Education forms the basis for social, political, legal and economic progress. With the emergence of the concept of globalization, proximity between different countries and individuals eliminate boundaries, individuals, societies and institutions obtain the opportunity to meet their needs from the most suitable places. The changing needs of society, developments in communications, education and technologies fields have brought the requirement for the review and development of education systems and programs in the field of higher education as in all areas. University education has gained an international dimension. It is important as a professional to have a minimum of knowledge and skill determined on a global scale. The opportunity for education in overseas universities during undergraduate and post graduate education with student and faculty exchange programs, ensuring the mutual recognition of education programs for those wishing to complete their post graduate education in another country, as well as diplomas received following graduation being recognized in other countries is important and required today. Accordingly, receiving a university education is not sufficient; the quality of the education provided at the universities is also queried. Educating professionals with individual characteristics is aimed. Quality assurance in education is documented with accreditations provided by national or international independent accreditation boards. Accreditation is defined generally as the assurance of quality, the development of quality, and the improvement of existing quality, and is accepted as an element of external observation (Esin, N. 2014)

Accreditation is a method developed in order to guarantee the quality of a program and services offered in many countries and industries with a systematic approach. ([http://www.yok.gov.tr/egtfakdoc/egtfakdoc/akr2/boll/bolum1\\_1.html](http://www.yok.gov.tr/egtfakdoc/egtfakdoc/akr2/boll/bolum1_1.html)). Accreditation is the process of giving formal recognition to the qualifications of an institution of individual carrying out a specific job by a competent institution. It is the certification by an independent and impartial institution that an institution works according to the technical criteria determined by a third party. (<http://www.dtm.gov.tr/SORULAR/AB/STAND.HTM#156>). Accreditation is one of the qualities within the total quality perception. It is an important factor for quality education and learning. It constitutes a system which is becoming increasingly important in recent years, and which must be applied to institutions offering education and training. The accreditation process is a phenomenon which requires careful handling particularly at universities offering graduate and post graduate education. The review of the benefits and features of

accreditation in academic studies will be valuable in terms of a quality education and being an indicator of the importance placed upon the quality of education in a country (Günlü, E.) Accreditation focuses on inputs, namely education, the characteristics of the teaching staff, academic and physical infrastructure (library, classrooms, computer laboratories etc.). With accreditation, the standards of the accrediting institution are created and the institution to be accredited meeting those standards at a minimum level is certified.

Accreditation is a method which determines a vision for an institution to improve, which improves dialog between employees, and offers information about the quality of the service to those benefiting from the service offered. In accreditation management, where the quality of programs and services offered to the public are ensured with a systematic approach, the increase in quality of education, the assurance and guarantee of the provision based on specific standards is ensured. Education institutions that provide accreditation usually follow the following method (<http://www.naab.org/accreditation/information/>): Accreditation, in general, is a process of external review that evaluates colleges, universities and educational programs for quality and improvement.

Any accreditation system includes five core elements:

- The evaluation is carried out by a non-profit, non-governmental organization.
- The program or institution prepares a self-evaluation report.
- The program or institution hosts a visit by a team.
- Judgments are made by peers who are trained.
- The program has opportunities to respond to the process at certain points along the way.

The Higher Education Council (YÖK) in Turkey defines the accreditation process in higher education with six basic factors ([http://www.yok.gov.tr/egtfakdoc/agtfakdoc/akr2/bol1/bolum1\\_1.html](http://www.yok.gov.tr/egtfakdoc/agtfakdoc/akr2/bol1/bolum1_1.html)):

- A “standards” set used in reaching a conclusion regarding programs,
- A self-assessment prepared by the faculty, describing how they work to meet standards and including their own assessment of how successful they are at meeting these standards,
- Visits carried out by a team of expert colleagues trained in the examination of the self-assessment report and other documents, the review of facilities, the monitoring of classes and carrying out discussions regarding teaching staff, teachers, the dean, and other individuals,
- A report prepared by the team carrying out the visit, including team assessments regarding to what degree the faculty meets standards regarding the accreditation, and their recommendations regarding the accreditation status of the programs,
- In the event of the team not considering an important fact in their report, or in the event of an important fact emerging following the visit, a written response by the dean of the faculty visited,
- The decision of the competent authority made on the basis of the evidence obtained from the faculty and the team carrying out the visit.

Within the scope of this study, the accreditation process commencing in the 2000s at Uludağ University Architecture Department and continuing with a certain quality understanding, as well as its contribution to education is described. The Uludağ University Department of Architecture program accreditation process experiences, which commenced with the application to the American NAAB Accreditation institution, due to a lack of an institution offering accreditation to architecture departments in Turkey at that time; and continued with the establishment of MIAK in Turkey and an application and accreditation by MIAK will be described.

## **2. INTRODUCTION OF ULUDAĞ UNIVERSITY FACULTY OF ARCHITECTURE DEPARTMENT OF ARCHITECTURE**

The 4th largest city in Turkey, Bursa has a rich historical heritage which carries the Byzantine, Ottoman and Republican era cultural history and physical structure to today, in addition to its natural wealth and green texture. Established in 1970, the university is home today to 15 Faculties, 18 Vocational School of Higher Education, 1 State Conservatory and provides education services in the centre and districts of Bursa. The Architecture Department, which began offering education in 1993, gives education at the Architecture Department Building, which was designed as 3 floors (Figure 1).



**Figure 1.** Uludağ University Faculty of Architecture Department of Architecture

The undergraduate program covers a 4 year education program, and at the end of the 4 years students graduate with an “Architecture Degree”. Students graduate from “Master’s Degree in Architecture” at the end of 2 year thesis and non-thesis master’s programs, and as “Architecture PhD” at the end of the doctoral program. The doctoral and thesis graduate program offers education in four different areas under the Architecture Department; Building Technology Department, Construction Design Department, Architecture History Department and Restoration Department. At the Architecture Department, undergraduate education began in the 1994-1995 academic year, post graduate education began in the 2000-2001 academic year, and doctoral education began in the 2005-2006 academic year. The student quota determined by YÖK as 20 students the year undergraduate education commenced in 1994-1995 was increased to 103 for the 2016-2017 academic years. As of the 2016 fall semester, there are 544 undergraduate, 144 post graduate and 23 doctoral program students undergoing education at the Architecture department. As of the 2012-2013 Academic Year, double major and minor programs with the Department of Civil Engineering are possible. In addition, students graduating from the 2 year vocational schools are able to vertical transfer into the Architecture Department depending on their External Transfer Exam scores.

On the other hand, according to agreements made with universities in Europe for programs such as Socrates/Erasmus (a support program organizing student and academic staff exchange between institutes of higher education in Europe and organized by the Education Commission of the European Union responsible for education) and Leonardo Da Vinci (European Union vocational training program), the Architecture Department can carry out student and academic staff exchange with architecture schools abroad. Within the scope of the exchange program, a large number of foreign students have received education at our department. The department has a young staff consisting of 3 professors, 9 associate professors, 5 assistant professors, 3 PhD lecturers, 2 PhD researchers and 10 researchers as of the 2016-2017 academic years.

### **3. ACCREDITATION PROCESS AND SELF-ASSESSMENT WORK**

In order to instil a quality culture, in line with this culture Uludağ University began national and international education and service accreditation as of the year 2000. The Accreditation Board under the Rectorate and the accreditation sub committees established at the Faculties and Departments under this Board defined their own self-assessment processes, and quality culture and accreditation work began in line with procedures. Uludağ University carried out adaptation work in all their education programs in the Bologna Process of which they were included in 2001, implemented ECTS, diploma supplement and program requirements which are the basic elements of the Bologna process, and commenced the quality process by ensuring continuous improvement of the education programs by obtaining the views of all stakeholders, such as students, teaching staff, graduates and employers. In parallel with this work carried out, Uludağ University was included in the Quality Culture Project and Corporate Assessment Program process of the European Universities Union. In this part of the study, the self-assessment processes of the Architecture department, which began accreditation work in 2012, are summarized.

1. Preliminary phase: The accreditation preparation process is a thorough process which requires a lot of preparation. First of all, everyone (faculty, administrative staff, and students) must believe in and be included in the work. In the preliminary phase involving all faculty members:

- Meetings were held on a Department level,
- An Alumni Advisory Board and Employer Advisory Board were established, meetings were held,
- The existing vision and mission of the Department reviewed,
- Swot Analysis completed,
- Activities and department strategic plan was determined in accordance with goals and objectives.

The Department swot analysis was carried out in accordance with the following setup: Strengths and weaknesses, opportunities-risks were determined under the titles of

- Education

- Research
- Social relations (communication and integration).

The Architecture Department Strategic Plan was evaluated under 2 main headings:

- Developing Education Services
- Increasing the level of scientific research and development activities
- To continuously improve the services offered to the community, to strengthen relations with stakeholders in the framework of social responsibility

In the preliminary phase, course files were prepared for all mandatory elective courses included in the program. Course files were prepared taking into consideration all knowledge and skills to be imparted, by determining under what conditions and how the course content is provided. Within the scope of the accreditation conditions, work was carried out on how the knowledge and skills within the compulsory program within the general program would be integrated to the students in line with the knowledge, skills and competency required. How it would be supported with elective courses was explained (preparation of course matrix).

In addition, by carrying out surveys of teaching staff and students within the scope of the course, clarification of the knowledge, skills and competency imparted by the class was carried out.

2. Defining the Self-Assessment Process

3. Identification of the Originality of the Program

Work has been carried out for the definition of our existing qualifications, how it is given in a studio environment, and for the definition of studio culture.

4. Preparation of the self-assessment report.

Work was carried out in accordance with the MIAK Accreditation Conditions Self-Assessment Report Content.

5. Ensuring continuity of accreditation activities.

### **3.1. International Accreditation Process: NAAB (National Architectural Accrediting Board)**

The initiative for Uludağ University Architecture Department architecture education to be brought to international norms, and becoming more beneficial to students, all teaching staff and administrative staff at the department began with the EUA-IRP process. Following the establishment of the Accreditation Committee in 2001 for the Architecture Department, due to there being no accrediting institution for architecture schools in Turkey in that period, no applications could be made. The National Architectural Accrediting Board (NAAB) is the only institution accrediting institutions offering education with “professional” diploma in the United States. When the NAAB took the decision to grant Substantial Equivalency certificates in the international arena in 2007, the Department decided to apply to this institution in 2007.

In order to obtain and maintain accreditation in America, an architecture department must develop a program parallel to their mission, and is expected to train knowledgeable and skilled individuals who can produce work according to performance criteria. NAAB members consist of representatives of four institutions. There are the ACSA (Association of Collegiate Schools of Architecture), AIA (American Institute of Architects), AIAS (American Institute of Architecture Students) and NCARB (National Council of Architecture Registration Boards). ACSA is the Association of Collegiate Schools of Architecture. AIA is the American Institute of Architects. AIAS is the Institute of American Institute of Architecture Students, which does not yet exist in our country, and has an active role in the accreditation process. NCARB is the board which carries out controls in America during the admission to the profession process, and issues authorization to candidates to work as architects. The process is as follows (<http://www.naab.org/>):

- Self-study
- Peer review
- Preparation of visiting team report (VTR)
- Action (judgment) by the NAAB Board
- Ongoing external review

In November 2007, General Secretary of NAAB visited Uludağ University Architecture Department and gave a positive view for the Architecture Department to be included to the work plan of NAAB. Consequently a Self-Assessment Report of the Department was prepared. There are four sections in the NAAB Self-Assessment Report (<http://www.naab.org/>). The report was prepared according to the articles below.

- **Program Description:** History and Mission, Learning Culture, Social Equity, Defining Perspectives, Long Range Planning, Assessment

- **Progress since the Previous Visit**

- **Compliance with the Conditions for Accreditation:** Human Resources and Human Resource Development, Physical Resources, Financial Resources, Information Resources, Administrative Structure & Governance, Student Performance Criteria, Institutional Accreditation, Professional Degrees & Curriculum, Evaluation of Preparatory Education, Public Information, Annual Statistical Reports, Interim Progress Reports

- **Supplemental Material**

As Uludağ University Architecture Department, all these conditions were dealt with in detail in the report (APR) prepared for the delegation to visit from the NAAB. The NAAB Visiting Delegation was welcomed at the Architecture Department 25-28 November 2007 (Figure 2). With the Annual Reports at the end of 2008 and 2009, the arrangements made in accordance with suggestions were relayed to the NAAB Board. The NAAB process was slowed in 2010 due to budget constraints. However as a result of the positive and encouraging 2nd Visit Report, thanks to the motivation of our university administration, resuming work at speed for a 3rd and final visit is on the agenda at our faculty.



Figure 2. NAAB Visit

### 3.2. National Accreditation Process: MIAK (Architecture Accrediting Board)

Under the leadership of Uludağ University Rectorate, at the end of 2010, a decision was made to support work in accreditation and education quality, and the accreditation through MIAK, the first and only architecture school accreditation institution in Turkey, became the primary objective in the self-assessment process.

Architectural Accrediting Board MIAK; is a board which accredits Architecture Education programs, established in accordance with the Chamber of Architects Accreditation Board Regulations. The basic purpose of the Architecture Accreditation Board is to develop architecture education through assessment and competency work. Thus it is aimed for better educated and quality architects to be cultivated and the welfare of society to be increased. Aims to guarantee the required design, technical and professional skills and ethical formation for a competent professional practice to be sufficient for those successfully graduating the education program for the benefit of society, whether voluntarily requested by the institution itself, or deemed mandatory by the competent authorities (<http://www.miak.org>, Chamber of Architects Architecture Accreditation Board Regulations, Aim, Article 3). The course program of an architecture department accredited by MIAK includes vocational courses, general courses and elective courses. An architecture education program which wishes to be accredited is requested to develop an education program suited to their own mission and providing MIAK accreditation conditions, and to provide students with an education to meet “MIAK Knowledge and Skills Required of Graduates”.

The Architecture Department, in recognition of the importance of national accreditation, made its application in 2011 with a Self-Assessment Report prepared again in accordance with MIAK criteria. MIAK Accreditation Conditions Self-Assessment Report Content consists of the following sections (<http://www.miak.org/>):

- **General Information Regarding Program:** Affiliated Institution, General Specifications and History of Institution, Vision and Mission of Institution, General Characteristics of Program, History of program, Mission and Vision of Program, Program-Institution Relationship, Program Self-Assessment Work, Report on Improvements, Responses Regarding Findings of Visiting Team, Responses Regarding Revisions of MIAK Accreditation Conditions, Program Approach, Architecture Education and Academic Scope, Architecture Education and Students, Architecture Education and Professional Environment, Architecture Education and Society, Human Resources, Teaching Staff, Students, Administrative Staff, Resources Regarding Learning Environment, Physical Resources, Information Resources, Financial Resources.
- **Education Features of Program:** Education Degree and Curriculum, Learning Environment and Performance Level, Learning Culture, Knowledge Required To For Graduation, Skills

- **Attachments:** Resume Information of Full and Part Time Teaching Staff, Architecture Education Qualification Framework/Knowledge, Skills and Competency, Courses, Statistical Information, Visit Team Report of Previous Visit

Annual reports following previous reports and MIAK Assessments, Annual Catalogue of Institution The MIAK Visit took place in December 2012, and the Architecture Degree Program accreditation process was successfully completed (Figure 3).



**Figure 3.** MIAK Visit

As a result of the evaluation of the Visit Team Report, with the 06.07.2013 dated 4/10 numbered meeting of the Architecture Accreditation Board, the Architecture Degree Program was accredited. In Table 1, the architecture degree programs accredited by MIAK in Turkey and their accreditation status is given (<http://www.miak.org/>).

**Table 1.** Architecture degree programs accredited by MIAK in Turkey and their accreditation status

<b>Programme Name</b>	<b>Accreditation Type</b>	<b>Accreditation Year</b>	<b>Next visit year</b>
ANADOLU UNIVERSITY Faculty of Architecture and Design Department of Architecture	2 Years - Monitored	2008	2010
	3 years	2010	2013
	6 Years - Conditional	2014	2020
YILDIZ TECHNICAL UNIVERSITY Faculty of Architecture Department of Architecture	6 years	2010	2016
İSTANBUL KÜLTÜR UNIVERSITY Faculty of Architecture Department of Architecture	3 years	2010	2013
	6 Years - Conditional	2014	2020
EASTERN MEDITERRANEAN UNIVERSITY Faculty of Architecture Department of Architecture	6 Years - Conditional	2011	2017
ULUDAĞ UNIVERSITY Faculty of Architecture Department of Architecture	6 Years - Conditional	2013	2019
MİMAR SİNAN FINE ARTS UNIVERSITY Faculty of Architecture Department of Architecture	6 years	2014	2020
CYPRUS INTERNATIONAL UNIVERSITY Fine Arts Faculty Department of Architecture	6 Years - Conditional	2014	2020
GİRNE AMERICAN UNIVERSITY Faculty of Architecture, Design and Fine Arts Architecture Department	Accreditation Process		
NEAR EAST UNIVERSITY Faculty of Architecture Department of Architecture	Accreditation Process		
OKAN UNIVERSITY Faculty of Engineering and Architecture Architecture Department	Accreditation Process		

As of the 2016/2017 academic year, in Turkey there are 45 state, and 47 private Architecture departments under YÖK, making a total of 92. There are also 10 private Architecture schools in the TRNC, as well as one in Skopje-Macedonia. The number of these departments that are accredited is a total of 7, 4 states and 3 private.

#### 4. GAINS POST ACCREDITATION

In this section of the study, the gains at the beginning, during and following accreditation are described under 3 titles.

● **Becoming a Faculty:** Changes were made to the administrative structure of our Department following the MIAK visit. It was decided by Academic Board decision for Architecture Education, which was included in the Faculty of Engineering and Architecture structure between 2002-2013, to be removed from the Faculty of Engineering and Architecture and to continue alone as the Architecture Faculty with its existing academic infrastructure and recommended departments. As Uludağ University Architecture Department, following the MIAK Accreditation Report, the necessary work was commenced and in February 2013, the application process was completed by the Architecture Faculty. In August of 2013, the Faculty of Engineering and Architecture was split and the “Architecture Faculty” was established. Changes were made to mission and vision. The Administrative and Education Staff were revised.

Within the Architecture Faculty, the Architecture Department, Urban and Regional Planning and Interior Architecture Departments were established. The Urban and Regional Planning and Interior Architecture Departments are expected to accept students when the necessary education and physical conditions are met.

● **Changes in Education:** First of all the Department Self-Assessment Report was prepared. Organizations to contribute to the self-assessment of the department, such as Employer Advisory Board and Alumni Advisory Board were established. Employer, Alumni and Student Surveys were prepared. The surveys were given to employers, alumni and students during the process. The course gain forms were prepared, and students and faculty members were requested to complete these forms for each course.

A file was created for every course in the education plan. Explanatory and introductory information such as tables containing course description, the knowledge and skills students must acquire, examples of good, bad and medium exam papers, course notes, course presentations, resources etc. were added to the file.

All courses offered within the scope of the Architecture Department education program are evaluated and revised according to the results of the “U.U. Course Evaluation Survey” carried out with students at the end of each term. In addition, opinions are also obtained on the revision of the course program from the Alumni Advisory Board, consisting of U.U. Architecture Department graduates working in different areas of the profession.

A new criterion was added to NAAB accreditation in 2005. This criterion, defined as “Studio Culture”, expects all architecture programs applying for accreditation to have a written policy explaining and shaping studio culture. Therefore, our department started work to define a net policy on “studio culture” as of 2002 when we applied to be accredited by the NAAB.

Revisions were made to the course program in order for students of Uludağ University Architecture Education Program to have obtained the knowledge and skills required of graduates by the NAAB and MIAK. The knowledge and skills intended to be imparted to students were matched with the U.U. Architecture Department Architecture Degree Program.

● **Improving Physical Spaces:** After becoming a faculty, the organization of the top floor was intensified. The studio area in the top floor was split, and the creation of studio areas, archive room and new additional offices began. The elevator, which was under construction during the period the Visit Team visited was completed and opened to use.

For the development of physical space, a protocol was signed between the Metropolitan Municipality and Uludağ University Rectorate on 02 July 2015 for the construction of an annex to the Architecture Faculty. The design work is ongoing. As part of the bicycle route throughout the university, a bicycle part application was developed for students coming to the department by bicycle. Work for the arrangement of the top floor continued, material cabinets were organized.

## 5. CONCLUSION AND EVALUATION

Accreditation is a subject recently on the agenda of university - vocational training in Turkey as it is in the rest of the world, and it is gaining importance each day. University education has gained an international dimension. While holding an accreditation documents the quality of the education offered by an educational institution, increases its desirability and demonstrates that it meets national or international standards; it also ensures the recognition of the diploma issued by the institution. Moreover, with globalization has come the ability for architects to find work in other countries as well as their own. The diplomas being recognized in other countries, having a minimum knowledge and skill as a professional are of great importance today.

For the first time this year, the Institute for Higher Education (YÖK) has included information regarding the accreditation of universities in its Student Selection and Placement System (ÖSYS) Higher Education Programs and Quotas Guide for students making their applications. In order to obtain accreditation, an architecture department must develop a program parallel to their mission, and is expected to train knowledgeable and skilled individuals who can produce work according to performance criteria. Accreditation is an ongoing process. An institution holding an "accreditation" certificate does not mean that it is permanently accredited. The accreditation process is repeated at the education institution at specific intervals by the institutions carrying out the reviews, and whether the determined standards are met is controlled.

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[http://www.yok.gov.tr/egt fak doc / agt fak doc / akr2 / bol1 / bolum1\\_1.html](http://www.yok.gov.tr/egt fak doc / agt fak doc / akr2 / bol1 / bolum1_1.html)

# Achievement Comparison of Lecture Method and Media Using in Rural People Training at Kanchanaburi Province

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## ABSTRACT

Main purpose of this research was to study the effectiveness of media using in training to rural people relative to traditional lecture method. The sample groups were people in Kanchanaburi province, Thailand. The data were collected by questionnaire. Sample groups were divided to 4 groups by age. They were under 15 years old, 15 – 25 years old, 25 – 55 years old and more than 55 years old. From this research, it was found that the satisfaction in using media as technology-assisted instruction had an average assessment as followed, 3.6, 3.3, 2.2 and 2.9. The research showed that younger people are better in learning from media. Senior in rural area liked tradition learning more than self- studying from media.

**Keywords:** Achievement, Rural people, Kanchanaburi province, Media

## INTRODUCTION

People in rural areas training is the mission of the Thailand University. The purpose of the training is to increase knowledge for improving the quality of people's lives. Trainings with trials are having trouble in explaining because of the lack of basic science learning. Most training failed to establish adequate control experiments to rule out alternative explanations for the different groups. Therefore, it is necessary to find a solution. The idea is find something to help, such as media. Media refers to technological devices used for the purpose of instruction (Clark & Sugrue, 1995). Instructional methods refer to strategies used within a course to convey course content such as providing opportunities for practice or group discussions. Media-based instruction is one of another way that can create a meaningful learning environment where learning is fostered and supported. In a survey of organizations in the American Society of Training and Development's benchmarking service, the percentage of companies using technology-delivered training increased from 8% in 1999 to 24% in 2003, and more than half of the technology-based courses in 2003 were delivered online (Sugrue & Kim, 2004). In addition, over 1,100 institutions of higher education in the United States offer online courses (Newman & Scurry, 2001). The present study examines cumulative evidence of the effectiveness of media relative to lecture method, since it is the most common training technique (Sugrue & Kim, 2004). It is important to determine whether or not media is effective for imparting useful knowledge and skills, as a form of technology-assisted instruction (TAI). If evidence suggests that it is not as effective as existing, organizations and institutions may be more cautious about replacing traditional teaching instruction with media, or develop more effective training methods. But if using media is effective under some conditions, we can use the results of this study to identify optimal conditions for learning.

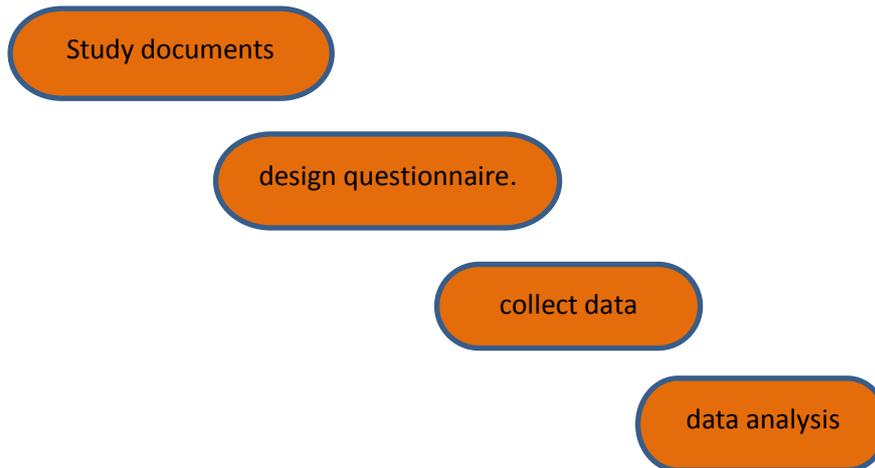
## RESEARCH QUESTIONS

The objective of the study was to examine the effectiveness of media-based instruction relative to traditional lecture method.

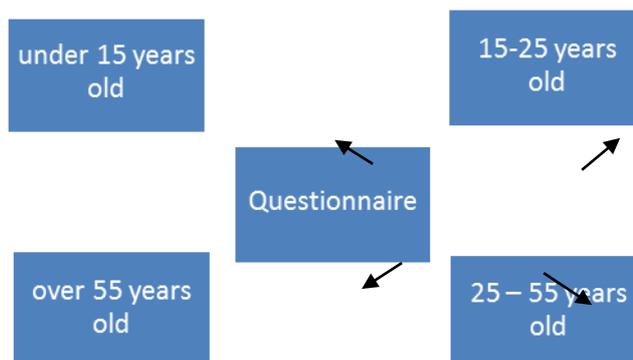


## METHOD

This research paper utilized the qualitative method. The data were collected by questionnaire. Questionnaire had been conducted by the researcher. First, study all available documents and research papers. Second, design the research tools and prepare questionnaire. The research tool was designed to elicit information from the respondents. The questionnaire sheet consisted of two parts, the first part was about the status of the respondents and the second part consisted of satisfaction in using the media. Third, collect data. Fourth, do the data analysis. The statistics used to analyze the data were percentage, average and standard deviation.



The informants could be classified into four main groups. The first group consisted of 10 persons who were children in rural area, under 15 years old. The second group consisted of 12 persons who were teenager, 15-25 years old. The third group consisted of 12 working persons, 25 – 55 years old. And the last group was 13 senior persons, over 55 years old. Collected data was conducted by these steps.



## FINDINGS

### 1. The status of the respondents:

Respondents of this research are divided into male and female by females is 65.9 percent and 34.1 percent were male. If differentiate by age group, the first group of age under 15 years old had 60 percent of female and 40 percent of male. The second group (15-25 years old) had 83.3 percent of female and 16.6 percent of male. The third group of 12 working persons consisted male and female evenly by 50 percent. And the last group, which is senior people, had 53.8 percent of female and 46.2 percent of male.

**Table.1.** status of the respondents (%)

Group	male	female
All respondents	34.1	65.9
under 15 years old	40	60
15-25 years old 0.031	16.6	83.3
25 – 55 years old	50	50
over 55 years old	46.2	53.8

## 2. Satisfaction in using the media:

From this research, it was found that the satisfaction of using media as technology-assisted instruction had an average satisfaction assessment (from full mark 5) as follows; The average assessment of the first, second, third and fourth group were respectively 3.6, 3.3, 2.2 and 2.9.

**Table 2.** Satisfaction assessment of media using

Group	Satisfaction score
under 15 years old	3.6
15-25 years old 0.031	3.3
25 – 55 years old	2.2
over 55 years old	2.9

Group 1 could learn from the media as well. They didn't have problem about media playing speed. And also, they understood word on media. They didn't want more explanation. They informed that the content in the media are sufficient. Group 2 was similar to group 1. But Group 3 and Group 4 were different from groups 1 and 2. They wanted more slowly speed. They couldn't catch word on media clearly and they wanted more detail.

**Table 3.** Problem of media using

Group	main problem
under 15 years old	Not have
15-25 years old 0.031	Not have
25 – 55 years old	Quick speed, couldn't understand clearly
over 55 years old	Couldn't catch word, couldn't understand

## CONCLUSIONS

From the findings revealed that the essential factors influencing the media understanding of people in rural areas were age and education. Gender was not the factor. From the questionnaire, there are no different data between male and female.

Children under 15 years are familiarity with the media because it currently has a widespread of medium instruction in classroom. Population in the age range 15-25 years old in rural areas sometime finish their school learning but they still continue learning about new technology.

So these 2 groups are able to understand the media as well while the other 2 group are focus on the work and daily routine. They are not familiar with studying from media. They like traditional classroom instruction, learn from human which have the interaction. In addition, physical performance is also the other factor especially in senior group.

## **RECOMMENDATION FOR FUTURE RESEARCH**

The future research in this area should focus more on type of method which suitable for member of each age and each community area.

## **ACKNOWLEDGMENTS**

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## **Action Research in Teacher Education: Cases From ELT Teacher Trainees**

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### **ABSTRACT**

Collaborative action research is a powerful form teacher development. In the recent years, it is becoming a common and a popular tool in English Language Teacher Education by taking its place as an important component in pre-service teacher education. Since it is still relatively uncommon for teachers to conduct action research studies in their own teaching, we aim at familiarizing our English Language Teaching (ELT) teacher trainees with the major characteristics and procedures of action research by also giving them opportunities to conduct their first collaborative action research studies. The present study discusses ELT trainees' first implementations of collaborative action research studies in the teacher training programme. Four collaborative action research cases conducted by ELT teacher trainees focusing on their own solutions and conclusions to their unique problems related to classroom silence, motivation, and vocabulary learning are discussed. The results indicate the positive role of action research as an important component of teacher education.

### **INTRODUCTION**

Action research is a process in which participants examine their own educational practice systematically using the techniques of research (Kemmis & McTaggart, 1988; Nunan, 1992; Burns, 1999). Nunan (1992) points out the three major characteristics of action of action research: It is carried out by practitioners- the teachers, it is collaborative, and it is aimed at changing things. In practice, teachers conduct action research studies when they want to solve an educational problem they have in their own classrooms in order to improve their practices.

Collaborative action research is also known to be a powerful form teacher development. However, it is still relatively uncommon for teachers to conduct action research studies in their own teaching (Borg, 2010). Thus, in the recent years, it is becoming a common and a popular tool in teacher education by taking its place as an important component in pre-service teacher education in order to familiarize teacher trainees with the major characteristics and procedures of action research and by also giving them opportunities to conduct their first collaborative action research studies from the very beginning of their teaching experience (Atay, 2008, Shanks, & Miller & Rosendale , 2012).

The purpose of the present study is to explore ELT teacher trainees' attitudes towards action research studies. We also aim at gathering more information on teacher trainees' overall evaluation of their own action research experience, the effects of this experience on their teaching and their concerns towards being a 'Teacher as Researcher'.

### **THE STUDY**

The participants of the study are 9 ELT teacher trainees from Uludağ University, Turkey. All the trainees are 3rd grade- 5th semester- students. All of the participants are in charge of planning and teaching English to their assigned classrooms. They are taking their regular courses including ELT Methodology II (2-theory, 2-practice). ELT Methodology II course primarily emphasizes the application of classroom-based research, teacher-directed research and action research: characteristics, procedures, data collection techniques by giving particular importance to action research.

In the initial stages of the term the teacher trainees are well informed about the definition of the action research, its major characteristics and procedures. After reviewing the components of the research, the data collection techniques, four different action research studies selected for further examining are dealt with the course instructor during the practice sessions. Then, the teacher trainees are asked to form pairs or groups of threes to

conduct their own collaborative research studies relying on classroom problems they have in their actual teaching. Following the action research procedures suggested by Cohen, Manion, and Morrison (2000) as shown below, the teacher trainees are asked to perform their action research samples.

- Stage 1: Researchers identify, evaluate, and formulate a problem that is viewed as critical to their everyday teaching.
- Stage 2: Researchers consult with other interested parties – teachers, other researchers, and administrators – in order to focus the problem more and perhaps suggest the cause of the problem.
- Stage 3: Researchers review research literature to find out what can be learned from comparable studies.
- Stage 4: Based on their reading, researchers may modify or redefine the initial statement of the problem, which may take the form of a set of objectives or a testable hypothesis.
- Stage 5: Researchers specify the research design including the participants, choice of materials, and procedures.
- Stage 6: Researchers clarify how the project will be evaluated with an understanding that this evaluation will be continuous.
- Stage 7: Researchers implement the project undertaking the data collection process.
- Stage 8: Researchers analyze the data, draw inferences, and evaluate the project.

During the remaining ten weeks, the action research groups have step by step followed the procedures listed and provided weekly reports to their instructors about their research. The course instructor-and also the author of the present study- is responsible to provide feedback to each group in each practice session. Thus, the challenges action groups faced with are immediately solved and suggestions are provided.

Besides the four collaborative action research cases conducted by ELT teacher trainees focusing on their own solutions and conclusions to their unique problems in the classroom setting, the data collection techniques employed in the present study include semi-structured interviews with the trainees, course instructor's field-notes and observation.

## **FINDINGS**

In this part of the paper, brief information about the each four action research case is summarised by giving details about the real classroom problems teacher trainees detect during their teaching and then decide as the focus of their action research studies.

- **CASE I:**  
The first research group consists of two collaborative teacher trainees. The trainees are teaching 38 7th graders- two groups. From the first lessons of their teaching, they notice a problem: "Silence". Students are keeping quiet throughout the lessons and they are unwilling to participate. So, the trainees identify their problem as 'Classroom Silence' and following the action research procedures they collect data via questionnaires, interviews and observation. They try identifying the reasons of silence and solving the problem by trying different strategies in the classroom. Finally, relying on the data, they list out some effective strategies that may help them in their unique setting.
- **CASE II:**  
The second research group consists of 3 collaborative teacher trainees. The trainees are teaching 36 A2 level- three groups- adult learners attending a private language school. Although they have been taking EFL courses for over 10 years, they still have difficulties in English. Relying on their observation and consultation, the trainees identify 'limited vocabulary repertoire' as the main reason of their failure. Getting help from the related literature and asking students' preferences, the trainees decide on different actions like vocabulary learning with e-materials, vocabulary learning with vocabulary reports etc. After applying different techniques in the classroom, they get students' opinions by arranging interviews. They also evaluate students' progress by referring quiz results. Finally, they figure out some effective vocabulary teaching activities that are supposed to be valid in their own setting.

- CASE III

The third group is comprised of two collaborative teacher trainees. They are teaching 16 A2 level university students. The greatest challenge they have with their young adult students is their students' being 'unmotivated' in the Foreign language lessons. Considering their age and needs, the research group, tries integrating technology to their EFL classes. They basically focus on vocabulary learning as they believe this is the most important limitation in their language classes. They prepare different word lists, videos, vocabulary games, tests to take their attention and discuss with the students how effective they are in their setting.

- CASE IV

The fourth group, similarly, consists of two collaborative teacher trainees. They are teaching 15 5th graders attending a public school. The trainees are quite dissatisfied with the students' limited interest on learning English. Reviewing the literature on young learners, they decide to take their attention by considering the recommendations of 'peripheral learning'. They, then, decorate the classroom setting by posters, flashcards and colourful materials. They conduct follow up interviews with young children to support the observation data and identify some tips that would work well with their young learners.

## CONCLUSIONS

Just before the term is over, the teacher trainees have completed their action research studies. Then, it is time to explore trainees' attitudes towards action research. After the analysis of the qualitative data gathered through different sources, some emerging key themes are categorised. First of all, the ELT teacher trainees emphasise the power of action research to enable them engage more closely with their classroom teaching. That is, the trainees indicate that the process help them both to understand their own practices and improve them. With regard to personal and professional growth, the trainees indicate the positive role of action research in terms of developing confidence, building self-efficacy in teaching, encouraging change and reflection, increasing self-awareness and personal insights, developing critical thinking. The teacher trainees also indicate that action research provides them the opportunity to develop teacher-student relations by encouraging mutual 'sharing'. Secondly, collaboration with other teacher trainees is also declared as one of the important contributions of action research. The teacher trainees all agree that action research encourages sharing and cooperation among them. Collaboration also facilitates the process by challenging them to think many issues. Thirdly, the trainees are quite satisfied with their action research and they are encouraged to write up and publish their own work. This is considered to be an important step in achieving the concept 'Reflective Practitioner' and 'Teacher as Researcher' perspective. As Stenhouse (1975: 143) indicate

- The uniqueness of each classroom setting implies that any proposal-even at school level-needs to be tested and verified and adapted by each teacher in his own classroom. The ideal is that the curricular specifications should feed a teacher's personal research and development programmes through which he is increasing his own understanding of his own work and hence bettering his teaching... It is not enough that teachers' work should be studied; they need to study it themselves.

As we strongly believe the potential of action research as an important tool in teacher education, we would highly recommend teacher education programs to integrate action research practices to their curriculum. It is also particularly important to increase planning/ teaching opportunities for 3rd grade EFL teacher trainees', where they can perform real action research samples as practitioners in their own classrooms. Providing in-service training for more experienced ELT teachers in order to make them familiar with action research may also take an important part in teacher development. Last but not least, we also need to encourage and support action research studies in school-settings in Turkey.

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## Actual Problems of Inclusive Pedagogy in Slovakia from the Education Aspect

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### ABSTRACT

One of the possibilities of increasing the social position and social interactions of pupils with special educational needs is the application of targeted educational programs. The presented scientific study approaches the current issues of inclusive education in Slovakia in terms of the educational aspect in the context of the social component of inclusive pedagogy. In practical terms, the author points out the social situation and interaction of pupils with special educational needs in inclusive leisure activities. The possibilities of its support were also explored through targeted educational programs with a sketch of the perspective of their further development.

### INTRODUCTION

Nowadays the inclusion is the part of the basic human rights movement. Its supporters seek to ensure that regular pupils are not excluded by their physical disability or by psychological or physiological differences. Inclusive education, in essence, does not only concern certain specific groups of pupils, but all pupils involved in the process of education and training. So, talking about the school environment as such, because every pupil is an individual, is something specific. It is just a school that should go as far as possible to the pupils to meet their specific development needs. Of course, in order for education to be directed towards a certain cultural homogenization. Each participant should therefore have at the end of the learning process such competencies (knowledge, skills, competencies and values) that enable him / her to apply to the society in which he / she lives.

### THE THEORETICAL BACKGROUND

As stated by B. Kováčová (2010), we do not refer to the majority and minority groups **in the process of inclusion** but to a heterogeneous group of people or children with their differences, especially with relatively irreparable mental, somatic, sensory impairment, with a potentially damaging impairment of communication ability, psycho-social disturbances or children with obvious or hidden threats or an acute risk of disruption or disability, mother tongue, family, environment, different nationality, different eye color, height, weight, etc.

J. Průcha et al. (2008, p. 322) in the Pedagogical Dictionary define the inclusion in the field of education as follows: *"This is a change in the view of the child's failure in the school system or the failure of the school system in the case of a particular child. The principle of inclusion implies that ordinary schools should educate children regardless of their physical, intellectual, emotional, social, linguistic or other conditions. Conventional schools with inclusive orientation are the most effective means of suppressing discriminatory attitudes. Through climate change at school and class, it allows children inclusive education, including children with specific needs, including children with severe disabilities."*

Introducing an inclusive education model requires these **changes and conditions**:

- It is essential to relieve the external pressure on pupils' school performance, the quality of the teacher's work and the quality of the school have to be considered more complex. The success of the learning process should be given in particular by the individual progress of each pupil;
- The teacher should have greater autonomy in the pupil assessment process. They have to be able to use all forms of evaluation, not only summative (classification by marks), but also a formative, critical and authentic assessment. School marks can't have a primary status in inclusive school;
- There is a need to strengthen the competence and responsibility of teachers and teachers for the individual progress of pupils. This, in turn, implies a weakening of the importance of an external evaluation, which primarily monitors objective test data and draws attention to quality indicators of success (e.g. the success of methods and practices for helping pupils with special educational needs). Emphasis should be put on an internal assessment (self-assessment), which is built on its own quality concept and on the priorities that the school follows (Bagalová, L., 2015, pp. 6-10).

Š. Porubský (2013) states that an inclusive education system is the only way, as otherwise there will always be some groups that are marginalized or excluded from the learning process in the sense that they do not get what they need in order to succeed successfully in company. The gap between standard middle streaming and marginalized groups has increased so that we will need ever greater costs to bridge this gap.

D. Ostatníková (2013) points out that the moral decline of today's society and its excessive economic focus threaten not only the healthy functioning of society but also the successful inclusion of individuals with disabilities, disruptions and threats.

While in the past, the platform of access to these individuals, in particular the socio-economic factor and the cultural and ethical factor played a very important role in accessing and caring for these individuals, we believe that in today's society, these platforms can paradoxically in the inclusive education more harm than help. Obviously the whole concept of inclusion and its implementation is significantly influenced by current social conditions. As P. Zászkaliczky (2010) adds: *"The economic crisis and the identity crisis in society cause many conflicts and the values, such as acceptability, tolerance, and respect that are characteristic of inclusion, are increasingly disparaging"* (In Šuhajdová, I., 2005, p. 17).

To **the current problems of inclusive education** we could note the following starting points. Inclusive learning means to create education conditions for all pupils in schools to help them overcome barriers to learning and encourage the development of their individual potential. An inclusive approach is defined as "unconditional acceptance of the special needs of all children". Heterogeneity is perceived as normality (Bizíková, L., 2015, p. 5).

Understanding inclusion as a natural, everyday part of our lives requires that inclusive education be developed in the world of children, through education in educational institutions as well as in the adult world, their cultural, social, working environment.

People with disabilities, disturbances, threats are inseparable parts of our society. Passing their pre-school and compulsory schooling together with intact children and pupils does not mean for them the end of the inclusion, on the contrary, it should be the beginning of their life-long social inclusion. As a consequence of this, inclusive society and inclusive education have to create a symbiosis whereby they will enrich, complement, learn from one another, or ultimately cooperate to achieve the common goal of inclusion in all areas of our life (Šuhajdová, I., 2015, p. 18).

A study by B. White (2007) found that from the five participating inclusion teachers after five years was only the one convinced that inclusive education could be successful. Others teachers were frustrated and tended to blame pupils with special needs for not being sufficiently motivated. Alarming on this research was that the attitudes of teachers at the beginning and the end of the study and hence of inclusive education did not change very much.

Despite the increasing interest in educating pupils with health disabilities in regular schools, they are not sufficiently secured in all schools in the constituency of municipalities or self-governing regions compared to special education. The practice and the findings of the checks imply the need to endorse in schools, in particular, support services and other elements which are aimed at educating all pupils without distinction according to their educational needs and personal prerequisites so that each school can effectively educate all pupils without distinction of their special educational needs or talents (Tekelová, M., 2013, p. 18).

It is obvious that our education isn't ready for inclusion. If materials are lacking, there is a lack of cooperation between primary school teachers and special pedagogues and psychologists, and such cooperation with special schools is naturally. The results as such can't yet be evaluated as inclusion pupils have not yet reached the years in which such an assessment could be made. However, the results are offered, for example, in the current research on the issue of special pedagogical diagnostics, special pedagogical counseling and early intervention for children with disabilities in Slovakia (Vančová, A., Kastelová, A., 2016).

In inclusive school, any variety is perceived as an opportunity to develop acceptance, cooperation with others, empathy, tolerance. **Experience from abroad** shows, for example, to the inclusive school that has been implemented in the Czech Republic for many years.

One of the successful projects is the Human Rights League project "Fair School". The main objective of the project is to contribute to the development of a basic education system in which no one will be excluded from the mainstream of education due to social disadvantage. The League grants the Fair School Certificate to a school that meets the standards, particularly in the field of human rights and non-discrimination. Valuable are the experiences that can be generalized and appropriately used or revealed problems that do not arise from the nature of the process of inclusion but stem from external objective as well as subjective factors.

The "Fair School" project details the benefits and possible problems that may arise in the process of converting a regular school to an inclusive school, at the level of a pupil with good social background, disadvantaged child (social, mental, physical), parents, schools and society (Bagalová, Ľ., 2015, p. 14).

<p style="text-align: center;"><b>Table 1</b>  <b>INCLUSIVE EDUCATION FROM THE PERSPECTIVE OF:</b>  <b>(Tannenbergerová, M., Krahulová, K., 2011, pp. 4-8).</b></p>		
	<b>BENEFITS:</b>	<b>POSSIBLE PROBLEMS:</b>
<b>1 PUPIL</b>	<ul style="list-style-type: none"> <li>- Class diversity provides the child with a realistic picture of the society in which the child will live, work, and better prepare for the future.</li> <li>- Teacher's individual approach can help the child to discover skills that the child didn't know.</li> <li>- The child learns to naturally perceive and respond to changes and differences.</li> <li>- In a heterogeneous group, a child better develops social and civic feelings, communication skills, or the ability to solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>- If a parent does not have a positive relationship to inclusive principles (for example, he or she expresses negatively about his / her child's classmates), it may affect the child negatively, because the child perceives the differences as a natural part of life.</li> </ul>
<b>2 PUPILS WHO ARE SOCIALLY OR PHYSICALLY DISADVANTAGED</b>	<ul style="list-style-type: none"> <li>- The child gets the opportunity to find friends in a regular college, its social environment is not limited to children with disabilities.</li> <li>- Teacher's individual approach can help the child to discover skills that he / she didn't</li> </ul>	<ul style="list-style-type: none"> <li>- Children with disabilities, disabilities are mostly accustomed to special treatment, which can lead to dependence on others. Inclusive school teaches kids to make the most of their own abilities which children can perceive negatively, for example as a loss of attention.</li> </ul>

	<p>know.</p> <ul style="list-style-type: none"> <li>- The child gets the feeling that is a part of society, which strengthens its self-esteem.</li> <li>- The diversity of the class provides the child with a real picture of the society in which it's living, working, making it better prepared for the future.</li> </ul>	
<b>3 PARENTS</b>	<ul style="list-style-type: none"> <li>- The openness of teachers, their willingness and willingness to cooperate allows parents to more effectively control the results and the course of their children's education.</li> <li>- Inclusive access to education makes it easier for parents to educate their children.</li> <li>- By participating in various school events, parents better know the life of their children.</li> </ul>	<ul style="list-style-type: none"> <li>- Due to the fact that most inclusive schools are actively working with parents, parents may have to spend more time on school, which may seem to be a problem for someone.</li> </ul>
<b>4 SCHOOLS</b>	<p>They are constantly developing the teacher's abilities and forming a team from the pedagogical colleagues.</p> <ul style="list-style-type: none"> <li>- The inclusive school emphasizes the quality of team collaboration, making the teacher's work easier.</li> <li>- An inclusive school plays an important role in local community life. It is a cultural, educational and family center.</li> </ul>	<ul style="list-style-type: none"> <li>- Inclusive process is at the beginning time-consuming.</li> <li>- Implementation of inclusion requires organizational change and staffing.</li> <li>- Changing conservative thinking may be challenging for teachers, parents, and school leadership.</li> </ul>
<b>5 COMPANIES</b>	<ul style="list-style-type: none"> <li>- Inclusive school leads children from early childhood to tolerance, empathy and understanding.</li> <li>- Deconstruction of xenophobia, racism and learning to co-operate with minorities.</li> <li>- Inclusive school helps solve taboo topics.</li> </ul>	<ul style="list-style-type: none"> <li>- People usually oppose changing stereotypes, introducing new practices into practice may require many efforts.</li> </ul>

**In the issue of inclusive pedagogy in terms of education,** we quote P. Lenčo (2012, p. 182), which states that: *"Similarly to formal as well as informal education, it should pay increased attention to the application of an inclusive approach to people with special educational needs"*. From this point of view, free time education seems very necessary and beneficial. It's not an exception if such children are isolated from an intact population, nor do they have enough free time in all regions. In special schools, for mentally handicapped children, there are also school children's clubs, but there, as well as in education, children do not have the opportunity to interact with intact peers.

Education should include two processes: the individualization and the socialization. Although they may seem contradictory, a balanced and full-fledged life of man is necessary. It should be borne in mind that if the socialization is precarious, the child can become too conforming, passive and submissive, but if the individualization becomes precarious, the individual becomes selfish and unable to cooperate (Zelinová, M., 2012, p. 27).

**Non-formal education** has several distinct features over formal education. These can positively influence the inclusion of people with disadvantages or disabilities in society. Differences lie mainly in its principles, methods, forms. Furthermore, it is characterized by greater autonomy, non-standard environment, activity character, more open organization of educational activities, but also non-traditional composition of educators, not only professionals but also volunteers (Kratochvílová, E., 2010, pp. 75). These appears to be an appropriate environment for applying an inclusive approach to education. L. Fenyvesi, D. Kollárová and G. Pintes (2014) complement this topic in view of the specifics of the professional start of educators in the conditions of school children's clubs.

One of the main arguments for inclusive education is **the social interaction** in particular. However, it is important that educators can also ensure their direct interaction, as it may happen that intact children do not have to be interested in children with disabilities.

In addition to the pedagogue, however, according to some research findings, it appears to be an effective peer support. For example, research by S. Naraian (2011) has highlighted the fact that sustained parental support can be spontaneously provided in primary education to a pupil with disabilities. At the same time we have to state that we share the opinion of N. Bizová (2012, p. 148), which states that: *"The inclusion of a pupil with a disability in the classroom, a children's school club or an interest unit without further work with a group of children does not guarantee success inclusion"*.

One of the best ways to support inclusion is to rock support. C. Hughes and E. Carte (2008) describe the positive experiences of schools in the US where such forms of support were implemented within the framework of teaching. There are a number of rosters support programs that are mainly focused on tutoring, mentoring, or prevention of socio-pathological phenomena (Liberčanová, K., 2011, p. 202). In Slovakia, peer programs are used mainly for tutoring. They are mostly implemented by civic associations.

**The peer support for inclusion in educational establishments** is that the peer-bearer engages his or her disability or disadvantaged group in group activities, is involved in teaching, exercising tasks and knowledge, and last but not least, spends the time with him, and acts as a mediator in establishing new friendship relationships with other children. Therefore, their application in education is not only desirable but also perspective. The basic pillar is the difference of children and their guidance to understanding the differences as enriching factors and phenomena for their own personal growth.

The free-time and interest-based services could be a good environment for **diversity**, as they are not limited by any performance and content standards. Easily achievable is the age heterogeneity, gender heterogeneity, heterogeneity based on the type of temperament of children, the cultural, ethnic or linguistic heterogeneity. Here are some rules and principles for the effective functioning of such a social group as a whole. In addition, we are talking about the specifics of integration of students with specific educational needs at the university, which are addressed by V. Beliková, H. Zelená and Z. Babulicová (2012).

The first step should be to understand this heterogeneity, its naturalness and its benefits. Only then can we start working on its full application in practice. In order to implement inclusive education, it is necessary for the teacher to recognize in his/her educational group the basic criteria in which all are similar and different, which are specific to individuals, while fully respecting them in the direction of individual approach (Polakovičová, R., 2015, 2016; Komora, J., Polakovičová, R., 2013<sup>1,2</sup>).

## THE STUDY

In our study, we focused on the issue of inclusive pedagogy in terms of leisure time, and we followed several indicators (see Nagyová, K., 2017). Our **main goal** was to describe the issue in depth and to deepen it into its context. That is why we have chosen the qualitative nature of the work. We have therefore set two fundamental **research objectives**:

- C1: To point out differences in the education of intact children and children with mental disabilities.
- C2: To point out the benefits of inclusion of mentally disabled children in terms of leisure time education.

From the research objectives we have identified the following **research questions**:

- O1: Do children with mental disabilities have the opportunity to spend free time in the spirit of inclusion in Levice and its surroundings? (As an available research file)
- O2: What is the impact of inclusion in free time education on all its stakeholders?

- O3: Do children with mental disabilities in the interest group and some friends or their healthy children just accept as part of the group?
- C4: What positive is the inclusion of your free time?
- C5: Have parents of children with mental disabilities sometimes thought about inclusion in education?

Our **research group** consisted of 5 mentally handicapped children, particularly in the middle of mental retardation, attending a special elementary school in Levice within the framework of education, but in leisure time attending for a number of years various interest departments, with the common and basal reality of all interest departments is their inclusive nature. In addition to the children, our parents' testimonies were very much needed for the purposes of our study, and so they also belonged to our research team because they have innumerable experiences in the field and personally touch their issues. In addition, they are best able to describe the behavior and survival of their children, and to estimate the impact of individual devices and leisure time activities, taking into account the environment where the education takes place, on their offspring. A total of 9 parents were involved in our research.

A very important part of the research group was, last but not least, pedagogical staff leaders of individual interest departments who come into contact with children with mental disabilities and have decided to lead their interest department in the spirit of inclusion. We were able to obtain testimonies from 3 such pedagogues.

## **METHODS**

In order to achieve our stated goals, ie to answer research questions and to clarify the research objectives, we have chosen the qualitative nature of the work, taking into account the deeper penetration into the given issue and thus a better understanding on the basis of the personal experience of our respondents.

We used the following **research methods** to collect data:

The **case study** was used as an illustration of the individual life stories of children and their families, which were the subject of an entire study of the influence of free time inclusion. We focused on the description and characteristics of their diagnoses and the specifics that arise for teachers working with them, whether in education or training. We also described the family environment and the backgrounds of children, as the family environment is one of the important factors in shaping the personality of each person. Last but not least, in the case of case studies, we have left room for the description of personality expressions, behavior and survival as well as the work in the school environment of each child that formed the object of our investigation.

We interviewed parents who have children with mental disabilities included in the free-time interest group among healthy children, as well as educators who lead interest groups in the spirit of inclusion. We used a **structured interview**, in which we asked respondents open questions, which are more difficult to evaluate, but our goal was to give respondents the opportunity to express deeper thoughts and opinions, according to qualitative research. We focused on deeper intrusion into the issue of leisure time inclusion, and we were interested in the reflection of all stakeholders on the subject. We also wanted to point out how inclusion can, in our opinion, be more effective, since it is a matter of opinions, attitudes and understandings that should be based on quality education, which at the same time provides free time for adequate space.

**The data collection** was made through a meeting with individual respondents. We typed them with respect to our personal experience with them through work in a special elementary school, we knew that they were attending interested departments along with intact children. Data collection took approximately 3 weeks, each meeting was recorded on a dictaphone and then converted to a written form.

When interviewing families and their children, we proceeded individually, so we set a particular time for each family to get the most honest and truthful information possible and then compare the testimonies to each other. We preferred personal contact because of the greater authenticity of data collection and information. We

interviewed our parents without the immediate proximity of the children, playing on a nearby playground. However, the parenting couple had a synchronous interview with us.

When interviewing educators, we also approached individual interest groups without the presence of the children concerned with the research.

**The data processing method** was as follows. Case reports have been prepared on the basis of interviews with parents of children as well as with pedagogical staff in the special school attended by all children. We also went from a study of children's health records from specialist doctors as well as from psychological reports where a family history was also based, as well as a study of school documents (IVPs) and reports from which we were able to obtain information about children's behavior, specific educational needs as well as learning outcomes. Interview was obtained through direct contact with respondents, recording interviews on a dictaphone, and then transcribed for better illustration and comparison of the results.

## RESULTS

### Built case reports

For a more accurate illustration, we have compiled the following case studies of the individual children that are part of the subject of our research. We briefly focused on a family history, a description of the state of health, behavioral characteristics, the school environment, the specifics of access to them, and a description of interest activities.

### Interview Analysis

In the interview, we turned to 9 parents, namely 4 parental couples and one single mother, who have 5 children with mental disabilities. It is also common for all that their children, at the same time, visiting or in the past attending an interest of an inclusive nature. Our parents willingly answered questions. They were speechless, they needed to express their opinions, feelings and attitudes, and appreciated the space offered. From many expressions, we felt joyful that even a handicapped child can be integrated into healthy children, others have read the disappointment in negative experiences, but we can say that all parents have a real interest in their children and do what they can to help their children To ensure the most valuable life possible in order to balance healthy children.

**Table 2**

**INTERVIEWS WITH PARENTS OF MENTALLY DISABLED CHILDREN ATTENDING THE INTEREST GROUP WITH HEALTHY CHILDREN ON THE PRINCIPLE OF INCLUSION INCLUDED THE FOLLOWING QUESTIONS:**

1. What are the opportunities for leisure time activities in the city and its surroundings for a child with a disability?
  2. Have you noticed some influence of the interest unit on your child?
  3. What attitudes have you registered from other children in the interest department or from their parents?
  4. Does your child also have some friends in the interest department?
  5. Your child is attending a special school. Have you ever thought about inclusion in a regular school? What were the reasons for this?
- Other questions have not been the subject of our research, but they are completing the picture of the whole issue:
6. How did you approach the neighborhood to you and your child, as well as your potential admission to the interest group, did you meet?
  7. Your child is attending an interest unit. Can you specify what kind it is?
  8. What does it mean to you that your child is attending an interest unit with intact children (children without disabilities)?
  9. Would you like to have some other options for spending your baby's free time?
  10. What plans do you and your child have at the end of his / her education? Where will your child spend time when it doesn't go to school?

From these interviews, we have come to the following results. The first research question as to whether **children with mental disabilities have the opportunity to spend free time in the spirit of inclusion within the city of Levice and its surroundings** has consistently learned from all parents that the possibilities are very limited. It is not yet common practice

for the heads of interest departments to accept children with disabilities and there is no prescription or law to motivate them. Nevertheless, these parents have been able to find interest for their children, where they have the opportunity to spend their free time in the company of healthy children. However, they had to submit a lot of papers on their child's ability to attend the chosen interest group, and first of all they had to make a nice, friendly, willing and new affair of the head of the department. In spite of this, children with mental disabilities have few options within the city and its surroundings to spend free time in the spirit of inclusion, but the demand for such options from parents is still small. All parties must gradually become accustomed to opening up new opportunities. Prevailing are facilities offering leisure activities but segregated to disabled clients, but there are also shortcomings in the perspective of prospective issues, especially for capacity reasons where demand exceeds supply and so the future will also be for the parents of these children, other children with disabilities within the city environment, the dilemma where to go with the child after the end of the educational process.

Our second research question was, **what impact does inclusion of free-time education have on all its stakeholders?** Parents of four children consistently reported observed changes in their children's behavior after long-term attendance of interest groups, and in particular, enjoyment of activity and therefore overall positive emotion. Furthermore, children became less shy, more open, self-confident, enjoyed a sense of usefulness, especially when they have the opportunity to present themselves to the public and experience success. In just one case, unfortunately, the inclusion did not follow the parental plan, and the child eventually turned off from the interest unit because she was not accepted among the group members, the teacher's intervention did not help and the girl had psychosomatic troubles. For all parents, however, the opportunity to visit their child's interest in healthy children was somehow fulfilled by their wish for meaningful spending of their child's free time; in addition, this option served as a form of satisfaction for all of their parents to have their child in something successful for a while the feeling of having a child with disabilities, and everyone expecting their children to grow up and grow personally will improve their social skills. Only in one case, for a negative experience, the parents came to the conclusion that their daughter would be better off among the seborrheic people.

The third question was whether **children with disabilities also had some friends in the interest department?** All the parents consistently said that they were still a form of acceptance rather than friendship, the children would greet, they would say a few sentences, but they did not want a deeper interest in themselves. It's still too little time to make progress against the beginning, but it also depends on the children in the group, it seems that younger people are adapting more easily. Of course, a great deal of attention must be drawn to the behavior of children with disabilities towards others, and that is why their reciprocal relationship with them depends on them. In one case, however, it turned out that the children did not get used to it and despite the effort, the problems could not be eliminated. In this case, the negative situation had serious consequences for children with disabilities in the form of psychosomatic difficulties. It therefore shows how extremely important it is working with healthy children as much as possible to bring them closer to the health problems of children with disabilities and to be a model for their right access to them. These facts arise from the personality of the head of the interest unit, that is, the pedagogue, his convictions, attitudes, moral values, education, experiences. On healthy children there is undisputed influence of family education and its value orientation.

We were also interested in **what kind of benefits has the inclusion in the free time?** Here, parents agree that their children, in the first place, bring joy and thus a more positive attitude. Furthermore, children became less shy, more open, self-confident, enjoyed a sense of usefulness, especially when they have the opportunity to present themselves to the public and experience success. For other children, such inclusive functioning as social training in the area of the elimination of prejudices, fear or feeling of superiority.

The last question that asked **whether parents sometimes considered inclusion in the education as well?** Three families said they never thought about inclusion in the classroom, or they had the opportunity to appreciate teachers' attitude as well as the quality of the teaching process in a special school or the whole climate and the relationships in school and class. In addition, they are aware of the limitations and specificities of their children's education, as well as intolerant approach to the environment. In two families, there were situations when they considered inclusion because their parents felt that their children did not develop sufficiently and collaterally. In the end, however, they did not reject the inclusion for the reasons already mentioned.

Parents' view of the inclusion of free-time units and facilities based on their personal experience has very accurately outlined the essence and gave us a comprehensive view of inclusion's core. Through the mediated experience, we looked at the shady pages of inclusion as well as the undeniable positive it brings.

However, we also enjoyed the view of the other side, namely the educators and the staff of the department, who also willingly shared their insights into inclusive practice as well as their valuable insights and attitudes on this issue. We contacted 4 pedagogical staff, who have just mentioned children with mental disabilities included in their interest departments/groups. The speech gave us a lead of art course in the Center of free-time, the head of the dance group at the elementary art school leading the folk dance class. The speech was refused by a former teacher who led the dance ring a year ago, focusing on social dances. Finally, we gave the speech from the head of the swimming course.

**Table 3**

**INTERVIEWS WITH LEADING INCLUSION INTELLIGENCE TEACHERS AND ATTENDING MENTALLY DISABLED CHILDREN CONSISTED OF THE FOLLOWING QUESTIONS:**

- 1. At present, it is becoming more and more common to include children with various disabilities in ordinary schools and ŠKD. What is your opinion on the inclusion of children with mental disabilities in interest groups?**
  - 2. What meaning do you see in this form of inclusion?**
  - 3. What responses did you have of healthy children and their parents about integrating and accepting children with mental disabilities?**
  - 4. What were the responses of your colleagues when you started practicing your interest group on the basis of inclusion?**
- Other questions have not been the subject of our research, but they are completing the picture of the whole issue:
- 5. What is the work with children with mental disabilities within your department?**
  - 6. What do you find the most difficult thing to do with children with mental disabilities?**
  - 7. What are your plans and visions for the future with your interest group, even with regard to an inclusive idea?**

Our research question has been **about the impact of inclusion in free time education on all its stakeholders**. Here all respondents have responded that the main impact is mainly on healthy children and on changing their attitude towards inactivity. At the same time, they consider this to be key. In addition, children with disabilities learn to respect social norms and rules of behavior, they also improve their skills and learn to be more prolific. For pedagogues, such experience also brings new experiences, while one learns a lifetime, so they can also shave their attitudes and values.

Another of the research questions was **whether the children with disabilities have in the interest groups some friends**. Like parents, pedagogues have pointed out that it is just a matter of tolerance and gradual interaction, but friendship can't be said so far. There is the possibility that over time, the situation will change when healthy children mature but there is also the chance that it will never change, as children with mental disabilities have different minds, interests, and this gap will grow as healthy children grow and move forward.

We were also interested in **what kind of benefits does has the inclusion in the free time?** Pedagogues agreed that for healthy children, such a form of leisure time activities provides a space for deeply educative action through immediate experiences, allowing them to positively influence their attitudes and values and to build socially desirable values. It's the opportunity for people with disabilities to meet healthy populations, experience new social situations, discern differences and build mutual tolerance.

## **DISCUSSIONS**

As demonstrated by research results analysis, inclusion appears to be a win-win process, although it requires a highly sensitive approach and a thorough preparation of all the stakeholders involved, as well as of the whole society, both theoretically and practically. However, the results should be worthwhile, although it must be kept in mind that the results will not arrive immediately and inclusion is a long-term process. One possible subject for research could be to observe and explore social relationships and interactions between healthy children and

children with disabilities to prevent only superficial territorial inclusion and to achieve a profound meaning of inclusion. A theory could also be developed, which would then be followed in practice. It would focus on specific activities aimed at bringing inactivity of children with disabilities to healthy children at an acceptable level as well as the so- "Entangling" activities for the entire inclusive team as a lesson for educators who choose to go through the inclusion process to make it easier for them to work in new children's composition and to prevent possible failure of inclusive efforts.

Last but not least, care should be taken to care for children with disabilities after school attendance, as there is a great lack of capacity in practice. As shown by the research, parents would appreciate more facilities working on the principle of day care, where they would provide their clients with activities and activities during the day while their working parents are in employment. The question of where to place a child who is already physically mature but mentally at the child's level or unlawful if parents do not want to place their offspring in a social service facility is a big dilemma for many parents and should be a matter of interest to the whole society, Government authorities and politicians to be able to ensure a full-fledged life for people with disabilities while allowing them to live in the home, with the people closest to them. Another subject of interest should be, at the same time, sheltered workshops, so that such people do not become marginalized exiles, but they can survive their lives knowing that they are useful, because many would want to prove that they can apply, only to them it is necessary to create acceptable opportunities for self-realization and also to help the society to get out of these people too, thus eliminating the barriers in the thinking of many people in society.

## CONCLUSIONS

As we discussed in previous sections and we were trying to point out that the current state of the school system in Slovakia is not adequately prepared for the inclusion of children with special educational needs in the educational process, we would see the possibility to start with inclusion first in the free-time (no in school-time). In the case of interest activities performed by children in interest groups, the mental level and knowledge of children, such as manual skills, interest in activity and some degree of self-realization, are not necessary. Even children with mental disabilities have their own interests and hobbies, though perhaps not so creased as their intact peers, because there are also no opportunities within which their children can develop and refine. But they have a great interest in doing, wanting to do something, wanting to succeed, not just sitting in the corner or between the four walls of the apartment. Moreover, leisure time as a space especially for the upbringing and shaping of the personality provides an ideal space for inclusion, since it should benefit not only disadvantaged children but also their healthy lay-ups. Children with mental disabilities would have the opportunity to accelerate their development in certain manual, social and personality skills, a team of healthy and more skilled children could act as a sufficient stimulus for activation and therefore legitimate improvement over time. Conversely, in intact children, such an experience could also create their attitudes, social feelings, empathy. At the same time, under professional and sensitive pedagogical leadership, it would act as a means of preventing racism, discrimination, exile, and egocentrism to egoism.

Even in this area, some training for pedagogical staff, especially educators, would be needed to also be able to properly and adequately access and develop potential children with mental disabilities. An inalienable part should be the high demands on the moral aspect of the pedagogue, as it should also be totally recognized as an educational aspect of inclusion, to be congruent, and thus to be able to conquer and properly nourish healthy children. He would also have to work on the part of parents and carry out as many activities as possible to present both the work of all children, including those with disabilities, but also to point out the cooperation of children in the group, positive relations and the climate.

In our view, in our opinion, such an optimal state would be, in addition to the conviction of a pedagogue and continuous education, it was necessary for the educator to provide suitable conditions for such an inclusive form of education at the leisure time. We mean a clear reduction in the number of children, particularly with regard to school clubs. It is equally important to us to involve the pedagogical assistant in non-teaching. In addition to the aforementioned hypothetical benefits, such a form of work with the child could improve his / her relationship with the assistant, as it would also be informal education, which allows a better and deeper knowledge of the child, and therefore a more adequate development of his / her personality or compensation in deficient areas.

Also, the work of the educator is very challenging, especially to maintain discipline (it does not have methods, forms, means to maintain it compared to the teacher), and if he should be adequately dedicated to all children, he would need some support and conditioning in this respect. It would be very beneficial for the educator to cooperate with experts who are more experienced in the education of children with special educational needs, especially children with mental disabilities, either with professional scholars (school psychologist, special pedagogue, social pedagogue and others) or directly with special pedagogues dedicated to educating mentally disabled children in school conditions at the time of teaching. They should have enough information about the child, his health status, his prognosis, as well as his / her genes, the development of personality, knowledge, progress and skills, or sufficient experience with working with such a child. They should therefore be able to advise adequately on what and how to do with the child, what can be developed, what its characters are, what appears to be the most effective in terms of educational attainment and personality formation, as well as what are potentially problematic sites and situations. Such cooperation between special pedagogues, pedagogues, educators, assistants and other professional staff or specialist doctors, however, will have to break the imaginary and wrong barriers, the false feeling of competition and superiority or inferiority, and start building on balanced cooperation, aware that every single article is extremely important and can improve the quality of the educational process, and thus the whole life of mentally handicapped, but also any other disabled and disadvantaged children, whose well-being should be the focus of all those who are interested in quality, responsible and honest work. Inclusive education seeks and is deeply and truly convinced about its accuracy.

In addition, a child with a mental disability would not act as a disruptive element, since discipline and atmosphere outside the classroom is more relaxed, and activities are not immediately focused on performance that is rigorously evaluated. In addition, the most common form of education is play, which is natural for every child without exception that is to say for children intact as for children with special educational needs, also children with mental disabilities. The game brings kids together, combines the differences between them provides space for self-fulfillment, fulfillment, a sense of success and satisfaction.

Inclusion as such is a demanding and long-lasting process, requiring engagement and philosophical conviction for all involved, and for the whole of society. There is a need for an overall change in the social perception of people with disabilities, their status in society, and the improvement of care in all aspects. This change requires a lot of money, but first of all everything is at the good will of the competent and all involved in this process because of the lack of it, all efforts can be made worse.

### **The research plan**

The presented results are partial output of the research solved within the UGA project *"Modernization and innovation of the teaching of subjects focused on communication in the educational process, development of technology and culture of speech of students of universities"* V / 12 / 2017<sup>th</sup>.

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## **Adaptation of Curricular Activities as a form of Inclusion - An Experience Report**

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### **ABSTRACT**

Inclusive education implies a bilateral commitment between people with and without disability. The activities in preschool education, such as the exploration of children's stories, nursery rhymes and songs, are special moments of knowledge sharing, linguistic development, social interaction and emotional improvement. Truly sharing these moments means sharing channels of communication between the interlocutors to provide an effective exchange of information between sender and receiver. Following this principle, during a school year, a set of activities was adapted in accordance with the needs of children with Autism Spectrum Disorder (ASD), so that they could be performed in a class context targeted at children both with and without developmental disorders. This adaptation, based on linguistic simplification/structuring and the provision of multimodal information, fulfilled one of the fundamental principles of the Salamanca Statement, namely that students with and without problems should learn together. This resulted in a more active and effective involvement of the 4 children with ASD in the dynamics of the class, as well as better ability by their colleagues to deal with other realities, fostering early social and civic concerns and competences.

**Keywords:** ASD, Inclusive Education

### **INTRODUCTION**

In 1994, the Salamanca Statement (UNESCO, 1994) established the transformation of the education system in an inclusive system for all children, regardless of individual differences, as a political and economic priority. In Portugal, the concept of inclusive schooling became official when legislation on special needs education came into force with Decree-Law No. 3/2008 (after publication in the Portuguese Official Journal, 1<sup>st</sup> series, No. 4 on January 7<sup>th</sup>, 2008) ("Decreto-Lei n.º 3/2008 de 7 de Janeiro," 2008). This Decree-Law regulates specialized educational measures for children with significant limitations in terms of activity and participation, resulting from permanent functional and structural changes (special educational needs, SENs), from preschool to secondary education. The objective is to ensure the principle of equal opportunity, both in access to education and learning results. In the particular case of children with autism spectrum disorder (ASD), Article No. 25 of the Decree-Law provides for the creation of Structured Education Units for Students with ASD (*Unidades de Ensino Estruturado para Alunos com Perturbações do Espectro do Autismo*, UEEAs) in schools that integrate students with this diagnosis. The creation of UEEAs sought to provide an adequate educational response to students with special needs. This decision included not only students but also the whole school environment, in which teachers play a particularly relevant role. Among other objectives, these units aim to “promote the participation of students with autism spectrum disorder in curricular and enrichment activities with their peers from the classes they belong to”, “apply and develop interdisciplinary intervention methodologies that, based on a structured educational model, facilitate learning, autonomy, and adaptation processes within the school context” (“Decreto-Lei n.º 3/2008 de 7 de Janeiro,” 2008). UEEAs are expected to “adapt resources to children’s needs”, “ensure the necessary support for speech therapy”, and “create spaces for reflection and training about differentiated learning

strategies from the perspective of the development of multidisciplinary and collaborative work among professionals” (“Decreto-Lei n.º 3/2008 de 7 de Janeiro,” 2008).

It was within the framework of this Decree that the speech therapist leading this project had the opportunity to work in a UEEA, where she became aware that it is still necessary to further improve the inclusion plan to achieve more effective educational practices in classrooms.

ASD is a neurodevelopmental disorder that affects all areas of child development, but most notably communication and interaction (Capucha & Pereira, 2008; Wetherby & Prizant, 2000). Although there is great variability in the characteristics of children with ASD, the Diagnostic and Statistical Manual of Mental Disorders - DSM-5 (American Psychiatric Association, 2014) defines two major diagnostic criteria: A) persistent deficits in social communication and social interaction across multiple contexts, and B) restricted, repetitive patterns of behavior, interests, or activities. It also determines that C) symptoms must be present in early childhood.

Language, the development of which is determined by the interaction between biological, cognitive, psychosocial, and environmental factors (ASHA, 1982; Sim-Sim, 1998), is a complex, organized, and dynamic system of conventional symbols (sounds, words, and signals) that allows human beings to communicate and think (ASHA, 1982). A socially shared linguistic code is essential to effective communication between interlocutors (Franco, Reis, & Gil, 2003; Sim-Sim, 1998). Speech, defined as “the production of language in its phonetic form through a process of sound articulation” (Sim-Sim, 1998), is the main communication vehicle in society. However, this communication channel is not effective for many children with ASD because they possess a limited speech mechanism, or no speech mechanism at all, to express themselves – or because they do not understand their interlocutors’ speech. For these children, speech ceases to fulfill its communication role and it is necessary to use other means of communication that contribute to identity building, knowledge, and socialization. Specialized technicians, namely speech therapists, are responsible for devising solutions to improve communication as much as possible (Morris, 2005).

Based on the needs identified in a kindergarten with a UEEA during a school year, several activities were adapted to be implemented in the class, among children with ASD and their peers. Inclusion is believed to imply a bilateral and symbiotic commitment between people with and without impairment. Thus, it is important to stimulate children with SENs to achieve their full potential within their condition and environment, as well as enable society to include them.

The adaptation of some curricular activities aimed to ensure a simpler, more structured and multimodal presentation of information with the purpose of facilitating understanding and communication when compared to the traditional verbal/oral communication channel.

It would be naive to think that the skills of children with ASD could be boosted to the levels of their peers with no developmental impairment. Rather, this adaptation sought to adjust the method and content of information to the children’s needs in order to maximize each child’s potential and contribute to the achievement of an inclusive school.

## **METHODOLOGY**

This project is a case study and the result of the speech therapist’s professional experience of the daily needs and demands of a kindergarten.

### *Characterization of the context*

The study was conducted in a kindergarten with a UEEA in the Centro region of Portugal that applies the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) program. This pedagogical response is centered on a set of principles and strategies that, by harnessing the areas of greatest potential in ASD students (e.g., visual processing, memorization of functional routines, and special interests), promotes the organization of places, time, materials and activities in order to structure the external environment, making it predictable and, thus, promoting internal organization. It is, however, a flexible model, capable of being adjusted to students’ individual characteristics to facilitate learning and autonomy processes (Capucha & Pereira, 2008).

Children with ASD remained in the usual classroom (which was adapted to the TEACCH structured teaching model) during most classes, only leaving for set periods of time to receive individualized and specialized support provided by the SEN teacher, the speech therapist, and the occupational therapist.

#### *Characterization of the participants*

All 21 children from the only classroom in the kindergarten participated in this study. The children were aged 4 to 6 years ( $M=5.01$ ;  $SD=0.51$ ). Among them, four children (three boys and one girl) had been diagnosed with ASD. From a functional perspective, the children with ASD were at different levels in the continuum of the spectrum and showed different clinical expressions of the disorder. Therefore, this small group highlights the variability and heterogeneity found in the literature regarding the communication and linguistic skills of children with ASD. Based on the classification of language subgroups (Rogers, 2006), two children (I. and F.) belonged to the subgroup of verbal children (they imitate speech - often in an echolalic manner - but are unable to deconstruct their interlocutors' speech and infer relationships between the form, content, and use of speech (Peixoto & Varela, 2009)). The two other children (M. and C.) belonged to the subgroup of nonverbal children, with no vocal imitation (they did not imitate adult behavior).

Children I. and F. interacted socially with adults they knew and peers, albeit with qualitative limitations, through verbal and non-verbal language. Children M. and C., on the other hand, exhibited social behavior marked by isolation, stereotyped movement disorders and, in the case of M., self-harm episodes. Children M. and C. used an aided Alternative Communication System (Communication Notebook) by means of ARASAAC (Aragonese Portal of Augmentative and Alternative Communication) pictograms, which they were learning through the PECS (Picture Exchange Communication System) teaching methodology. This system has different stages of implementation and aims to develop the understanding, communication, spontaneity and autonomy of people with severe communication difficulties. Pictograms are images that represent a word/concept to make it easier to understand, promote access to information and the participation of people with communication difficulties, and develop literacy and learning skills (Encarnação, Azevedo, & Londral, 2015). Pictograms were selected for each child's communication notebook according to his/her daily nutritional, hygiene and recreational needs.

The group was culturally diverse, comprising 12 Portuguese children and 9 children of other nationalities. Although there were no other children with SENs in the class, two children were referred to a neurodevelopmental pediatrician because their language development seemed greatly below the expected level for their age. To date, there are no clinical findings and some of the foreign children were not yet at the stage of Portuguese language acquisition.

## **PROCEDURE**

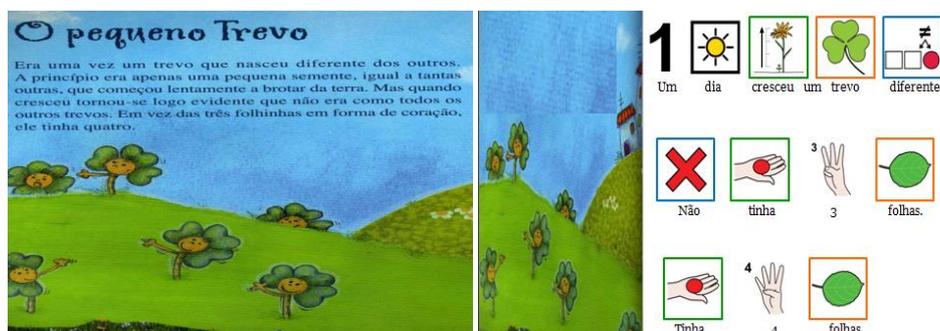
#### *Adaptation and implementation of the activities*

Several authors state that visual stimuli are a good learning strategy for children with ASD (Bruni et al., 2013; Fossett, 2004; Goldstein, 2002; Paasche, Gorrill, & Strom, 2010), due to their greater capacity to memorize visual/spatial stimuli than auditory stimuli. Taking this into account, the speech therapist adapted content taught in the classroom, notably that which was more demanding in terms of language skills (children's stories and songs, rhymes, recipes, etc.). These activities were carried out weekly or every other week, according to the class schedule. The kindergarten teacher provided the classroom activity plan to the speech therapist to allow the adaptation of activities to the characteristics of the children with SENs. The adaptation consisted in converting content into ARASAAC pictograms (Gobierno de Aragon, 2017) and their linguistic adaptation (Figure 1). These pictograms, which represented words and concepts, were selected due to their graphic quality and iconicity (the similarity between a graphic symbol and its meaning (Wetherby & Prizant, 2000)). In addition, both children who used the Alternative Communication System were already familiar with them. The linguistic adaptation consisted in rewriting the original sentences by: [1] reducing the length of the sentences; [2] simplifying the more complex sentences from a linguistic/cognitive perspective, mostly following Subject-Verb-Object order; and, given that children with ASD have difficulty understanding abstract concepts (Kutscher, 2011), [3] replacing abstract concepts with concrete ones while maintaining the semantic value within the linguistic context.

In most of the adapted activities, pictograms were framed using the Fitzgerald Key, which enhances sentence structure visually through a consistent color coding system for each part of speech: yellow for

people, green for verbs, blue for adjectives and adverbs, orange for nouns, pink for personal-social words, and white for function words (Encarnação, et al., 2015).

The goal was to help children to keep attention, understand the main concepts of the story, boost their initiative to communicate, and improve the quality and quantity of their communication. Children with difficulties in verbal comprehension and expression were provided with both the verbal label and visual representation of the concepts (multimodal language). Some of the adapted activities were provided in paper format, others in digital audiovisual format, and others used laminated images and signs with Velcro added, to ensure the durability of material and promote child interaction and participation. Whenever the activity involved handling signs (building sentences, organizing a narrative structure, etc.), children were given clear verbal and visual guidance.



**Figure 1:** Example of adaptation of one children's story.

The teacher in charge and the speech therapist selected and adapted the different activities based on the need to stimulate the different language components. The semantic component (the ability to acquire and express new words - their vocabulary - and their meanings, as well as the relationship between them (Franco, et al., 2003; Sim-Sim, 1998)) was developed through the representation of each word in a pictogram. Morphosyntax, which is essential in developing command of a language, is composed of rules that use parts of speech (nouns, verbs, adjectives, prepositions, etc.) and define the conditions that govern the organization and combination of words in sentences (Franco, et al., 2003; Mateus, Brito, Duarte, & Faria, 2003; Sim-Sim, 1998); (Gerber, 1996; Rigolet, 1998; Sim-Sim, 1998). This component became clear in the material that was adapted using the Fitzgerald Key.

Phonology is defined as the ability to learn and apply rules on how to use and combine speech sounds (Franco, et al., 2003; Sim-Sim, 1998). The teacher developed this component through songs and alliterations in rhymes.

#### *Results monitoring of the adapted activities*

The project was developed between the beginning of the second school term (January 2016) and the end of the third term (July 2016). During this time, results were monitored through direct observation of the children in the learning space (in adapted and non-adapted activities), interviews with the teacher in charge and SEN teacher, analysis of the notebook and the “Personal and Social Development” and “Expression and Communication” sections of the quarterly evaluation grids completed by the teacher in charge.

#### **Results and discussion**

The adaptation of activities within the classroom seems to have reduced the limitations and restrictions of children with ASD regarding their activities and participation. This was particularly evident in children I. and F., who possessed verbal-oral language skills. Thus, it appears that the visual communication system (signs) has helped to overcome the difficulty in understanding purely auditory information.

Children with ASD displayed greater levels of attention and active participation, albeit in different ways, in the adapted activities when compared to non-adapted activities. In the case of I. and F., these children displayed initiative to communicate more often, which points to improved self-confidence and

communication intentionality, as well as a greater ability to keep up topics of conversation related to the activities at hand, both with adults and their peers, thus contributing to the acknowledgment of social roles.

As for M. and C., the main changes in these children were the decrease in their levels of agitation and stereotyped movement disorders, and the improvement in their ability to self-regulate and maintain eye contact (although brief) with their interlocutor and the materials being used. These two children also displayed behaviors of motor imitation, such as clapping. However, this behavior was not exclusive to or more frequently observed in adapted activities. In the third school term, M. pointed to the used material twice when the activity was no longer in progress, and sat at the work table to explore it with the speech therapist, albeit only briefly. These displays of communication intentionality and attention, which, according to the literature, predict understanding and expression of verbal language in typically developing children (Peixoto & Varela, 2009), emerged for the first time in this context.

The observation of greater participation in adapted activities was not exclusive to children with ASD, as it was observed in most of the group, notably in children with poor language skills such as foreign children and two children with language difficulties.

When the activities started, children I. and F. had difficulties scanning in the reading direction (left - right), which is not uncommon in ASD (Kutscher, 2011). Throughout this project, children were able to develop this skill by performing appropriate readings using pictograms and building sentences in the correct direction and order. This ability allowed them to better follow the activities, which was demonstrated by the lower frequency of immediate echolalia and a greater ability to understand the main ideas of narratives and reproduce these using semantic content and more mature grammatical structure (aided by pictograms). According to Fossett (2004), the use of visual aids and graphic signs are good strategies to promote literacy. The observations of this study are in line with a case study by Francisco (Francisco, 2016), who adapted a book using the Communication Pictographic System. This system, when compared to the original version, was able to structure and facilitate understanding and communication in four children with developmental problems.

In addition, the repetition of adapted activities within the context of individualized support seems to contribute to the observed development, as repeating stories allows children to become familiar with them, thus benefiting the sequencing of events and memory (Ferreira, Ponte, & Azevedo, 1999).

Despite the development mentioned, and in view of the descriptive nature of this paper, it should be noted that because children with ASD receive support in many forms (special education, speech therapy, and occupational therapy), the progress cannot be solely explained by the inclusive work carried out through the adaptation of materials. However, all the professionals who took part in this project acknowledge its contribution.

The adapted activities, resulting from the simplification of syntactic structures and conversion of symbols, were not exclusively aimed at children with ASD, but rather at the whole group in order to enhance the naturalness of other forms of communication. Thus, it was possible for one sender to share two common codes with different receivers: verbal language and visual information. This conversion ensured that children with difficulties understanding verbal language were able to understand the main concepts of a story when provided with both the verbal label and visual representation of the concepts. This adaptation allowed students with SENs to overcome difficulties, giving them equal access to story contents, and raised other students' awareness of other forms of communication. Most children in the group acquired basic notions of Augmentative and Alternative Communication and displayed behaviors in line with this learning in their interactions with children with ASD during daily activities in the kindergarten. By the end of this study, the remaining children had become more competent communication partners. In order to communicate, they often retrieved pictograms themselves, and used the symbols to interpret what was said to them.

Early awareness by children of inclusion is of utmost importance in building positive environments and promoting ethical and social values for the future (Correia, 2013).

According to Wetherby & Prizant (2000), an effective ASD program should include not only learning more efficient forms of communication and motivation but also developing verbal and non-verbal understanding and imaginative capacity. The adaptation of activities provided a response to these challenges while maintaining the content of the class, placing equal importance on both components. The adapted activities

improved both the quality and quantity of experiences and exchanges among children with and without SENs.

The different presentation of the material elicited the curiosity and motivation of all those who took part, raised students' awareness, and increased communicative interaction between them. The interactions and experiences enable natural integration of children with communication difficulties by integrating them in their class, school, and society. Literature supports this idea, suggesting that interaction between children with ASD and typically developing children in the same settings improves social interaction between both groups and produces acceptable social behaviors (Levy, Kim, & Olive, 2006).

The adapted activities also proved to be useful to the teacher in charge and the SEN teacher by allowing the use of a multimodal language (auditory and visual), which facilitated the teaching-learning process, and by aiding the evaluation of children's skills.

As far as limitations are concerned, the main difficulty in this study was adapting the material to be used in the classroom due to the heterogeneity of competences found in the children with ASD. This also limited the creation of grids to monitor the children's evolution.

### **Final remarks**

Communication and language disorders hamper the development of other cognitive skills, namely learning, thinking, and reasoning. For this reason, this project contributed to the psycholinguistic and social development of children with ASD and their peers. It is important to conduct similar projects since 75-90% of autistic children will gain a certain degree of functional use of verbal language if they receive adequate attention during preschool age. (Rogers, 2006).

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## **Adult Part-Time Students' Self-Regulated Learning**

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### **ABSTRACT**

This paper deals with the self-regulated learning of adult students in the part-time form of study. The focus stems partly from the methodological criticism of the traditional positivistic study of this phenomenon over the last decade, and partly from criticism of the research regarding adult education in the Czech Republic, which is also predominantly positivist in its orientation. This paper presents a qualitative study conducted in response to these criticisms. The research project included four focus groups comprised of a total of 34 informants enrolled in the part-time study programme. A grounded theory design was applied in order to analyse the data obtained. A paradigmatic model of tertiary education was designed within coding. Then the acquired categories were integrated into the grounded theory. The research identified motivation as the key variable affecting self-regulated learning management. Managing the context of learning also plays a pivotal role and is a prerequisite for the process of self-regulated learning.

### **INTRODUCTION**

This paper describes qualitative research in self-regulated learning. Through an analysis based on the grounded theory, the paper aims to understand the process of self-regulated learning in a group of adult part-time students in tertiary education. The research subject choice and methodology used are based on the current state of knowledge in two previously-unconnected research fields: (1) the study of self-regulated learning and (2) adult education (in the Czech Republic more often referred to as andragogy). Recently, both have been a target of epistemological and methodological criticisms that challenge the dominant positivist view used for the study of the phenomena.

While there are numerous definitions of self-regulated learning based on various theoretical approaches (see, e.g., Boekaerts, 2002; Borkowski, 1996; Pintrich, 1999, 2000; Winnie, 1995; Zimmerman, 2001, 2002; Zimmerman & Schunk, 2011), for qualitative research it is appropriate to work with the most general, and in relation to the research phenomenon, with only a provisional definition, that is a definition which is not a definitive, deductively-testable model, but rather a “sensitising concept,” as for example the one offered by Herbert Blumer (1969). Such a concept is provided by Jonathan H. Turner (2006, pp. 371–372), who identifies self-regulation as an individual's ability to manage their activities – behaviour, actions and experiencing – with regard to both the social structures that surround the individual and the individual's own psychodynamic processes. In relation to learning, self-regulation is the ability to manage one's activities with regard to learning and intervene factors.

A deeper understanding of the process of self-regulated learning is crucial, as it enables a determination of the socio-psychological factors and meanings that influence the regulatory mechanisms of human learning, which change during the life course of the individual depending on the particular situation. Deeper understanding

concerns efforts to identify the “deep meanings” (Reed, 2011) that learning and its management have for the social actors and that orientate their motivation and their cognitive and metacognitive processes and actions, as well as shape their selves. These meanings are only accessible via an interpretation of statements of individuals placed in the natural environment of their “life-worlds”, which create their horizon of meaning (Schutz, 1967).

At present, there are a number of theoretical approaches to self-regulated learning, which, on the one hand, draw from general concepts of self-regulated behaviour, especially from the approach of cybernetic control of organism (Carver & Scheier, 1981, 1998, 2012; Carver 2012) or of behaviour control (Powers, 1973), and on the other hand, from the social-cognitive theory of Albert Bandura (1986, 1997). Among the most influential concepts at present are the following:

- (1) Paul Pintrich’s (1999, 2000) four-phase model of self-regulated learning. According to Pintrich, self-regulated learning is a process of management of cognition, motivation and learning context, which takes place in four consecutive phases: planning, goal setting, controlling and reflecting.
- (2) The multidimensional concept of self-regulatory strategies of Monique Boekaerts (2002, 2005), characterized by her consideration of self-regulated learning as a conglomerate of various partial control mechanisms (attention, motivation, emotions, and will) and related strategies, which should help the individual to achieve goals based on a self-rewarding system.
- (3) Zimmerman’s (2001; 2005; Zimmerman & Schunk, 2011) social cognitive theory of self-regulated learning. This theory operates with a model of three recurrent phases: (i) forethought, (ii) performance, or volitional control, and (iii) self-reflection. While the first phase takes place before the specific learning activity and includes components of motivation and goal-setting, the performance phase occurs within the actual process of learning and includes mainly the processes of attention and effort control. The last of the phases described by Zimmermann occurs after learning has been finished and includes mainly reflection on the experience, a comparison of the results with the set goals and their justification.
- (4) Events-oriented approach of Phillip Winne (Winne & Hadwin, 1998, 2008; Winne, 2010, 2014). This approach emphasizes that self-regulated learning is conclusively a contextual phenomenon, and that it is useful to conceptualize it in terms of events, because context evolves as learners regulate learning. Like with the previous concepts, this theory claims that self-regulated learning is a multi-phase process that includes the following: (i) reflection of the learning activity on the basis of the previous experiences of the individuals and their levels of success in solving tasks; (ii) goal-setting and planning; (iii) deciding on tactics and strategies to be used in the context of problem-solving; and (iv) reflections on the experience gained during the previous three phases. Duration, specific content and even the order of the individual phases under this concept are dependent on the context of a situation and on the learner’s abilities.

The four approaches share several important characteristics. First, they understand self-regulated learning as a model of various sub-processes of management of cognitive and meta-cognitive operations, behaviours and emotions of, as the case may be, a generally defined environment. Second, the individual processes conceptualize into sub-phases or dimensions, the successful implementation of which is a condition for obtaining the final results of learning. Individual concepts differ in whether they anticipate the needed consequentiality of some phases (Pintrich, Zimmerman) or not (Boekaerts, Winne). Finally, the theoretical approaches count with a certain degree of universalness of the processes of self-regulation, a fact that has major consequences on epistemology and methodology, which build on them. In other words, it impacts the methods of recognizing self-regulated learning and studying it.

These epistemological and methodological consequences lie mainly in the strongly-positivist orientation of theories on self-regulated learning, which manifests itself on several levels. The components of self-regulated learning are understood as operationalizable variables, among which causal relationships can be determined; and theories of self-regulation also assume that these components (variables) remain the same regardless of the changing environment and individuals. A partial exception in this regard is Winne’s theory (2010, 2014), which is more sensitive to the context and differences among learners. Nevertheless, even this theory works with the phases of self-regulation, which are omnipresent in a situation.

An argument against this epistemological position, however, is that not even the partial phenomena of self-regulation, such as goal-setting or emotion management, are simple variables convertible into a system of

indicators. Their valency for individuals and concrete meaning is specifically bound to the environment, in which they occur, to the relationships, in which they are placed, and to the values, which they profess. Individual components of self-regulation can thus unimaginably vary depending on the individuals and the learning environment, but they can also reversely influence each other. It is therefore impossible to assume simple causal dependence between the individual components. Additionally, if the contents of self-regulated learning (i.e., individual processes of control, goal-setting, self-reflection, etc.) are predetermined by a theoretical model, and the process of their scientific recognizing is dominantly focused on confirming their existence (deductive-nomological testing of a theory), there is a significant risk of reification of the given models. There is a risk of confusing self-regulated learning “on paper” (the analytic concept) for self-regulated learning “in reality” (real mechanisms of learning of real actors in real social conditions).

Positivist orientation is not only manifested on the level of epistemology, but also methodology, namely in using questionnaire-style research tools. A large part of the current research in the area of self-regulated learning has been criticised for over-relying on self-assessment questionnaire methods, which do not measure what they originally intended to measure – i.e., the problem of its validity and reliability. This is because general questions allow for diverse interpretations from respondents, deviating from the intent of researchers, as, for example, illustrated in detail by Karaberick et al. (2007). This can happen within the studied group, as well as when re-using the research tool with another sample of respondents.

In addition, self-assessment questionnaire techniques also ignore the context, which is always bound with the participants, even despite Hadwin et al.’s (2001) indication that respondents have a tendency to associate even general questions with a certain specific context, created by their personal experiences. As a result, these research techniques are unable to capture the changes in the self-regulation strategies that occur with a change in the individual’s situation, whether due to the maturation of the respondents or a complete transformation of the environment in which their learning takes place. Studies of self-regulated learning thus neglect what is referred to as “social worlds” or “life worlds” in the symbolic interactionism and phenomenology (Schutz, 1967; Strauss, 1982; Clarke, 1991), or as “situational conditions” (Clarke, 2003, 2005), which affect the behaviour of individuals by offering a “horizon of possibilities.”

What is equally important is that self-assessment scales and other traditional positivist techniques merely refer to the probable strategies/choices of the learners, rather than their actual practices (Boekaerts & Corno, 2005; Nesbit & Winne, 2006). Therefore, there is a substantial difference between what the respondents declare they would do in a certain situation and what they actually do. Winne, Jamieson-Noel & Muis (2002) confirm that respondents are highly unreliable in reporting on their learning (for example, in the frequency in which they use specific tactics), unless it immediately precedes the interview.

The positivist approach to the issue has been, in the last decade, trying to solve a part of this criticism by shifting from the self-assessment questionnaire techniques to sophisticated software research tools enabling monitoring of the currently-ongoing processes of learning within electronic platforms (Järvelä & Hadwin, 2013; Järvelä et al., 2013; Zhou & Winne, 2012). A clear advantage of this research strategy is the possibility to monitor not just the probable strategies, but the actual processes taking place in real time. On the other hand, this research procedure creates a unique epistemological problem in that it produces for the study of self-regulated learning an artificial (laboratory) environment, which is often distant from the learner’s real-life experiences. It also sets aside certain important mechanisms relating to self-regulated learning – e.g., motivational processes or management of emotions that go beyond the currently-ongoing learning processes (Pekrun, 2006; Pekrun, Elliot & Maier, 2009).

Such methodological shortcomings can be partially overcome by intensive qualitative research, which will focus on how actors situated in a natural environment understand the process of their own learning and its self-management. Qualitatively-oriented methodology allows the collection of answers to the questions about specific experiences of individuals in regulating their own learning, with an emphasis on particular situational conditions and actual strategies rather than the hypothetical choices of the individuals.

The research in the area of adult education is also dominantly built on positivist epistemology and the related quantitative methodology. Consequently, it brings rather biased results on the adult educational reality (see, e.g., Merriam 2008; Usher & Bryant, 1989; Usher, Bryant & Johnston, 1997; Usher & Edwards, 2007; in the Czech Republic, see, e.g., Průcha, 2014). In addition, the theory and research in this area are also based on the hidden premise that the education of adults is different from the education of children and youth in the fact that an adult participant is endowed with the ability to regulate their learning, i.e., self-direction (Knowles, 1978, 1980; Grow 1991; Long et al., 1992; Merriam et al., 2007). However, it has neither been sufficiently theorised nor tested to what extent adults are able to regulate their learning and how they do so.

This makes it necessary to develop a qualitatively-oriented study to a greater extent and also to begin to address the issue of self-regulated learning in adults, which will make it possible to determine exactly how adult learning differs from the learning of children/youth, or what features they share.

The logical outcome of these two streams of methodological criticism is formed partly by the choices of subject and objectives of this study and partly by the methodological strategy used. The research method is based on grounded theory (Corbin & Strauss, 2008; Strauss & Corbin, 1999; Charmaz, 2005, 2006), which allows a post-positivistic understanding (Charmaz, 2009) of self-regulated learning in adults. It also allows data creation from a shared relationship with the research participants and on this basis, builds a theory that is strictly tied to the place and actors concerned (see, e.g., Bryant, 2002; Clarke 2003, 2005; Charmaz, 2007; Charmaz & Belgrave, 2012). Such a “theory” or, more precisely in the terminology of the contemporary philosophy of science, rather a collection of local generic mechanisms, differs substantially from what was previously presented as a theory of self-regulated learning – i.e., general deductive-nomological models seeking to explain the widest range of phenomena (see, e.g., Boekaerts, 2002; Pintrich, 1999; Zimmerman, 2001; in the Czech Republic, Hladík & Vávrová (2011, ch. 2-3), Jakešová (2014), and Vávrová, Hladík & Hrbáčková (2012).

## THE STUDY

The aim of the conducted research was to attain a deeper and well-situated understanding of the process of self-regulated learning in adult students of the part-time form of study, i.e., those who enter tertiary education from practice and often after a longer period of time since the completion of their secondary education. In accordance with Strauss and Corbin (1998, p. 25), the research question was broad but “not so broad as to give rise to unlimited possibilities.” The main research question was, How do students of the part-time form of study regulate their own learning and process of study in relation to context, meanings and determinants? Due to the nature of the research problem, a qualitative research strategy was chosen, using the technique of focus group interviews. Such a technique focuses on smaller groups (eight to twelve respondents are recommended) with an emphasis on understanding the opinions and assessments provided by the participants (Morgan, 2001; Plichtová, 2002).

The focus group technique was chosen on the basis of the research participants’ preferences. Given the choice of either individual in-depth conversations or the focus group technique, the participants chose the latter, considering it more natural and more suitable for sharing information about their learning and studying. This choice might also have been associated with the fact that a higher number of participants in the focus group created a safe environment for the students, in which they could support each other and offset any “power” imbalance between themselves as students and the researchers as members of the academic community. The use of this technique did not limit in any way sharing of meanings and feelings about studying and learning, because the interactions in the group led to a high degree of reflexivity of experience of the learners.

The research itself took place in November and December 2014. The selection of the research sample was deliberate via the institution - the university. The data were collected through four focus groups with a total of 34 informants (4 men and 30 women), aged 27–56 years, who were all employed (with one exception). The informants were 3rd year students of service professions in the part-time form of study. The majority of them returned to the formal education system after lapses greater than ten years. Thus, they can be considered as representatives of the so-called “non-traditional students in tertiary education” (Slowey, 2011). Each focus group contained seven to nine informants, and the main exploratory part took 60–80 minutes. The course of the interviews was recorded on camera along with an audio recording on a dictaphone.

In accordance with (Lofland and Lofland (1995), a group of respondents was chosen with whom the researchers had already had a positive personal experience (through classes) and with whom a sense of trust and openness was easily created. For this reason, focus was also placed on the emotional dynamics of the interviews, as recommended by Ezzy (2010), which is reflected in the following results discussion. Promised anonymity, the research participants agreed with the publication of their views in professional studies. Therefore, all names used in the research are fictional.

The group interview was a variant of the focus group oriented towards content rather than interaction within the group (Beitin, 2008; Morgan, 2010, 2012). However, the study also reflects on the most significant characteristics of interaction among the focus group participants. Given that all participants came from one study group, there were close interpersonal relations among them, established during their 2.5 years of studying together. It followed that all participants knew each other well, and therefore their declared opinions were subject to a certain group control. This led to the participants themselves taking over the activity of the group moderator and urging others to contribute when convinced the others might actually want to relate. At times, the role of an informal group leader also emerged, assuming the right to speak on behalf of others. None of this could hinder the situations in which the group split into two mutually opposing “camps”. However, group solidarity appeared to be a more common phenomenon – consistent agreement with the presented opinions. Group cohesion proved to be of a great advantage for the researchers, as joint discussions in all focus groups were dynamic and produced large amounts of data. However, the researchers also realised the cons of such cohesion as certain group symbols, the significance of which they were not able to decode, could remain latent.

The questions in focus group interviews focused on the perception and evaluation of various areas that affect the process of self-regulated learning. The research on the selected social phenomenon - self-regulated learning in

students of service professions in the part-time form of study - uses interactional and organisational research questions abstracted in previous research (Hladík & Vávrová, 2011, p. 41) aimed at helping students of professions in the full-time form of study. The interactional research questions deal with the effects of motivational factors in the process analysed, students' self-efficacy and causal attribution. In contrast, the organizational questions aim at cognitive and metacognitive strategies in students applied in the learning process. The questions for discussion in the focus group were selected from the previously-used set of questions, which however appeared to be too broad. The idea of selecting from the existing questions rather than constructing new ones was prompted by a possible comparison of the selected areas of self-regulated learning in students of full- and part-time forms of study.

In the interviews, the following basic groups of questions were used:

- (1) How do you perceive yourself as a student? What are your strengths and weaknesses?
- (2) What led you to study your field? How do you perceive/assess your studies?
- (3) What do you think your success depends on when studying? How can you affect these causes?
- (4) How do you prepare for lessons? What influences your choice of modes of learning? What are the differences in your preparation for various subjects or exams?
- (5) What specifically do you think about in connection with your learning? What do you do when you find out that you don't understand something or that you are not good in something? How do you know that you have made progress in learning? How do you regulate your learning (at home)?
  - (6) What motivates you when learning? How do you motivate yourself to learn?
  - (7) What helps you when learning? What makes your learning difficult?
- (8) What feelings do you experience in connection with learning (school)? How do you try to influence these feelings?

In order to achieve researcher triangulation, as demanded by Norman K. Denzin (1978), interviewing and moderating the debate was carried out by two moderators, and each of them moderated two focus groups based on the identical scenario. Triangulation of the researchers was then used in data analysis including only the codes that both researchers agreed on within the final analysis.

## THE DATA ANALYSIS AND FINDINGS

The data gained in the focus groups were first transcribed and subsequently analysed through the grounded theory procedures: open, axial and selective coding (Strauss & Corbin, 1999; Strauss & Corbin, 2008; Charmaz, 2005, 2006). A commented data transcription was used to transfer the data from oral into written, using the audio recordings taken. The transcription was completed by field notes, so as to also take into account the emotional dynamics of the interactions within each group, in addition to the content. First, open coding of the obtained data allowed for the exploration, comparison and ultimately the categorization of 62 abstracted codes into twelve categories. The codes were often assigned the names used in the informants' own statements. In vivo codes were used due to their higher degree of authenticity and lower degree of distortion. Table 1 provides the list of codes merged into categories and their dimensions.

**Table 1:** List of acquired codes and categories.

<b>CODES</b>	<b>CATEGORY subcategories</b>	<b>CATEGORY FEATURES AND THEIR DIMENSIONALISATION</b>
I want to study	<b>DECISION ABOUT STUDIES</b>	Spontaneity (low / high)
I have to study		
Choice of field of study		
Availability of school		
I can still do it	<b>MOTIVATION intrinsic</b>	Degree (low / high)
To make progress		Duration (short-term / long-term)
To be successful		Scale (negative / positive)

Having a career	<b>extrinsic</b>	Degree (low / high)
Safe future		Duration (short-term / long-term)
I need it for work		Scale (negative / positive)
Home alone	<b>CONDITIONS FOR STUDIES family</b>	Assessment (bad / good)
Little children		
Supporting partner		
They have to create conditions		
Busy at work	<b>work</b>	Assessment (bad / good)
I join theory and practice		
I learn at work		
A lot of free time	<b>time</b>	Assessment (bad / good)
Children have grown up		
Academic year plan	<b>ORGANISATION OF STUDIES</b>	Quality (low / high)
Access to information		Assessment (bad / good)
Classmate cooperation		
Meet deadlines		
Soft skills	<b>CONTENT OF STUDIES</b>	Assessment (content / discontent)
Difficult subjects		Difficulty (low / high)
Easier subjects		
Adults have different approach	<b>RESPONSIBILITY</b>	Degree (high / low)
I stress about it		Adequacy (adequate / inadequate)
Responsibility to family		
I do not give up	<b>PERSEVERANCE</b>	Intensity (low / high)
I simply have to		
When I start, I always finish it		
I can overcome problems		
I learn some things easier	<b>KNOWLEDGE OF SELF</b>	Evaluation (low / high)
Start in advance		
I need a deadline		
New group of people	<b>STUDY GROUP</b>	Effect (strong / weak)
Close people		
Mutual support		
I struggle for time	<b>TIME MANAGEMENT</b>	Quality (bad / good)
Juggle more things		
Do less of something		
I come from work and study		
I use weekends		
The sword of Damocles		
Last minute		
Nothing else interests me	<b>LEARNING STRATEGIES</b>	Efficacy (low/ high)
Updating information		
Looking up terms		
Mind map		
Re-reading		
Using highlighting		
Self-awarding		
Making notes		

Revision		
Using post-its		
Learning plan		
Learning as fun		
Just do it	<b>SUCCESSFUL COMPLETION OF STUDIES</b>	Quality (low / high)
Not to be ashamed		
To have a university degree		
The best I can		

Axial coding enabled the establishment of connections between individual categories. Managing one's own studies proved to be a key category in self-regulated learning. Managing the external organisational aspects of the studies, i.e., time management of persons taking over for the students while they fulfil their study duties, together with the so-called self-management (managing oneself) create conditions for learning. The key category of Managing one's own studies forms the basis on which the student's self-management develops, particularly in relation to time management and efficient use of time, combining work, family and study duties, and to self-regulated learning. It is obvious that self-regulated learning only follows once appropriate conditions, within managing the studies and self-management, have been created. The research showed that part-time students emphasise the creation of external conditions for learning, which they associate with their academic success. The attainment of such conditions is only possible when combining several social roles: an employee, a parent, a grandparent, a student, etc.

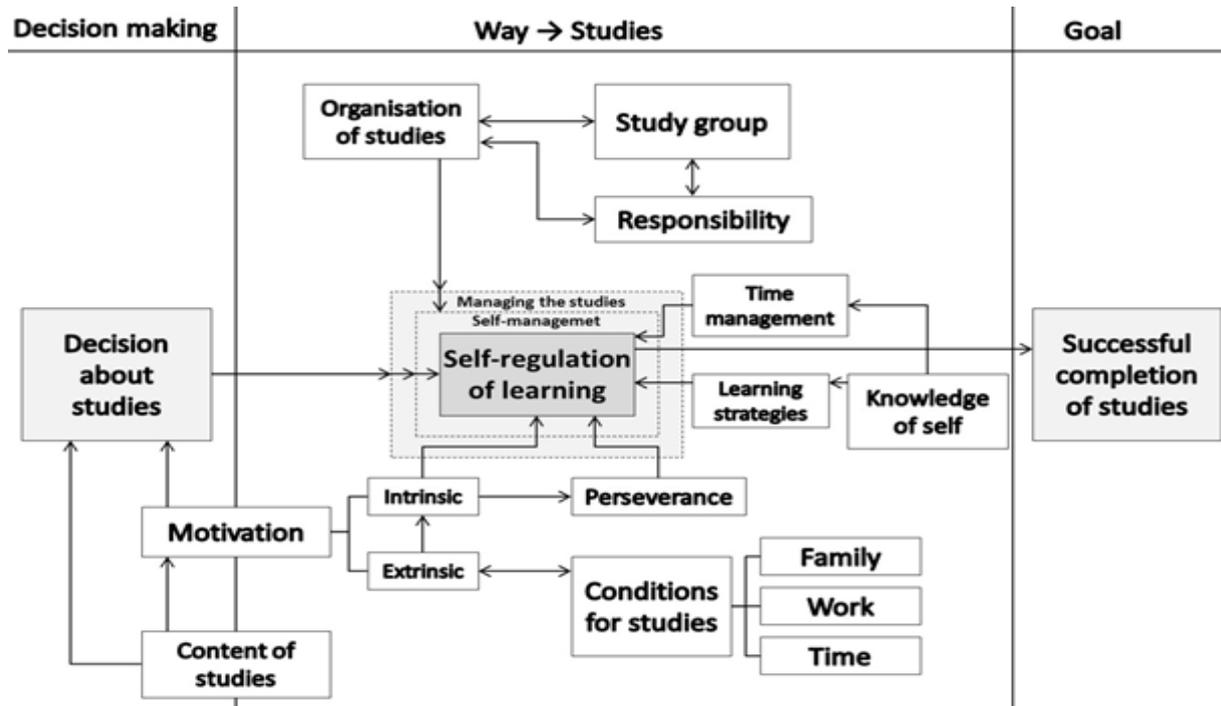
**Table 2:** Paradigmatic model of tertiary education of part-time students.

CAUSAL CONDITIONS	PHENOMENON	CONTEXT	INTERVENING CONDITIONS	ACTION STRATEGIES AND INTERACTION	CONSEQUENCES
<b>Decision about studies</b>  <b>Motivation /</b> - intrinsic - extrinsic	<b>MANAGING THE STUDIES</b> ↓ <b>SELF-MANAGEMENT</b> ↓ <b>SELF-REAGULATION OF LEARNING</b>	<b>Conditions for studies /</b> - family - work - time  <b>Organisation of studies</b>	<b>Content of studies</b>  <b>Responsibility</b>  <b>Perseverance</b>  <b>Knowledge of self</b>  <b>Study group</b>	<b>Time management</b>  <b>Learning strategies</b>	<b>Successful completion of studies</b>

**The data source:** the authors' own research, 2017

Axial coding served as a basis for selective coding. After an in-depth analysis of the data, the findings were integrated into grounded theory. The categories with their dimensions were related to each other as well as to the central category in accordance with the general coding paradigm. The relations between the categories and their dimensions created a model depicting the process of self-regulated learning in adult students in the part-time form of study in tertiary education (Fig. 1). Table 2 shows the result of the second phase of the analysis, i.e., the paradigmatic model.

**Figure 1:** Self-regulated learning in adult students in the part-time form of study in tertiary education.



### **From managing the studies to self-regulated learning**

A data analysis of the findings revealed that in the first phase, the students in tertiary education find it most important, and also most difficult, to manage their studies. In the broadest sense, it entails incorporating their studies into their life rhythm and introducing the related changes into their current way of life. The time devoted to their studies is usually made by ending or limiting other activities. One of the informants in this regard reports: "I see more disadvantages to the part-time form of study. Simply because combining the time with education is a huge problem. You have a family, you have a job and you have to function in multiple directions, it is not just learning, as in the full-time studies ... It's different now" (Martina).

Managing one's own studies is a context in which self-management, i.e., effective management of oneself, and self-regulated learning develop. Without successful management of one's own studies, the student is incapable managing other persons in their social environment (in the family, in work) in order to create favourable conditions for learning. Only mastering both the management of their studies and self-management provides space for self-regulated learning and its development. Self-regulated learning constitutes the so-called tip of the iceberg, while its degree determines students' academic successes and the successful completion of their studies. Self-regulated learning could be understood as a higher phase in the process of tertiary education of adults in the part-time form of studies. It is dominantly connected with goal setting and time management. Students achieve success in this phase only when successfully regulating the general areas related to their studies. This point is highlighted by a participant who points to a link between her readiness for study and for exams and her ability to manage the learning process: "it is possible that I won't manage to do everything (...) I have just finished an essay, so I must catch up on weekends, but then again it is possible that I will not be fully prepared for the school or exam" (Karla).

All three types of an individual's self-regulation are oriented by a long-term goal in the form of the successful completion of their studies, which represents their broadest common framework. What differentiates them are the specific behaviour goals that emerge in the given situation. While studies management is dominantly associated with the regulation of behaviour in relation to the educational institution, self-management is associated with managing the work- and family-related conditions of the student, self-regulated learning is linked with setting goals of the learning, using learning strategies and their timing during the academic year, as well as within the weekly and daily cycle of the student.

The learning strategies and time management depend on the self-reflection of the actors – on the knowledge of self. In this respect, it is interesting that students unequivocally declare that they know themselves well in terms of learning and that they know precisely how to learn, for their learning to be effective and their time management good. A typical statement by a student: "In our age, we know very well what method of learning suits us and what not at all. I also know very well that I have to start studying at the last possible moment. If I don't feel at least a bit under pressure, my learning is not very effective. However, I need a free weekend for that. I then evict everyone from the house for two days, to have my quiet" (Pavla).

The knowledge of self in the field of learning management is the basis for all learning activities. In this respect, students often do not carry out a metacognitive reflexion of their learning on the basis of various feelings for various items, or on the basis of a success or failure in reaching them. On the contrary, they emphasize that they always routinely learn in the same way and that they always routinely use the same repertoire of learning techniques. One student stated, "I learn always in the same way. I have my system. I have a notebook, notes from the classes and a learning plan with a checklist of items. Then, I just look for key terms in my notes and underline and underline" (Petr). Similarly, another student stated that she bases her learning on a model of learning that she found useful in the past and now just replicates it: "I do it again and again. You said that you first read it in parts and then the whole thing. I must do it the other way round. First the whole unit and then smaller segments" (Eva).

The only aspect that changes in the case of their learning is their time spent on learning. The more difficult the subject or exam, the more time the students devote to preparations. This applies even to the last-minute learners. It is the ability to find and reserve a sufficient amount of time for the preparation for difficult subjects that the

participants of the survey consider to be the most crucial criterion of whether their time management is good or bad.

### **Decision about studies and motivation**

The presented model (Fig. 1) shows that an important intervening component of the process of self-regulated learning is the decision regarding one's studies. Such a decision is influenced by the content of studies and by motivation, whether intrinsic (I want to study) or extrinsic (I have to study). As reported by the informants themselves, in the case of positive motivation (I want) based on a volitional decision, the student stands a higher chance to increase the degree of self-regulated activities (learning, self-management, and management of the studies). This is faithfully illustrated by the statement of one student: "If someone is capable of self-motivation, then they definitely have an advantage in learning over those who aren't, and who are then less successful." (Václav)

In the opposite case of negative motivation, when the student has to obtain a university degree because of impending sanctions (decrease in pay, job loss or demotion), the development of self-regulated practice is often hampered. In this case, the path towards achieving the desired objective (obtaining the required degree) is often taken with the lowest effort possible. This is frequently the case of students with low levels of development of self-regulation, who prefer strategies aimed at quick goal achievement.

The content of the studies that resonates with one's personal interests becomes the source and the driving force of motivation for some students. The basis of self-regulated learning is formed by intrinsic motivation and closely-related perseverance - defined by the students themselves as the ability to overcome the initial and ongoing difficulties (internal and external) and not giving up: "I am studying of my own will. I was not forced by the employer. It is my own choice, so for me it is internal motivation, which is probably good because it pushes me forward. I am satisfied with my studies and my knowledge" (Blanka). "For me, it is actually all about motivation, the more the subject interests me, the more I learn. There is also responsibility, although only to a certain extent" (Pavčina).

Extrinsic motivation is related to the learning conditions, i.e., within the family, work and time. Family, relatives or work colleagues usually become external motivators in the process of adult education. They offer support and encouragement and often help the students persevere, despite their tendency to drop out. Sometimes, however, they may become a constraint: "Not everybody can be made to study by the employer. Those of us who are doing it voluntarily, just come to their boss and say, I need the day off and they just say no, simply no. ... I just had to choose, and I chose to finish the school so I had to leave work" (Martina).

### **Intervening conditions**

Among part-time students, unlike among daily students (Vávrová, Hladík & Hrbáčková, 2012; Hladík & Vávrová, 2011), formal organisation of studies becomes an important determinant of self-regulated learning, i.e., timetable, exam and credit test dates, credit and exam requirements. Organisation of one's own studies has a significant effect on management of one's studies and self-management and is thereby latently participating in creating conditions for the process of self-regulated learning. An important factor in the organization of one's studies is the access to information in the form of study materials and communication with teachers. Students highlight in this regard that teachers who communicate keep them motivated: "When I am getting feedback and [the] teacher talks to me normally, I am energized and much more motivated. It makes me want to learn more than when I have no information" (Jana).

Another key category related to organisation of studies is responsibility, not only to oneself but also to others. A student highlights in this regard that an adult learner must act much more responsibly during studies: "An adult approaches school a little bit differently ... a fresh high school graduate comes and says "I will just sail through somehow" (Jiří). The responsibility here works as an additional motivational factor that is attributed by the students to their age and the status of an adult and that emerges from the attitude to the organization of studies.

Group cohesion and solidarity also play an important role. "At my age, if I can say so, it's about communication

and asking for help. ... When you really do not know, I know there are people in the group that I can ask” (Klára). “And one more thing, but perhaps not entirely related to the studies, the classmates ... You meet a new group of people and you become close. You laugh together, you cry together, you are happy together when you pass [an] exam” (Saša). From these two examples it is apparent, how important it is for adult learners to have mutual support that enables not only collaborative forms of learning and sharing of materials, but also sharing of positive and negative emotions.

## CONCLUSIONS

The research suggested that self-regulation of learning is an integral part of the process of managing one’s own studies, which includes a significant component of self-management. Only after creating optimal conditions for learning can the development in self-regulated learning be observed. The main source of self-regulation development is motivation, especially intrinsic motivation affecting perseverance. In students entering tertiary education after a break, perseverance is associated with will and serves as a prerequisite for a successful achievement of goals.

The present study demonstrates the extraordinary benefits of qualitatively-oriented methodology, as it allows identification of the unique situational context and meanings of self-regulated learning, which the quantitative design tends to omit. Moreover, self-regulated learning is examined from the perspective of the students who are directly concerned, which leads to the determination that the process is perceived rather widely and depends on numerous determinants.

For the informants themselves, self-regulated learning includes the management of the social determinants of learning, which represents a significant difference compared to some other definitions of the phenomenon (cf., e.g., Boekaerts, 2000; Zimmerman, 1999, 2008). It is therefore necessary to consider self-regulated learning in the learner’s natural environment always in relation to other areas of self-regulation of their behaviour and not to limit the given phenomenon only to cognitive and metacognitive processes of management of the study subject. Social structures in the form of family and working relationships or in the form of organization of studies on one the hand and psychodynamic processes relating to long-term intrinsic motivation on the other hand, clearly exceed the “temporal boundary” (Zerubavel, 1998) of currently ongoing learning activities. However, they are still important, as they frame and structure the given processes.

Relating the research results to the existing theories of self-regulated learning, in many ways they correspond to the findings of Monique Boekaerts (2005), who highlights the extraordinary importance of intrinsic motivation. According to Boekaerts, the higher intrinsic motivation, the easier the process of self-regulation and the higher the efficiency of learning. However, the mechanism of intrinsic motivation is, in the case of the analysed students, closely associated with two different sources of intrinsic motivation. The first one is the obtaining of a university degree, which is, by many, considered the goal of one’s self-development during middle age and a tool for improving one’s position on the labour market. The second one is the learner’s interest in the field of study. In that case, the motivation is primarily oriented towards an effort to learn as much as possible about the field of service professions.

Also typical for the learning situation of our informants is that the management of the context of learning acts as a key area, compared to other areas of management cited in the professional literature (Boekaerts & Niemivirta, 2005; Pintrich 1999; 2000) as the main dimensions of self-regulation: i.e., management of attention, will, emotions, motivation or cognition.

This research has not identified the sequence of the processes of self-regulated learning in the form of several phases assumed by some theories (Pintrich 1999, 2000; Zimmerman 2001; 2005; Zimmerman & Schunk, 2011). The individual sub-processes of management do condition one another (see Fig. 1), but they do not form a sequence of consecutive processes. They are different sub-dimensions of self-regulation that permeate one another and act in dependence on the learners and their environment. The findings thus fully confirm Winnie’s (2010) argument that self-regulation of learning is always contextual and should be conceptualised in terms of the learning event, which includes both the learning context and the learning person, who tries to regulate their

activity.

This study further finds that metacognitive processes related to learning strategies play a relatively-small role in the case of the analysed group. The students declare that they rely on a habitual learning pattern, unmodified in regards to the goal of learning, with the exception of the temporal aspect (the duration of learning activities). This contradicts the opinion of Pintrich (1999) and Zimmerman (2001, 2005), according to whom learning processes are accompanied by a reflection of undergone experience and a modification of behaviour. Students do not verbalize such reflections and they cannot be detected in their behaviour. It is likely that the “reflections” of results and learning processes take place only at the level of affects, as highlighted by cybernetic control of organism (Carver & Scheier, 1981, 1998, 2012). This allows students to receive feedback on their learning and the achieving of goals only on the emotional feedback level – feelings about their conduct.

Such findings can serve in many ways as a higher reflection of one of the standard assumptions of adult education, according to which an adult learner is able to manage the learning process without difficulties (Grow 1991; Long et al., 1992; Merriam et al., 2007). Authors claim that an adult student does not require direct pedagogical support, but merely a facilitator of their leaning, who helps them with understanding the content of learning. The results of this study have shown that not every adult is capable of self-organised learning, especially when unable to manage one’s own studies and self-management. An adult learner needs greater facilitation in the area of managing their studies and self-management, rather than in the area of the management of learning.

These findings cannot be generalised and applied to all cases of self-regulated learning in students of the part-time form of study or adults, as it is possible that the presented model (see Fig. 2) could have been influenced by certain unique situational factors present only among this study’s informants. In this regard, the conditions for studies could be a factor. These could have been distorted mainly by the fact that the vast majority of informants were women, who, in the Czech society, are faced with greater challenges while combining work and family studies (see Kuchařová et al., 2006). Another factor could be the area of organisation of studies, which is characterised by the unique profile of the studied undergraduate programme, with focus on service professions, and its difference from other undergraduate programmes, e.g., of an economic or technical nature; A third factor could be the knowledge of self. Since the informants were third-year students, they had already developed the knowledge of self as a student, for example, what is easy for them to learn and how to manage the time needed for learning. A final factor might be social ties. The informants had previously known each other for 2.5 years, which created strong social bonds allowing for group support in their studies, both in dealing with the emotional stress associated with studies and in the distribution of the learning materials.

Despite the specificity of the study group, further qualitative research on self-regulation of learning is essential, as it enables a description of other “arenas” and “life-worlds” (Schutz, 1967; Clarke, 1991, 2005) in which learning takes place. In other words, it is possible to record variations in the mechanisms of self-regulated learning depending on various situational contexts and actors who enter them. This concept of further research activity could possibly further the current empirical knowledge of the issue, as well as generate a meaningful theoretical programme striving to create situation-specific models of self-regulated learning.

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# **Alleviating Students' Misconceptions About Newton's First Law Through Comparing Pdeode\*e Tasks and Poe Tasks: Which is More Effective?**

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## **ABSTRACT**

Students' misconceptions are difficult to change in a short time because misconception is embedded in students' thinking. The alternative instruction that can be done is present the phenomenon with supported by relevant tasks. Therefore, the purpose of this research was to comparing PDEODE\*E tasks with POE tasks to alleviating students' misconceptions on Newton's First Law. The research method used the 4D (Defining, Designing, Developing, and Disseminating). The participants in this research are 13 senior high school students (7 boys and 6 girls, whose ages were middling of 16 years-old). At the disseminating step, we get the value of effect size is 1.00 in the "large effect" category, thus PDEODE\*E tasks are more effective than POE tasks.

**Keywords:** Students' Misconceptions; Newton's First Law; PDEODE\*E Tasks; POE Tasks

## **INTRODUCTION**

The furthestmost key aspect that students fetch to their lessons are conceptions, nevertheless most of which unlike from scientists conceptions (Gurel et al., 2017; Carmona et al., 2016; Sumpter, 2016). The different students' conceptions and scientists' conceptions called misconceptions. Misconceptions are thriving entrenched in students' formerly thinker outline, time-consuming process to change, sturdy to transformation through customary teaching and prerequisite extraordinary courtesy for students to improve a scientific conceptions (Samsudin et al., 2017; Gurel et al., 2017; Liu & Fang, 2016; Samsudin et al., 2015; Costu, 2012). Students embrace misconceptions can be described by quite a few causes; teaching instruction, student foregoing understanding, scarce linking among conceptions, and other (Ipek & Calik, 2008). Furthestmost teaching in science concentration on facilitating students accumulate facts about scientific concepts, on the other hand does not substitute improvement of accepting of these concepts, nor does it benefit them to learn in what way to smear the concepts freestanding of school in the actual sphere in which they breathing (Costu, 2008).

For the reason that of the meaning of daily lifespan uses, teaching instruction should be established for teachers in the direction to deliver students to create linking among their science' understanding and linked daily conditions (Dudu, 2017; Anderhag et al., 2015; Costu, 2008). Create linking among science' understanding and daily conditions on students' mind may unveiling the students' misconceptions. Research by Samsudin et al., (2017) shows that PDEODE\*E tasks effectively in improving students' conceptual understanding and altering students' misconceptions. In another hand, Costu et al., (2012) stated that POE tasks can supports students to succeed restored conceptual accepting and allows students to recollect newfangled conceptions in their continuing remembrance.

Modifications among POE and PDEODE\*E is tally Discussion (D) and Explore (E\*) into POE. Tally "D" into POE provisions students for producing an educational air that provisions discussion assemblies, and an assortment of opinions (Samsudin et al., 2017; Costu et al., 2010). The existing research is efforts to comparing PDEODE\*E tasks with POE tasks to show which is more effective in alleviating students' misconceptions. Many researchers (Poutot & Blandin, 2015; Ipek & Calik, 2008; Bayraktar; 2009; Liu & Fang, 2016; Samsudin et al., 2017) in the physics education discuss students' misconceptions, such as force and motion, force and acceleration, mechanics and magnetic field. We focus on the Newton's First Law about the balance forces and inertia concept.

## **METHOD**

In this research, we used the 4D model (Defining, Designing, Developing and Disseminating) (Samsudin et al., 2015; Fratiwi et al., 2017; Hermawan et al., 2017; Afif, Nugaraha, & Samsudin, 2017). At steps defining and designing, we define and design the PDEODE\*E tasks and POE tasks. At step developing, we developed two tasks with the same topic but different stages. And then, at the disseminating, we calculate the differences PDEODE\*E tasks and POE tasks to know which is more effective. Before PDEODE\*E tasks and POE tasks are given, students fill a pre-test of eight Four-Tier Newtonian Test (FTNT). And then, one week after the pre-test, treatments are done for 3x45 minutes. After that, three weeks later students are given a post-test with the same question as the pre-test. The FTNT used to identifications the students' misconception. The instrument was developed by the researcher before used for pre-test and post-test. The test items were systematized in the formula of four-tier test items that established as of the two-tier test. The instrument test arranged on two-tier was employed in the introductory study to accumulate students' rejoinders as reasoning choices positioned in the third-tier. The FTNT was validated by four experts in physics education. The validity of the instrument was acknowledged at .84.

The participants in this research are 13 senior high school students (7 boys and 6 girls, whose ages were middling of 16 years-old). All of the students acquired to the pre-test and post-test, and then they were separated into two clutches. One clutches are used PDEODE\*E tasks and another are uses POE tasks with the same of average score on the pre-test. The sum of students that used PDEODE\*E tasks are seven students and the sum of students that used POE tasks are six students.

### ***Defining***

The PDEODE\*E tasks are involved seven stages (Samsudin et al., 2017; Zulfikar et al. 2017). In the first stage is Prediction (P), the teacher accessible a conceptual occurrence to students by exhausting worksheet and entreated them to predict independently as to what ought to arise. In the second step is Discuss (D), the resolve talented to discuss and stake students' discerning in their team. In the third stage is Explain (E), students in apiece team explored to clench a conciliation and deduction about the occurrence, and to present their concepts to other teams concluded class deliberations. Consequently, the students over functioned in their teams to undertake a practical experiment and independently recognized their observations roughly what happened. In the fourth stage is Observe (O), the students observed vicissitudes in the occurrence and the teacher primes them to the emphasis on observations that pertinent to the beleaguered concepts. In the fifth stage Discuss (D), the students were entreated to settle their predictions with the unaffected observations completed in the previous step. At this stage, the students were requested to investigate, associate, dissimilarity, and disapprove with their colleagues in their teams. In the sixth stage is Explore (E\*), to deliver conceptual change and to improve conceptual understanding. In this stage, students explore the occurrence by them self. In the last stage is Explain (E), the students challenged completely inconsistencies among observations and predictions.

The POE procedure examination student understanding by demanding students for three stage (Costu et al., 2012; Halai, 2012). In the first is Predict (P) stage, students need to predict the consequence of some occurrence and need to rationalize their prediction. In the second stage is Observe (O), students designate what they perceive transpire. Finally, is Explain (E), students need to reunite any incongruity among prediction and observation.

**Designing**

According to the stages at PDEODE\*E tasks that are Predict, Discuss, Explain, Observe, Discuss, Explore and Explain, we can design the PDEODE\*E tasks as shown in Figure 1.

**PDEODE\*E Tasks**

**Predict**

.....

.....

**Discuss and Explain**

.....

.....

**Observe**

.....

.....

**Discuss**

.....

.....

**Explore**

.....

.....

**Explain**

.....

.....

**Figure 1.** Design the PDEODE\*E Tasks

The design of POE tasks according to the stages that are Predict, Observe and Explain as shown in Figure 2.

**POE Tasks**

**Predict**

.....

.....

**Observe**

.....

.....

**Explain**

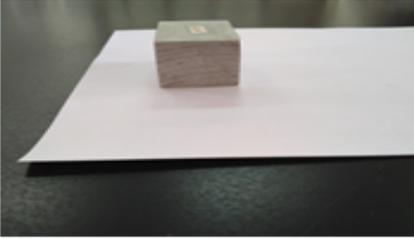
.....

.....

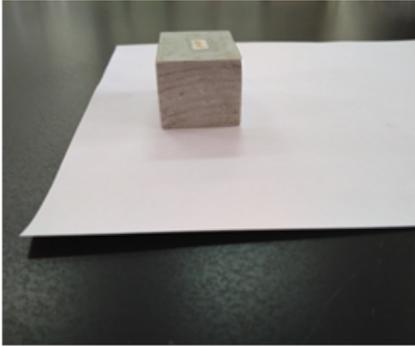
**Figure 2.** Design the POE tasks

**Developing**

The developed PDEODE\*E tasks in this research embrace two concepts that balance forces and inertia concepts. One of the example about inertia described in Figure 3.

	<p><b>Predict (P)</b></p> <p>Predict what will happen to the beam when HVS paper and duplex paper are pulled slowly and quickly? State and explain the reasons for your predictions!</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p><b>Discuss (D) and Explain (E)</b></p> <p>Discuss your predictions and reasons in your team, and then explain your reasons in detail!</p> <p>.....</p> <p>.....</p>	
<p><b>Observe (O)</b></p> <p>Observations that occur on the beam as the HVS paper is pulled slowly and quickly! What will happen? Is there a difference between the two occurrences? State your observations!</p> <p>.....</p> <p>.....</p>	
<p><b>Discuss (D)</b></p> <p>Why does this happen? Discuss with your team! Then explain your reasons in detail!</p> <p>.....</p> <p>.....</p>	
<p><b>Explore (E*)</b></p> <p>Do a further exploration of the observations you get using the equipment already provided! Write the conclusions on the Exploration Sheet below! (Exploration Sheet attached)</p> <p>.....</p> <p>.....</p>	
<p><b>Explain (E)</b></p> <p>Compare observations, explorations with your predictions! Is it the same or different? Explain your reasons! What can you conclude from the phenomenon? Please write your reasons below!</p> <p>.....</p> <p>.....</p>	

**Figure 3.** Example of the PDEODE\*E tasks  
 And then, the example of the POE tasks was shown in Figure 4.



**Predict (P)**  
 Predict and discuss your predictions in your team about what will happen to the beam when the HVS paper is slowly pulled and fast pulled? Then explain your reasons in detail!

.....  
 .....  
 .....  
 .....  
 .....

**Observe (O)**  
 Observations that occur on the beam as HVS paper is pulled slowly and quickly! What will happen? Is there a difference between the two occurrences? Why does this happen? Discuss with your team!

.....  
 .....  
 .....

**Explain (E)**  
 Explain in detail what happened! What is the conclusion of the above results? Write down the results of your discussion!

.....  
 .....  
 .....

**Figure 4.** Example of the POE tasks

At Figure 3 and Figure 4, we can see that the content of PDEODE\*E tasks and POE tasks was same. The differences are at the stages on each task. At the tasks, accessible two pieces of paper that different thickness and several blocks of different mass. Researchers did the tasks in the order that students can test some phenomena and build their own conception based on what they have experienced. As suggested by some researchers (e.g. Gurel et al., 2017; Liu & Fang, 2016; Samsudin et al., 2015; Costu, 2012; Stein et al., 2008) that student misconceptions can be powerful and awkward to alteration as of wrong to right understanding. Therefore, students must experience and discover their own scientific concepts in order to avoid misconceptions.

**Disseminating**

At disseminating, we use the effect size to indicate an indistinguishable prominence that analyzes the size of the distinctions midst sets (Tellez et al., 2015). The Glass’s delta was used to the effect size as given by Equation 1.

$$\Delta = \frac{\bar{X}_{PDEODE*E} - \bar{X}_{POE}}{SD_{POE}} \tag{1}$$

After analyzing the significance of Glass’s delta, Table 1 was used to explanation roughly the significance.

**Table 1.** Explanation of the consequence on Glass’s delta

Glass’s delta effect size	Explanation
.00 ≤ Δ < .20	Trivial effect
.20 ≤ Δ < .50	Small effect
.50 ≤ Δ < .80	Medium effect
Δ ≥ .80	Large effect

Students’ conceptions are clarified on five categories, that are Sound Understanding (SU), Partial Understanding (PU), Misconceptions (MC), No Understanding (NU) and No Coding (NC). Each conception was scoring as shown in Table 4.

**Table 4.** Scoring the students’ conceptions

Students' Conceptions	Score
Sound Understanding (SU)	2
Partial Understanding (PU)	1
Misconceptions (MC)	0
No Understanding (NU)	0
No Coding (NC)	0

After the test, we scoring each students' conceptions using Table 4 and then finding the average, standard deviation, and effect size of students with PDEODE\*E tasks and POE tasks as shown Table 5.

**Table 5.** The effect size of the data

Students with...	Average ( $\bar{x}$ )	Standard deviation ( <i>SD</i> )	Glass's delta ( $\Delta$ )
PDEODE*E tasks	6.3	2.4	1.00
POE tasks	5.2	1.1	

At Table 4, the value of effect size is 1.00 that explanation as "large effect". This value shows that students with PDEODE\*E tasks more effective than POE tasks to alleviating students' misconceptions. The finding is related to Samsudin et al. (2016); Zulfikar et al. (2017) that stated PDEODE\*E tasks was effective earnings of altering misconceptions students whispered.

## CONCLUSION

PDEODE\*E tasks is a development of POE tasks. Based on research, we can compare the PDEODE\*E tasks with POE tasks in alleviating students' misconception. The results show that value of effect size was 1.00 with interpretation "large effect". The effect size has facilitated recognized that the influences of differences (Sinaga & Feranie, 2017) between PDEODE\*E tasks and POE tasks on decreased students' misconceptions. So, the use of PDEODE\*E tasks is more effective than POE tasks in alleviating student's misconceptions on Newton's First Law.

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# **An Analysis of Digital Native Preferences for Design of Educational Mobile Applications: Mixed Design Research**

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## **ABSTRACT**

For the new generation, defined as digital native learners, mobile learning and mobile applications constitute a motivation source with no alternative. For individuals who know the language of information technology and the internet and communicate easily by this language, mobile learning has become a matter of concern as a new teaching method. As mobile learning becomes increasingly widespread and digital native learners want to utilize it in their learning, it is also important how mobile learning applications, directly related to mobile learning, should be designed.

This study was conducted with digital native learners studying at undergraduate level in the Faculty of Education. The purpose of the study is to reveal the design preferences of digital native learners for educational mobile applications and to reach the principles and guidelines related to mobile designs in this concept. In this study, Sequential Exploratory Mixed Methods Research Design was used. Qualitative data were collected first, and then quantitative data to augment qualitative data in the design. The qualitative dimension of the study includes 10 digital native learners with maximum sample diversity while 285 digital native learners are included in the quantitative dimension with random sampling.

Results of qualitative data analysis indicate that the most preferred, by digital native learners, mobile applications are educational applications followed by social media, entertainment and shopping applications. Digital native teacher candidates point out that they prefer to be provided mostly with “pleasant visual design, user friendly menu, rich content, fluency and speed” in the educational mobile application, and when it comes to design aspect, the most important elements of design are "color palette, layout, font selection and smooth transitions" they added. Participants also expressed the importance of "navigation and application logos" in educational mobile application design.

The results in analysis of quantitative data, collected to augment qualitative findings, support these findings. The majority of digital natives pointed out that the design should be prioritized in mobile application rather than content / information. They also stated that the number of users who downloaded the mobile application and the screened images of the mobile application placed on the market affect the downloading behavior for the application; but there is a factor that needs attention here. Digital natives also think that the logo preferred in mobile application will affect the use of mobile applications and that a simple design should be preferred when preparing the mobile application logo rather than complex one. According to them, the logo should not be traditional logos such as universities, schools, diplomas; it should be creative or suggestive logos. In addition, a good mobile design should include blank spaces for the user to feel spacious, and short words should be preferred instead of long ones in mobile application titles due to limited space. Looking at the preferences of digital natives, it seems that the number of elements seen in the menu of a mobile application should be at most 3 to 6. Regarding content, digital natives have stated that there should be as little content as possible on a screen, and that the text should include known / familiar fonts. Georgia, Comic Sans and Arial fonts are preferred typing characters top to bottom. In regard to mobile design, digital natives are also emphasizing the fact that the unique icons and, if possible, the use of vivid colors in design instead of neutral ones such as black, white and gray will positively influence the use.

As a result, designing an educational mobile learning application is not just about combining specific icons, elements and colors, but to try to make sense of the user's effectiveness and to offer a unique experience. As a result

of this study, a number of design principles and guidelines based on data on mobile learning applications have been put forward.

**Keywords:** digital native learner, mobile application design, educational mobile applications, mobile application interface, mobile app layout

## INTRODUCTION

Along with the widespread use of mobile technologies, a new social identity emerged that sociologically preferred to express itself on a technological level. It is possible to define this sociological community, called digital natives, as "a generation that can speak the language of machine and digital technology". It is suggested that digital native learners differ from previous generations not only from the sociological point of view but also from the physiological structure of the brain (Prensky, 2001b). For this generation, which has its own distinctive differences, mobile learning and mobile applications constitute a source of motivation with no alternative. It is seen that this new approach spreads as an instructional method and especially the individuals who start their life by opening their eyes into the digital age want to carry out their learning in this way.

Mobile technologies have a significant impact on learning and supporting teaching (Zurita & Nussbaum, 2004). Despite this favorable impression of mobile technology, it should be stated that it does not mean learning directly and should not be regarded as equivalent to learning. Students may not be aware of the use of mobile technology for learning, even if they have mobile products / devices and are benefiting from them for everyday use. Mobile learning and mobile learning environments have educational benefits and unique advantages, provided that student awareness, motivation and active participation are ensured. Schofield, West and Taylor (2011) have compiled a comprehensive review of literature in regard to advantages of m-learning. Mobile learning, according to them, is primarily handy and flexible. This provides access at any time from any location. The work place, the school, the task field, the house now becomes a single learning center. Mobile learning ensures learning "as required". Mobile technologies and devices now reduce the amount of information delivered to students, thereby reduce cognitive burden and provide a more internalized learning experience. Mobile learning is also more convenient to situated learning than vicarious/simulated learning. The situated learning is more significant in terms of learning and provides sufficient learning when required. Additionally, choosing what, when, how much and by which method (text, graphics, video, animation, blog, discussion forums, search engine, etc.) to learn transforms mobile learning into a "fully customized" learning format. Mobile learning is also economical. Producing a single design and distributing it to multiple platforms is a very economical way.

An important dimension of mobile learning consists of mobile learning platforms and mobile applications. M-learning platforms and applications are not just learning environments where users are left alone with mobile technology to carry out their own learning. Mobile learning platforms and applications have their own unique design principles. There are some criteria to be considered both in terms of design / interface and in designing content for mobile application. Ko and Rossen (2004) state that "if you publish your courses and lessons on the Web without a design, you are not creating a viable and applicable tool for your students. The missing element here is the lack of instructional design". An application with a poor content but good design may motivate the student thus increase his interest in the lesson while another one with a high quality content but poor design may affect teaching negatively from the very beginning. When developing an educational mobile application, it is necessary to pay attention to the design / aesthetic preferences of the users and to make use of the established practices and create quality designs.

Ballard (2007) stated that there are many criteria in designing. These criteria are summarized as follows:

**Small devices:** Small screens of mobile devices may not support multiple windows. In this case, for example, a drop-down list, pop-up menus and small dialog boxes can be used. Because of this feature, care should be taken when creating mobile content so that it does not scale so as to prevent the reader from focusing on the small screen. Also, users may have to quit applications suddenly. A mobile application should keep the data in the cache as much as possible, reduce the wait time and offer its functions very quickly.

**Personal Device:** Each mobile device is also a personal device, an application must be designed to store each password entry or secure data entry. An application should offer the option to store private information, such as member login. If an app uses cookies, it should not delete them immediately.

**Customizable Device:** Even though quite appealing in terms of design, an application should offer its users freedom to use different themes. Some colors may be found by some users unfavorable. The difficulty in choosing the size of texts can also be overcome in this way.

**Always On and Always Connected:** Silent or vibrate mode should be available in the design as mobile devices to be used almost everywhere.

**Battery:** An application must be designed to use less power (keeping processor less busier, display usage, data connectivity).

**Difficulty of Text Input:** Users prefer to type short texts. In addition, an application should also provide other input sources such as cameras, address books, calendars, autocomplete, speech, image recognition, and GPS other than text input / keyboard.

Designing a mobile learning environment is an extremely demanding and specialization-required activity. Among the features that should be considered in terms of mobile learning design are speed, performance, design, fluency, updateability, debugged mobile software and codes, correct analysis of user experiences, mobile application development platforms, privacy, auto rotate function for images and shapes both horizontally and vertically, while "allowing interaction, individualized learning, individual pace, graphics intensive text and interactive links" are important criteria in terms of teaching. In relation to this, Ozata and Ozdamar Keskin (2014) have examined the preferences of learners regarding mobile learning application design and stated that students prefer features such as visual learning, updateability, allowing interaction and being entertainment oriented in mobile applications. With respect to visual learning, learners have stated that information is easier to grasp with shapes, graphics and pictures, and that long texts are intimidating and boring. In regard to updateability, learners have emphasized that the most important factor in determining mobile application preferences is updating the application. In terms of interaction, the learners expressed that they want both human-machine interaction (presentation of contents in different forms such as text, sound, video) and human-human interaction (interaction with other students and social media integration). Reviewing the literature, Naismith and Corlett (2006) list the principles of mobile learning design in the following way:

*"Creating fast and simple interactions, Preparing flexible materials that can change according to the needs of the learners, Designing access and interaction by considering the differences of devices and standards, Contributing to the learner experience by using the features and restrictions of mobile devices, Using mobile technologies not just as a means of distributing learning content, but also as a facilitator to learn by employing local applications (notebooks, camera, calendar, voice recording) of mobile devices, Designing material with a learner-centered design approach "*

As a result, mobile learning has been examined in terms of many factors such as unique potential of experience, advantages of use and its influence on learning; but the design issue in mobile learning remains a matter of further research on it. Therefore, this study aims to determine what kind of preferences real users have for mobile design and to set guidelines for how a mobile learning application design should be.

## **METHOD**

### **Research Design**

In this study, sequential exploratory design was adopted as a research method from mixed research models. When using a mixed method in a scientific research, it is necessary to pay attention to the strengths and weaknesses of this method. Creswell (2003) stated that using both quantitative and qualitative approaches together would provide better understanding of research problems than using each approaches alone. It is very important to know how and for what purpose to combine qualitative-quantitative data in mixed method searches (Onwuegbuzie and Leech, 2006). Creswell (2003) presented six basic mixed method designs. In this study, Creswell's sequential exploratory mixed method design was used; because, by doing so, first it is aimed to explain the case by qualitative data, and

then to augment qualitative data with quantitative data by developing a quantitative measurement tool in the second stage.

### **Population and Sampling**

For combining probabilistic and purposive sampling techniques in mixed method research is the most common and most powerful way preferred in these studies (Creswell, 2003, 284-285); Purposive sampling for qualitative data, and probabilistic random sampling for quantitative data were utilized in this study. For the collection of qualitative data, purposive sampling method was preferred and 10 digital native teacher candidates were selected in maximum diversity with teacher candidates at undergraduate level from each department. The quantitative data of the study were composed of 285 digital native learner undergraduate students (teacher candidates). These digital learners were undergraduate students studying at Faculty of Education, Mersin University, in 2016, and the sample was determined by random sampling method. Digital natives participating in the research were teacher candidates studying Elementary Mathematics Teaching, Science Teaching, Classroom Teaching, Preschool Teaching, Turkish Language Teaching, English Language Teaching and Psychological Counseling and Guidance.

### **Data Collection Tools**

For qualitative dimension of the research, a focus group interview consisting of 10 digital native learner undergraduates and researchers was conducted. The data were gathered by voice recording and then converted into a written form. The interview took approximately 180 minutes in three sessions. It has been noted that the interviews based on the question and the response to be in the form of daily conversation. Previously, questions were asked another sample group and their intelligibility was checked. At the beginning of the focus group interview, the researcher gave information and explained the purpose of the study. The responses of the participants were analyzed and the themes related to the design were identified. Using these themes, Mobile Learning Application Design Preferences Survey was created for the quantitative data collection tool. In line with the opinions of the three experts who were experienced in the field of Educational Sciences and Educational Technologies, three items were ruled out and after the correction was made in 5 items, the pilot application was carried out and the final form was decided.

### **Analysis of Data**

In this study, it is planned to analyze qualitative and quantitative data in a sequential manner. In the qualitative aspect of the research, collected data were analyzed by content analysis (using NVIVO) from the techniques in qualitative research methods, and then codes and themes were revealed. For reliability, these data were further coded by two teaching staff experienced in qualitative research. All the data were given to encoders and they asked to recode according to the prepared code definition table. Miles and Huberman's (1994) procedure was applied to calculate the reliability of qualitative analysis.

*Reliability = Consensus / Consensus + Dissidence X 100.*

In the study, the overall correlation level of the researcher with the first encoder was 0.88 for all codes, and it was 0.92 with the second encoder. The average correlation score of the researcher with two scorers was calculated as 0.90. It is stated that it is sufficient for the researchers to have more than 80% correlation for the coding credibility (Miles and Huberman, 1994).

The distribution normality was checked to determine which of the central distribution measures would be used in the analysis of quantitative data. Saphiro Wilk Test, one of the most powerful tests for determining distribution normality of the data, was used. A significant difference was found in the test result ( $p < .05$ ) for each item. It has been decided that the distribution of the test result is not normal, so the median should be used instead of the average from the central distribution measures in the analysis of the data.

### **Findings**

As a result of analysis of the qualitative data obtained in the research, various codes and themes were obtained. The responses of the 10 digital native teacher candidates to the questions regarding their preferences of mobile applications were analyzed by content analysis. The codes in Table 1 were obtained at the end of the analysis.

Table 1 Types of mobile applications that digital natives prefer most

Mobile apps used by participants	F
Entertainment	4
Shopping	3
Educational applications	6
Social media	5

Digital native learners have responded that they use primarily educational applications, followed by social media and entertainment applications. This situation is expressed by the following statements:

*"Mostly, I download the application to learn languages" (C1)*

*"I prefer applications developed for learning purposes" (C2)*

*"I download entertainment applications such as games, travel." (C5)*

On the other hand, three digital native teacher candidates have responded that they download the mobile app for social media use. This situation is expressed by the following statements:

*"I communicate through social media; therefore I prefer applications for communication purposes" (C9)*

Digital native participants were asked about how educational applications should be and their responses were analyzed by content analysis. As a result of the analysis, the participants stated that the content should not be text-intensive in educationally developed applications. These considerations were expressed by the following statements:

*"Educational design should not mean just text." (C3)*

*"There should be various alternatives in the context, such as color, font, figure, table" (C6)*

*"Even if applications are good in terms of information, it is always incomplete if its design is bad, and consists of just text." (C7)*

On the other hand, one of the participants stated that the design of educational applications should be in line with modern mobile application designs:

*"If students download an educational app, they look for its visuality, especially whether it resembles the design of appealing and popular applications that have emerged in recent times" (C2)*

Digital native teacher candidates were asked about whether a mobile application could be designed for each course and their answers were examined by content analysis. Eight out of ten participants indicated that the mobile application of the courses should be designed, while two participants regarded it unnecessary.

*"I support the implementation of mobile applications for courses" (C4)*

*"It's a pretty exciting idea" (P5)*

*"Considering its advantages, one thinks that "why not, it deserves to be tried". It would be nice to login the mobile application and prepare for the class "(C7)*

The two participants stated that a mobile application for each course is unnecessary:

*"The mobile application is cool, but it doesn't mean something that required for every course" (C10)*

*"Some courses need to be learned only by reading, underlining it" (C2)*

Digital native teacher candidates were asked about what kind of expectations and preferences they would have in a mobile application developed for educational purposes and their responses were examined by content analysis. The codes in Table 2 were obtained at the end of the analysis.

Table 2 Preferences and expectations of digital natives for an educational mobile application

Mobile activity preferences	F
Audio narration	1
Pleasant visual design	6
User friendly menu	5
Concept maps	2

Taking notes	2
Rich content	5
Fluency and Speed	4

Digital native teacher candidates have responded that they preferred primarily to be provided with "pleasant visual design, user-friendly menu and rich content" in an educational mobile application. They expressed this situation with the following statements:

*"Visuality is important. The design should be pleasant "(C1)*

*"When the user looks at the application, he/she should not get bored. So appropriate and plain colors should be used in harmony "(C4)*

*"Now when we login the menu, it must be clear what is where, and the student should not be in a difficult situation" (C6)*

*"An educational application related to a course should cover the subject matter thoroughly, and satisfy learner in terms of knowledge." (C7)*

*"There should be more concept maps. I mean, at least we can keep it in mind in verbal lessons. "*

*"It works quite well if there is a note taking section in mobile application" (C9)*

Digital native teacher candidates were asked about how learning would be influenced by a mobile application that would be developed for educational purposes, and their answers were analyzed through content analysis. As a result of the analysis, 9 participants showed positive opinion. These views were expressed by the following statements:

*"I think that with educational applications, individuals somehow can maintain their own education. In addition, applications for learning really work "(C1)*

*"I think it will be positive in terms of learning."(C3)*

*"Learning via mobile applications instead of carrying books can be beneficial both in terms of time and impact." (C4)*

*"People now prefer to learn something by downloading a mobile application. While sitting at somewhere, you can just login your application, and start to learn. If you do not understand, you can login and look at it again "(C6)*

On the other hand, a participant expressed a negative opinion on the subject. This view was expressed by the following expression:

*"In fact, there is nothing like teachers and books. I do not think educational mobile applications will be like a teacher, no matter how instructive and effective. "(C10)*

The responses of the digital native teacher candidates to the questions directed to them about what should be the main points in the design if an educational mobile application design will be developed are analyzed by content analysis. The codes in Table 3 were obtained at the end of the analysis.

*Table 3 Digital natives' preferences for mobile application design*

Mobile app design preferences	F
View (Layout)	6
Navigation	4
Color palette	6
Font Selection	5
Smooth transitions	5
Application Logo	4

Digital native teacher candidates have indicated that the most important design elements in educational mobile application designs are "color palette, layout, font selection and smooth transitions". Participants also expressed the importance of "navigation and application logos" in educational mobile application design. These considerations were expressed in the following statements:

*"The colors need to be well chosen. Colors in pastel tones make mobile application more effective; but yellow-blue, yellow-red colors can be distracting." (C3)*

*"The colors are the first thing drawing attention in the mobile application. Plain colors should be preferred." (C4)*

*"Using the right color will both satisfy the user providing a good experience and make the media look more organized." (C7)*

Digital native teacher candidates expressed their thoughts about the layout order as follows:

*"When the mobile application is launched it is more appropriate to see all the menus. The user should have a schema and be able to access everything easily" (C7)*

*"Depending on the topic or lesson, a layout that appears as a list or stands side by side in boxes may be preferred. If the whole menu is visible on one screen, user will be provided with comfort." (C9)*

It is also stated that another important mobile application design factor is smooth transitions and speed perceived. These considerations were expressed in the following statements:

*"Yes, there should be no halt or freeze. If there is too much on a screen, it would cause strain on application. I should be able to work fast in an educational app." (C8)*

The font selection is another important point related to mobile application design. Digital native teacher candidates expressed their views on font selection in mobile application design with the following statements:

*"The preferred font character can affect the whole feeling in application. Too thick or too thin fonts are all distracting"*

*"Some applications have a font incompatibility. The screen is shifting, some characters are not legible. In an educational mobile application, a known font should be preferred. The size of the text is also important. For example, it can be 12 pt. I need to try and see it on the screen. "*

Quantitative data were collected and analyzed after qualitative findings were analyzed. When we look at the descriptive statistics of the digital native learners in the quantitative part of the research, 44 percent of participants were using Android Operating system on their mobile devices, 32 percent IOS operating system; 18 percent Windows operating system. When we look at the frequency of mobile application searches on the market, it is seen that 40 percent of the participants searches once in a month, 38 percent once in a week and 15 percent more than once in a week. When the monthly mobile application downloading frequencies are examined, it is seen that 37 percent of them download almost no applications, 45 percent 1 to 5; 11 percent download 5 to 10 applications. The most common reasons for downloading mobile apps include "feeling a need (58 percent), looking for entertainment (11 percent), and downloading aimlessly (10 percent)".

The preferences of digital natives for mobile application design have been examined. The majority of digital natives pointed out that the design of the mobile application should be at the forefront rather than content / information. They also stated that the number of users who downloaded the mobile application and the screened images of the mobile application on the market affected the downloading behavior for the application; but there appears a factor that needs attention here. Digital natives have stated that the size of the mobile application must be at the minimum level, otherwise larger application size (i.e. how many MB's.) will reduce the downloading behavior for the application. Digital natives also think that the logo preferred in mobile application will affect the use of mobile applications and that a simple design should be preferred when preparing the mobile application logo, not complex one. According to them, the logo should not be traditional logos such as universities, schools, diplomas; it should be creative or suggestive ones. In addition, a good mobile design should include blank spaces for the user to feel spacious, and short words should be preferred instead of long ones in mobile application titles due to limited space. Looking at the preferences of digital natives, it seems that the number of elements shown in the menu of a mobile application should be at most 3 to 6.

Regarding content, digital natives have stated that there should be as little content as possible on a screen, and that the text should include known / familiar fonts. Georgia, Comic Sans and Arial fonts are preferred writing characters top to bottom. With regard to mobile design, digital natives are also emphasizing the fact that the unique icons and, if possible, the use of vivid colors in design instead of neutral ones such as black, white and gray will positively influence the use. Instead of using multiple colors throughout mobile design, they added, it would be more effective to use a dominant color or shades of the color. Another factor, important in mobile design other than the color, has

emerged as page transition effects. In respect to this, digital natives stated that they prefer uncomplicated, plain and simple transitions (non-bending, non-folding and non-rotating reversibly) and that being exposure to unavoidable advertising images on mobile applications, even it covers a small area, is extremely demotivating. When digital natives visit the application store, the most important factors that lead them to download an application emerged as in the following order: "comments and reviews of the application, the application's logo and colors in general; and finally the name and the subject of the applications." Looking at their interface preference associated with a mobile application, digital natives favor at most matrix interface (78 percent) and then comes the list interface (12 percent). The interfaces for mobile design preferred by digital natives are shown in Figure 1 and Figure 2:



Figure 1 Matrix / Grid interface



Figure 2 List Interface

## DISCUSSION AND RESULTS

Mobile learning, on the basis of mobile technologies, is a dynamic process which eliminates the need for specific location in access to the content, and enables communication with other users. When performing these functions, mobile learning applications offer them through an interface design and application menus. Mobile learning applications are easily adopted or rejected by digital native learners depending on their design and menu items they contained. Although there are limited number of options with regard to items they contain, interface and themes, each mobile applications are different from each other in terms of their design.

It is found in this study that digital natives are in favor of a simple design in general, that they seek creativity in selection of logos and icons with simplicity; but they prefer familiar characters and fonts in text writing. Digital natives give quite importance to choice of logo. The logo are designed for the small area, thus it is best to choose abbreviation of the app and single drawing rather than too many colors, drawing or text, relevant to app's purpose. According to Kim, Rueckert and Seo (2013), consistent with this finding, practicality and simplicity in design are the two most important design principles to be considered. Kim et al, put emphasis on need for making mobile learning environment pedagogically user-friendly. If this condition is met, they concluded, the content communicated with small mobile devices would be useful as much as that of big-screen computers. Addressing the design principles for mobile apps, Hermansson (2013) indicated that "a high level practicality" is of great importance. This principle leads a better experience for the users and more widely utilization of applications. Furthermore, the application shouldn't have a complex layout to cause distraction, and not require much time and effort to learn /to use it; otherwise users quit using the application and uninstall it from their mobile devices after a while. In their study on mobile application design, Charland and Leroux (2011) pointed out that application interface should met criteria of "scrolling via kinetic physics, lovely bounces, easing" to make feel real and to be a delight to use it. According to them, text and visuals with scrolling problems and freezing on the screen affect adversely the student's user experience.

This study demonstrated the need to use vivid colors in mobile application design instead of neutral ones, and to use contrasting colors or a dominant color with its shades in order to avoid a chaos with color. In mobile application design, it is not only the color choice, but also other factors including icons, text frames and line thickness should also be taken into consideration. These factors also increase users satisfaction and pleasure that they receives from

the app. Referring to this point, Gong and Tarasewich (2004) emphasized the need mobile applications to give users "feeling of pleasure". According to them, an application should be visually pleasing and entertaining as well as practical. Also, functions with context sensitive and capable of adapting to environmental conditions should be included in designing mobile applications.

Regarding the mobile application interfaces, the study reveals that digital natives mostly prefer matrix / grid (box layout) interface followed by list interface. Matrix interface is a layout which elements are presented in categories and folders as boxes in a single screen. The List interface is a layout which elements are presented as a list extending downwardly. As the reason why digital natives prefer the matrix / grid interface, it can be said that they are primarily accustomed to this layout and they find it easy/simple to use due to appearance of everything on a single screen. In line with these findings, Sarac (2014) noted in his study about the factors affecting the mobile learning design, that "designing interface in a simple, perceptible way avoiding distraction", " complying with the principles of visual design such as color, balance, size, legibility, etc.", "fitting for purpose of used multimedia elements (audio, video, text, animation, simulation, image, etc.)", "having pause, forward, backward, replay features for items such as video, audio, etc. and their smooth operation" are "very important".

Kineo (n.d) has made a number of inclusive suggestions in the design of mobile learning. According to him, the most important feature of the mobile design is "updatability". To give an example, the changes in colors, menu, icon or text made by designer in the application should be available as soon as the end user launches the application. These changes may be about either the learning process or the product itself. Secondly, mobile design should have a high quality appearance. Many times, however, better graphics and high quality visuals can lead to higher cost in apps. Thirdly, the design should be able to utilize features of mobile device (GPS, camera, barcode reading). Mobile learning design does not mean replacing the mouse clicks of the desktop users with touch screen finger taps. An environment to be explored by user should be designed. Mobile application design is different from the design of website etc. Mobile devices allow a single interaction on screen. This is about the principle of simplicity in design. The object to be focused on is presented on the screen. The design of the object to be communicated is also very important for just a single interaction occurs at a time. A balance should be sought between attractive and highly intriguing design, and fast, simple but functional solutions.

Elias (2010) also mentions eight factors on the user interface design. According to the Elias, following items should be taken into consideration when designing mobile interfaces. These factors related to the mobile interface design are "equitable use, flexible use, simple and intuitive, perceptible information, tolerance for error, low physical and technical effort, community of learners and support, and instructional climate". Table 4 includes inclusive advices on interface design for m-learning:

*Table 4 Suggestion for Inclusive M-Learning Interface Design*

Interface Design Principles	M-learning Suggestions
<b>1. Equitable Use</b>	Deliver content in a format as simple as possible Use cloud-based file storage and sharing sites Course content should be available for users with different competence and on different venues
<b>2. Flexible Use</b>	Pack content in small portions Consider options for non-traditional assignments.
<b>3. Simple and Intuitive</b>	Keep mobile application codes as simple as possible open source code software
<b>4. Perceptible Information</b>	Add captions, tags, descriptive information
<b>5. Tolerance for Error</b>	Support situated learning methods
<b>6. Low Physical and Technical Effort</b>	Writing text on a mobile device is about physical effort. Responding open-ended questions via small keyboard can sometimes be intimidating. Use specific assistive technologies unique to mobile phones
<b>7. Community of learners and support</b>	Encourage for multiple communication method Take technological access and preferences into consideration when creating groups
<b>8. Instructional climate</b>	Communicate reminder, exams and questions to students on a regular basis Allow the content that learner can also contribute as much as possible

(Elias, 2011)

In conclusion, designing a mobile learning application is not just to bring some elements, colors and icons together, deliver the content in a visual feast or bias the users; it is about making sense of the user's activity and to provide him with an opportunity of unique experience. In this context, some design principles and guidelines suggested in results of the study can be listed as follows:

- When designing mobile learning media, focusing particularly on content should be avoided
- Text should not be displayed frequently on the screen; instead, schemes, graphics and figures should be prepared
  - Mobile application should be finger-friendly in exercising its activities
  - The information in the content should be highly valuable
  - Access to menu should be easy and comfortable
  - Screen scrolling or page transition effects should be kept as simple as possible
  - Menu should have 3 - 6 categories maximum
  - Keyboard should be user friendly in typing text
- Horizontal and vertical use of screen should be supported; but the screen should be optimized in portrait layout as default
- Creative/unique icons should be utilized in application (taking colors, thickness of lines and frames into account)

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# **An Analysis of The Project Education for A Culture of Peace to Promote Reconciliation in Cyprus**

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“A culture of peace will be achieved when citizens of the world understand global problems; have the skills to resolve conflict constructively; know and live by international standards of human rights, gender and racial equality; appreciate cultural diversity; and respect the integrity of the Earth. Such learning can not be achieved without intentional, sustained and systematic education for peace.”

(Global Campaign for Peace Education, 2016)

## **Abstract**

This paper discusses the importance of peace education and the impact it can create on post-conflict societies by analyzing the project of Education for a Culture of Peace in Cyprus. The lack of contact and communication between the Turkish and Greek Cypriot communities in Cyprus over the years has not only resulted in protracted conflict but also produced great educational challenges as well as a culture of violence within the education systems on both sides of the divide. UNICEF (2009) emphasizes the crucial role of education in peace-building processes in prevention of conflicts in the future. The project of Education for a Culture of Peace in Cyprus follows a similar rationale that peace can be cultivated and sustained, and real social change can be achieved by transforming the educational systems across the divide, through peace education. This project enabled to bring students and educators together from both communities for the first time for multi-communal peace education workshops, and this has created a potent space for everyone to participate, communicate, tolerate, understand and show empathy to each other effectively.

## **Introduction**

According to the figures, approximately half of the 104 million children worldwide that do not attend schools currently live in countries recovering from violent conflicts or similarly fragile states (UNESCO, 2004, cited in Vonhm, 2015). Over the past fifty years, our world has seen major conflicts. Two world wars and many different regional conflicts generated a new urgency for humans to pursue peace more than ever. Therefore, the traditional explanation of peace as absence of war is no longer sufficient now (The father of international law, Hugo Grotius in 1625, developed this idea (Alliez & Negri, 2003), this is widely known today as the definition of negative peace -absence of physical violence-); instead peace has come to mean harmony at all levels of human endeavour (Educational innovation and information, 1999). UN Charter also states that it is “we, the peoples of the United Nations, determined to save succeeding generations from the scourge of war” (UN Charter, Preamble). As is also stated by Alger (2014), I believe that the first step should be the attainment of belief in the possibility of peace everywhere. The pursuit of existence of a system of economic and social justice requires a vision of a peaceful world. To be able to do this, we have to engage with the depths of our history to teach ourselves alternative orientations that can be achieved through education. We cannot create world peace in one day but through education, we can offer an important contribution to the development of a “culture of peace” (Vriens, 1999). Peace education is actually the result of the pacifist movement, where much of its work remained with small projects and groups and it was right after the First World War that peace education became an international concept (Pandey and Upadhyay, 2016). In the beginning, it was associated with the League of Nations in the preservation of peace and security. However, there was no significant development for the concept for a long time (Pandey and Upadhyay, 2016). Since its establishment, the United Nations has been seeking to establish conditions to pave the way towards peace. The Universal Declaration of Human Rights (1948) affirms that ‘Everyone has the right to freedom of thought, conscience and religion’ (Article 18), ‘of opinion and expression’ (Article 19), and that education ‘should promote understanding, tolerance and friendship among all nations, racial or religious groups’ (Article 26) (Declaration of Principles of Tolerance, 1995). Education of people towards building peace became the vital mission and peace education has been developed as a means to achieve the goals stated above. In 1999, The Hague Appeal for Peace was created as an international network of organizations and individuals dedicated to the abolition of war and making peace a human right. The Network has launched the Global Campaign for Peace Education and took the responsibility of coordinating the peace education campaign. The Network defined peace education as “a participatory holistic process that includes teaching for and about democracy and human rights, nonviolence, social and economic justice, gender equality, environmental sustainability, disarmament, traditional peace practices, international law, and human security” (The Hague Appeal for Peace, 1999). Hague Appeal for Peace (1999) further elaborates that we can

only reach a culture of peace if we develop an understanding of global problems of our earth and create an ability to tackle conflicts non-violently with justice. In this sense, cultural diversity is important. We have to develop respect to the Earth as well as each other. This kind of learning can be attained through peace education (The Hague Appeal for Peace, 1999, cited in Bhatti, 2010). In fact, today, peace is recognized as an essential condition for human survival and a new way to think about peace is necessary to eliminate unforeseen circumstances for human beings. Peace education is of fundamental importance to the mission of the UNESCO and the United Nations. As the Director-General of UNESCO also stated, building a culture of peace throughout the world is a difficult social action and it involves long-term social and cultural changes. Education at all levels is a fundamental element of to this process (Matsuura, 2008, p. xix).

So, what is peace education then? There are many different definitions of peace education in literature. Pandey and Upadhyay (2016) define peace education as the process of acquiring the values, the knowledge and developing the attitudes, skills and behaviours to live in harmony with oneself, with others and with the natural environment. Ian Harris and John Synott (2002) further described the term as a series of “teaching encounters”, where people’s desire for peace and non-violent alternatives for managing conflict and skills for critical analysis of structural arrangements that produce and legitimize injustice and inequality becomes evident (Harris and Synod Jones, 2002, cited in Gill, 2016:99). This definition addresses the prevailing violence in our societies today. In fact, violence is not a new concept for our globe; it has been predominant throughout the history of the world and it is certainly not about to disappear unless something has been done about it. Therefore, we need a structural change through education as a means through which one can develop critical thinkers and active, democratic citizens, willing to participate in the affairs of their country and to seek creative solutions to problematic situations, supporting equality for all, justice and compassion (Kotziamani, E. POST RI, 2014). Culture of peace and the role of education for a culture of peace in bringing forward this change are both crucial to deal with potential violence in a given society and to establish a civil and peaceful society (Pandey and Upadhyay, 2016). In this sense different types of peace education exists. Harris (2004) lists five different types: international education, human rights education, development education, environmental education and conflict resolution education. These are different types of peace education but yet they make an effort to explain forms of violence and present information about alternatives to violence (Harris, 2004:5). “Peace educators point out problems of violence and instruct their pupils about strategies that can address those problems, hence empowering them to redress the circumstances that can lead to violent conflict”. In schools and community settings they impart to their students the values of planetary stewardship, global citizenship and humane relations” (Harris 2004:5).

Cyprus is an island with a tortured history of ethnic intolerance and has been divided since 1974. The island is a perfect example of a post-conflict society that is divided, with separate dominant educational systems across the divide. Both of the systems are designed to promote national education as part of societal cohesion and unity as part of the nation-building process. In fact, it is the central dilemma for education in divided societies that lies in the way it engages with difference (Gallagher, 2009).

The use of peace education in this paper refers to teachers’ and students’ involvement on a day of workshops about peace through music, arts and other activities to define what peace is and how to achieve it. These workshops become an eye-opener for the participants to see the challenges of achieving peace, developing non-violent skills and promoting peaceful attitudes. Therefore, this paper discusses the importance of peace education and the impact it can create on post-conflict societies by analyzing the project of Education for a Culture of Peace in Cyprus (Education for a Culture of Peace was held between the years of 2014-17, the project is supported by the European Commission through the Civil Society in Action IV Program opened for the Turkish Cypriot Community. It was held with the collaboration of POST Research Institute and Association for Historical Dialogue and Research in Cyprus). It is important to mention that the research was conducted on an NGO level with the collaboration of the two NGOs at the grassroots level. The project received EU funding only for duration of three years and worked on different fields within education throughout the running of the project. Those fields were: gender studies, human rights, children’s rights, environmental education, conflict resolution studies, human security, development studies, intercultural education, citizenship and democratic education, and migrant education. These are all inter-related issues that have the goal of enabling individuals to act upon their environment and transform their societies into more peaceful ones. Education for a Culture of Peace can be considered the methodology that one can use to develop a culture of peace. International law and human rights conventions are the foundations that support the field and make it stronger and more stable to the wind (e4cp, 2014). The project took the model called the Petals of Peace Education. The Petals can be described as: dismantling the culture of war, living with justice and compassion, building cultural respect, reconciliation & solidarity, promoting human rights and responsibilities, living in harmony with the earth, cultivating inner peace. In the workshops, these were the topics that were covered, discussed and analyzed

In this paper, my methodology primary involves ethnographic research that I carried out during the workshops, also student questionnaires, meeting reports designed by the E4CP project team in the duration of the project helped me to conduct this research. I should also add that my main focus is the Turkish Cypriot community. On the day of the bi-communal peace education workshops, more than 200 children participated. The event was the first ever large-scale, full-day peace education event and was open for youngsters aged between 6 and 18 from both communities. Bi-communal Peace education workshops were comprised of 177 Turkish Cypriot and Greek Cypriot children and youth that took part in activities and workshops ranging from sports, music, theatre and music were held with topics on human rights, social inclusion, antiracism, intercultural dialogue and sustainable development (Final Narrative Report, E4CP, 2016).

Over the course of the project, the students were first introduced with the concept of peace education through mono-communal introductory workshop on education for a culture of peace. These workshops were organised with a maximum duration of 4 hours for the second half of the school year 2015-2016 in selected schools on primary, secondary and gymnasium levels. Then, one-day long bi-communal workshops were organised for the duration of 8 hours for the same students on education for a culture of peace in May 2016. In this paper, I will focus on this one-day long workshop and the use of peace education on 80 students across the divide in Cyprus. As is mentioned by Karahasan (2007), “education is not the only thing that will help mutual trust and understanding but it is through individuals’ interactions that meaning is given to issues like peace education” (Karahasan 2007:555). The bi-communal peace education workshop therefore, has proved to break the routine and provided a practical way of interaction for students with their peers from “the other” community. During the workshops on education for a culture of peace, the students were provided with two sets of questionnaires at the aftermath of the workshop, on their perceptions of Greek Cypriots. In the questionnaire after the mono-communal introductory workshop, the students displayed mostly negative or neutral comments, as they have never met a Greek Cypriot of their age before. In the bi-communal peace education workshop however, the students displayed friendly and more positive reactions to the same set of questions, showing that contact and interaction with each other made a huge difference in students’ reactions against each other. A questionnaire was prepared by the E4CP team and was distributed to the participant students at the end of the mono-communal workshops to draw images as an answer to the questions on how they feel about members of the “other group whom they never had opportunity to meet; the answers provided the students’ perceptions on the image of “the other group”. These images predominantly displayed negative perceptions of fear, insecurity and hostility against something that is unknown, as the students had never met their peers from the other community before. Then, after the first interaction with one another in the bi-communal workshops, another set of questionnaire was provided to the students at the end of the workshops. This time students predominantly provided a positive picture with the themes of friendship, coexistence and peace. The obvious change in the perceptions of students towards a positive reaction and this shows us the impact and importance of interaction between two groups without any prior contact with each other. This can be explained with the contact hypothesis tradition that social change can be attained through extensive interaction (Bekerman, 2009). The possibility of regular good contact between in-group and out-group members with equal status seems to generally promote intergroup acceptance and diminish intergroup anxiety caused by fearing the unknown. This is an assumption that is captured in the contact hypothesis (Allport, 1954, cited in Niens, 2009) that proposes contact between members of opposing groups will promote positive intergroup attitudes in individuals and improve relationship between groups (Niens, 2009). “Prejudice may be reduced by equal status contact between majority and minority groups in pursuit of common goals. The effect is greatly enhanced if this contact is sanctioned by institutional supports... and if it is of a sort that leads to the perception of common interests and common humanity between members of the two groups” (Allport, 1954:281). It should also be mentioned here that it is rather difficult to meet all of the conditions required by the contact hypothesis. The key is to create environments to lead cooperation and interdependent interactions in pursuit of common goals, shifting people to re-categorize from “us and them” to “we” (Desforjes et al., 1991; Dovidio & Gaertner, 1999; Sherif, Harvey, White, Hood, & Sherif, 1988)

As also mentioned by Karahasan (2007) elsewhere, this paper deals with intergroup interaction on a micro-level and I am aware that micro-level interactions do not provide a basis for macro-level transformations. In other words, it is a fact that peace education cannot resolve intractable conflicts in one day, however it can prepare the ground for desirable political change. In order to promote peace education, peace and reconciliation should be encouraged on a micro level, because daily interactions can change the whole structure (Bekerman, 2005). Reconciliation process necessitates is the restoration and rebuilding of relationships. Kosic and Senehi (2009) states that contact may lead to improved communication and better understanding between groups and consequently, to greater cooperation and coexistence at the individual and group level. These statements are based on the theory of contact hypothesis (Allport, 2004, cited in Kosic & Senehi, 2009:163). Contact hypothesis is one of the most durable ideas in the sociology of racial and ethnic relations. It states that close and

sustained contact with members of different groups promotes positive tolerant attitudes. In contrast, the absence of such contact is believed to foster prejudice and stereotype (Allport, 1954; Williams, 1964; cited in Gibson, 1951:136). It should also be mentioned that contact with members belonging to the other community might be associated with social anxiety, especially in post conflict areas (Kosic & Senehi, 2009). Therefore, different strategies and activities should be used to produce positive attitudes towards others. Education becomes a great tool here that involves a variety of strategies to be used in the activities prepared for the societies with post-conflict situations. Intergroup contact can greatly decrease prejudice and improve attitudes. In the case of Education for a Culture of Peace Project in Cyprus, students from different sides of the divide interacted with each other for the first time in their lives. This first contact was very crucial for the project and it should be noted that the bi-communal activities that involved the teachers and the students were very well received. While the teachers really benefited and enjoyed sharing ideas and building knowledge in a collaborative setting, the students at primary and secondary level, particularly those from underprivileged, immigrant or right-wing families in public schools, were given the opportunity to meet peers from the 'other' community for the first time. Those interviewed expressed their enthusiasm, surprise and amazement at the prospect, and clearly expressed that this helped them 'break' their prejudices (POST RI report, 2017).

Peace education can transform people's mindsets in the long run with regard to the inevitability of war and can enable people to see that alternatives exist and there are ways violent conflict can be prevented. In other words, it can be argued that education itself is not the only thing that will help mutual trust and understanding but it is through individuals' interaction that meaning is given to issues like peace education (Bekerman, 2005). Education, within its wider definition, can play an essential role in embedding the value of peace. I envision creating an educational system for Cyprus to bring the two communities to a mutual understanding, toleration and compassion to contribute to peace-building process itself. As the 'Education for a Culture of Peace to Promote Reconciliation in Cyprus' project also states that Cyprus could be set as an example for future initiatives in Europe and elsewhere on how to integrate Education for a Culture of Peace in societies with conflict or post-conflict societies. In the activities, peace education workshops were designed with games in sports; arts, music, drama and students were encouraged to participate in games with students from the 'other' community. These activities were well designed, where the language barrier was absent and communication between students was possible, it was clear that they also recognized and grasped some of the key concepts of peace education such as the concepts of 'bullying', 'environmental sustainability', 'mediation' or 'gender equality'. The workshops were held on the buffer zone, which could be accepted as a neutral zone across the Cyprus divide. The activities facilitated learning in a playful and innovative way to connect the participants. It should be noted here that classroom research has found that cooperative learning techniques increase the self-esteem, confidence, and understanding of students across racial and ethnic divisions, also the academic performance of minority students is improved without compromising the performance of majority group students (Aronson & Bridgeman, 1979).

The workshops were therefore very crucial to promote peace for Cypriot students across the divide. My only criticism for the workshops could be the lack of continuation and follow up process as the Education for a Culture of Peace was held between the years of 2014-17 and was supported by the European Commission through the Civil Society in Action IV Program opened for the Turkish Cypriot Community. According to the contact literature, contact should be regular and frequent (Bekerman, 2009). However, as much successful this one-day activity was, lack of continuity makes it difficult to measure the impact and the extent/depth of learning of the participants. As the key theorist behind contact theory Gordon Allport (1954), a positive impact of intergroup contact occurs only in situations marked by four key conditions: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom. I believe the fourth element, support of the authorities is a crucial aspect for the success of the project Education for a Culture of Peace in Cyprus. The project faces a great danger to lose its value with the lack of support by authorities or any law in Cyprus. This can be accepted as a criticism for the future of the project. In conclusion, I would like to add that this one-day workshop of the project and its activities can be set as an example that everyone can contribute to the promotion of peace. It is only a matter of enthusiasm, commitment and action to make it happen. It is true that peace education cannot resolve protracted intractable conflicts as it is in the case of north Cyprus, but it can prepare the ground for desirable political change. Education will prepare the path towards peace.

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# **An Analytical Study of Organizational Implication in EFL Writing Experienced by Iranian Students with Learning Difficulties (LD)**

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## **ABSTRACT**

This present study concentrates on the organizational implication the Iranian students with learning difficulties (LD) experience when they write an English essay. Particularly, the present study aims at exploring students' structural problems in EFL essay writing. A mixed method research design was employed including a questionnaire and a semi-structured in depth interview. Technical Data Analysis of findings exposed that students experience a number of difficulties in the structure of EFL essay writing. Discussion and implications of these findings are presented respectively.

**Keywords:** *organizational implication, EFL, writing, Iranian Students, learning difficulties*

## **1. INTRODUCTION**

Students' writing ought to indicate their consciousness of their own Communicative objectives, of the reader, and also of the writing context. Essay writing, which constitutes a problem for many ESL/EFL students widespread, is a foremost challenge for a considerable number of students with learning difficulties (LD). In spite of various attitudes and broad number of approaches to the teaching of writing have evolved from different methods, tackling EFL writing is still one of the most challenging areas for teachers of students with LD. Iranian students with learning difficulties (LD) need to authorize many academic assessments in English. Nonetheless, these students still experience certain obstacles in the organization and organization of their English essay writing as revealed by the results of an introductory essay writing questionnaire administered to fifty students.

In Iran yet there have been conducted limited studies in the field of essay writing. The present study is associated with investigating the organizational difficulties that Iranian students with learning difficulties (LD) experience while writing their essays in English.

Iranian students with learning difficulties face particular implication in writing. As many teachers of candidates with LD of English have observed, learning and developing the writing skill seems to be more painstaking and challenging than acquiring the other language skills (Zheng, Y., 1999). The fact of the matter is that generating an effective and well-organized piece of writing is an enormous challenge, particularly in one's second language (Nunan, D., 1999). This is hugely highlighted by the notion that the rhetorical conventions of English texts-the structure style, and organization-often vary from those in other languages (Leki, I. (1991) as they necessitate a great effort to identify and manage the difference. This is principally true of the rhetorical conventions of the Persian language as candidates' mother tongue.

In Iran, the education system gives importance to writing mainly for taking tests. In this respect, several studies in Iran were conducted offering different approaches and remedial programmes to tackle the de-contextualization of writing and to develop candidates' EFL essay writing skills (21).

The present study attempted to find answers to the students with learning difficulties and their teachers perceive the organization of the written essays.

How do Iranian students with learning difficulties (LD) and their teachers perceive the structure of the written essays?

## 2. LITERATURE REVIEW

Writing is “a reflective process and requires time to think about the topic, to analyze and classify background knowledge (Chakraverty, A., & Gautum, K., 2000). Writers need to employ an appropriate language to organize these concepts in the form of an efficacious and well-organized discourse. Writing is an intricate activity, a social act which reflects the writer’s communicative skills which is complicated to learn and develop, particularly in an EFL context (Shokrpour, N., & Fallahzadeh, M., 2007). L1 writing is perceived as: a cognitive psychological perspective, a socio-cultural perspective and a linguistic perspective (Myhill, D., 2009). In line with the process writing approach, this paper perceives EFL writing as a multi-dimensional process composed of a cognitive activity affected by a number of linguistic and contextual factors; EFL linguistic proficiency, instructional, psychological, sociocultural, and socio-political issues. If these factors are well-addressed, this will make writing an easy experience.

L2 Writing has consistently been regarded a seminal and significant skill in teaching and learning. According to Rao, Z. (2007) EFL writing is beneficial in two respects: First, it stimulates students thinking, forming ideas, and developing their aptitude to summarize, analyze and criticize. Second, it reinforces student learning, thinking and reflecting on the English language.

In regard to the context of the present study, essay writing is substantial to the learning of Iranian students with learning difficulties (LD) since it assists students and teachers’ acquisition of the fundamental study skills needed for understanding what they study and expressing it in their own words. This will assist them to evade memorization, rote learning and plagiarism that are much discouraged in the recent theories of teaching learning. Furthermore, aptitude and competence in essay writing will aid students pass their academic courses effectively and also successfully. Likewise, being proficient in essay writing in English will facilitate students with LD and their teachers to be successful teachers and action researchers in the future.

Coherence, or texture, is the combination of semantic configurations of two dissimilar, kinds: register and structure (Halliday, M., & Hasan, R., 1985). Text-based features mean structuring (i.e., the linking of sentences) and unity (i.e., being straightforward and sticking to the point). Reader-based features mean that the reader interacts with the text reliant on his/her earlier awareness. Structuring defined as “the organization of discourse with all elements present and fitting together logically” (Heller, M., 1999). This signifies that a well-organized essay involves an introduction, a thesis statement, rhetorical support, and a conclusion.

A number of research papers across Iran would have illuminated students’ organizational problems in English writing. For instance, Arab students’ written products revealed that repetition, parallelism, sentence length, lack of variation and misuse of certain cohesive devices are major sources of structure and textual deviation (Qaddumi, M., 1995). Furthermore, other studies declared that Yemini and Moroccan student writers have some weaknesses, in terms of organization, displayed in the student writers’ written texts.

In relation to EFL essay writing organization, numerous researchers come to an agreement that organization, on the instruction level is related to connecting concepts while on the micro level, it is concerned with connecting sentences and phrases. “The concept of organization is a semantic one; it refers to relations of meaning that exist within the text, and that define it as a text” (Halliday, M., & Hasan, R., 1985). Many researchers have highlighted the importance of text organization asserting that a text stands as

a text by means of organization. But for organization, sentences would be disintegrated and would result in a number of unconnected sentences (Hinkel, E. (2004).

### **3-METHODOLOGY**

In respect of the investigative nature of the present study, and its context-specificity, the interpretive, qualitative research was selected. The interpretive approach will aid the researcher inspect and comprehend the context within which essay writing in English is taught and learnt in typical Iranian upper-intermediate level colleges. This, in turn, will assist the researcher reveal the problems those Iranian students with learning difficulties (LD) and teachers face in the organization of their texts.

The sample of the present study includes fifty students with learning difficulties. Students with learning difficulties were recognized through a check list designed by the researcher. Ten out of fifty students were chosen to be interviewed. Additionally, five teachers filled in the questionnaire and were interviewed to supplement the data and findings. The present study made use of a questionnaire and a semi-structured interview.

### **4-FINDINGS**

Findings of the present study exposed that students with learning difficulties have to undergo organizational problems in their English writing. In respect to organizational problems in their English writing certain problems were discovered such as difficulty in writing the introduction, the thesis statement, the topic sentence, writing concluding sentences and writing the conclusion. Equally important, the teachers reported that their students have difficulty writing the thesis statement, the topic sentences, transition of notions, and sequence of notions.

A great variety of motives are linked with students' organizational problems in English essay writing. Primarily, the effect of topic-specific background knowledge was seen as effective on the overall quality and local organization of students' writing (Langer, J.,1983). What is more, it was highlighted that low English proficiency students find it difficult to develop well-organized writing due to paying attention to language matters rather than making meaning (Lee, C., 2004). Furthermore, this paper supports that students are inclined to observe distinct techniques in their written English that make their writing poorly organized such as including a broad statement in the opening sections of their essays before introducing the topic sentence the same was found with Iranian students with learning difficulties. In addition, Iranian students with learning difficulties overused coordinate sentences and misused topic sentences which were the reasons for their poorly organized and improper quality of writing.

In reference to student problems in organization, some were reported such as difficulty in using cataphoric and anaphoric reference, ellipsis, substitution, and genre related organizational bonds. Besides, overusing certain cohesive bonds was also reported. Varied studies have approved the value of text organization in English writing as a mechanism that expedites discourse flow. These studies also added that constructing well-organized texts by second language learners entails focused instruction and additional attention (Reid, J., 1993a). Moreover, numerous reviewed studies emphasized that production of well-organized text in English constitutes a serious problem to Iranian students.

### **5. DISCUSSION**

The present study exposed in its findings that there are varied and diverse elements and contexts lying behind these organizational problems. In fact, in terms of psychology, students undertake a number of barriers such as lack of incentive, lack of self-assurance, and writing uneasiness.

Iranian students with learning difficulties (LD) are not encouraged to write English essays for more than a few conceivable reasons. First of all, they are taught in a large class characterized by physical as well as intellectual distance between teachers and students. Second of all, Iranian teachers tend to use traditional teaching techniques such as lecturing, reading aloud, and book reading; they are frequently indifferent to student writers' communication in class; and student writers report negative attitudes towards essay writing as a difficult course. These factors are similar to the issues revealed by Holliday, A. (1996) as "sings of boredom", "passive watching" and "teaching spectacle". Lately, it has been referred to the impact of student passive listening on their learning in general and particularly creative writing (Abdollahzadeh, E., 2010). This lack of enthusiasm can affect negatively on students' improvement in essay writing. Finally, another study has confirmed that students' lack of motivation intensity impact on their vocabulary problems in writing (Al- Akloby, S., 2001).

Students' low self-esteem could be attributed to a number of socio-cultural issues. Parents' perspective on controlling might be an influential element in students' confidence-rising. As they unintentionally insert a lack of self-confidence in their children by disregarding their opinion in the family. Students distrust their parents to communicate their thoughts; this ordinarily occurs in the Iranian upbringing context where notable number of parents is potentially willing and ready to reprimand both physically or psychologically their children. Moreover, students habitually have a tendency to ask someone else to assist them in personal activities or school learning tasks. It is common among many Iranian that they depend totally at home on their parents or elder siblings. Individuality and self-reliance in study is an uncommon phenomenon in the Iranian education system and living culture. Another significant factor is parents' unrealistic academic expectation which is beyond some students' intellectual abilities. Regarding the educational system in Iran, students in classroom due to the fear of the teacher's strong authority are not given the opportunity to argue or negotiate with their teachers. All these factors might be the original source of lacking self-confidence among most Iranian students.

Most learning environments at Iranian public high schools or colleges are not designed to elevate student's self-confidence. In fact, it is underscored that writing multiple drafts, putting emphasis on the "publication" of students work, and teachers' comments that focused more on content and organization than on grammatical errors helped them create better pieces of written composition and grow more self-confidence in writing (Tyson, R. , 1997). Similarly, it is claimed that when students are self-possessed in their reading and writing skills, they are able to adjust to new teaching/learning methods quickly (Albertson, K.,2006).As a result, teachers and colleges must design a mentally reassuring and fostering learning environment in to the Iranian context to develop students' self-reliance and ease their psychological challenges.

Writing tension is said to negatively affect both the learners' incentive (Cheng, Y., 2002) and their academic accomplishment (Macintyre, P., Noel S, K., & clement, R., 1997) on one hand and their outlooks towards writing on the other hand (Atay, D., & Kurt, G., 2206). Research has confirmed that high anxious writers, in comparison with other low anxious ones, tend to stop more while writing and are less concerned with planning the overall structure of their essays (Selfe, C. ,1984).

Data exposed a number of features that might have contributed to Iranian students' writing anxiety such as lack of written feedback, undesirable oral reproach, working under time limitation, and about difficult topics for writing. A study across the Iranian context underscored that students with low wrote better quality pieces of written composition and had higher self-esteem than those with high nervousness (Hassan,C., 19981). Furthermore, it is acknowledged that students' writing anxiety is triggered by their previous negative assessments or by more complex psychodynamics (Rose, M., 1985). In reference to feedback, it was revealed that the peer feedback group of prospective teachers experienced considerably less writing anxiety than the teacher feedback group as they received opinions from their classmates to

elaborate on, and this collaboration assisted them look at their papers differently and lessen their writing anxiety (Rose, M., 1985). Additionally, it is implied that writer's block that leads to their anxiety in writing may be due to students' writing under time pressure (Lee.S., 2006). As a final point, it was reported that students with high apprehension selected topics that were more familiar to them and avoided unfamiliar topics (Lee.S., 2006).

Findings of the current study emphasized that teachers have expressed their concern about their students' lack of reading authentic English texts resulting in substantial challenges with regards to topic prior knowledge, coherence, organization, style, range of vocabulary, and grammatical structures and punctuation. What is more, teachers reported that students normally read the simplified texts of novels and plays. They are not used to reading for long hours and they are not ready to apply that effort. This is likely to impact on English writing because the more one reads the better writing style and vocabulary one develops.

To highlight how strong and close the relationship between reading and writing should be, it is exploited that the teaching of reading and writing are inseparable (Zheng, Y., 1999) academically, it was recommended that L2 reading would help improve L2 writing at the primary and the higher levels (Bell, T. 1998). In line with this, it has been confirmed that reading for pleasure and mandatory reading affect developing writing skills positively (Feeris, D., & Hedgcock, J., 1998). In reference to the Iranian context, the importance of reading to enhance students' previous knowledge was highlighted (El-koumy, a., 1983). He added that the teaching of reading and writing should be integrated. A few of reasons could be counted for this lack of broad reading, such as lack of motivation from parents, lack of monetary resources, lack of appropriate and well-resourced libraries.

The current study also exposed that Iranian student's lack topic previous knowledge. This was reinforced by the observations of both students as well as their teachers. Accordingly, it was asserted that there is a convincing relationship between topic-specific background knowledge and the quality of student writing (Larios, J., Marin, J., & Murphy, L. , 2001). Similarly, previous knowledge and writing experiences appeared to influence on students' revision processes more than any other factors (Selfe, C. ,1984). Previous knowledge about written English is thought to be one among other effective factors in students' success (El-Mortaji, L. ,2001).

Rote learning is one of the characteristics exemplifying the Iranian educational system. Students are stimulated to memorize what they study rather than actively take part in serious and generative thinking processes. In cultural terms, Iranian students who memorize what they study are viewed as smarter than those who do not. This is supported by most exams in the diverse educational steps in most courses which ask students questions that mostly require them to evoke what they have memorized in their earlier studies. These exams do not only generate distress and hindrance, but also accentuate rote memorization and restrain critical thinking.

It is widely believed that the Iranian educational system is to evoke competitive learning environment. In an Iranian classroom, students are ranked based on accomplishment that is gained through a grim competition. This has led to teachers constructing some perplexing exams that permit only smart students to pass and necessitate other students to resist several exams or repeat the whole academic year. Consequently, Students contest due to specific socio-cultural factors such as teachers and parents' inspiration.

## 6. IMPLICATIONS FOR TEACHING OF WRITING

The current study contributes significantly to EFL education in Iranian in terms of English language educational research, and curriculum planning and design. Furthermore, the present study has the potential to develop English language teacher education in several of ways:

a) It highlights the very importance of students' needs as this will facilitate teachers to appreciate ways to find to satisfy these needs and also conduct an effective learning.

b) It functions as a model for further studies in education in terms of using the explanatory constructivist research agenda. This attitude has been entirely overlooked in Iranian and no previous study having used an investigative approach to study the organization and organization problems faced by Iranian students with learning difficulties (LD).

c) It assists curriculum designers take into consideration students' needs and interests in planning their core curriculum.

## 7. CONCLUSION

- The teaching resources used with Iranian students ought to cover a wide range of organizational skills coping with students; diverse proficiency levels.
- Teaching and learning tasks should be categorized and varied to aid students make the most out of them, in particular, in big classes of different capabilities and skills.
- Essay writing teachers should be educated to employ different classroom interaction techniques and teaching approaches such as pair work and group work, peer-review, student-teacher conferences and any other related techniques. It is also recommended that teachers should be acquainted with using technology in the classroom to help students with different learning styles learn efficiently and rapidly.
- It is recommended that essay writing lecturers should be involved in conducting studies in general and action research in particular where they can discover students' weakness areas and attempt to develop them.

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# **An Effective Personal Education Through English & American Novels**

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## **ABSTRACT**

English has usually been necessary and sufficient condition from the younger generation to adults. Specially, there are many universities and companies to need English abilities in South Korea. Ultimately, this can consider why English is important to get ideal jobs. Accordingly, diverse ways to master English have been studied and poured out for many years. However, English education should serve as not only helping learners improve its skill but as a guide lightening the course of one's life. Above all, personality education can be the most important. So this paper aims to examine the effect of building humanism through a variety of English & American novels. Works at the ages of students are selected. In fact, personality educations have been done in many ways, but many students tend to be inspired easily by characters of literature works. However, those who have concentrated on academic knowledge may be deficient or negative about the opportunities building upright character. Especially for those who long to get good grades of English exam. Such much concern can decrease by acquiring English ability through the sentences of novels. Therefore, literary works help students do much better in two aspects. Therefore, this paper is comprised of introducing and the various application method of English & American novels which the author of this paper has been teaching and researching over years in the school curriculum.

## **INTRODUCTION**

Personality is a set of individual differences that are affected by the development of an individual: values, attitudes, personal memories, social relationships, habits, and skills (McAdams, Mischel & Shoda & Smith). Engler mentioned that different personality theorists present their own definitions of the word based on their theoretical positions. The term "personality trait" refers to enduring personal characteristics that are revealed in a particular pattern of behavior in a variety of situations. It has been shown that personality traits are more malleable by environmental influences than researchers originally believed (Briley, Tucker & Jeronimus). Personality differences also predict the occurrence of life experiences. Is an effective personality class through English & American novels possible?

## **THE STUDY**

According to the regular curriculum, English novel is opened to the 3rd grades in every spring semester, and American novel to the 2nd in every fall semester. Once Collecting distinguished novels is important and then, reading and analyzing works follows. Discussing works in English with each partner (Using the sentences in works). Writing the key sentences after discussing and reading novels. Some of works which the author has taught or studied are summarized as follows.

With main texts, other novels (including young-adult literary works) are introduced and studied. First, *River Boy* is a young adult novel by Tim Bowler, published by Oxford in 1997. It is the story of a teenage girl facing the prospect of bereavement. Bowler won the annual Carnegie Medal, recognizing the year's best children's book by a British subject (Tim Bowler's Official Website. Retrieved 2012-09-10). *River Boy* also won the 1999 Angus Book Award (Angus Council. Retrieved 2010-05-30). Fifteen-year-old Jess, a dedicated swimmer, dotes on her grandfather, a fiercely independent and cantankerous artist. When he falls ill, he insists on returning to the isolated valley where he lived as a child to finish his last painting, a haunting landscape called 'River Boy'. Jess is desperately trying to cope with the knowledge that her grandfather is dying, and she does her best to help him finish the painting that is so important to him. Jess then learns that her grandfather has died peacefully, leaving her his painting of the 'River Boy', which she now realizes is both a landscape and a portrait of the boy she met – a self-portrait. Focused on understanding the gap between generations. Second, *The War that Saved My Life*, written by Kimberly Brubaker Bradley, is a 2015 children's middle grade historical book published by Dial Books

for Young Readers. *The War that Saved My Life* was a Newbery Honor Book in 2016 and was Bradley's first Newbery Honor Book. *Ada Smith: The protagonist of the story.* Ada is a ten-year-old girl with a clubfoot (right foot). She has been abused by her mother physically and mentally. She learns how to walk, write and ride horses after running away from her mother to the countryside. Third, *Summer* is a novel written by Edith Wharton published in 1917 by Charles Scribner's Sons. The story is one of only two novels by Wharton to be set in New England, who was best known for her portrayals of upper class New York society. The novel details the sexual awakening of its protagonist, Charity Royall. "Wharton begins her book, in other words, with Charity Royall discarding both models of female perfection from the past: the ancient erudite make one and the modern sentimental female one" (Wharton, Introduction by Elizabeth Ammons of *Summer*, xxvi). This work is focused on real love and the value of life in the class. Fourth, *Number the Stars* (1989) written by American author Lois Lowry is a work of historical fiction and about the escape of a Jewish family (the Rosens) from Copenhagen during World War II. "I think readers of every age match themselves against the protagonists of books they love. *Would I have done that?* they ask themselves as they follow a fictional character through a novel. *What choice would I have made?* And ten-the age of Annemarie in *Number the Stars*, and the approximate age of most of the book's readers- is an age when young people are beginning to develop a strong set of personal ethics" (Lowry, "Introduction of *Number the Stars*"). Fifth, *The Great Gatsby* written by Fitzgerald, F. Scott explores themes of decadence, idealism, resistance to change, social upheaval, and excess, creating a portrait of the Jazz Age or the Roaring Twenties that has been described as a cautionary tale regarding the American Dream- "a dream that goes unrealized for Gatsby and Daisy in Fitzgerald's prose." In *The Great Gatsby*, Fitzgerald brilliantly captures both the disillusionment of post-war America and the moral failure of a society obsessed with wealth and status (64. Leland, Person S. "'Herstory' and Daisy Buchanan." *American Literature*, Vol. 50, No. 2, (May, 1978), pp. 250–257. Web.). There's much to be learned from the author's fiction, too, especially his most famous novel, "The Great Gatsby." According to HUFFPOST, there are 7 Life Lessons From 'The Great Gatsby'. These are:

1. Optimism is a noble, if futile trait.
2. Money can't buy you love (or friends).
3. Unbridled passion isn't always a good thing.
4. It's not easy to leave your past behind you.: So we beat on, boats against the current, borne back ceaselessly into the past.
5. Don't critique others: His open-mindedness gives him a deeper perspective on the people around him and protects him from falling subject to the glitzy, surface-level materialism of the '20s.
6. Physical beauty is fickle and fleeting.: From the moment we're introduced to Daisy, she seems more like a beautiful caricature of herself rather than an actual person, but ultimately she leaves Gatsby the dust in spite of his immense efforts.
7. You know what they say about assuming. : When George discovers that his wife has died after being hit by a car, he assumes that Gatsby was the driver and proceeds to take revenge on him. In fact, Gatsby was covering for Dais. (HUFFPOST, [http://www.huffingtonpost.com/2013/09/24/great-gatsby\\_n\\_3976598.html](http://www.huffingtonpost.com/2013/09/24/great-gatsby_n_3976598.html)) (09/24/2013 07:50 am ET | Updated Sep 24, 2014)

In the class students can discuss and think about these lessons. Also, they may adapt the work to themselves and their surroundings. Gradually they recognize and understand self and others. Finally, *About a Boy* written by Nick Hornby in 1998. Nick Hornby is a popular England writer and has written many novels related to various social problems and let readers perceive. His typical works sports are *Fever Pitch*, *High Fidelity*, and *About a Boy*. As mentioned above, the works have diverse subjects, that is, family, life, or love-is original, moving, and insightful. When readers face some problem, it helps them resolve the solution. Especially it is considered his works are useful for young people in 21st century. There are favorable reviews on *About a Boy*. Here are praises for About a Boy. The Washington Post praised that "You should read [About a Boy] for its depictions of the trials of motherhood, the drawbacks to self-imposed detachment, the ache of childhood need, the elastic confines of what constitutes a family, and how it may never be too late to grow up." And Vogue reviewed that "An utterly charming, picaresque tale of an older guy, a young id, and the funky, dysfunctional real-life ties that bind-and unbind."

## FINDINGS

At the beginning of class, students are worried, nervous and hesitate to select novels because most novels have many pages. As it goes by, they acquire various vocabularies and expressions from novels and finally they can write compositions. Of course, the instructor encourages them to create their opinions and compositions. Most of all, it is very important to give students' confidence a boost. These scanned materials are written by students taken courses. Students were given assignment and quiz after finishing each work. These scanned materials are permitted by some students.

Picture 2: Student 1's writing about one's Past, Present & Future

Quiz. English Fiction. May. 23<sup>th</sup>, 2017.

학번: 20091287 이름: 이희진

Prejudices.

When I was 20, when I started university, I had a lot of prejudices, which made me a bad person. One of the prejudices was what I thought of who people smoke was bad. So I have never tried smoking. But I realized that I was wrong. It was just prejudice. There were a lot of people who were nice, even they smoke. I was in the class and I saw one of my classmates giving a presentation about his stories when he was young. After this class, I was talking to him, and he told me about his stories much more. It was impressive. He always does his best, even he doesn't like. I realized later that he smoked, but I wanted to keep meeting him because he was so nice. At the very least, he was not someone who would do anything bad. And he became my best friend now. At that time, I could know that I was wrong about thinking of smoking people was bad.

Now, I have done better than before about prejudices. If I meet someone, I have tried to meet several times and then I judge if the person is good or bad. Not to have any prejudices, I have tried to talk a lot to someone since 20 years old. Talking a lot to someone is one of the best ways to solve my problem.

I want to understand more people like foreigners, gay, lesbian and so on. When I was in Canada, I met a lot of friends, there were some gays. I didn't like gay people and I kept away from them until I was in Korea. But they are people like me or my friends. In the future like 40 years old, I want to be a familiar person to everyone. To do this, I have to meet more people, talk a lot, and learn their culture. I will do my best to be a familiar person and I keep trying always.

### Picture 3: Student 2's writing about one's Past, Present & Future

Quiz. English Fiction. May. 23<sup>th</sup>, 2017.

학번: 20140206

이름: 임서진

When I became 14 years old, I transferred to another school in Cheonan. I was lonely because there is no one who I knew. Almost of students knew each other because they came from same elementary school. I should adapt to new school and circumstances. I kept trying to hang up with friends. Unfortunately, the more I gave affection to them, the more they required something to me. For example, whenever I said funny joke, they required more and more joke. I was tired of everything and even I told to my parents that I wanted go back to Daejeon where I left. My parents who worried about my school life didn't scold me and touched my feeling. My mother advised for me to refuse my friends' requests if the requests made me painful. With my parents' support, I could manage the relationship with my friends. When I concerned about which high school should I go to, my parents and I always talked together. I can't tell my story and life without my parents' love. One day, I came back home after school and I heard sound of crying in my house. My mother was crying quietly because someone hurted her feeling. I was really sad and realized that even adult could be hurted and cry. Even though there is problem in their life, they always masked their bad feeling in front of me. They worried about me first. With my parents' love I entered Hannam University. Before I became an adult, I thought that there would no problems in my life. Because I already have been too stressed out due to Korean SAT. I faced some problems as an adult. In this case, I should overcome myself. I easily get red in my face and I have shy character. All of my classes in the school required me to speak in front of many people. I was really embarrassed and got red in my face, announcing in front of people. My father always told me to be a positive person and I thought what my father told to me.

So, I became to think positively. I acknowledged my weakness and kept trying to be brave. To be honest, I'm still shy and easily get red in my face, but I have confidence to overcome these things. Also, I have confidence to overcome any problems in my life. In my 30 years old, maybe I'll become a good mother and have a counseling job. I have a passion to listen someone's hurts and touch their mind. I want to give love to people as my parents do to me.

Picture 1: High Potal site in HNU

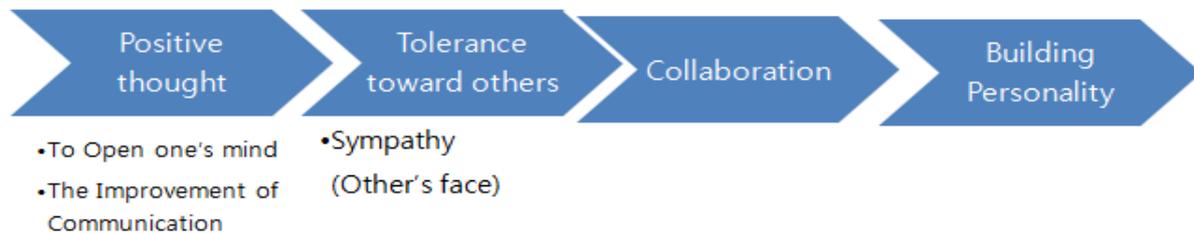


**CONCLUSIONS**

By reading distinguished English & American novels, students learn vocabularies and sentences naturally. Through works, they think and discuss again and again, and they get accustomed to accept others' opinions. Gradually they can break down walls of prejudice. As many scholars have mentioned, we all have faced an era of artificial intelligence, like AI, so most of all personality education is very important. In the end, English & American novels are considered as the best appropriate. These are the steps of developing personality:

- First, Positive thought
- Second, To Open one's mind
- Third, The Improvement of Communication
- Fourth, Tolerance toward others
- Fifth, Sympathy (other's face)
- Sixth, Collaboration

Figure 1. Four steps building personality through reading English & American novels



Consequently, they can be represented as above diagram and gradually students' personalities are expected to get improved and do better.

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# **An Exploration on Intercultural Competency Skills: Thai International College Students' Perspectives**

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## **ABSTRACT**

This study aimed to explore the intercultural competency skills among Thai undergraduate final year students who are studying in an international college of a public university located in Khon Kaen province, Thailand. Researcher utilized qualitative method focus group interview design. A total of six students were involved as informants. Results revealed that most of them prefer to practice cultural tolerance rather than cultural adjustment when they are dealing with their foreign course mates. They respect, accept, and appreciate of other people cultures and let other people behave according to their beliefs even though they disagree with the belief.

**Key Words:** Intercultural, competency skills, international college students

## **INTRODUCTION**

Intercultural competency skills are one of the values that critical and demanding to be added through educational process in order to produce future relevant human capital for the nation. The key challenge of higher education institutions particularly international college is building knowledge-based and skilled workforce. As a result, the aim of this study was to explore the intercultural competency skills of Thai students of an international college in a Thailand public university. Since the main characteristic of international college students are ready to work in international communities, intercultural competency skills are significantly important to explore so that the graduates will possess knowledge that will allow them to compete successfully by fulfilling the needs of society and providing world-class quality labor and talent.

Intercultural competency skills refers to an individual's ability to function effective across cultures (Whaley & Davis, 2007), to think and act in intercultural appropriate way (Hammer, Bennett, & Wiseman., 2003: 422) or an individual's effectiveness in drawing upon a set of knowledge, skills, and personal attributes in order to work successfully with people from different national cultural backgrounds at home or abroad (Johnson, Lenartowicz, Apud, 2006: 530). Intercultural competency skills development is emerging as an important competency as well as relevant to employability especially in the diversity of the world and the pressing global challenges confronting us as humans (Deardorff, 2012).

The key issue for education policy makers is the extent to which the higher education institutional design of education systems makes a difference to university-to-work transitions or whether economic aspects dominate (Karmel, 2017). Therefore, higher education institution rely greatly on numbers of graduates to exhibit success in internationalization, such as developing intercultural competent graduates who can compete successfully in the global workforce. Tang and Sanoamuang (November 2016) emphasized that the result of internationalization of international college has become one possible response to such challenges. However the specification of anticipated outcomes of internationalization are often general and vague, with goals stated broadly that the institution will become internationalized or that a goal is to graduate cross-culturally students or global citizens (Tang & Sanoamuang, November 2016).

The studied international college was established in 2008 and strives to be the leading international education center especial in north-east of Thailand. The international college was attached to the public university aims at producing quality graduates equipped with the knowledge and professional skills in the areas of business and social sciences. Students are recruited from various countries including China, South Korea, Vietnam, Cambodia, and so on thus creation of a multicultural society. Therefore the improvement in the quality of graduates that possess knowledge and skills that will allow them to compete successfully by fulfilling the needs of society and providing world-class quality labor and talent is especially important.

Multicultural societies in this international college help to promote cultural acceptance and pluralism among students. However students should be careful not to focus on simple aspects of culture such as food, dance, music, and clothing, as they do not represent a culture in its complexity and do not disturb the organization and power of the dominant culture. In its rich diversity, culture has intrinsic value for development as well as social

cohesion and peace. Then living in multicultural societies requires tolerance and acceptance of the diversity in the societies.

The Thailand Qualification Framework (TQF) of higher education system is planned to support the educational practice based on the guidelines set out in the National Education Act, to guarantee consistency in both standards and award titles for higher education qualifications, and to make clear the correspondence of academic awards with those approved benchmarks set by other universities worldwide. As a result, this TQF will assist to deliver appropriate ideas of comparison in academic standards for higher education institutions in their planning and internal quality assurance processes, for evaluators involved in external reviews, and for employers, in understanding the skills and competencies of graduates they may employ (Thailand Ministry of Education, November 2006). Consequently, all the higher education students in Thailand have to study according to these five domains namely ethical and moral development, knowledge, cognitive skills, interpersonal skills and responsibility, and analytical and communicative skills. Out of these five domains, intercultural competency skills are mainly included in interpersonal skills.

Cultural tolerance is defined as the respect, acceptance and appreciation of the rich diversity of our world's cultures, our forms of expressions, and ways of being human. The essence of tolerance is the right of people to behave according to their beliefs, even when there are others who disagree with the belief. Being tolerant means not to exert any pressure on anyone to change his/her beliefs, to respect opposite opinions, habits, and to be free from prejudices. Tolerance is not a compromise, forgiveness or encouragement of negative behavior. On the other hand, it is an active attitude on the basis or recognition of the human rights and freedoms. Cultural adjustment is defined as a common stress reaction that individuals have when they find themselves immersed in an unfamiliar culture. Generally cultural adjustment has four common stages namely 'The honeymoon – initial euphoria/excitement, culture shock – irritation/hostility, gradual adjustment, humor and perspective, and feeling at home – adaptation and biculturalism (Oberg, 1954).

### **CONCEPTUALIZATIONS OF INTERCULTURAL COMPETENCY SKILLS**

Leung, Ang and Tan (2014) had conceptualized intercultural competency skills based on 300-plus personal characteristics identified in previous research that could be distilled into the content domains of intercultural traits, intercultural attitudes and worldviews, and intercultural capabilities. Costa and McCrae (1992) and Funder (2001) defined personality traits as enduring personal characteristics that determine a stable pattern of cross-situational behaviors. In other word, intercultural traits refer to enduring personal characteristics that determine an individual's typical behaviors in intercultural situations. Researcher concluded the operational meaning of intercultural traits as open-mindedness (Van der Zee & Van Oudenhoven, 2000), dissimilarity openness (Lloyd & Härtel, 2010), tolerance of ambiguity (Bird, Mendenhall, Stevens, & Oddou, 2010; Dearthoff, 2006), cognitive complexity (Lloyd & Härtel, 2010), flexibility (Matsumoto, LeRoux, Ratzlaff, Tatani, & Uchida, 2001), inquisitiveness (Bird et al., 2010), quest for adventure (Javidan & Teagarden, 2011), patience (Kealey, 1996), and emotional resilience (Kelley & Meyers, 1995).

Intercultural attitudes and intercultural worldviews as the second component of intercultural competency skills focus on how an individual perceive other cultures or information outside their own cultural worlds (Leung et al., 2014). According to Leung et al., individual may have positive or negative attitudes toward other cultures or intercultural interactions. Individuals who are highly culturally competent have positive attitudes toward intercultural contact. Bennett (1993) and Srinivas (1995) highlighted that individual may have cultural or global worldviews that either ethnocentric (i.e., seeing the world from one's own cultural worldview) or emphasize the complexity and contradictions of different cultures and countries, as well as the similarities beneath surface-level differences. Individuals who are highly intercultural competent should have sophisticated, rather than ethnocentric or simplistic, construal of cultural differences and similarities. Constructs that capture such individual differences include ethnocentric-ethno relative cultural worldviews (Hammer, 2011), cosmopolitan outlook (Bird et al., 2010; Javidan & Teagarden, 2011), and category inclusiveness (Bird et al., 2010).

Intercultural capabilities will be the third components of intercultural competency skills emphasize what a person can do to be effective in intercultural interactions (Earley & Ang, 2003). Examples of the intercultural capabilities include showing knowledge of other cultures or countries (Earley & Ang, 2003; Javidan & Teagarden, 2011); metacognitive, motivational, and behavioral cultural intelligence (Earley & Ang, 2003); linguistic skills (Imahori & Lanigan, 1989); social flexibility (Bird et al., 2010); adaptability to communication (Lloyd & Härtel, 2010), and cultural tuning in terms of holistic concern, collaboration, and learning (Leung & Cheng, 2014).

In this study, the intercultural competency skills are domain specific and focus solely either intercultural traits

(Van der Zee & Van Oudenhoven, 2000), intercultural attitudes and worldviews (Bennett, 1993), or intercultural capabilities (Earley & Ang, 2003). The Bennett's (2004) Development Model of Intercultural Sensitivity (DMIS), with cultural worldviews as its conceptual basis, posits that intercultural competency skills advance along a developmental continuum, with increasing complexity and sophistication in the perception and understanding of cultures and cultural differences was utilized in this study. The trajectory of intercultural competence development begins with an ethnocentric mindset characterized by a simplistic set of perceptions regarding cultural commonalities and differences. Across six distinct stages, intercultural competency skills progresses toward an ethno relative mindset characterized by a complex understanding of cultural commonalities and differences and the ability to shift between cultural perspectives. The six stages are denial, defense, reversal, minimization, acceptance, and adaptation (Hammer, 2011).

## LITERATURE REVIEWS

Leung et al. (2014) surveyed the current conceptualizations of intercultural competencies and proposed the intercultural competency skills consisted of traits, attitudes and worldviews, capabilities, or a combination of all the dimensions. Dimitrov, Dawson, Olsen, and Meadows (2014) investigated on how teaching programs facilitate the intercultural competency development among the graduate students as well as prepared them for communicating effectively in the global workplace after graduation. Dimitrov et al. found that teaching development programs should be planned to make students became more aware of cultural and disciplinary differences and were able to adapt their communication style to audiences with different levels of background knowledge, and felt more prepared for interpersonal interactions across cultures. In addition, they revealed that students were able to transfer the skills that they learned to other areas of their specialization and used effective intercultural communication strategies when interacting with their foreign peers and faculty supervisor.

Tang and Sanoamuang (November, 2016) employed a survey design to 129 undergraduate students in an international college of a public university indicated that international college students possess intercultural competency skills differently according to their nationality, program, and academic year by using independent t-test and one way ANOVA analysis. Findings of their study indicated that there was a significant difference between Thai students and international students of their intercultural competency skills in terms of identification of their friends' ethnic group ( $p = .001$ ), different cultural practices ( $p = .036$ ), and the impact of prejudice ( $p = .009$ ). In addition, there was a significant difference between the different program of students on their intercultural competency skills such as impact of cultural background on their thinking and actions ( $p = 0.006$ ), impact of different ethnic and cultural background on their learning ( $p = .007$ ), impact of institutional practices ( $p = .010$ ), and building positive relationship with friend from different ethnic and culture ( $p = .002$ ). Finally there was a significant difference between the different academic year of their study on their intercultural competency skills namely ignore racist statements ( $p = .032$ ), impact of cultural background on their thinking and actions ( $p = 0.000$ ), concern about values, traditions, and culture of others ( $p = .004$ ), and the impact of prejudice ( $p = .009$ ). Table 3 indicates the inferential findings of this study.

The implications of Tang and Sanoamuang's (November, 2016) study revealed that the international college students should have an opportunity to reflect consciously on their intercultural skills, receive feedback on those skills, and develop a foundation of intercultural knowledge would be better prepared them to take on leadership roles in diverse group. This is because when these students enter the workplace later, they are often identified as potential leaders, given their training in areas such as project management and leading teams. However, according to Chuang (2013), to be successful leaders in a diverse workplace specifically need to acquire intercultural skills and knowledge. These international college students have to become increasing globally mobile, moving from country to country as part of their career areas such as global business, international marketing, and tourism management. Even within Thailand, international college students are going to encounter a highly globalized workforce upon graduation. Tang and Sanoamuang (November, 2016) suggested that all the teaching programs have to be planned to enhance with intercultural competency components in order to allow graduated international college students in the future are equipped with a highly transferable set of interpersonal and facilitation skills that are sought by employers both in academia and in industry setting. Faculty educators were expected to help international college students to reflect on the competencies they have gained in the training programs and articulated them to potential employers after graduation.

## RESEARCH QUESTIONS

In this study, researcher planned to look at the intercultural competency development from the perspectives of six Thai students who experienced in dealing with people who have different cultures. The researcher would seek to describe the intercultural competency skills development from these 10 specific research questions as below:

1. Do Thai international college students find difficulty to get along with some of their friends who have

- different culture with them?
2. Do Thai international college students feel uncomfortable when someone shows different values and beliefs with them?
  3. To what extent do Thai international college students have knowledge regarding the culture of other ethnic groups in their class?
  4. To what extent that their cultural background affecting their thinking and actions?
  5. To what extent do Thai international college students agree that the international college practices that impacting on students from ethnic minority groups?
  6. To what extent do Thai international college students understand about the concept of cultural diversity and sensitivity?
  7. Do Thai international college students able to communicate their needs to their friends who are from different cultural background?
  8. To what extent Thai international college students are able to build positive relationship with their friends from different ethnic and culture?
  9. To what extent Thai international college students can apply their cultural awareness and knowledge while interacting with multicultural friends?
  10. What do Thai international college students understand about the meaning of prejudice?

## **METHOD**

Purposeful sampling technique was employed in this qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2002). This involves identifying and selecting individuals that are especially knowledgeable or experienced with this phenomenon of interest (Cresswell & Plano Clark, 2011). In addition to knowledge and experience, Bernard (2002) noted the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner.

After considering the above circumstances, focus group interviews were conducted to six final year international college Thai students. The selected participants had the experience in dealing with other countries cultures such as stayed at overseas countries through student exchange program for the length of time spent ranged from six months to four years. The study was approved by the university's Research Ethics Board. Participation in the research was voluntary. Participants were invited to indicate their willingness to participate in focus group interviews (Dawson, Dimitrov, Meadows, & Olsen, 2013). The duration of the focus group interview was one and a half hours. The interview guide included a series of probes and clarification questions to maintain consistency in questioning across participants. The most frequently represented cultures included China, Mexico, United States, and Europe cultures.

The interviews were audio recorded and partially transcribed, then coded using a theme analysis approach (Miles & Huberman, 1994). During coding, key themes related to research questions were identified, such as concrete examples of intercultural competency skills learned and also examples of how participants' knowledge of cultural differences influenced their interactions with their foreign course mates. After the first round of coding, similar themes were grouped into larger categories (Strauss & Corbin, 1990). Exact quotes representing each frequently occurring theme were then fully transcribed based on the audio recordings. To ensure participant anonymity, participants' quotes are identified only by symbol R.

## **RESULTS**

Results of this study are presented according to the research questions as indicated above.

### ***Difficulty to get along with different cultures friends***

Qualitative findings indicate that most of the Thai international college students found difficulty to deal with their foreign course mates particularly from China. All the informants did not take initiatives to work together with foreign course mates partly they have their own Thai friends whom they can understand each other very well. Language differences can be one of the reasons made them feel reluctant to work together. They also found difficulty to understand their foreign course mates' cultures. Likewise they also found their foreign course mates did not take initiatives to understand their cultures.

*"I did not join together with them...just a little bit. I do not have language problem but I have many friends from Thai. We can easily understand each other. But foreign course mates like those from China, they did not understand our Thai culture like they did not take off your shoes when they come to have discussion in our hostel." (R1)*

*"They have different identity with us and also different cultures with us. But they always try to cope with our Thai culture and learn the Thai culture from us. I have difficult to explain to them about our*

cultures.” (R2)

“May be because of the language.... Sometimes I find difficult to work with them. Most of the time, I will let them do what they want.” (R3)

“Most of the China boys are very stubborn, they do not accept our ideas when we are doing our group assignment together. Most of us have given up to work with those China boys. China girls slightly better, they are not that stubborn.” (R4)

“I find difficult to work together with them. They do not understand our Thai culture.” (R5)

“When we do activities together, China course mates are very serious. We are more relaxed, not as serious as them. They are very serious in their studies. But we have to work it up with them. Most of them I have to tolerate with their style.” (R6)

“My foreign course mates especially those from China, now they have their group already. They do not want to mix with us. Actually they understand what they have to do by studying in other country like Thailand. But they just do not want to learn our cultures and they do not have much commitment in our student union. They refused to be part of our big family.” (R4).

### **Feeling comfortable with different values and beliefs**

Majority of the informants can tolerate with the different values and beliefs. The informants stated that they are young generation therefore they are also very open to accept west values and beliefs. They are not extremists. They found some similarities between eastern cultures but not western cultures.

“Thai people are not serious about religion. We do not go to temple very often. I can accept the modern culture nowadays like the couples stay together without marriage, nothing wrong.” (R1)

“We do not mind so much about other people’s belief and value system that are different from us. Well, they can do what they like” (R4)

“I found that most of the eastern cultures like Thai culture and China culture are quite the same in term of value. For example, we respect older people, we take care of our parents. But not western people, they do not care about their parents once they grow up, they stay on their own, they do not so much respect elderly people.” (R2)

“Sometimes I really cannot accept the west value like they like kissing at the public, hugging their girl friends. Wear very little clothes....Oh..Oh, I do not know what happen to our parents if we do that.” (R3)

### **Having knowledge regarding the culture of other ethnic groups**

Most of the informants do not have much knowledge about other ethnic groups’ cultures unless they have opportunities to go abroad or visit other province. If they are locals, most of them do not have much knowledge about other people cultures.

“I have been in United States for 4 years under student exchange program. I stayed with my adopted Mexican family and learned a lot about their cultures. Such as they believe that their ancestor will become ghost after they died. They will pray to their ancestor and believe the spirit of their ancestor will help them to have better life.” (R2)

“I do not have a chance to travel abroad. But I found that I myself do not have knowledge about cultures in other province of Thailand either. For example, the local language here is different from the north of Thailand, different place, same word may have different meanings. I am always confuse.” (R4)

“Our Chinese friends like to talk loudly. When they are eating, they eat loudly. I do not understand why they like to act like that. It seems to be rude in our culture.” (R3)

“During the first year, I was quite shock with China students’ attitudes.” (R4)

“I have an American roommate during my first year. She is very open, always bring different boyfriends to our room. Sometimes even have sex with the boyfriend in our room. I cannot understand how can she do that. Finally, I advise her to do this outside the hostel, not in the hostel. After that she did not do that again. I can accept her openness by having sex with her boyfriend before marriage but not in my territory.” (R6)

“Besides, she likes to be naked, she always drunk. This is her daily life, but it is ok for me. I know this is their cultures” (R6)

“I want to say about Laos culture, their people like to wear long skirt and very formal most of the times. Thai people are not like that, we do not like to wear very formal.” (R5)

“I found that my foreign course mates are quite different from us especially those from western countries. For example 3 years ago, my foreign friend came late to the class, still can say hello to the lecturer. They do not feel sorry at all. Thai people are very respect teachers or lecturers, we will look down to the floor if we came late, we dare not to say hello to our lecturer. We respect and trust our lecturer.” (R1)

“Those China students sometimes even hold lecturer’s shoulder. I never see that happened to Thai

students. Thai student will not stand near to the teachers, we must sit or bend lower or knee down when we talk to our teachers. This is our culture to show respect” (R4)

### **Cultural background affecting thinking and actions**

Most of the informants agreed that their background have affected their thinking and actions. For example, sometimes they do not need words to understand each other because their friends who are from the same cultures will send the message automatically to them through their actions.

“We do not reject people directly in Thai culture. We seldom say no even though we disagreed with somebody. It is considered rude if we do that.” (R4)

“Thai people want something from you but they do not say they want. They still do not want your gifts although they like it so much. We have to give many times, then only they accept. This is our manner that we learned since we are young.” (R2)

“Normally when we invite our friends several times, he or she still not responded, means that he or she rejected my invitation.” (R4)

We don’t mind so much if our friends rejected to join us for any activities. For me, it is important to have many friends around.” (R2 and R4)

“Most of the time, we can understand each other very well because we are from the same background. It is easy to talked among friends, normally the young people say no means no. Not like adults, when we talked to adult, we need to be more polite.” (R6)

### **The impacts of international college practices on ethnic minority groups**

Informants stated that most of the international college practices are using English as a medium. Therefore they concluded as a part of concern on ethnic minority group. However, certain events were not welcomed by foreign students such as Freshman Activity because of using Thai language instead of English.

“This international college is using English most of the time, which shows that they are considered about minority group.” (R1)

“Because some words we cannot express in English, we have to use Thai language. Thai language and English language are very different. Chinese students do not like to join us because they cannot use Thai language. For example Freshman Activity, I never see any China student attend it.” (R4)

“All the forms in our international college are in English. But China students very funny. Sometimes we talked to them in English but they like to reply using Thai language.” (R2)

“My feeling why they act like that because they try to be parts of us. Thai language is hard. It is difficult for China students to speak Thai. Likewise we Thai students found hard to speak in English.” (R4)

“We are shy and less confidence to speak English. That is why you will find that Thai students do not answer questions asked by lecturers.” (R5 and R6)

### **Understanding about the concept of cultural diversity and sensitivity**

Most of the informants are not sensitive about cultural diversity and they got culture shock when they started to mix with their foreign course mates.

“For me, I am not sensitive. I was shock at first but is ok after that. For example, take off the shoes, sit on the floor are the Thai cultures. But our foreign course mates do not care about it.” (R3)

“But we are not sensitive about that. If they do not take off their shoes, just advise them.” (R2)

“In Thai culture we are very sensitive about women cannot touch monks. I always advise my foreign course mates to be sensitive in this matter.” (R1)

“In Thai culture, we respect monks and older people very much. If they are older than us, we have to alert for not going close to them or touch their head.” (R4)

### **Communicative abilities with different cultural background friends**

All the informants do not have problems dealing with friends who have different cultural background.

“Yes, I have no problem to tell my friends about our Thai culture.” (R1)

“We not only tell them about our culture, we also help them to understand.” (R4)

“I have Australian friend, she come to my house to stay for a few weeks. My mum and dad cannot speak English. But because of her, now my mum and dad can speak English a little bit.” (R5)

“I joined the student exchange program to Hungary. I spent time with them and told them my lives in Thailand.” (R6)

### **Abilities to build positive relationship with their different culture friends**

All the informants did not clearly show that they possessed this kind of ability to build positive relationship with friends from different cultures.

*"I have friends from countries like Mexico and Taiwan. They like to give candy to each other to build positive relationship." (R1)*

*"Although I was in US for 4 years, but it took me 6 months to adapt to their cultures. I like Mexican friend but I do not like US friend. They are more arrogant." (R2)*

#### **Cultural awareness and knowledge while interacting with multicultural friends**

All the informants seemed to be low cultural awareness and knowledge while interacting with multicultural friends.

*"I have New Zealand friend and Japanese friend, but I do not know very much about their cultures." (R5 and R4)*

*"I do not have any knowledge about their cultures, they come to me and approach me as friend." (R2)*

*"Normally I learned other people cultures through watching movie. Among us, we seldom talk about other people cultures." (R4)*

*"I will only start to learn about other people cultures if I plan to visit that country especially about its law. Because some country may restrict us from doing something so I will alert about that." (R1)*

#### **Understanding about the meaning of prejudice**

All the informants did not really understand the meaning of prejudice.

*"I found easy to talk with my Thai friends but I wish to have friends from other countries too." (R1)*

*"I can accept anyone, I am easy going person." (R2)*

*"I can easily accept Thai but not others." (R3)*

*"I choose friends because of their behavior but their ethnic groups. As long as their cultures not much different. I am comfortable to talk with them."*

*"I would like to add on why Thai people speak weak English. This is because we learned English according to principles. So Thai people will laugh at us when we speak grammatical wrong English. But when we speak to foreigners, we do not care about the principles anymore. Thai people may look at you as you are showing off if you speak English too much."*

*"We do not like to speak English because we scared to make mistake in front of our Thai friends." (R4)*

#### **CONCLUSIONS**

In conclusion, the more different people from one to another, the more difficult it will be for them to work together and communicate, which is the basis of any society. Diversity is not only involves how people perceive themselves but also how they perceive others. Those perceptions are affecting their daily interactions. Today the awareness of this diversity has become much more widespread because of being facilitated by globalized communications and increased cultural contacts. Findings of this study revealed that most of Thai international college students are practicing cultural tolerance more than cultural adjustment when they dealing with their foreign course mates. This can produce a range of consequences form such as simple lack of civility or ignoring others, through elaborate social system or the international destruction of people in the perpetuation of genocide. On the other hand, peace is impossible without tolerance. To live in the multicultural society like this international college, we should practice cultural tolerance which will contribute to the evolution of a culture of peace and social harmony. The essence of tolerance is the right of people to behave according to their beliefs, even when there are others who disagree with the belief. These Thai international college students are not practicing cultural adjustment due to they did not find themselves immersed in an unfamiliar culture that can cause culture stress. Since they are the majority ethnic group of the multicultural society, cultural adjustment is not a necessity.

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## **An Impact of Legislation on Self-Evaluation Processes in Slovakia**

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### **ABSTRACT**

The paper deals with an analysis of Slovak legislation concerning quality assurance in education. A collection of data indicates a diversity of legislation implication in primary and secondary schools in Slovakia. Research, carried out in 2016-2017, has revealed different approaches to monitoring quality at Slovak schools, particularly a role of self-evaluation processes. Formality and informality of self-evaluation is significantly influenced by engagement and enthusiasm of people involved. Based on good practice in the European Union, specifically in Portugal, a set of recommendations will be presented and discussed.

### **INTRODUCTION**

The current orientation on monitoring and assuring quality in society has reached also the sphere of education. What is and what is not of good quality, what works for the society and contributes to its development, is a difficult question to answer. However, in the Slovak context, quality in education can be declared, when the expected and real results of schools are in agreement, when the school-leavers have the skills to find their place in the labour market, and finally, when the schools have good relation with their environment (Novák, 2012, Valent & Sihelsky, 2014). School quality is often evaluated in comparison. For measuring quality in education, several international measuring procedures (e. g. PISA, PIRLS, TIMMS) were introduced, allowing the participating countries to enter a direct comparison of the quality of their educational systems. The results of these comparisons indicate that Slovakia needs to develop better and more effective conditions in order to assure quality in education. Traditionally, the quality of schools in Slovakia is monitored by an external evaluation system at different levels of schools, in coordination with the thorough work of the State School Inspection. External evaluation reveals a significant disparity between different schools in different regions of the country.

The experience gathered from other European countries, more specifically Portugal, prove that external evaluation of school quality should be supplemented by internal evaluation processes, i.e. self-evaluation of schools and their employees, pupils, material and technical conditions of schools, with active participation of municipalities and stakeholders. Self-evaluation plays a significant role in quality assurance in education and the idea of it was first introduced in Slovakia in the late 1990s, when institutions and informal teacher organizations started to design its implementation to the Slovak educational system. A comparison of different approaches is necessary, as there is no one uniform framework of quality assurance and self-evaluation neither in Europe nor the world. Finding a framework suitable for most schools in the diverse Slovak educational system is therefore viewed as the first step towards quality assurance.

## LEGISLATION ON SELF-EVALUATION PROCESS IN SLOVAKIA

Self-evaluation of schools and quality assurance in most European countries is established in a legal framework. In Slovakia, there are several documents on self-evaluation of schools.

The first legal document dealing with evaluation of schools and its teachers is the *Act No. 596/2003 Coll. on State Administration in Education and School Self-governing Bodies* that specifies the roles of all participants of school network in terms of establishing, funding and inspecting school processes. The head teacher of a school is made responsible for evaluation of the school in a written annual report (§5, Stat. 7f) on schools performance. The municipality is responsible for its approval. The Act defines the duties and responsibilities of a school and its head teacher towards other bodies of government (ministry, self-government region, and municipality) as well as the pupils and their parents. Head teachers are responsible for qualification of the teaching staff and their further education (§5, Stat 1d and 1e). All processes at lower secondary schools are supervised by municipalities (§6); higher secondary schools are supervised by self-governing regions (§10). According to the §6, Stat 23, municipalities also monitor and evaluate the qualities of head teachers. The ultimate supervising body is the State School Inspection (§12 and §13). All these bodies perform external evaluation of school performance by monitoring the performance of schools in the sphere of curriculum and its implementation, examination and assessment of students, funding, and material and technical conditions. The Act gives these bodies specific rights and tools to assure the quality of education in local schools.

The second Slovak legal document on self-evaluation, the *Decree 245/2008 Coll. on Upbringing and Education*, is more specific in education practices and governs the following areas:

- the principles, aims, conditions, extent, content, forms and organization of education in schools and school facilities,
- conditions of entry to the school and for completion of study,
- the length and accomplishment of obligatory school attendance,
- curriculum at the national level,
- school network,
- the rights and duties of schools and school facilities,
- the rights and duties of parents or other legal representatives of children.

The law binds the head teacher to create a school curriculum as a principal document of school, which has to comprise also an internal system of evaluation and assessment of teachers and pupils (§7, Stat 4m and 4n). For these purposes, schools create plans for internal audit that covers specific areas of school life, from ensuring the schools perform their educational duties in sufficient material and technical conditions, to evaluation of the pedagogical staff from the perspective of their proper qualification and participation on continuous education. All requirements, duties and rights of teachers and pupils are precisely defined in individual articles, giving the head teachers clear parameters on schools of quality. The organs monitoring school quality are primarily the National Institute for Certified Educational Measurements, the State School Inspection, both responsible for external evaluation, but also the schools themselves (§154, Stat 7a). The paragraphs 155 and 156 treat external testing of pupils.

The final legal document covering the area of evaluation and self-evaluation of schools formulated to assure the quality of education is the *Regulation 9/2006 Coll. on the Structure and Content of School Reports about Activities, Results and Conditions of Schools and School Facilities* and its executive regulation no. 10/2006-R from the 25<sup>th</sup> May 2006. The head teachers are responsible for compilation of the report and it must be approved by school's parent council before submitting it to the municipality for the final approval. The report must be available to the general public, published online, and schools may select the data they publish, as this report represents the school in the local community and may influence its perception and reputation in the local community. The full report should contain the data on:

- pupils (including the number of pupils with or without special education needs (SEN))
- the number of new pupils and the number of school-leavers entering secondary school; the data on performance and classification of pupils in individual degrees of education),

- school curriculum and the study programmes school provides,
- school employees (the number of teachers and their qualification, the data on continuous education of teachers),
- projects school participates in and activities that present school in public,
- the results of school inspection,
- material and technical conditions of schools,
- financial data (from the ministry, parent's contributions, vouchers for leisure activities, donations and other financial means),
- the annual concept of the school and its evaluation,
- the identification of school's strengths, weaknesses and proposed solutions,
- success rate of the pupils in the labour market,
- optional additional information (a SWOT analysis of the conditions of mental hygiene, leisure time activities, cooperation of school with parents, providing services to children, pupils and parents; relations of school and children, parents, and other stakeholders).

The final legal document on the qualities and qualification of teachers is the *Act No. 317/2009 on Pedagogical and Professional Employees* delimiting:

- the rights and duties of pedagogues,
- requirements for pedagogical activities execution,
- professional development, career degrees, postgraduate certification,
- qualification requirements for employees,
- pedagogical activities of pedagogues including their teaching,
- the extent, organization and completion of different types of continuous education,
- accreditation of programmes of continuous education,
- evaluation of pedagogues,
- care and protection of pedagogues.

The above listed legislative documents are legally binding to all participants of education in Slovakia. The issue of self-evaluation and quality assurance in education is spread across four main legal Acts on education. The relative openness of these documents in this area leaves enough room for their interpretation and implementation in particular schools and municipalities overseeing these processes.

Municipalities therefore issue their own specific regulations identifying the processes that monitor the quality of schools and head teachers. Formally, they have to approve the annual school reports; on the other hand, they have a direct impact on the ongoing processes in schools. Comparing one school to another, there are noticeable differences in the processes of school self-evaluation and quality assurance depending on the municipality managing them. Each school undergoes the processes related to quality assurance differently; therefore the next sections will discuss the formal and informal engagement of teachers, teacher associations and institutions in these processes.

Besides legislative processes, the attempts to design, test and implement self-evaluation processes in Slovak schools were the projects called *Bridges across Boundaries: Cross-disseminating Quality Development Practices for Schools in Southern and Eastern Europe* (2004-2005) and “*External Evaluation of the School Quality Supporting Self-evaluation Process and School Development*” (2009-2013) carried out by the State School Inspection. Both projects proposed their models of school self-evaluation that were not generally accepted; however, they opened the discussion on the topic and helped schools find the ways for improvement.

## **A COMPARISON OF FORMAL AND INFORMAL SELF-EVALUATION PROCESSES IN SLOVAKIA**

The aim of the paper is to analyse the Slovak legislation on quality assurance in education and identify its impact on self-evaluation processes in Slovak schools. As the brief overview of the legislation indicates, there is a room for diversity in its implementation at different schools. The following section of the paper will discuss these processes from two main perspectives: the schools and the municipalities.

## THE STUDY

For the purposes of this study, head teachers and teachers from different parts of Slovakia were asked to provide information in semi-structured interviews on different aspects of quality assurance and self-evaluation at their schools. The answers were compared with the contents of the annual school reports (175 schools in total) published online from all regions in Slovakia. The schools are overviewed by eight largest municipalities in Slovakia, situated in the capitals of the Slovak self-governing regions. The key parts of the reports were the SWOT analyses and action plans. The prevailing tendencies in individual categories were quantitatively evaluated and are presented in Table 1. Then, the official information provided online and in the interviews provided by local authorities were analysed in Figure 1. The paper presents the main tendencies in implementing school self-evaluation practices and quality assurance approaches in selected schools in Slovakia.

## FINDINGS

Based on the legislation (the Decree 245/2008 Coll.) and the experience achieved in the above-mentioned projects, schools prepare and design a plan to monitor and evaluate the school quality that should be a part of the school curriculum. Annual planning of self-evaluation typically corresponds with the concurrent processes at school. Typically, in September schools coordinate the contents of school curriculum to the national curriculum; in October schools promote the cooperation of parents with school. In November, school analyse the material, technical and financial conditions. In January and June, students are tested before getting their marks. The self-evaluation of teachers typically takes place in May, as teachers reflect on their teaching and participation in various pedagogical activities in the past year. In June, schools collect data on their school-leavers in order to implement their suggestions. In July and August, head teachers prepare plans for the following school year and compile the annual reports (the Act 596/2003 Coll., §5 and the Reg. 9/2006). Complemented by opinions of stakeholders, classroom observations and interviews with teachers and pupils are carried out throughout the whole school year. The implementation of plans, however, varies from school to school.

The schools are given a lot of freedom in choosing self-assessment tools and aspects of focus. The analysed annual reports reveal that most schools evaluate themselves from several perspectives. The main issues of focus comprise the quality of curriculum, pedagogical documentation and its implementation, the school results in external testing and national competitions, success rate in pupils' admission at secondary schools, the qualification and didactical methods of teachers, the quality of social relations of all participants (teachers, pupils, parents), implementation of school developmental projects, teaching pupils with SEN, the view on schools by the community, the material and technical conditions of school, etc. The data are primarily collected using questionnaires (with open or closed items, varying in length), observations, open classes, individual interviews and group discussions, evaluations by pupils and parents, etc., which may be followed by discussions and reflection on the findings.

The schools are obliged to make SWOT analyses (the Executive Regulation 10/2006-R). Only about 50% of schools published the school reports online, and from them, only about 46.25 % published their SWOT analyses. The SWOT analyses reflect on the aspects of school life viewed as the most crucial for their existence. As the collective analysis of the published SWOTs reveals (Appendix 1), the schools view the same aspects of school life differently, i.e. the strength of one school can be a weakness for other one; or an existing weakness of one school can be a possible threat for other school, etc.

As Appendix 1 shows, the financial aspect (e. g. teacher salaries: W = 20.56%, T = 19.99%, operational costs: W=7.99%) dominates most categories of the conclusive SWOT analysis, followed by the assessment of the material and technical conditions of schools. The positives for all schools are the participation in projects and grants. The analysis also reveals the shifting position of education and teachers in society – the motivation of pupils is decreasing and parent participation in school life is becoming less present.

The role of self-evaluation processes in schools is viewed positively by a relatively small number (0.57%) of the analysed schools; however, there are schools perceive it as an opportunity for improvement (12.57%). On the other hand, a number of schools (6.28%) view a lack of clear criteria on self-evaluation and quality assurance as

one of the weaknesses of the Slovak educational system. This may lead to a tentative conclusion that the role of self-evaluation is growing.

After submitting the complete annual reports to municipalities for approval (the Act 596/2003 Coll.), the municipality evaluate them and compare them. The employees know the school and typically take into consideration the specifics of the school. The results of the schools are largely influenced by the structure of pupils and the structure of pedagogical staff, and as well as by material and technical conditions of that particular schools. Statistics and numerical data of the school results are usually not sufficient for the municipality and together they try to find solution for the problems, and also encourage the head teachers in the future work. The Act 596/2003 Coll. §6, Stat 23, gives the municipalities the right to evaluate the head teachers. Municipalities formulate their own criteria, which may be partially used for evaluation of pedagogical staff at the particular school.

A comparison of several approaches to head teacher’s evaluation by municipalities might conclude these three main areas:

- the quality of management (the effective use of work time, the quality of abiding by the legislation, following documentation, the quality of work related to specific tasks, etc.),
- school development (contribution and presentation of school in public, head teacher’s personal contribution to school, cooperation with parents, organizing leisure time activities, participation in projects, school maintenance, strategic development of school, etc.),
- managerial skills (the use of ICT, resolving conflicts, the use of newly acquired skills, getting additional funding, communication with the municipalities, formulating criteria and evaluation of results of teaching staff assessment, etc.).

The approach of municipalities to quality monitoring and assurance may be judged also by the way they engage in the public discussion and communication of the goals they set for schools. The information published on the websites of the municipalities provides the guiding principles for schools in the region. The quality and content of the information indirectly reflects on the attitude of the municipality to quality assurance at schools. The analysis of the contents of the websites in Figure 1 identifies the priorities of the analysed municipalities:

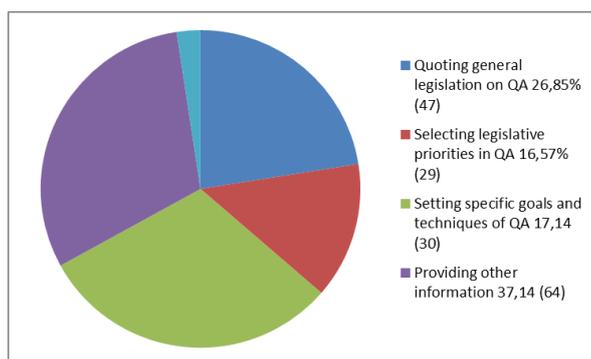


Figure 1 Priorities of municipalities in quality assurance

Figure 1 shows that almost half of the analysed municipalities limits their activities in monitoring school quality according to legislation, and less than 20% of municipalities lead to schools to choose their priorities or even their own goals in quality assurance. More than 37 % of schools do not want to participate in public discussion on the quality assurance in education.

As the overview of the quality monitoring and assurance performed by the self-evaluation suggests, the lack of legislation has an impact on its implementation in the practices at schools. There is not one tool that would be generally accepted and used in all schools in Slovakia, however, the teachers and head teachers regularly meet to share experience and shape the tools and systems for monitoring quality in the Slovak schools.

## **AN EXPERIENCE ON SELF-EVALUATION AND QUALITY ASSURANCE FROM PORTUGAL**

Within the mutual project between the Trnava University in Trnava, Slovakia, and the Porto University in Porto, Portugal, the authors of the study visited several schools around Porto in July 2016. The partners from the university introduced them to experience and practices in quality assurance and self-evaluation of the local head teachers is a series of discussions, interviews and meetings at schools. The legislation on self-evaluation and quality assurance, its tools, methods and impact on education in Portugal (Santiago et al., 2012) are more specific than in Slovakia. As observed, self-evaluation processes have an impact on their daily life at schools. The schools try to engage every participant of school life to take part in self-evaluation, be it teachers, pupils or their parents. Participation of the local community in school life and the impact of school at the local community are not typical for Portugal. Therefore, Portuguese schools make specific action plans with the aim to make parents participate in the life of school, raise interest in the children's performance at school and encourage the children to work hard. The results of self-evaluation are published online specifically for each school, available for inspection to all members of the Portuguese society.

## **RECOMMENDATIONS AND SUGGESTIONS**

On the basis of analysis of the legislation, tools used in selected schools in Slovakia and observation in Portugal, the authors formulate the following recommendations:

- legislative changes,
- making a standardized tool for self-evaluation, formulating criteria and techniques of data collection and analysis,
- explaining the head teachers and pedagogical staff the importance of self-evaluation and quality monitoring,
- motivating the head teachers and pedagogical staff to participate in the aforementioned processes,
- enabling teachers to visit schools with effective self-evaluation processes abroad, especially the countries with good scores in international measurements.

## **CONCLUSIONS**

Self-evaluation as a method for monitoring quality in education has proven to be an important tool on the way towards being effective and achieving good results in international measurements, but also in developing the set of skills for real life and employment in the labour market. The legislation on self-evaluation and self-assessment, or the lack of thereof, provides a great variety of opportunities for each subject of education to adopt and adapt the available tools to their particular needs. Since in Slovakia the approaches towards quality assurance are not uniform, the processes may benefit from looking into the experience of other countries and finding the most suitable approach for Slovak conditions. The collected data in this study indicate that schools around different parts of Slovakia naturally agree on some tools for monitoring school quality and the areas they should concentrate on in search for quality in education. The number of schools that discuss self-evaluation positively is growing steadily and public discussion on quality assurance may bring positive changes to the Slovak system of education.

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 Authentic self-evaluation documentation available upon request.

## Appendix 1

Strengths	Weaknesses
<p>the variety of leisure time activities, sports ( 41,12)            the qualification of employees (25,73)            project and grant participation (24,56)            cooperation with other subjects of education (e. g. methodology centres, universities, etc.; 23.42)            education forms and methods, the use of ITC (21.7)            the continuous education of pedagogic employees (19.42)            good accessibility and environment (18.85)            specialized classrooms with multimedia (18.28)            pupils' parliament, humanistic approach in problem solving, open communication (18.28)            individual work and integration of pupils with SEN and talent (15.42)            results in external testing and competitions (14.28)            pupils' counselling (13.71)            school reputation and public presentation (13.14)            the work of subject committees (13.14)            the quality of nutrition (13.14)            school curriculum (12.57)            communication with local authorities (6.28)            school atmosphere, team spirit (3.99)            school library (2.28)            cooperation with parents (1.14)            school self-evaluation system (0.57)</p>	<p>lack of financial means for teacher evaluation and motivation (20,56)            technical and material conditions (20,56)            behavioural problems of pupils (18,85)            lack of teaching assistants and supporting expert employees (18.85)            lack of interest in teaching profession (18.85)            outflow of good students to 8-year grammar schools and bilingual schools (13.14)            graduates (12.57)            the low motivation of teenagers (12.57)            the high age of school employees (12.57)            the results of external evaluation (12.57)            insufficient didactic tools and ITC (12.57)            the absence of pupils from school (12.57)            social status of teachers (12.57)            operational costs (7.99)            lack of textbooks (10%)            lack of support for teachers (e. housing; 7.03)            the condition for continuous education (6.28)            lack of school counselling (6.28)            safety and security at schools (6.28)            lack of criteria on school quality (6.28)            administration and bureaucracy (6.28)            cooperation with parents (6.28)            communication with institutions (6.28)            lack of male teachers at schools (1.71)</p>
Opportunities	Threats
<p>participation in projects and grants (13.14)            the use of ITC in education (13.14)            cooperation with parents (13.14)            continuous education of pedagogic employees (12.57)            the managerial competence of the leading school employees (12.57)            systematic financial evaluation of school employees</p>	<p>teacher salaries (19.99)            legislative changes (19.42)            outflow of good students to 8-year grammar schools and bilingual schools (13.14)            outflow of young pedagogues because of their financial evaluation (13.14)            the growing number of pupils with SEN and behavioural problems (13.14)</p>

(12.57)	lack of interest in the work of non-pedagogical school employees (12.57)
self-evaluation system of schools (12.57)	lack of financial means for improving material conditions and operational costs (3.42)
the proximity of institutions, libraries and centres of education (7.99)	the decreasing number of pupils (2.28)
school curriculum (2.28)	lack of interest of parents (2.28)
the use of the Internet websites (1.71)	lack of motivation of pupils (1.14)
open classes, school presentation (1.71)	social status of teachers (0.57)
cooperation with school counsellors (0.57)	lack of male teachers at schools (0.57)
less bureaucracy (0.57)	

Table 1 A SWOT analysis of selected Slovak schools (in percentage)

# **An Investigation of Pedagogical Formation Students' Views About Instructors' Professional Values**

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## **ABSTRACT**

This study aims to investigate views of prospective teachers attending pedagogical certificate formation about their instructors' level of professional values. The study, which is descriptive case study in nature, involved 52 prospective teachers who received pedagogical formation training in Çukurova University Education Faculty. Data were collected through an interview which included six open-ended questions; and the collected data were analysed using descriptive analysis methods. Results show that prospective teachers found the instructors most competent in the items that included "compliance with professional values in assessing success and giving marks" and "Trying to communicate sufficiently with prospective teachers". While the participants evaluated the instructors positively mostly in terms of "Concern about effective education", the most frequently cited negative view was "ignoring effective education".

**Keywords:** Professional Values, Instructor, Prospective teachers

## **INTRODUCTION**

Teaching, due to its multidimensional and direct effects, has always been an occupation which is given importance, aimed to be controlled and directed, and discussed in terms of work ethics and professional values as well. Therefore, prospective teachers' attaining professional ethics and values of the teaching profession is one of the fundamental components of the teacher training programs. On the other hand, teacher training programs include no courses for instructing professional ethics and values. Professional ethics and values training is left to the faith of implicit programs of the faculties. As for the explicit programs, they do not go beyond a unit which is included in the Introduction to Teaching Profession book; it is not known whether it is covered or not, or even if it is covered the degree is not known. Hence, a study conducted by Tunca (2012) found that prospective teachers graduated from the faculties without gaining the professional values sufficiently. In fact, as it is emphasized in the literature, it is highly important for a teacher to be qualified in terms of professional ethics and values (Altinkurt and Yılmaz, 2011; Dönmez and Cömert, 2007; Gözütok, 1999; Güler, Yıldırım, Gürbüz and Koç 2016; Şimşek and Erdem, 2016; Tunca, 2012). Otherwise, educating generations with the required skills would not be possible. As emphasized by Levine (2006), who states that the future is in the hands of teachers, quality of tomorrow will be no better than the quality of the teachers army.

Professional values form a special compound of human values (Göbelová, 2011). Tunca (2012, 19) defines the values of teaching profession as the "criteria and standards that guide teachers' feelings and behaviours while planning, organizing and conducting teaching; providing and maintaining students' learning; ensuring classroom discipline; enhancing self-development; and fulfilling professional responsibilities". Professional values as preferences, attitudes, thoughts and views that affect professional decisions, behaviours and practices are considered inseparable part of teachers' becoming professionals (Göbelova, 2011). Campbell (2008) claims that teaching has a number of morally and ethically fed abstract aspects beyond the training program and pedagogic techniques. Campbell states that these abstract dimensions can be perceived from the tone of voice when the teacher talks with students, the fair balance s/he creates with profits and needs, attention in the choice of references, honest and respectful assessment of students' work, and implementation of daily practices in a proud, careful, fair and loving way.

Lisman (1991), in the study that reviewed the studies on the moral aspects of teaching profession, states that it is important to understand moral mission of teaching profession in order to define teaching profession correctly.

However, Campbell (2008) emphasizes that ethics as a moral profession in the teaching field is an interesting but challenging issue. What professional values should a qualified teacher have? In the study conducted by Tunca (2012), values including “being open to learning/ being open to improvements and innovations, having sense of responsibility/taking social responsibility, being honest, respecting differences, having principles, objecting violence, being understanding, being consistent, being loyal to profession, being open-minded, being investigative, giving importance to national language, being democratic, being patriotic, being productive, being patient, being open to cooperation, being humanist, being loyal to Atatürk’s principles, being sensitive about national symbols, giving importance to cultural values” were perceived as professional values that should be possessed by teachers according to both instructors and teachers and prospective teachers. Tunca collected these values under “respecting differences”, “personal and social responsibility”, “objecting to violence” and “being open to cooperation” aspects.

An analysis of the studies about teachers’ pre-service education found that the participants mentioned a number of inadequacies. For instance, in the study conducted by Eret-Orhan (2017) it was reported that prospective teachers could not attain some information and skills in the teaching process well in the education faculties and experienced a number of problems about some aspects of teacher training. Other studies also reported results that emphasized the existence of various problems in teacher education (Buyükgöze-Kavas and Bugay, 2009; Eret, 2013; Eret-Orhan, 2016; Senemoğlu, 2011; Özoğlu, 2010). Although some studies that focused on instructors dealt with communication (Kaya, Sungurtekin, Deniz, 2017; Keçeci & Taşocak, 2009) and democracy (Aydoğan & Kukul, 2003; Duman and Koç, 2004; Erdem and Sarıtaş, 2006; Kaya, Taşdan, Kop and Metin, 2012; Şentürk & Oyman, 2014) issues, none of the studies accessed seemed to focus on the professional values possessed by instructors as educators.

In fact, achieving success in teacher education programs could be possible through a holistic view that involves quality of instructors as well as knowledge, skills, and values. Yıldırım (2013), who investigated studies on teacher education in Turkey, reported that studies focused on some fields, but a number of important aspects were ignored; listed the prioritised areas in teacher education studies; and emphasized the need for research about “teacher educators and their effects on prospective teachers”. These kinds of studies should investigate teachers’ competence in terms of professional knowledge and skills as well as professional values; and in line with these studies it is important to highlight teacher quality as well as the training of teacher trainers. Expecting educators who do not have sufficient professional values themselves to educate qualified teachers in terms of this aspect would only be a dream.

Attainment of this emotional aspect of the teaching profession by prospective teachers completely could be possible through the topics instructed in the courses as well as, may be even more importantly, through an educational environment in which they have good role models in terms of professional ethics and values. This “being a model” becomes more concrete through the instructors’ behaviours towards prospective teachers in and out of classroom. Therefore, just like in the assessment of instructors’ general professional competence, prospective teachers’ evaluations about professional ethics and values are considered to give more accurate data. In this regard, the main purpose of the study is to investigate views of prospective teachers attending pedagogical formation at Çukurova University Education Faculty about their instructors’ level of professional values. In line with this main purpose, the study aimed to find answers to the following questions;

What are the views of prospective teachers about;

1. Their instructors’ general competence in terms of professional values?
2. Their instructors’ commitment to raising qualified teachers?
3. Their instructors’ care and effort to communicate?
4. Their instructors’ giving importance to and respecting students’ personal characteristics, interests, and needs
5. Their instructors’ compliance with professional values while giving marks and assessing academic success?
6. Their instructors’ being role models in terms of professional ethics and values?
7. Their suggestions about graduating as teachers who are equipped with professional ethics and values?

## **METHOD**

This study which aims to investigate views and perceptions of prospective teachers attending pedagogical

formation certificate program in Çukurova University Education Faculty about their instructors' level of professional values, utilised a phenomenological design. Yıldırım and Şimşek (2011, 72) state that phenomenological studies focus on phenomena that are recognised but not explored in depth and in a detailed way. Prospective teachers in the present study were asked to evaluate their instructors in terms of having professional values, and their views and perceptions about the instructors were analysed in the framework of professional values.

### Participants

The participants included 52 prospective teachers who were enrolled in the Çukurova University Pedagogic formation certificate program from six different departments (Nursing, Mathematics, Accounting, Turkish Language and Literature, Theology, and Agriculture). Of all the prospective teachers, 36 (69.2%) were female, and 16 (30.8%) were male. Average age of the participants was 26.05 with standard deviation of 6.20.

### Data Collection Tools

Data were collected through the “Views about Instructors’ Professional Values” Form developed by the researcher. The first section of the study involves questions about the participants’ personal features (department, age, gender). The second section composes of six open-ended questions about the participants’ assessing their instructors in terms of professional values. Through these questions, the students were asked to assess their instructors on the basis of some dimensions which included level of having professional values, the effort they make in order to help students become good teachers, assessing student success and giving marks, and being a role model for students. Each prospective teacher was asked to indicate the percentage for the instructors in terms of demonstrating the features indicated. An example is as follows:

*Some of our instructors are always ready for classes. I believe that they make a lot of effort so that our lessons could be more enjoyable and more effective (about 70% of our teachers show these features). On the other hand, some of our teachers are sometimes late and leave the class early (about 30% of our instructors show these features).*

The form also included a question in which the participants were asked to write their suggestions about helping prospective teachers to graduate as teachers who have professional ethics and values.

### Data Analysis

The data collected from the forms were analysed using descriptive analysis methods. The data in descriptive analysis are analysed according to a framework identified beforehand. Yıldırım and Şimşek (2011) state that the purpose in descriptive analyses is to present findings in an organized and interpreted way. The questions which were in the data collection form used in this study formed the framework of the descriptive analysis. To do this, responses given by the participants were put in computer to obtain raw data. Then, these data texts were organized in a way the participants’ answers to each question are one under the other. Then, the organized data were read carefully for the coding process. The codes were grouped according to their common features in order to form themes. Findings are presented in tables demonstrating the distribution of frequencies and percentages. No interpretations were made in the presentation of the findings; direct quotes from prospective teachers’ explanations were included. The participants were referred using codes such as P1, P2, etc. in these quotes.

## FINDINGS

### Prospective Teachers’ Views about their Instructors’ Competence in terms of Professional Values

The first finding of the study is about prospective teachers’ views about their instructors’ competence in terms of professional values indicated in the questions. The ratios in relation to this question were found by calculating the mean scores of the 52 participants. Accordingly, Table 1 demonstrates findings in relation to prospective teachers’ views about their instructors’ competence in terms of professional values.

**Table 1:** Ratios in relation to finding Instructors Competent in terms of Professional Values

	Competent %	Incompetent %
In terms of making sufficient effort for educating prospective teachers	72.72	27.27

to become good teachers		
In terms of communicating sufficiently with prospective teachers	80.79	19.40
In terms of respecting prospective teachers by giving importance to their personal characteristics, interests, and needs	67.64	32.35
In terms of complying with professional values in assessing success and giving marks	83.44	16.55
In terms of being role models for prospective teachers in terms of professional ethics and values	71.46	28.53

As it is seen in Table 1, the prospective teachers participating in the study found 72.72 % of their instructors competent and 27.27% of them incompetent in terms of “making sufficient effort for educating prospective teachers to become good teachers”; they found 80.79% of instructors competent and 19.40% of them incompetent in terms of “communicating sufficiently with prospective teachers”; they found 67.64% of the instructors competent and 32.35% of them incompetent in terms of “respecting prospective teachers by giving importance to their personal characteristics, interests, and needs”; they found 83.44% of the instructors competent and 16.55% of them incompetent in terms of “complying with professional values in assessing success and giving marks”; and they found 71.46% of the instructors competent and 28.53% of them incompetent in terms of “becoming role models for prospective teachers in terms of professional ethics and values”.

### Findings in relation to the Instructors’ Commitment to Raising Qualified Teachers

The first question in the views form was “How do you evaluate your instructors in terms of their efforts to raise you as good teachers?” Findings in relation to the answers given to this question are presented in Table 2.

**Table 2:** Views about Instructors’ Efforts for Raising Good Teachers

Theme	Positive Codes	Participants	f
	Making the required effort (commitment, care) for the effectiveness and efficiency of the course	2-3-5-9-10-11-12-13-15-18-19-20-21-22-23-27-30-37-38-40-41-42-43-44-45-46-47-48-49-50-51-52	32
Concern about effective education (f:68)	Being ready for the lesson	2-3-7-8-10-14-16-17-23-28-40-41-52	13
	Trying to make lessons fun and enjoyable	2-3-5-16-20-14-33-35-43-47	10
	Using the necessary materials	10-14-34-43-44-47-51-52	8
	Associating the topics with life through current and concrete examples	5-33	2
	Being disciplined and organized	9-48	2
	Giving satisfying, explanatory responses to the questions	11	1
Student-centred Education (10)	Creating opportunities to involve students in the lesson	5-7-20-33-39-43	6
	Motivating students	7-27	2
	Considering students’ needs	17	1
	Helping them to experience teaching (through giving presentations, responsibilities, etc.)	39	1
Democratic environment (f:6)	Giving importance to students’ views	4-8	2
	Interacting with students like friends	10-24	2
	Showing tolerance to different views	4	1
	Caring about students	12	1
General Satisfaction (17)	General satisfaction about the instructors	1-6-9-15-19-22-24-25-26-27-28-33-35-37-38-39-40	17
Ignoring	Doing nothing and always asking students to	3-5-4-6-8-9-18-31-43-45-50-51-	13

effective education (f:40)	present the topics	52	10	
	Not giving up teaching in a boring and inefficient way	9-18-21-27-30-33-34-41-46-47-51		
	Irresponsibility, showing no care and seriousness for the lesson, not attending classes regularly	12-14-27-34-41-43-46-48		8
	Keeping the lesson much longer/shorter than its usual duration	6-8-33-43-		4
	Instructing without breaks	4-13		2
	Always being unprepared for the lesson	8-41		2
	Not giving clear, understandable, appropriate instructions	27		1
Humiliating students (f:10)	Not caring about students	1-12-26-27-29	5	
	Giving destructive and offensive feedback	8-27	2	
	Dealing with something else while students are presenting topics	8-27	2	
	Not recognising students, ignoring them	32	1	

As it is seen in Table 2, prospective teachers' views about their instructors' efforts for raising them as good teachers are presented under four themes called "concern about effective education", "student-centred education", "democratic environment" and "general satisfaction". Effective instruction theme included the most frequently indicated views as "Making the required effort (commitment, care) for the effectiveness and efficiency of the course" (f:32), "Being ready for the lesson" (f:13) and "Trying to make lessons fun and enjoyable" (f:10). Student-centred education theme involved "Creating opportunities to involve students in the lesson" (f:6) and "Motivating students" (f:2) themes as the most frequently cited items while "Giving importance to students' views" and "Interacting with students like friends" themes under the democratic environment theme were cited twice. Analysis results showed that 17 prospective teachers were generally pleased about the instructors, regardless of a specific feature, rate, or explanation.

An analysis of the negative codes about the views about the instructors indicated that the responses were collected under two themes called "ignoring effective education" and "humiliating students". The most frequently cited features in the ignoring effective education theme were found "Doing nothing and always asking students to present the topics" (f:13), "Not giving up teaching in a boring and inefficient way" (f:10), and "Irresponsibility, showing no care and seriousness for the lesson, not attending classes regularly" (f:8). The most frequently indicated feature in the humiliating students theme was "Not recognising students, ignoring them"

A number of excerpts from students' views are as follows:

*Majority of our instructors are always prepared for the lesson. They instruct lessons in an enjoyable way through slights, notes or lectures (90%). There are also some teachers who I think do not teach me anything; most of the time they do not come to lessons (10%). P14*

*While some of our teachers do their best in terms of instructing well and teaching us the topics (about 80% of our teachers have this feature); some other teachers make us present the topics, and they do nothing. However, this method is not effective. I think teacher's instruction is important. P.18*

*Our teachers always instruct the lessons in a way to help us understand and enjoy the course. They help us to have a new point of view by giving examples from daily life. Therefore, solutions are found beforehand. As the courses are interactive, the teachers prevent us from distracting by making us participate in the lesson. 85% of our teachers have this feature. On the other hand, some of our teachers make lessons longer and longer. It causes us to get distracted. 15% of our teachers have this feature. P.33*

### **Findings in relation to Instructors' Care and Effort to Communicate with Prospective Teachers**

The second question asked to prospective teachers was for evaluating instructors in terms of making effort for

communicating with students. Table 3 demonstrates the analysis of the responses given to this question.

**Table 3:** Views about the Instructors' Care and Efforts to Communicate

<b>Positive Codes (f:94)</b>	<b>Participants</b>	<b>f</b>
Being careful and successful in communicating	2-3-4-5-6-7-8-10-11-12-13-14-15-16-17-19-20-21-22-23-24-25-26-27-28-30-31-33-34-35-36-37-38-39-40-41-43-44-45-46-47-48-49-50-51-52	4 6
Giving importance to students' learning, problems, etc.	6-18-23-27-33-34-35-39-40-50	1 0
Using an understanding and affectionate language	6-9-39-41-42-43-44	7
Respecting and tolerating students' views	4-14-15-30-34-35	6
Responding to students' questions sincerely	6-9-10-17-34-39	6
Listening to students attentively	4-9-17-42-50	5
Being open to communication out of lessons as well	42-44-47-48-51	5
Using a praising language	3-9-17-39	4
Showing the	34-39-50	3

importance given to the student		
Being accessible	13-30	2
<b>Negative Codes (f:35)</b>	<b>Participants</b>	<b>f</b>
Being closed to communication with students	1-12-19-20-25-26-27-29-32-39-41-46-49	13
Lack of communication skills (particularly not greeting)	7-31-32-50-51	5
Aggressive attitudes and behaviours towards the student	7-11-31-32	4
Looking down on students	6-7-21	3
Ignoring students	7-18-50	3
Not making an eye contact	7-29-49	3
Not listening to students	18-32	2

An analysis of Table 3 shows that prospective teachers mainly evaluated their instructors very positively in terms of care and effort to communicate. The most frequently stated positive views included “Being careful and successful in communicating” (f:46), which was followed by the most frequently cited views that included “Giving importance to students’ learning, problems, etc.” (f:10) and “Using an understanding and affectionate language” in communication (f:7). The most frequently stated negative views included “Being closed to communication with students” (f:13), “Lack of communication skills” (f:5), and “Aggressive attitudes and behaviours towards the student” (f:4). Following excerpts show prospective teachers’ views:

Majority of our teachers are very good at communication, rhetoric, and interaction; they are competent. However, some teachers' ego is very high; they behave like they are addressing a group they sympathise rather than the whole group of learners; and some other teachers have aggressive attitudes while interacting with students". P.7

All of our teachers are good at communication. However, let alone answering the question, 10% of our teachers start to shout at students without understanding. This attitude should not happen in an institution like university. P.11

Majority of our teachers communicated so well that I enjoyed attending the classes. 75% of our teachers had this feature. However, I did not want to attend the courses with the 25% our teachers; these teachers never made an eye contact and rushed to their rooms as soon as the lesson was over; they never interacted with us P.49

### Findings in relation to Prospective Teachers' views about Instructors' Giving Importance to and Respecting Personal Characteristics, Interests and Needs

The third question which was asked to prospective teachers was about their views about their instructors' giving importance to and respecting personal characteristics, interests and needs. Table 4 demonstrates the analysis of the findings in relation to the responses to this question:

**Table 4:** Views about Instructors' Giving Importance To and Respecting Students' Personal Characteristics, Interests and Needs.

Positive Codes (f:74)	Participants	f
Showing awareness about students' interests, problems and needs	3-6-10-11-17-18-20-22-23-33-42-43-45-46-47-48-50-51-52	19
Respecting students' personal characteristics	3-6-7-9-10-11-13-14-17-18-19-31-33-35-45-46-47	17
Showing care and effort for dealing with students	1-4-5-8-20-23-25-30-33-38-46-47-49	13
Giving importance to students	2-6-8-9-10-13-38-41-47-50-51	11
Considering students' views	4-17-24-28-46-47-50-52	8
Considering individual differences	15-40-41-46	4
Treating students without prejudices and in an equal and fair way	17-27	2
Negative Codes (f:29)	Participants	f
Not trying to know students	1-20-32-38-41-42-44-46-49-50	10
Being indifferent to students	12-18-20-25-30-41-47-50	8
Being indifferent to students' interests, problems and needs	18-24-29-33-40-41-48	7
Allocating no time to students	22	1
Ignoring individual differences	7	1
Being uncomfortable with students	29	1
Not knowing how to know students	34	1

As it is seen in Table 4, majority of the responses were positive regarding the instructors' giving importance to and respecting prospective teachers' personal characteristics, interests and needs. The most frequently cited positive features about this issue included "Showing awareness about students' interests, problems and needs" (f:19) and "Respecting students' personal characteristics" (f:17) while the most frequently cited negative features included "Not trying to know students" (f:10) and "Being indifferent to students" (f:8)

Our teachers respect and give importance to us, they listen to us. This is true for 85% of our teachers. P.6  
Some teachers give examples according to our branches, they give importance to our interests (60%). However, some other teachers even do not know that were TDE -= TLL students. Let alone our personal features and interest, they do not care about who we are. P.41

*One of our teachers simply assigned the topics and asked us to present it, without even thinking whether we were interested in these topics or not. she did not care about us. However, our other teachers generally gave importance to us; we decided the make-up lessons together. One of our teachers conducted the lesson at lunch time, just for us. He did not even have lunch just for us. P.50*

### **Findings in relation to the Instructors’ Compliance with Professional Values While Giving Marks and Assessing Academic Success**

The fourth question in the form was about prospective teachers’ views about their instructors’ compliance with professional values while giving marks and assessing academic success. Analysis of the findings about the responses to this question is demonstrated in table 5.

**Table 5:** Views about Instructors’ Compliance with Professional Values While Giving Marks and Assessing Academic Success

<b>Positive Codes (f:46)</b>	<b>Participants</b>	<b>f</b>
Giving marks fairly	7-9-11-12-13-14-17-20-22-24-26-27-30-44-45-46-47-48-50-52	20
Assessing objectively	6-13-17-21-23-33-40-41-42-43-44-47-49-51	14
Being careful about giving marks and assessing	2-5-10-15-27-33-35-37	8
Not seeing exams as the main goal, not imposing the exams	4-11-34	3
Adjusting the difficulty of the questions according to students	20	1
<b>Negative Codes (f:26)</b>	<b>Participants</b>	<b>f</b>
Ignoring students’ level while writing questions	6-25-31-32-35-51	6
Tendency to give low marks	10-19-29-32	4
Giving higher scores than one deserves	14-16-26-43	4
Weak fight against cheating	40-41-44	3
Asking questions about the topics that were not covered in lessons	8-46	2
Giving the same marks to everyone - unfair grading	14-16-18	2
In the exam, requiring the information in the book as it is	29	1
Giving marks carelessly-inattentively	8	1
Not being at the exam place	44	1

An analysis of the instructors’ compliance with professional values in the assessment and evaluation process indicated that positive views focused mostly on giving marks fairly and objectively. On the other hand, “Considering students’ level while writing questions”, “tendency to give low scores” and “giving scores more than one deserves” were the main negative views in terms of professional values.

*Our teachers want us to write everything in detail in our exam papers, even full points and commas. If the answers are not how they expected, we cannot get full scores. 65% of our teachers have this feature. P.29*

*I believe that the assessment was valid and reliable, but some students cheated. Some of our friends quarrelled with the proctors because the teachers were not at the exam place. P.44*

## Findings in relation to the Instructors' Being Role Models for Prospective Teachers in Terms of Professional Ethics and Values

The fifth question in the form was related to Instructors' being role models for prospective teachers in terms of professional ethics and values. The analysis of the the participants' responses is presented in Table 6.

**Table 6:** Views about the Instructors' being Role Model for Prospective Teachers in Terms of Professional Ethics and Values

Positive (f:63)	Codes	Participants	f
Generally possessing role model features in terms of professional ethics and values		3-4-5-6-9-10-11-12-15-18-19-21-22-23-24-31-33-35-37-38-41-42-43-49-50-52	26
Effort for instructing the course effectively		6-10-15-27-28-46-47-51-	8
Giving importance and showing love and respect to students		4-13-14-28-44-50	6
Professional competence (in terms of knowledge, rhetoric, classroom authority, getting attention, giving feedback)		7-15-16-23-47-	5
Always trying to communicate with students		12-20-28-44-48	5
Starting and finishing lessons timely		6-14-27-51	4
Demonstrating exemplary behaviours		18-22-47-	3
Trying to make students love the teaching profession		11-47	2
Exemplary outfit and speech		40-47	2
Witty attitudes and behaviours in the lesson		13	1
Giving information about the exam, being at the exam		48	1

Negative Codes (f:25)	Participants	f
place Possessing no role model features	1-27-29-30-32-46-51-52	8
Not considering students' values and desires	32-44-45-46-47-50	7
Too much tolerance for absence	6-31	2
Making no effort for the efficiency of the lesson	49-50	2
Starting lessons late –finishing lessons early	47-50	2
Saying bad things about students to others	35	1
Inappropriate clothes and behaviours that do not comply with the culture of the profession	40	1
Lack of self-esteem	42	1
Assigning the topics to students and and doing nothing	47	1
Not coming to school on the exam day	48	1

An analysis of the participants' views about the instructors' being role models in terms of professional values indicated that although majority of the participants made positive evaluations, they also mentioned some negative views about their instructors' being role models in terms of professional values. While positive comments focused on "Generally possessing role model features in terms of professional ethics and values" (f: 26) and "Effort for instructing the course effectively" (f:8), negative comments mainly included "Possessing no role model features" (f:8) and "Ignoring students" (f:4). Following excerpts demonstrate students' views on this issue:

*Some of our teachers were real role models about this issue, with their teaching, rhetorical skills, clothes, everything. These teachers were the ones who loved their profession and conducted their lessons with utmost efficiency. Approximately 50% of our teachers had this feature. However, some other teachers were always late. Some teachers came, took attendance and left, or instructed very shortly. We never take our teachers who assign the topics to students and play with their cell phones as role models. I think these teachers do not have professional ethics. I am sorry to say so. P.47*

*In the formation program I had two teachers whom I took as role models in every aspect. These teachers never skipped lessons, always came on time, and always gave information before and after the exams. These teachers*

came during the exams and asked if we had any questions. I liked it very much because it was not possible to reach some teachers on the exam day. P.48

### **Prospective Teachers’ Suggestions about Graduating As Teachers Who Are Equipped With Professional Ethics and Values.**

The last question in the data collection tool was “What are your suggestions about graduating as teachers who are equipped with professional ethics and values?” “What do you think are the roles of university and faculty administration, instructors, and students about this issue? The participants’ suggestions are given in Table 7.

**Table 7:** Prospective Teachers’ Suggestions about Graduating As Teachers Who Are Equipped With Professional Ethics and Values

<b>Suggestion</b>	<b>Participants</b>	<b>f</b>
Formation education should be given free in the undergraduate program	7-19-20-22-25-26-33-46-47-49-50-51-52	13
Instructors should deal with students, empathise, respect, allocate time, and communicate	7-11-12-14-24-26-29-32-33-35-36-42-48	13
Instructors should be given courses about professional values, empathy, communication, knowing students, etc.	7-11-14-24-36-41-43-44-49-50	10
Activities on this issue should be conducted with students	4- 6-15-29-34-35-45-47-48	9
Instructors should be examples about professional ethics and values	8-10-14-15-32-35-40-41-46	9
The program should include courses on this issue	4-10-29-30-43-50	6
Instructors should develop themselves in terms of knowledge and professional values.	4-33-34-43-	4
Instructors and students who do not attend courses should be monitored carefully	6-35-40-48	4
Class sizes should be decreased	31-42-44	3
Teachers should love teaching and make students love teaching	7-34-47	3
Exams should include questions about the topics that were covered	37-38-46	3
Instructors who do not have high professional ethics should not be given duty in the program	11-34- 47	3
The program should be given by instructors who are competent about the topic	40-47	2
Teachers should be present at the exam places	44-48	2
Course hours should be arranged according to students’ available times	5-24	2

As it can be seen in Table 7, there are 13 prospective teachers who associated free pedagogical formation education in undergraduate degree with professional values. 13 prospective teachers also indicated that teachers should deal with students, empathise, respect, allocate time, and communicate so that prospective teachers could be equipped with professional ethics and values. Teachers’ receiving training on these issues was suggested by 10 participants, and conducting activities with students was suggested by 9 participants.

*To help us develop professional ethics and values, firstly our teachers should develop themselves. Then they should teach these issues to their students, or they should organize symposiums or programs about professional ethics and values and raise students’ awareness. P4*

*There should be a formal relationship between teachers and students, but there should be no walls. It should always be kept in mind that students are also human beings. I am telling this both as a student and as a prospective teacher who is at the end of her education. P11*

*Courses should be given by competent teachers. Some teachers show it so clearly that they are coming solely for money. Teachers who do not attend classes should be identified and warned. P.40*

*Prospective teachers should be given education about professional ethics and values in a separate course. Same training should also be given to our teachers I think. P43*

*Teachers who are competent on the issue and who have high professional ethics should teach us. Teachers who do not love teaching should not be given any duty in the program. P47*

## **DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

An analysis of prospective teachers' views about their instructors' competence in terms of professional values indicated that the highest competence was in the "compliance with professional values while assessing success and giving marks" item (83.44%). As mentioned by Metin (2013), all teachers regardless of the grade they are teaching should know about assessment methods and be competent about applying them so that they can identify what students have learned and in what areas they are inadequate. Instructors' being evaluated as competent in terms of commitment to professional values in assessment and evaluation issues indicates their proficiency in the assessment and evaluation issue. Hence, an analysis of the findings in this issue show that 20 participants found the instructors competent in terms of "giving marks fairly" issue, and 14 participants found them competent in terms of "giving marks objectively" issue.

The professional value that the participants thought 80% of the instructors were competent was "trying to communicate with prospective teachers sufficiently". An analysis of the detailed explanations about this question indicates that the participants' positive views were cited 95 times while negative ones were cited 35 times. Given that these results which mainly indicated positive views about instructors' giving importance to and respecting prospective teachers' personal characteristics, interests and needs might mean that the instructors at the university where the study was conducted are considered successful in this issue. On the other hand, presence of negative comments of the participants should not be ignored. These kinds of bidirectional findings could be seen in the findings of other studies as well. For instance, prospective teachers who participated in the study conducted by Kumral (2009) evaluated their teachers' communication which indicated 25 competent and 17 incompetent citations. Kaya, Sungurtekin and Deniz (2017) investigated instructor-related communication problems and found that some inadequacies existed related to such factors as being closed to criticism, inconsistent behaviours in and out of classroom, and insufficiency in the effective listening skills. On the other hand, in their review Keçeci and Taşocak (2009) found that the instructors perceived themselves better in terms of communicating than students. Although the participants of the present study made generally positive evaluations about the communication of the instructors; based on the negative views and the bidirectional findings in the literature, more studies are needed on the issue of instructors' communication skills and giving importance to communicating with students.

Findings in relation to instructors' commitment to raise qualified teachers showed that the participants found their instructors sufficient in terms of "efforts for effective education" (f:68), but they did not indicate satisfaction in similar rates for student-centred education practices (f:10) and creating a democratic environment (f:6). The literature also reveals similar findings. For instance, a study conducted by Erdem and Sarıtaş (2006) found that prospective teachers perceived their instructors "generally" democratic at a ratio of 61.4% and "rarely" democratic at a ratio of 36.8%. Şentürk and Oyman (2014) found that the level of instructors' having democratic classroom management behaviours was "yes" for 44%, "partly yes" for 19%, and "no" for 37%. In a similar vein, Duman and Koç (2004) found that instructors' democratic attitudes and behaviours were not sufficient. When all these findings are considered together, it could be said that instructors' concerns about providing an effective education that would include everybody and creating a democratic classroom environment were not perceived high enough by prospective teachers. Hence, this finding is supported by the negative views of the students; "Ignoring effective education" was cited 43 times, and "insulting students" was cited 11 times.

Views about Instructors' being role models in terms of professional ethics and values revealed 63 positive and 25 negative views by the participants. Cio and ML (2014) state that there is a universal consensus that students learn from their teachers through different ways and emphasize that they learn from their teachers' clothing styles, speaking, and behaviours. Teachers' being role models is one of the most important factors in the instruction of values that could be attained through classroom and school life. Teachers should be aware of this issue, and have the consciousness and responsibility that they become role models all the time with their actions and make sure that this role model is a good one. Values education, just like in other education levels, happens every time and everywhere in teacher education institutions, as well.

As stated by Narvaez and Lapsley (2008), teachers teach values implicitly while they are choosing topics, insisting on the correct answer, encouraging students to search the topic, identifying classroom routines, forming groups, and applying the discipline. In this regard, in order to raise teachers with improved professional values, instructors should always keep in mind that they have the responsibility of being role models in terms of professional ethics and behave accordingly.

In line with all these results,

- Activities could be organized to help instructors and prospective teachers to adopt the values of the teaching profession better.
- Instructors could be given in-service trainings on such topics as communication, empathy, time management, and effective instructional practices so that they can give the required seriousness and importance to their courses and to prospective teachers.
- Total number of courses and class sizes could be decreased so that the instructors could better reflect the values they have to students and allocate more time to them.
- Instructors who do not have pedagogical formation or are not competent about the topic should not be given duties in the program.
- Too large groups should be avoided in the identification of pedagogical formation quota as they cause to compromise the quality of the teachers to be raised.

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# **Analysing of the Lecturer Practice at The Vocational School Mathematics**

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## **ABSTRACT**

In this study, it is focused on the analyzing of the teaching practice of vocational school mathematics lecturers. For this purpose, a mathematics' lecturer pedagogical practice in a mathematics course were examined by using Schoenfeld's framework. In this examining, the relationship of resources and goals to decision-making to analyze of the practice are analyzed via this useful framework. The basic way in the study is describing of the lecturer's goal of teaching students and the teaching methods used to make this lecture rich and more comfortable. At the end of the analyze, we can say that the basic approach of lecturers is to give the basic concept of mathematics rather than to solve a problem.

**Key words:** mathematics, lecturer, pedagogy, vocational school

## **INTRODUCTION**

In last years, there has been more research that has considered the practice of university teachers, examining of education quality and teachers' beliefs on teaching and learning (Bergsten, 2007; Kane, Sandretto and Heath, 2004; Nardi and Iannone, 2004 & Paterson, Thomas, and Taylor, 2011). However, many of the pedagogical issues about university education are still to be debated (Speer, 2008). In this study, we focused on the issue of how teachers may make teaching decisions and seek to describe the beliefs and goals (Hannah, Stewart and Thomas, 2010).

Schoenfeld has developed a theoretical framework for goal-oriented decision-making in the mathematics classroom (Schoenfeld, 2008 & Schoenfeld, 2011). For shortly, the framework helps teacher to analyze how decisions are made, given that they assist in accomplishing goals that the teacher has planned. We can say that, in mathematics teaching, the goals of lecture are usually prioritized, since one leads to another. Additionally, a goal to motivate the students might be done before or after a goal to use technological applications in a lesson. It is clear that when teacher orients himself and set goals for the subject, he focuses on the direction to achieve the goals. We can say such a process involves complex interactions of resources, orientations and goals (ROG). The decision making that affects how successful a teacher is to reach the goals he has set and the processes of self-monitoring and self-regulation are important in deciding how well education are progressing (Schoenfeld, 2011). we need to add teachers have different set of beliefs and values regarding what understand in learning mathematics, so this situation can cause to make very different choices.

Schoenfeld's method in an analysis of school teaching or of teacher's training. In this study, we apply it to an analysis of a high school mathematics teacher's teaching of a basic mathematics course (Schoenfeld, 2008). One

of our research aim is to obtain some useful information from the framework about the decisions made by the lecturer. And the other is analyze the discussion of the lecturer's ROG to increase the important of the orientations and goals.

## **METHOD**

This study is a research project involving a mathematician (the first-named author referred to as 'the teacher') reflection on practice, and secondly, a case study of his practice by two mathematics education researchers (Hannah, Stewart and Thomas, 2010). The math education researchers are from a state university in Turkey, formed a small community of practice to determine the effectiveness of certain aspects of the teacher's teaching of a basic mathematics course. The study took place in 2016 and involved cycles of planning the relevant teaching material and then reflecting on and evaluating the findings. In this research, the teacher spent a certain time after each lecture writing a detailed reflecting on events that happened in each lecture, totally, for 14 hours lectures. He was also interviewed twice by the two researchers at the beginning and end of the lectures. Some of the discussion focused on teacher's goals for the lecture, and in particular to determine how these goals related to the method of three worlds (embodied, symbolic and formal) of mathematical thinking (Tall, 2004 & Tall, 2008). In addition, other questions dealt with the day-to-day implementation of these goals during lectures.

The first analysis was to use the data from the interviews and lecture notes to construct a description of teacher's ROG for the course. Since some ways of this data were inferred from what the teacher said, it was validated in discussion with him. In performing the analysis, it was often difficult to separate an orientation from a goal, since one usually wants to reach what one sees as important. Sometimes we may obtain an orientation from a goal.

## **FINDINGS**

We found about the teacher's ROG that the orientations could be categorized related to didactics and mathematics. A basic aspect of this method is the ability to aware of that mathematics is not a sequence of independent parts but that there are important and meaningful connections. The two-major orientation here were taken from teacher's oral or written words;

The general view in mathematics is important.

'This course is more about the "the general view" rather than solving a problem'

"To reach the general view involves making connections and analyse between ideas and concepts"

Abstraction is an important learning tool. 'I usually start with something which is graphical or a picture Free and independent thinking is a valuable part of mathematical learning. Concreteness can sometimes cause difficulties with understanding

The teacher explained his observes that "As a guide, what I'm trying to do is get them see that actually there are connections and relations in my presentation. I'm trying to get them into thinking general view (or main subjects)".

In addition, teacher's primary goals were closely linked to the above orientation;

"As a guide, my main goal was I want them to think like a mathematician"

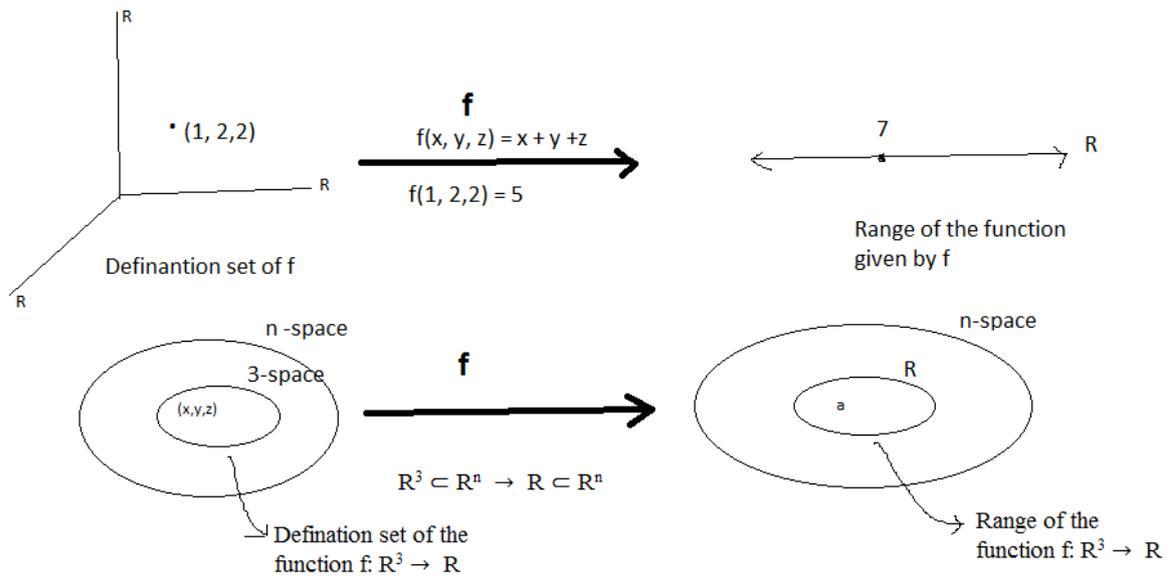
"To help students understand the general view in basic mathematics"

"To show students to the structure of mathematical thinking"

"To help students make connections between mathematical ideas rather than learning procedures (teacher solution methods)"

Written and oral communication is an important part of the teaching - learning process in mathematics.

An example of the kind of important connections that the teacher espoused was when he said that the textbook ' . . . looks after  $R^3$  by fonctionning to  $R$  (so a vector in  $R^3$  become a constant), then using the method we saw the general defination of the function  $f$  (Figure 1).



**Figure 1:** An example of connection between mathematical ideas and examples.

For the mathematical idea, the teacher stressed that “I’ve never declared to the students what big picture is, but I’m hoping that they’ll get the main idea of the lecture that they need from the calculations in the lectures.

“To make familiar students to mathematical formats and symbols”.

In this point, the teacher said that for advanced students in mathematics, they need to become familiar with the procedures of proving some main theorems.

To encourage students with Tall’s ways (resource, orientation, goal) of mathematical thinking.

To make clearer how the teacher’s ROG, described in part above, were involved during in-the moment decision-making, we give one example from lecture.

The one of the main concepts of basic mathematics is solution criterions of

$$ax + b = 0, \quad a \text{ and } b \text{ are constants}$$

The importance of communication and the goal of getting students to communicate are shown in teacher’s reflection; “I have been emphasizing that students need to become familiar with the new concepts such as unique solution, infinite solution and no solution.

On focusing what has developed this level in-the-moment decision we see it was motivated by powerful and insistent beliefs, including some major orientations and some important goals mentioned above.

## CONCLUSIONS

In this study, we applied Schoenfeld’s method for provide useful information on lecturing practice, and believe that the construction of a description of the teacher’s ROG determines its position. Effective teaching is not innate but can be learned and developed (Hannah, Stewart and Thomas, 2010). One way to reach this goal is that “The key for new teachers at the tertiary level, just as at primary and secondary, is to encourage the development of the skills of reflective practice” (Kane, Sandretto and Heath, 2004).

Registering the reflections on his lectures and attending in discussions in a community of practice have assisted the teacher to analyze on his teaching. When we examined the teacher’s lecture notes, we met some interesting

and important phrases; "...It's been valuable to see that.... It's interesting but I can tell you're only having my words on the concept....".

One of the main conclusions of this study joint research between mathematicians and mathematics educators is the opportunity for study of teaching and pedagogical approaches (Hannah, Stewart and Thomas, 2010). Paterson stressed that for some mathematicians a tension arises in their lecture between the desire of the mathematics and the ways of mathematicians and the need to be a teacher (Paterson, Thomas and Taylor, 2011).

In this study, this was little finding, with the mathematician's goals. The headlines of the teacher's practice were that visualization was applied through using of models and figures in lectures and experimentation using technology was done.

The teacher had the community of practice a special educational experience. Sharing lecture discussions with mathematics education researchers gave him the opportunity to reflect on his teaching practice. As these people were also teach similar mathematics courses, this corporation were able to include ideas from recent research about teaching, and this led to an increased awareness of his own orientations and goals.

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# Analysis of a Didactic Experience in Teacher Training: Twitter as a Learning Space

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## ABSTRACT

This paper is a report the findings of a didactic experience in social networks (Twitter) carried out in the academic years 2015-16 and 2016-17. It has been developed with future professors, postgraduate students of the subject 'Curriculum design and development', Master's Degree in Teacher Training at Universidad Nacional de Educación a Distancia (UNED) (Spanish National University of Distance Education). The didactic experience comprised two main parts: participation in Twitter and design of a didactic proposal of RRSS in the classroom. A qualitative (content analysis) and quantitative (descriptive) analysis has been carried out. Students have valued highly the experience. Not only have they acquired academic information and improved their professional knowledge through social networks, but it has also enabled them to generate a community with shared interests. It can be concluded that implementation of a didactic activity based on social networks can constitute a motivational element for students. The students have participated in Twitter with high degrees of satisfaction; also at the end of the course have considered that the effort has been worthwhile, since the activity is useful.

## INTRODUCTION

According to some authors different variables could be considered decisive in the learning process: academic engagement, communication process, create a community of interest, importance of analysing students' perceptions about satisfaction, positive assessment and usefulness.

The importance of academic engagement) has been highlighted by several authors, such as: Astin, 1984; Junco, 2011; Kuh, 2009; Rankin, 2009; Evans, 2013. The communication process is an esencial aspect of online learning (DeLotell, Millam, & Reinhardt, 2010; Gunawardena, Linder-VanBerschoot, LaPointe, & Rao, 2010). Academics as Ozturk and Hodgson (2015) have highlighted that develop democratic teaching approaches could facilitate collaboration and communication in the learning process.

Twitter has been considered a communicational and learning space (Andrade, Castro y Ferreira, 2012), which facilitates the creation of a community of interests, which broadens the contacts of its participants, not only inside but also outside the classroom (McKenzie, 2014; Carpenter and Krutka, 2014).

Finally, the importance of analysing students' perceptions about satisfaction, positive assessment and, positive valuation, usefulness has been emphasised by several authors (Gunawardena et al., 2010; Wang y Meiselwitz, 2015; Ozer, Karpinski and Kirschnerb, 2013).

In summary, the main research goal is to know the students' assessment of an educational activity based on the use of Twitter and how it influences the learning process. The specific objectives are:

1. To analyse the fulfilment of students' expectations.
2. To determine how students assessed the activity in terms of quality.
3. To determine how students assessed the activity in terms of satisfaction and usefulness.
4. To study the contribution of social network use to learning.

## THE DIDACTIC EXPERIENCE

'Curriculum design and development' is a course of the official postgraduate students of the Master's Degree in Teacher Training at the UNED School of Education (Universidad Nacional de Educación a Distancia - Spanish National University of Distance Education).

Learning is assessed by means of continuous assessment and a summative assessment which combines the results of the final examination in the subject (70%) and the marks obtained in the continuous assessment activity (30%).

In the academic years 2015-16 and 2016-17, a social network-based activity was launched. The activity comprised two main parts: participation in Twitter and design of a didactic proposal of RRSS in the classroom.

The main objective of the first part of the activity was to introduce students to the scope and use of Twitter.

Twitter was used as a space for student work and communication. Briefly, the objectives were:

1. To exchange information on any subject of social and/or educational interest.
2. To create a community of interest.
3. To acquire competence in proficient and effective use of Twitter.

On the other hand, the main objective of the second phase of the activity was that the students integrate the knowledge acquired and share information by TW. It was sought that students generate innovative ideas for their application in the classroom, where the social networks constitute an essential component.

Communication took place through the online course discussion boards and through Twitter. The online course and the discussion boards were hosted on the ALF platform.

With regard to participation on social networking site, the activity lasted 3 weeks and could be completed whenever each student wished in February, March, April, May and / or June. During this period of time, students were to participate actively on Twitter by posting every day or every other day. The minimum required frequency of participation was at least 50 posts from Twitter.

Posts were not solely retweets but also the result of the different forms of communication facilitated by the tool. These included:

- Direct messages (original messages)
- Retweets (RT) of posts from various sources.
- Tweets with @ sign.
- Replying to other posts.

To create a community of interest, students carried out two main actions:

- 1) Communication and interaction with other twitter users through the different means facilitated by the tools: retweeting posts, citing tweeters in posts using the @ sign, responding to posts by others, asking twitter users direct questions, marking posts as favourites and thanking new followers and/or twitter users who retweeted their posts.
- 2) Attracting and managing followers: Creation of the community began by inviting other UNED students also doing the activity to become their followers. To create a community of interest, students first sought followers with shared interests from the course or elsewhere.
- 3) Use of the subject hashtag: all the posts forming part of this activity used the hashtag #D16\_UNED or #D17\_UNED (depending on academic year) to facilitate communication, follow students and assess their activity on the sites.

## **METHOD**

### **Study Participants**

The population was formed 1340 students: 656 enrolled in the academic year 2015-2016 and 684 in the academic year 2016-17. The sample was formed of students who voluntarily completed the online survey (302). Finally, taking into account the population of 1340 students and the sample of 302 students who completed the online survey, there is a sampling error of 5.06% (0.5).

### **Research and instrument design**

A mixed quantitative and qualitative design was employed based on statistical (descriptive and relational) analysis and content analysis.

An ad-hoc questionnaire was designed to identify students' opinions about the social network-based activity (satisfaction, usefulness and assessment of the activity's contribution to their learning). It can be viewed at: <https://goo.gl/ZT7p4t>. The questionnaire contained 8 Likert-type or open questions.

In sort, two main software was used to analyse the data: SPSS Statistics version 22 and Atlas.ti HM.

Regarding the closed questions a descriptive analysis (frequencies and percentages) was done and it was analysed by Statistical analysis was performed using SPSS Statistics version 22. On the other hand, to analyse the open questions and content analysis was used Atlas.ti HM.

An analysis was conducted of the most important concepts, taking into account their frequency of occurrence, density (the number of codes with which they were related), and the relevance of their meaning in the study

context. First, students' opinions were coded using an identification number (from 1 to 302) and a letter indicating that they are students (S). Subsequently, the texts were analysed to extract general categories and the relationship between these categories. Satisfaction and usefulness were combined since they yielded very similar conceptual maps.

### Procedure

The learning activity implemented in the academic years 2015-16 and 2016-17 consisted of the following phases:

- Phase I, October 2015: design of the assessment online survey.
- Phase II, February to June in both academic years: implementation of the activity.
- Phase III, April to June in both academic years: administration of the online survey.
- Phase IV, July 2017: data analysis and report preparation.

### FINDINGS

#### Students' assessment and perception of the social network-based activity

The online survey results showed that in relation to the activity, most students considered that their expectations had been met (74.8%), reported that the expectations had been overtook (7%) and they had been met halfway (13%) (See Fig. 1) On the other hand, the vast majority of students had highlighted the high quality of the activity (73.5%) (See Fig. 2).

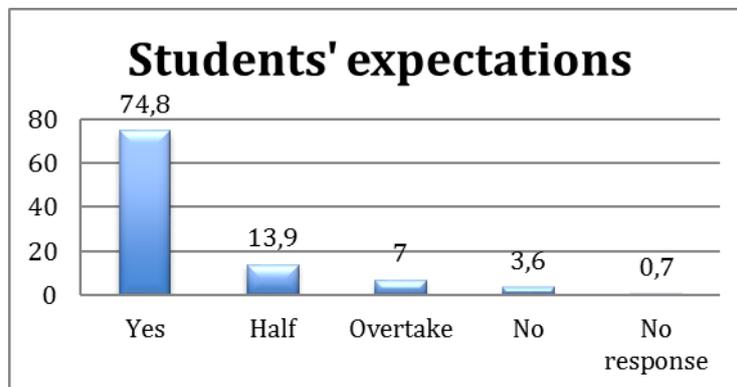


Figure 1. Activity students' expectations

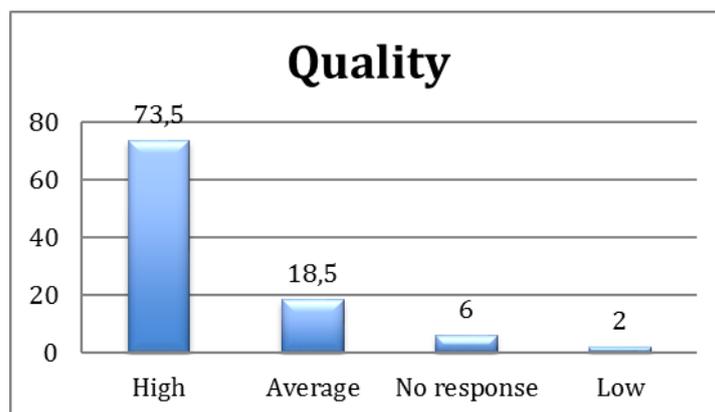


Figure 2. Assessment of the activity: Quality (percentages)

On the other hand, students had reported a high (60.9%) or very high (18.5%) degree of satisfaction with the activity, and rated the activity as being of high (57.0%) or very high (21.5%) usefulness (see Fig. 3).

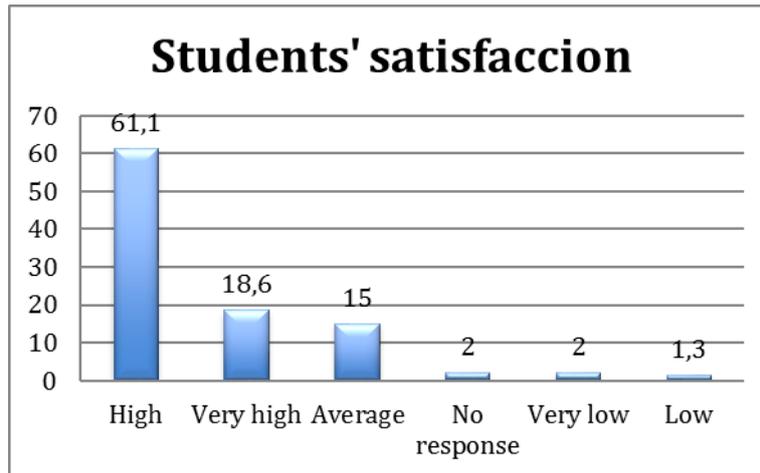


Figure 3. Assessment of the activity: student satisfaction (percentages)

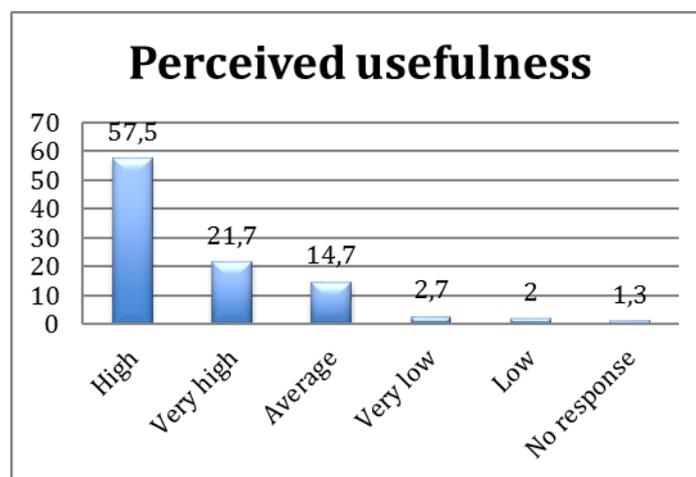


Figure 4. Assessment of the activity: Perception of Students About the Usefulness (percentages)

To determine highlighted aspects in the students' assessment of the activity, their open answers to the online survey were analysed.

An analysis of student satisfaction and perceived usefulness indicated that there were three main aspects that determined assessment of the activity: its influence on learning, the opportunity offered by social networking sites to and acquire knowledge, and the possibility of communicate with other Twitter users (See fig. 4)

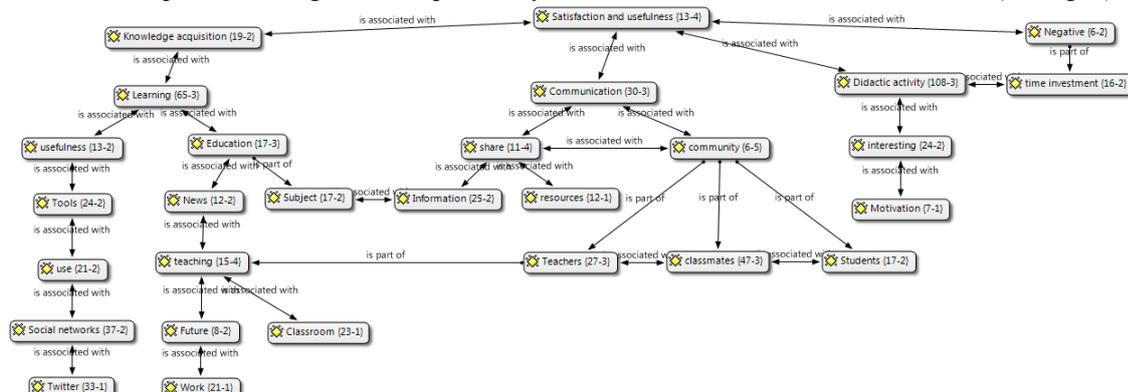


Figure 4. Conceptual map of satisfaction and perceived usefulness

The opportunity offered by social networking sites to acquire knowledge was the main advantage indicated by most students.

Not only were academic aspects emphasized, but also the practical aspects of networks were highlighted.

Learning to use Twitter had been considered a very important and useful aspect for future teachers (“(...) As I have said, it has allowed me to discover new ways of giving lessons and new tools to use. In addition, the same activity itself is another example of how to use social networks to learn” [S09]). In addition, the acquisition of knowledge related to education had been highlighted. Both aspects had been considered essential: subject knowledge and learning innovative aspects of education (“An innovative task, which I have learned many things from as having to develop a subject quite known till now to me now was little known to me. I have had active learning on the subject in question by conducting research work over a long period of time” [S34]; “I am very satisfied because until now I was only able to conceive innovation from a purely theoretical approach. This activity has allowed me to visualize and concretize in real examples what underlies in the notes” [S36])

Learning new ways to teach based on social networks was considered fundamental for future teachers and, above all, to develop innovative methodologies in the classroom: “It has made me think about how to offer content to students in an enjoyable and current way, without falling into boring lessons where teacher speaks and the students listen” [S31]

Secondly, the students highlighted the activity developed on Twitter as a means of communication and generation of a community with shared interests. A community formed by students from UNED, others Twitter users and teachers. Through Twitter they had shared information and educational resources: “It was an attractive activity because has allowed me to learn to research in a different way than I am used to. In addition it generates a community of colleagues, which if in the university in general is already complicated, it is much more in the UNED, where the workmates do not know each other” [S32]

Thirdly, the students emphasized that the activity, in general, is very interesting and motivating. Although they consider that it had some negative aspects, that is: time investment which they needed in order to carry the activity out. Nevertheless, it is possible to affirm that the participation on Twitter is worthy due to the fact that they acquired knowledge and created a community with shared interests.

Finally, it is possible to emphasize as summary of the valuation of the activity with the affirmation of this student:

“This activity has been a work and learning experience in which I had never participated before. It is true that through the forums of the platform and other communities of students I have maintained a more or less active contact in the subjects at UNED, but this activity is the first online experience in which to be an active member in a social network it is valued as part of the learning process (...)”. [S43]

A few criticisms were made. These mainly concerned the time required to use the sites, impinging on time for study.

### **Contribution of the activity to learning**

The contribution of the activity to the learning process was valued according to three variables: acquired knowledge, Innovation in the learning process and communication process.

The students stated that the activity had meant an increase in knowledge, not only content related to the subject, but also had been considered a means of finding out the possibilities of social networks in the educational field.

Mainly, activity had been emphasized as a way to open their perspectives as teachers. The students had highlighted the innovative value of the activity. Students stated that they had acquired very useful information about how to apply Twitter as a teaching tool, as a technological medium and, above all, as a supporting space in the classroom. They claimed to have acquired new ideas of application in the classroom and new technological resources to support teaching.

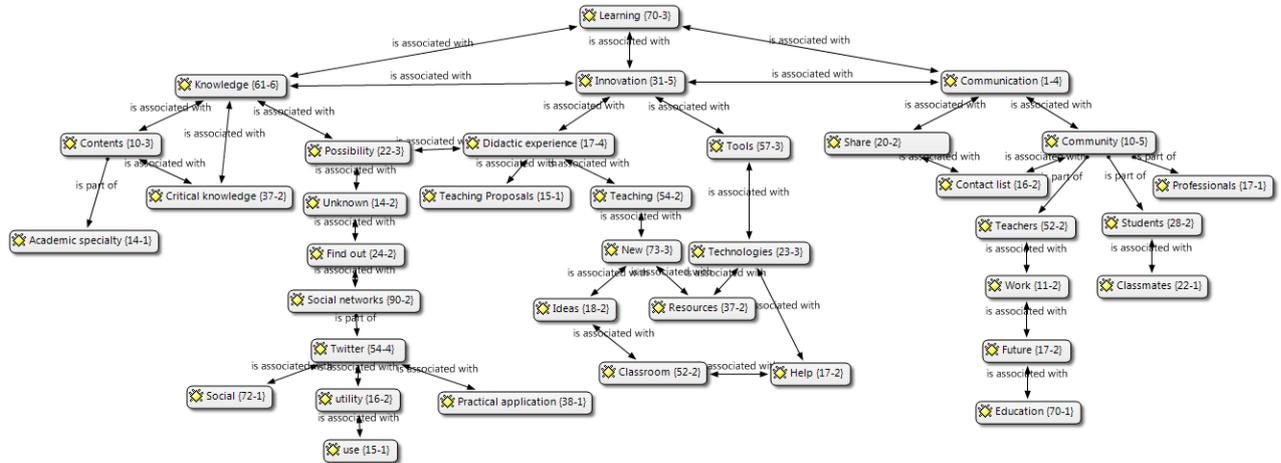
Thirdly, the activity had been a way to be in contact with others teachers, students and professionals. Not only Twitter gave them the chance to share information with other Twitter users, teachers and other professionals, but also it gave the opportunity to create a community with shared interests among them. This community had been valued as a space which facilitate their professional future in educational field.

A student’ opinions can be emphasised in order to summarize these results:

“This activity has facilitated access to innovative content that has allowed me to expand

knowledge about the use of new communication and information technologies. In addition, having been able to exchange and share information related to the activity with the rest of colleagues through Twitter has been a collaborative experience which in an online university like UNED is much appreciated". [S43]

Figure 3. Contribution to learning of the social network-based activity



## CONCLUSIONS

The generation of a true communication and interaction process between students should be one of the main objectives of academic activities. Social networks can help us get it. Through creation of a professional community with shared interests, it is possible to design activities which involve real contact with the working world, with the world outside the classroom.

It can be concluded that implementation of a didactic activity based on social networks can constitute a motivational element for students. The students have participated in Twitter with high degrees of satisfaction; also at the end of the course have considered that the effort has been worthwhile, since the activity is useful.

The knowledge acquisition, not only technical, but also academic, has been one of the aspects especially valued by students. The activity has also enabled them to create their own contacts network which opens new working possibilities to them. Both aspects, knowledge acquisition and contacts network, have contributed to the success of the didactic proposal.

To sum up, when designing an academic activity, it is fundamental to propose activities which facilitate the students involvement in the teaching-learning process and, from this point of view, it is necessary to know their interests and their assessment of the work done.

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# **Analysis of Professional Maturity Levels of Candidates Who Take Special Skill Talent Exam**

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## **ABSTRACT**

The purpose of this research is to analyse Professional maturity levels of candidates who take special talent tests at Erciyes University The School of Physical Education and Sports by some variables. 705 of 1395 candidates, who have taken special talent tests at Erciyes University The School of Physical Education and Sports, have been chosen randomly and attended voluntarily to the research. Professional maturity scale and personal information form prepared by the researcher are used as data collection tools in the research. Acquired data is analysed statistically using SPSS 20.0 packaged software. Personal information and total inventory points and factor points are given by identifying frequency (f) and percentage (%) values. In order to present the relation between points acquired from scales Mann-Whitney U test statistic is used in comparisons by gender and branches while Kruskal Wallis test statistic is used in comparisons by age, field, points of transition to higher education examination and place they live. In conclusion; professional maturity levels of the candidates who take special talent tests are analysed, there is no statistical difference by gender and age while statistically significant differences are identified by field, points of transition to higher education examination, branch and place they live.

**Key Words:** Professional maturity, special talent, university

## **INTRODUCTION**

In today's modern societies, professions are the most important activities which enable individuals to gain place and status in societies, to become financially independent, help them to realize themselves, make the life meaningful. Selection of these important activities is possible through healthy decisions given by the individuals. Because the primary objective of profession choice which is a milestone in individuals' lives, is to plan a happy future (Gülbahçe, 2007).

The society expects individuals of certain age to show some profession attitude and behaviours. In this respect, professional maturity is the period of having skills that are predicted by some professions to make the profession (Aşkın, 2003: p.28). Bowsbey defines professional maturity as; "an individual's enter into decision-making period, gaining awareness of his own skills, interests and values and having information about professions, specifying profession areas compatible with his qualities and condition he is in and readiness to take necessary steps to reach his goals" (qtd. Dölek, 2008: 108).

When above mentioned definitions' common features' examined, individual's readiness level is emphasized in his coping with developmental tasks, current career development phase and making profession decision by his

age, collecting information about himself and others. In addition, it is seen that attention is drawn to information level on himself and profession types, and level of factuality and consistency of his choice (Oğuz, 2008).

When choosing a profession, it is required to recognize all professions which are open to us entirely, evaluate our needs, expectations, interests and skills and decide to head for the profession which is suitable for us to achieve satisfaction in our career. Such decisions are highly important in human life. Therefore it is inevitable to say that profession choice is the most important decision for us (Sarucan, 2007).

As to Super and Jordan, there are two ways to measure one's professional maturity. First is to compare individual's current place on development line with the professional development grade one should be in that age, second is to see where individual's maturity level is among others' being on the same step in terms of their fulfilment of development tasks (Kuzgun, 2000: 178).

When above mentioned information examined all in all it is seen that professional maturity term can be effective at different sizes and levels in different fields of life. When literature reviewed, it is seen that there are studies which analyse professional maturity terms on various sample groups (Oğuz, 2008, Sekmenli, 2000, Sürücü, 2005). However it is ascertained that there are few studies analysing professional maturity levels in the field of physical education and sports. This study is thought to fill the deficiency in the field of physical education and sports and bring a different perspective. The general purpose of the study in this context is analysis of professional maturity levels of candidates who take special talent tests at Erciyes University the school of physical education and sports.

## **MATERIAL – METHOD**

### **Model of the Research**

This study is of relational screening. This screening model can be defined as, "... research model aiming to assign the presence or degree of covariance among two and more variables" (Karasar, 2007: 49-53).

### **Research Group**

Study group consists of candidates who take special talent tests at Erciyes University The School of Physical Education and Sports. 705 candidates, chosen randomly, attended to the research.

### **Data Collection Tools**

Professional attitude scale and socio-demographic information form are applied as data collection tools in the research.

### **Socio-Demographic Information Form**

Socio-Demographic Information Form includes 6 questions to gain information about participants' age, gender, field, points of transition to higher education examination, branch and place they live.

### **Professional Maturity Scale**

This inventory is developed by Kuzgun and Bacanlı (1996). Reliability is calculated by internal consistency and stability factors. Internal consistency is calculated as  $\alpha$  (alfa) = 0,89 from 100 high-schooler at 3<sup>rd</sup> grade. stability factor is applied to 50 students 5 weeks later. Person- multiplying correlation coefficient calculated as  $r = ,82$ . Having points below than corresponding to 50<sup>th</sup> percentage (143): are those whose professional maturity levels are low. Those people should improve their professional maturity levels in order to make accurate profession choice. Having points corresponding to 50-75% (143-155) : are those who have reached professional maturity level. However Those people should also improve their professional maturity levels in order to make more accurate profession choice. Having points above than corresponding to 75<sup>th</sup> percentage (155): are those who have reached expected professional maturity level. Rise of professional maturity levels are in direct proportion to accurate profession choice. Therefore, those being in the last group are suggested to continue improving their analyse and research behaviours in order to choose profession relevant their skills, interests and values.

## Data Analysis

Acquired data from personal information form, general self-efficacy and questioning skill scale are encoded to SPSS 20.0 packaged software and analyses are made through this program. Kolmogorov-Smirnov (Kalaycı, 2009) test is done in order to decide statistic type to be used in the study. Because data don't range normally, nonparametric test statistics are used. In order to present the relation between points acquired from scales Mann-Whitney U test statistic is used in comparisons by gender and branches while Kruskal Wallis test statistic is used in comparisons by age, field, points of transition to higher education examination and place they live.

## FINDINGS

**Table 1.** Socio-demographic features of participants

	<b>Variables</b>	<b>N</b>	<b>%</b>
<b>Gender</b>	Male	422	59.9
	Female	283	40.1
<b>Age</b>	17-21	404	57.3
	22-25	271	38.5
	26 and more	30	4.2
<b>Field</b>	Mathematical	39	5.5
	Non-Math	580	82.3
	Math and Literature	86	12.2
<b>Transition to higher education exam point</b>	180-220	401	56.9
	221-260	282	40.0
	261-300	17	2.4
	301 and more	5	0.7
<b>Branch</b>	Individual Sports	160	24.4
	Team Sports	385	58.8
<b>Place they live</b>	Mediterranean	89	12,6
	Black Sea	11	1,6
	Aegean	6	0,9
	Marmara	18	2,6
	South-eastern Anatolia	30	4,3
	Eastern Anatolia	137	19,4
	Central Anatolia	414	58,7

Socio-demographic features of participants are shown on the Table 1.

**Table 2.** Evaluation of Participants' Professional Maturity Levels By Gender

	<b>Gender</b>	<b>n</b>	<b>median</b>	<b>min</b>	<b>max</b>	<b>Z</b>	<b>P</b>
<b>Professional Maturity</b>	Bay	422	147,00	100,00	188,00	-1,794	,073

Bayan      283      147,00      89,00      188,00

When table 2 examined; it is determined that there is no statistically significant difference between participants' professional maturity scores by gender.

**Table 3.** Evaluation of Participants' Professional Maturity Levels by Age

	Age	<i>n</i>	<i>median</i>	<i>min</i>	<i>max</i>	$X^2$	<i>P</i>	<i>U</i>
<b>Professional Maturity</b>	18-21 <sup>1</sup>	404	147,00	89,00	188,00			
	22-25 <sup>2</sup>	271	147,00	100,00	188,00	5,719	,057	-
	26 and over <sup>3</sup>	30	145,00	104,00	188,00			

When table 3 examined; it is determined that there is no statistically significant between participants' professional maturity scores by age ( $p>0.05$ ).

**Table 4.** Evaluation Of Participants' Professional Maturity Levels By Fields

	Field	<i>n</i>	<i>median</i>	<i>min</i>	<i>max</i>	$X^2$	<i>P</i>	<i>U</i>
<b>Professional Maturity</b>	Mathematical <sup>1</sup>	39	125,00	89,00	187,00			1-2
	Non-Math <sup>2</sup>	580	147,00	100,00	188,00	74,359	,000	1-3
	Math and Literature <sup>3</sup>	86	157,50	122,00	188,00			2-3

When table 4 examined; it is determined that there is statistically significant difference in participants' professional maturity scores between mathematical and non-math , mathematical and math and literature scores( $p<0.05$ ).

**Table 5.** Evaluation of Participants' Professional Maturity Levels by Transition to higher education exam points

	Transition to higher education exam points	<i>n</i>	<i>median</i>	<i>min</i>	<i>max</i>	$X^2$	<i>P</i>	<i>U</i>
<b>Professional Maturity</b>	180-220 <sup>1</sup>	401	145,00	89,00	187,00			1-2
	221-260 <sup>2</sup>	282	153,00	100,00	188,00	42,531	,000	1-3
	261-300 <sup>3</sup>	17	155,00	144,00	188,00			
	300 and over <sup>4</sup>	5	177,00	144,00	188,00	1-4		

When table 5 examined; it is determined that there is significant difference in participants' professional maturity scores between 180-220 and 221-260, 180-220 and 261-300, 180-220 and 300 and over ( $p<0.05$ ).

**Table 6.** Evaluation Of Participants' Professional Maturity Levels By Branches

	Branch	<i>n</i>	<i>median</i>	<i>min</i>	<i>max</i>	<i>Z</i>	<i>P</i>
<b>Professional Maturity</b>	Individual	433	148,00	101,00	188,00		
	Team	272	145,00	89,00	188,00	-5,296	,000**
	Team	272	20,00	8,00	26,00		

When table 6 examined; it is determined that there is statistically significant difference in participants' professional maturity scores between individual and team sports ( $p<0.05$ ).

**Table 7.** Evaluation Of Participants' Professional Maturity Levels By regions they live

	Region	<i>n</i>	<i>median</i>	<i>min</i>	<i>max</i>	$X^2$	<i>P</i>	<i>U</i>
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<b>Professional Maturity</b>	Mediterranean <sup>1</sup>	89	152,00	107,00	188,00	15,658	,016	1-4
	Black Sea <sup>2</sup>	11	152,00	101,00	175,00			
	Aegean <sup>3</sup>	6	144,50	105,00	179,00			
	Marmara <sup>4</sup>	18	130,50	106,00	185,00			
	South-eastern Anatolia <sup>5</sup>	30	147,00	100,00	188,00			
	Eastern Anatolia <sup>6</sup>	137	147,00	101,00	188,00			
	Central Anatolia <sup>7</sup>	414	147,00	89,00	188,00			

When table 7 examined; it is determined that there is statistically significant difference in participants' professional maturity scores between Mediterranean and Marmara region scores ( $p < 0.05$ ).

## DISCUSSION AND RESULT

In the presented study it is determined that there is no statistically significant difference between participants' professional maturity scores by gender ( $p > 0.05$ ). When literature reviewed, there are studies arguing that there is no significant difference between participants' professional maturity scores by gender variable Kağnıcı, 1999; Mathewson and Orton, 1963; Sahraç, 2000; Saracaloğlu, Karasakaloğlu and Gencil, 2010: 265-283; Sekmenli, 2000; Sürücü, 2005; Taşkıran, 2008; Touma, 1997; Vriend, 1969: 377-380; Westbrook, et al. 1990: 20-32; Yazar, 1997; Zeren, 1999). These studies show parallelism with this research. In different researches, it is encountered that there is significant difference in professional maturity levels by gender (Akbiyık, 1991; Akbalık, 1996; Bal, 1998; Creed ve Patton, 2003: 277-290; Çakar, 1997; Lau, Low ve Zakaria, 2013: 36-42; Kalafat, 1998; Otrar, 1997; Yazar, 1997). The presented study shows that there is no participants' gender change has no effect on professional maturity levels. This situation is thought to be resulted from that, those who have taken special talent test have made their future career plannings regardless of gender differences.

When participants' professional maturity levels by age examined, it is determined that there is no statistically significant difference ( $p > 0.05$ ). There are studies arguing that there is no significant difference in professional maturity levels by age variable in the literature (Çakar, 1997; Kağnıcı, 1999; Kutluğ, 2007; Mathewson ve Orton, 1963). These studies show parallelism with this research. In different researches, it is encountered that there is significant difference in professional maturity levels by age (Creed ve Patton, 2003: 277-290; Patton ve Creed, 2002: 69-85). This is a contradictory situation. In this study, it is thought that because those who are at universal education level have reached specific professional maturity level regardless of age group, there is no difference in professional maturity levels by age variable.

Statistically significant differences are identified between professional maturity scores by participants' fields ( $p < 0.05$ ). When literature examined, there are some studies that analyse professional maturity levels by field variable showing parallelism with our study (Acısu, 2002; Akbalık, 1996). In other studies, the result is that there is no significant difference in professional maturity levels by field variable (Emilova, 2014; Zeren, 1999). The reason why students from Math and Literature field have high scores is because it offers more profession alternatives to the students. The reason why students from math field have higher scores in general self-efficacy levels is because they have competence both in mathematical and non-mathematical field.

Statistically significant differences are identified between professional maturity scores by participants' Transition to higher education exam points ( $p < 0.05$ ). when literature examined, any study analysing professional maturity levels by participants' transition to higher education exam point variable has been encountered. Students having high exam score, have high levels of professional maturity because they are aware that their exam scores are effective in their success and they prefer this department more for their future plannings.

Statistical significant differences are identified between professional maturity scores by participants' branch variable ( $p < 0.05$ ). When literature examined, any study analysing professional maturity levels by participants' branch variable has been encountered. Professional maturity levels are higher in Individual sports branches than team sports branches because in individual sports individuals are conscious of having the full responsibility on themselves.

Statistical significant differences are identified between professional maturity scores by regions where participants live ( $p < 0.05$ ). When literature examined, there are some studies determining that there is no significant difference between regions they live and their professional maturity levels (Acısu, 2002; Akbiyık, 1991; and Kutluğ, 2007). These studies have no parallelism with our study. In presented study, Statistical

differences are identified between professional maturity scores by regions where participants live because profession alternatives offered to the individuals change region by region due to their population level.

In conclusion, when professional maturity levels of whom take special talent tests examined; there is no statistical differences by gender and age while there are statistically significant difference by field, transition to higher education exam scores, branch and regions they live.

#### **SUGGESTIONS**

- This research has been practised on candidates who take special talent tests at Erciyes University the school of physical education and sports. In later studies population and sample can be extended. By doing similar researches, the results can be compared.
- Activities should be carried out to improve participants' professional maturity.
- An educational environment can be created by giving the participants chances of selection and self-expression to make them feel more comfortable.

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# Analysis of Science Diaries With Text Mining Techniques\*

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## ABSTRACT

Science laboratory lessons are being made in relation to science and biology in faculty of education. In these lessons, experiments are being designed together with students according to the lesson subjects. The aim of this study is to determine the effects of keeping diaries which were written at the end of experiment day and to analyze these diaries using text mining. Diaries were kept by the second-grade students during the course of general biology laboratory I who studies in the Undergraduate Program in Science Education. In the study diaries kept by twenty-five students which contains the experience and feelings of the students about the experiment process were analyzed using text mining. The analysis revealed the most frequently used terms, associations between words, and the similarities among the diaries. The findings showed that the most frequently used words and terms are those which are about the content of the experiments. It was also found that the students sufficiently reflected the content in their diaries. Associations between words reflects the points which students focused on during the experiments. It was also found that similar diaries that produced from one origin can be detected using the similarity analyses.

## INTRODUCTION

Data mining techniques are employed to reveal hidden patterns and associations in huge data sources. If the data is text-based than the data cannot be used as in normal text mining. Text mining analyses these non-structural data and transforms these data in a manner to be used with data mining. Text mining is defined as a process to make sense of the non-structural data. In order to extract information from such data certain processes are needed (Kılınc, 2015). Given that textual production does not follow clear rules computers cannot interpret it. The language and goal of texts vary. Traditional ways to extract information from non-structural data include search for key words, statistical or probability algorithms, systems of pattern discovery (Dolgun, 2009). Text mining is used to evaluate text groups produced in different fields. Dolgun (2009) analyzed the performance of different text mining methods. Çalış (2013) analyzed the advertising e-mails written in Turkish using text mining and found that kNN could correctly classifies these e-mails with the accuracy level of 96,5%. Kılınc (2015) used text mining techniques to evaluate software and suggested that both problems and recommendations can be grouped using this technique.

There are numerous studies on the work in science laboratories. For instance, Yurdatapan (2013) analyzed the effects of problem-based laboratory activities on pre-service science teachers' scientific process skills, their self-confidence and self-efficacy concerning biology laboratory. It was found that such activities improved their scientific process skills. Ürey and Aydın (2014) concluded that web-based activities in biology laboratories resulted in improvements. There are also studies on diaries kept by students. Çavuş and Özden (2012) found that diaries kept by students in science courses have positive effects on student achievement and their attitudes towards the course and their teachers. Arslan and Ilgın (2011) found that students' diaries kept in Turkish language courses helped their writing skills and suggested that these diaries can be used to assess students' writing skills. Kasapoğlu (2014) used science diaries to evaluate learning environments in the graduate course of "Science and Technology Teaching I" and found that the learning environment was constructive one. Demirci (2016) found that experimental students who kept diaries improved their higher levels of cognitive skills. İmer (2009) found that

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students could easily express their views about concept maps through diaries. Peker (2014) concluded that diaries contributed to students' reflections of emotions and views and that diaries improved their high cognitive skills. Karaca (2016) found that keeping diaries positively affected the views of the eighth grade students about science course. Akkoç (2010) analyzed the diaries kept by pre-service science teachers about laboratory practices and found that they had trouble in developing hypotheses and in connecting topics with daily life. The views of the pre-service teachers about diaries were examined using content analysis and it was found that following the implementation their positive views about laboratory work increased.

In the literature review, there are studies about laboratory practices especially about method, attitude and cognitive contributions. However, there isn't any studies about using text mining techniques in the analyze process of kept diaries. The aim of this study is to analyze diaries kept by students during "Biology Laboratory I" course using text mining techniques and determine the efficacy of keeping diary.

## THE STUDY

The study was designed as a case study, part of qualitative research. Major characteristics of qualitative research include an integrated approach, revealing perceptions, flexible research design and using an inductive analysis (Yıldırım ve Şimşek, 2005)

Within the scope of the study, students kept diaries at the end of each laboratory application during the course period. At the end of course period diaries were examined through various text mining methods. The findings showed the words which were frequently used, the words used together, associations between the words, similarities between text files. Based on these findings efficiency of keeping diaries has been tried to be determined

The study was conducted in the academic year of 2016-2017 and the students were asked to keep diaries reflecting their laboratory experience and processes. Table 1 shows the topics of the experiments as follows.

**Table 1.** Topics of the experiments

Weeks	Topic of the experiment
1	Laboratory rules and the use of microscope
2	Analysis of cells (onion membrane)
3	Comparison of plant and animal cells
4	Observation of organic ingredients of cells (of starch extracts)
5	Observation of organic ingredients of cells (protein, carbohydrate and fat)
6	Observation of cell organelles (chloroplast in wax plant)
7	Observation of cell organelles (of other plastids)
8	Photosynthesis (food production in photosynthesis)
9	Observation of mitotic and meiosis divisions in preparats
10	Observation of the phases of mitotic division in onion cells

The texts were transferred to computer and data processing was made. In the process, the followings were made: identifying terms, excluding non-textual elements, identifying the stems and stopword cleaning. Then the word categories were identified. In these processes, techniques such as stemming or lemmatization were employed. At the final stage, unnecessary terms were found and listed. Next the weight of each term was calculated and term metrics were developed. Using these matrices several data mining algorithms is used to find similarity rates.

## FINDINGS

Table 2 shows the number of diaries analyzed, total number of words and mean word numbers.

**Table 2.** Info about analyzed diaries

Week	Number of diaries	Total word count in diaries	Average word number
1	19	2974	156.5
2	24	3126	130.2
3	22	2726	123.9
4	20	2509	125.5
5	21	2803	133.5
6	20	2367	118.4
7	21	2329	110.9
8	17	1636	96.2
9	24	2349	67.9
10	14	1583	113.0

Table 2 shows that each week diaries ranging from 14 to 24 were analyzed. The number of the words is the highest

in the first week. The first week diaries mostly reflected students' emotions and excitement that they participated in experiments. The number of the words was the lowest in the 9. week. It may be a result of the fact that in that students did not make any individual or group work, instead they just observed mitotic and meiosis divisions in preparats.

Table 3 indicates the most frequently used words by weeks, their frequency by each week and the number of diaries which the words used.

**Table 3. Most used words (weekly)**

Week	word	Total count in diaries	Diary count in which words seen
1	microscope	85	19
	course	53	19
	how	31	12
	image	25	11
	laboratory	24	13
2	image	55	19
	onion	54	21
	membrane	52	20
	microscope	42	18
	on to	28	18
3	cell	54	19
	image	47	16
	microscope	39	16
	course	29	14
	onion	25	17
4	image	46	12
	potato	30	13
	microscope	24	12
	starch	20	11
	bean	15	11
5	experiment	30	12
	fehling	24	10
	color	22	10
	microscope	21	15
	nitric acid	20	10
6	flower	44	15
	image	37	12
	section	24	14
	leaf	24	10
	rubber plant	18	11
7	image	41	13
	experiment	21	11
	we analyzed	19	13
	leaf	19	7
	cell	16	6
8	leaf	45	11
	experiment	24	12
	starch	22	13
	sardinia	13	11
	diary	15	15
9	phase	42	20
	cell	33	14
	experiment	25	14
	microscope	23	14
	mitosis	17	13
10	phase	20	10
	cell	18	11
	diary	13	11
	onion	13	10
	mitosis	11	8

Table 3 shows that the most frequently used words reflect those which are related to the content of the experiments. At the first week, the most frequently used words “microscope, course, how, image” forms a thought about the experiment's content. As these sample, the second week's the most frequently used words “onion, membrane, microscope, image”; the most frequently used words at the fourth week “image, beans, potatoes, microscope” and the most frequently used words of fifth week's “color, fehling, nitric, acid” shows the content of the experiments.

At the seventh week, the most frequently used word was “we analyzed ...”, which emphasizes students’ involvement in the process. At the 9. and 10. weeks the most frequently used word was “phase”, because the experiments were about mitotic and meiosis divisions.

Association rules between words week by week is given in table 4.

**Table 4.** Association rules between words

Week	Antecedents	consequents	Support	Confidence
1	Microscope	Course	1	1
	Microscope	Diary	0,84	0,84
	Course	Diary	0,84	0,84
	Microscope	Laboratory	0,68	0,68
	Microscope	How	0,63	0,63
2	Onion	Membrane	0,90	0,95
	onion	image	0,86	1
	onion	diary	0,82	0,86
	onion	membrane, image	0,82	0,86
	onion	microscope	0,77	0,81
3	cell	diary	0,76	0,84
	cell	Onion	0,76	0,84
	onion	Membrane	0,76	0,94
	cell	Membrane	0,71	0,79
	cell	Image	0,71	0,79
4	course	Potato	0,68	0,87
	diary	Course	0,63	0,80
	diary	Potato	0,58	0,73
	diary	Rice	0,58	0,73
	course	microscope	0,53	0,67
5	diary	microscope	0,65	0,77
	diary	experiment	0,55	0,65
	Acid	nitric	0,5	0,91
	Nitric	acid	0,50	1
	Nitric, fehling	Sudan III	0,50	0,91
6	diary	flower	0,68	0,87
	Section	Flower	0,53	0,71
	Rubber	flower	0,53	0,91
	image	flower	0,47	0,75
	We analyzed	flower	0,47	0,82
7	diary	we analyzed	0,55	0,69
	diary	carrot	0,50	0,63
	image	course	0,50	0,77
	we analyzed	image	0,40	0,62
	we analyzed	carrot	0,40	0,62
8	diary	experiment	0,71	0,80
	Diary	starch	0,65	0,73
	Diary	leaf	0,59	0,67
	starch	Sardinia	0,59	0,77
	diary	Starch, experiment	0,53	0,60
9	diary	phase	0,78	0,90
	phase	cell	0,57	0,65
	mitosis	diary	0,57	1
	phase	microscope	0,52	0,60
	phase	experiment	0,52	0,60
10	cell	diary	0,70	0,82
	cell	onion	0,70	0,82
	cell	phase	0,70	0,82
	onion	cell	0,70	0,90
	diary	onion	0,62	0,73

Support is an indication of how frequently the items appear in the diaries. Confidence indicates the number of times the if/then statements have been found to be true. Support specifies the number of total occurrences of both antecedents and consequents. The percentage of cases which has antecedents also has consequents specified by Confidence. For instance, the word group “onion- membrane” was observed in 90% of diaries analyzed and in

95% of the diaries in which the word “onion” was included there was also the word “membrane”. Similarity analysis generally gave the values under “0.1”. However, in some weeks the similarity level was bigger than “0.4” among some diaries.

## CONCLUSIONS

In this study diaries kept by the second-grade students during the course of “General Biology Laboratory I” who studies in the Undergraduate Program in Science Education were analyzed using text mining. Of the students participating in laboratory work, 24 of them took part in the activity of keeping diaries. Using text mining techniques, the most frequently used words and associations between them were identified.

The findings indicated that the most frequently used words reflect the content of the related experiment (Table 3) and that the participants reflected the content sufficiently in diaries. However, the findings also showed that the participants did not sufficiently evaluate their learning and did not cover their emotions in the diaries. Studies about science laboratory practice are mostly about views and perceptions of teachers and students. For instance, Kaya and Büyük (2011) found that science teachers regarded themselves as efficient in relation to laboratory practices. Özgür (2016) concluded that pre-service biology teachers need assistance in chemistry laboratory practices. Güneş (2013) found that most of the science and technology teachers did not use laboratories in their courses.

Association analyses showed the words which used in pair. The connection between the word pairs can be considered to show those points which students mostly focused on and interested in during and after the experiments.

As stated earlier it was found that similarity rate among diaries was generally under “0.1”. It means that the participants used different words and sentences while writing their diaries. There were also diaries with the similarity rate bigger than “0.4”. When diaries with a similarity ratio of over 0.4 are examined, it was seen that some new diaries were generated by changing the order of some words and phrases in a diary, by removing some sections or by making some additions. It shows that some of the participants used the same diary sheet by changing some of the sections. This analysis has in fact determined that most of the diaries express the feelings and thoughts about experiments using different words and sentence patterns. But in some diaries, it is seen that the similarity rate is high and diaries may be duplicates of each other in some sections. Similarity analyses can be executed in some courses in which the diaries are used to evaluate the students in order to determine the singularity or originality of the work.

This study is one of the first research which analyses student diaries using text mining. Therefore, it may inspire other studies. In the educational system in which open-ended items will be much more important such studies may guide the research. This study can be used as a pre-study to automatic grouping and scoring of diaries by students.

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# **Analysis of the Dependence of the Study Results of the Subjects Microeconomics on Mathematics**

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## **ABSTRACT**

Mathematics as a subject of study is usually said to be important as a base for other economic subjects. Problems with understanding mathematics can evoke consequential difficulties with understanding economic theories inferences. The aim of this paper is to compare the study results of Microeconomics and Mathematics subjects of the bachelor students from the College of Polytechnics Jihlava, Czech Republic and find out if there exist any dependence between the results in these subjects. Both subjects belong to the study programme “Economics and Management” and study fields “Finance and Management” and “Travel and Tourism” and they are obligatory for the full time and part time forms of study. The success of students in both subjects was examined depending on the form of study (full-time or part-time), study field (“Finance and Management” and “Travel and Tourism”), and gender. The comparison is based on the data for the period 2007-2015. To find out if the students with problems in Mathematics (no credits or “F” mark) could have also problems with Microeconomics Chi-square test and correlation coefficients were used. The results showed that students having better results in Mathematics achieved also better results in Microeconomics. According to our results we can prove that at least for Microeconomics the mathematical knowledge are necessary.

## **INTRODUCTION**

Mathematics belongs to the subjects that are essential for many other disciplines. It is usually studied at basic and secondary schools but also at higher education institutions, especially mathematically, technically or economically oriented, mathematics belongs to the obligatory subjects. The negative attitude towards mathematics is however evident in many countries. It has been widely studied (Ashcraft, 2002; Chinn, 2009; Núñez-Peña et al., 2013) to find the main reasons for this unfavorable situation. According to Mata et al. (2012), students’ attitudes towards mathematics are closely linked to their motivation and the degree of social support received. Núñez-Peña et al. (2013) described that the math anxiety can be a result of low performance on the course. Mathematics is usually seen as a “hard-to-pass” subject. It seems to be a serious problem not only in the Czech Republic but also in other countries (Chinn, 2009; Matulová, 2016). The study of Zámková et al. (2016b) showed that the success rate in Mathematics has been decreasing since 2006 in all of the monitored study programmes at the College of Polytechnics Jihlava. On the basis of decreasing level of mathematical knowledge and ability to learn this subject the number of math support centers or support subjects were established especially at the higher education institutions to help the students with this subject (Matulová, 2016; Zámková et al. 2016a). Mathematic knowledge are essential for other subject, especially of an economic origin but as Doucek and Maryska showed (2016) it can be connected also with the knowledge of English, so it is possible to expect better results in more subjects for

students with better mathematical performance.

In this paper we decided to compare the results of the students enrolled in the economic study programme (Economics and Management) at the College of Polytechnics Jihlava, Czech Republic, in the years 2007-2017. The main aim is to find out if there are any dependencies between the study results of Mathematics and Microeconomics subjects. Both examined subjects are based on logical thinking. In addition, the mathematical instruments and methods are largely used in Microeconomics. We suppose that success of students in both subjects will be very similar.

We also examine whether the study results of the subjects Mathematics and Microeconomics are dependent on the study field, form of study and gender of the students.

There are two study fields under study programme Economics and Management: Travel and Tourism (TT) and Finance and Management (FM). Study field FM is a discipline that puts more emphasis on logical thinking with comparison study field "Travel and Tourism". It also contains more mathematically oriented subjects and attracts students who have no problems with mathematically tuned subjects. We expect that the success of these students in both Mathematics and Microeconomics subjects will be higher compared to students of study field TT. With respect to the results of Jameson and Fusco (2014), that showed that adult learners (meaning older than 25 years and usually working) often enter their postsecondary experience with lower confidence than their more traditional peers, we suppose the results of part time students to be worse than the results of full time students. According to the gender we test the hypotheses that men had better results in Mathematics than women. This fact was reported for example by Hyde et al. (1990) although recent data suggest that the gap is closing (Lindberg et al., 2010).

## THE STUDY

The College of Polytechnics Jihlava belongs to the 26 public higher education institutions in the Czech Republic. It has 8 bachelor and 2 master fields of study and about 2000 students in full time or part time forms of study. Two of the study fields are economically oriented and belongs under one study programme Economics and Management: they are Travel and Tourism and Finance and Management.

In the article the analysis between the results of the subjects Microeconomics and Mathematics is made. Data was taken from the information system of the College of Polytechnics Jihlava ([is.vspj.cz](http://is.vspj.cz)) and covers the results of the examined subjects in the period 2007-2017. The subject Microeconomics is obligatory for both fields of study mentioned above (FM, TT) in the first year and first semester in the study plan. Data connected with this subject contain not only the final result (mark on the scale A-F where A-E means that the student passed the subject, F means that failed) but also if the student passed/failed in the first, second or third term or if he/she studied the subject for the first or second time (only 1 retry of passing the subject is possible at our college). For the subject Mathematics (especially Mathematics I) the data are similar but there is a difference as this subject has been obligatory for the TT study field only since the academic year 2013/14 (till that time it was only voluntary subject). According to this fact it was necessary to change the data to the same scale. The marks A-E of the FM students were changed into "passed" to be able to compare it with the "get credits" of the TT students. Data also includes the information about the field and form of study or gender of each student. The sample contains data of 3148 students (1720 students of TT study field and 1428 of FM study field) for both full time and part time study. Full time study means the attendance and learning during the 5 days in a week for 14 weeks in 1 semester, part time means that the courses are attended by student only during Saturdays and the rest learning and studying is based on the e-learning system (the Learning Management System Moodle is used). Details are shown in Table 1.

**Table 1:** Number of students in analysis

	Travel and Tourism	Finance and Management	Total
Full time study	1102 (64.1%)	721 (50.5%)	1823 (57.9%)

Part time study	618 (35.9%)	707 (49.5%)	1325 (42.1%)
Total	1720	1428	3148 (100%)

As the analysis was aimed also at the differences of results according to gender, Table 2 and 3 describe the number of female/male students. More women than men studied in both fields of study and more students were enrolled in the full time form of study than for the part time. But in FM study field the number of students of both forms of study are close to each other and in the last years a little bit more students are enrolled in the part time form of study – it might be caused by the fact that more people start to work and simultaneously they wish to study at the higher education institution and the study field Finance and Management is more “multi-purpose” for various works than Travel and Tourism could be.

**Table 2:** Number of student at study field Travel and Tourism by gender

	Travel and Tourism		Total
	Female	Male	
Full time study	829 (75.2%)	273 (24.8%)	1102 (100%)
Part time study	506 (81.9%)	112 (18.1%)	618 (100%)
Total	1335 (77.6%)	385 (22.4%)	1720 (100%)

**Table 3:** Number of student at study field Finance and Management by gender

	Finance and Management		Total
	Female	Male	
Full time study	507 (70.3%)	214 (29.7%)	721 (100%)
Part time study	467 (66.1%)	240 (33.9%)	707 (100%)
Total	974 (68.2%)	454 (31.8%)	1428 (100%)

Based on the previous research and our knowledge, four hypotheses were set:

- ▶ Students of the Finance and Management study field were better in Mathematics and Microeconomics than students of Travel and Tourism study field.
- ▶ Students of the full-time study were better in Mathematics and Microeconomics than students of the part-time study.
- ▶ Men were more successful in Mathematics and Microeconomics than women.
- ▶ Students with problems in Mathematics (failed) had also problems in Microeconomics.

The **Goodness of fit** test as one of the Chi-square tests was used (Gravetter, Wallnau, 2004; Hendl, 2004). Measures of goodness of fit typically summarize the discrepancy between observed values and the values expected under the model in question. We test a hypothesis

$$H_0: F(x) = F_0(x) \quad \text{vs.} \quad H_A: F(x) \neq F_0(x),$$

where  $F$  is the cumulative distribution function for the distribution being tested. There was detected  $n_i$  frequencies for the observed variable. We assume that the probability distribution of the variable is determined by the probabilities of  $p_i$ . The difference between observed and expected frequencies is given by the test statistics

$$\chi^2 = \sum_{i=1}^k \frac{(n_i - n p_i)^2}{n p_i}$$

Where  $n$  is the total sample size,  $p_i$  is the hypothesized proportion of observations in level  $i$ ,  $n_i$  is the frequency for the observed variable in level  $i$ ,  $k$  is the number of possible categorical values.

The degrees of freedom ( $DF$ ) are equal to the number of levels ( $k$ ) of the categorical variable minus 1:  $DF = k - 1$ . The  $P$ -value is used to interpret the results. The  $P$ -value is the probability of observing a sample statistic as extreme as the test statistic.

For the comparison of the dependency of the subject successfulness according to the field of study, form of study and gender the **Chi-square test of independence** was used. The  $\chi^2$  coefficient has the disadvantage that its value depends both on the dimension of the contingency table and on the sample size. For the elimination of the sample size dependence, the Pearson's contingency coefficient  $C$  was added to the analysis (to see the strength of the association):

$$C = \sqrt{\frac{\chi^2}{n + \chi^2}}$$

Other measure of the association of two binary variables that can be used in the given situation is the  $\Phi$  coefficient for binary contingency table (Minařík, 2013).  $\Phi$  coefficient in case of  $2 \times 2$  table for two random variables  $x$  and  $y$ , that describes the association of  $x$  and  $y$ , is calculated as:

$$\phi = \frac{n_{11}n - n_{1*}n_{*1}}{\sqrt{n_{1*}n_{*1}n_{0*}n_{*0}}}$$

where  $n_{11}$ ,  $n_{10}$ ,  $n_{01}$ ,  $n_{00}$ , are non-negative counts of number of observations that sum to  $n$ , the total number of observations – details are in Table 4.

**Table 4:** Description of  $2 \times 2$  table necessary for the  $\Phi$  coefficient calculation (Source: Minařík, 2013)

	$y = 1$	$y = 0$	Total
$x = 1$	$n_{11}$	$n_{10}$	$n_{1*}$
$x = 0$	$n_{01}$	$n_{00}$	$n_{0*}$
Total	$n_{*1}$	$n_{*0}$	$n$

For the final marks comparison (only for the FM students where both subjects Mathematics and Microeconomics were finished by exam in all selected years) the Spearman's rho was chosen. This is a nonparametric measure of rank correlation (for ordinal variables). We want to compare marks (the change of the marks into numbers is given by the college rules as follows: A=1, B=1.5, C=2, D=2.5, E=3, F=4) of Microeconomics and Mathematics 1 (only for Finance and Management). The Spearman correlation coefficient is defined as the Pearson correlation coefficient between the ranked variables (Myers, Well, 2003). For a sample of size  $n$ , the  $n$  raw scores  $X_i$ ,  $Y_i$  are converted to ranks  $rg_{xi}$ ,  $rg_{yi}$  and  $r_s$  is computed from:

$$r_s = \rho_{rg_x, rg_y} = \frac{\text{cov}(rg_x, rg_y)}{\sigma_{rg_x} \sigma_{rg_y}}$$

where  $\rho$  denotes the usual Pearson correlation coefficient, but applied to the rank variables,  $\text{cov}(rg_x, rg_y)$  is the covariance of the rank variables,  $\sigma_{rg_x}$  and  $\sigma_{rg_y}$  are the standard deviations of the rank variables.

## FINDINGS

First of all, the comparison of results for both subjects by the field of study was done. Table 5 describes the numbers of passed/failed students in the Microeconomics subject. It is visible that the structure of the numbers of passed/failed students of TT and FM is similar and this fact was confirmed by the  $P$ -value that is equal to 0.372. There is no significant difference between the results of TT and FM students. When we test if the success is dependent on the field of study the  $P$ -value is 0.511 which signify the independence on the study field.

**Table 5:** Microeconomics – number of students in TT and FM study fields (Source: Authors' computations)

Microeconomics	TT	FM
Failed	1070 (62.2%)	872 (61.1%)
Passed	650 (37.8%)	556 (38.9%)
Total	1720 (100%)	1428 (100%)

The results of the analysis of Mathematics are different. Table 6 shows the number of students that passed/failed this subject. First, we can see that the total number of students is smaller than 3148. It was caused by the fact that some of the students did not attend Mathematics in their first semester of study and because of the bad results the first semester was also the last for these students. Second, the percentage of “failed” is higher for the FM study field – this is also confirmed by the  $p$ -value ( $p = 0.0004$ ) meaning the different structure of results between the study fields. Also the  $p$ -value from the dependence analysis is low ( $p = 0.012$ ) and so the success in Mathematics is dependent on the study field and the students of TT were more successful. But the  $\Phi = 0.05$  signifies nearly no dependence on study field. We cannot confirm our first hypothesis that the FM student were better in Mathematics than TT students.

**Table 6:** Mathematics – number of students in TT and FM study fields (Source: Authors' computations)

Mathematics	TT	FM
Failed	709 (58.5%)	811 (63.5%)
Passed	502 (41.5%)	467 (36.5%)
Total	1211 (100%)	1278 (100%)

Next part of our analysis was aimed at the form of study (full time / part time). For both subjects the Chi-tests showed that the success was dependent on the form of study (for Microeconomics  $p < 0.01$ ;  $\Phi = -0.211$ ; or Mathematics  $p < 0.01$ ;  $\Phi = -0.179$ ). Full time students in both subjects were more successful than part time students which is in accordance with our second hypothesis. Table 7 shows the details for Mathematics where the passing rate for the part time students was lower than 30%.

**Table 7:** Mathematics – number of students in full time and part time forms of study (Source: Authors' computations)

Mathematics	Full time form	Part time form
Failed	680 (52.7%)	840 (70.1%)
Passed	611 (47.3%)	358 (29.9%)
Total	1291 (100%)	1198 (100%)

Third part of the comparison was connected with gender. We supposed that men should have better results in Mathematics and Microeconomics than women. But the results showed that it was not possible to confirm this hypothesis. In Microeconomics the strength of the dependence of the success on gender is almost none but the  $p$ -value shows dependence ( $p < 0.01$ ;  $\Phi = -0.109$ ). The rate of passing for women was higher (41.5%) than for men (29.6%) – Table 8. The same situation was in Mathematics ( $p < 0.01$ ;  $\Phi = -0.15$ ; passing rate for women 43.3 and for men 26.7).

**Table 8:** Microeconomics – number of student according to gender (Source: Authors' computations)

Microeconomics	Female	Male
Failed	1351 (58.5%)	591 (70.4%)
Passed	958 (41.5%)	248 (29.6%)

Total	1840 (100%)	649 (100%)
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The last part of the analysis was related to the mutual dependencies between Mathematics and Microeconomics study results. As in previous comparison we first analyze the structure of the passed/failed number of students in these subjects, then we compared it in a view of study field, form of study and gender. As FM students had exam in both subject we also measured the correlation of marks.

The percentage of passed/failed students was nearly the same for both subjects (Table 9) which the Goodness of fit test confirmed ( $p = 0.524$ ). By the chi-square test of independence the strong positive dependence between the success in Microeconomics and Mathematics was confirmed ( $p < 0.01$ ;  $\Phi = 0.735$ ) so it is possible to say that the students that were successful in Mathematics were successful also in Microeconomics (and also a lot of them failed in both subjects) – Table 10. These results are in line with our last hypotheses that students with problems in Mathematics (failed) had also problems in Microeconomics. But we wanted to analyze it deeply – by field of study, form of study and gender. As for the field of study the Chi-square test of independence confirmed dependence between the success in Microeconomics and Mathematics in both fields of study (stronger for FM where  $\Phi = 0.773$ , for TT  $\Phi = 0.702$ , in both cases  $p < 0.01$ ). Table 11 shows the number of students from this point of view where it is evident that higher number of students failed in both subjects or passed both subjects.

**Table 9:** Number of students passed/failed in Microeconomics (MIE) and Mathematics (MAT) (Source: Authors' computations)

	MIE	MAT
Failed	1942 (61.7%)	1520 (61.1%)
Passed	1206 (38.3%)	969 (38.9%)
Total	3148 (100%)	2489 (100%)

**Table 10:** Comparison of passed/failed number of students in Microeconomics (MIE) and Mathematics (MAT) (Source: Authors' computations)

	MAT Failed	MAT Passed	Total
MIE Failed	1361	155	1516
MIE Passed	159	814	973
Total	1520	969	2489

**Table 11:** Comparison of passed/failed number of students in Microeconomics (MIE) and Mathematics (MAT) from the field of study point of view (Source: Authors' computations)

Field of study			MAT		Total
			Failed	Passed	
Finance and Management	MIE	Failed	712	41	753
		Passed	99	426	525
	Total		811	467	1278
Travel and Tourism	MIE	Failed	649	114	763
		Passed	60	388	448
	Total		709	502	1211

The same situation was detected when we took into account the form of study (Table 12). Again, the dependence between the success in Microeconomics and Mathematics in both forms of study was confirmed. For full time study form the strong dependence was found ( $p < 0.01$ ;  $\Phi = 0.763$ ), for part time study the strength of dependence was moderate ( $p < 0.01$ ;  $\Phi = 0.674$ ). The last comparison view from the gender point of view confirmed the same results with strong dependence between the success in both subjects for both female and male (Table 13).

**Table 12:** Comparison of passed/failed number of students in Microeconomics (MIE) and Mathematics (MAT) from the form of study point of view (Source: Authors' computations)

Form of study			MAT		Total
			Failed	Passed	
Part-time	MIE	Failed	785	104	889
		Passed	55	254	309
	Total		840	358	1198
Full-time	MIE	Failed	576	51	627
		Passed	104	560	664
	Total		680	611	1291

**Table 13:** Comparison of passed/failed number of students in Microeconomics (MIE) and Mathematics (MAT) from the gender point of view (Source: Authors' computations)

Gender			MAT		Total
			Failed	Passed	
female	MIE	Failed	933	128	1061
		Passed	111	668	779
	Total		1044	796	1840
male	MIE	Failed	428	27	455
		Passed	48	146	194
	Total		476	173	649

Finally, we studied the marks of the students. As it was mentioned above the subject Mathematics for the TT students was till the year 2013/14 finished only by getting credits. We compare mark from Mathematics and Microeconomics for the FM students only. The correlation coefficient (Spearman's rho) of the marks in Microeconomics and Mathematics is 0.689 (the coefficient is significant at the 0.01 level) which means the moderate strength of dependence between results of these subjects. This fact showed us that the better/worse were the students of FM in Mathematics, the better/worse they were in Microeconomics. The same results we obtained when the dependence between marks of two forms of study and gender was measured (part time:  $\rho = 0.725$  full time:  $\rho = 0.725$  female:  $\rho = 0.725$  male:  $\rho = 0.725$ )

## CONCLUSIONS

The subjects Mathematics and Microeconomics belongs to the obligatory subjects in the first semester of the bachelor study programme Economics and Management (study fields Finance and Management, Travel and Tourism) at the College of Polytechnics Jihlava. As there is often a high percentage of students leaving the college because of the poor results (not only in these two subjects) and as the level of knowledge of students (especially in mathematics) is getting worse (Zámková et al., 2016b) we decided to analyze the dependence between the success and marks of these two subjects. For the analysis results of 3148 students in the period 2007-2017 were used.

We tested three hypotheses. Our first hypothesis about the more successful FM students in Mathematics and Microeconomics was rejected – the reason for this might be caused by the fact that till 2013 this subject was not obligatory for TT students and it was finished by getting credits only. The second hypothesis assuming that the full time students were better than part time ones was confirmed. It might be caused by the fact mentioned by Jameson and Fusco (2014) about adult learners less confidence but it is also caused by the lower number of direct education and higher necessity of self-study. That is why the extra hours and summer mathematical seminar was added to help the students pass the subject. The third hypothesis expecting men to be better than women in Mathematics and Microeconomics was rejected. In both study fields more women than men were admitted to study as especially Travel and Tourism is more popular among girls. The economic scope of the study fields is also more attractive to women (men usually prefer technically oriented study programmes). This might be the reason why women were

better than man (women are more diligent too). The last (but the most important) hypothesis telling that better/worse results in Mathematics means better/worse results in Microeconomics was confirmed. This is very important for us because it proves not only the necessity to help the students with Mathematics but also the fact that the better mathematical knowledge can contribute to the better results in Microeconomics (and maybe other economical subjects).

## ACKNOWLEDGEMENTS

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# **Analysis of the University Institution Through the Leadership Exercised by University Students: An Approximate Study at the University of Granada.**

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## **SUMMARY**

In this article, we present a descriptive research, carried out at the University of Granada. With the objective of analyzing university students' self-perception about their role as university leaders, a mixed methodological design was developed in which a questionnaire was passed, semi-structured interviews were conducted and discussion groups were given to a total sample of 80 students University professors who held positions of representation and actively participated in the various governing bodies of the University. This research is justified on the need to encourage the participation of the majority population, the student, in the curricular, organizational and political decisions of the university. At the same time, the fact that students are the main affected in these, further support the realization of this study. The results show a gradual increase in the level of involvement of university students to access the University management and participation bodies. However, at the same time and, we want to highlight the lack of diffusion and promotion of this figure of leadership, by the different positions of university government.

**Keywords:** leadership, student leadership, higher education.

## **INTRODUCTION**

Leadership can be defined as the influence that one or more people have on a particular group to perform a particular action (RAE, 2014). Leaders are usually characterized by good social and communicative skills, often charismatic, assertive, and resolute people (Leithwood, 2009, Harris, 2014). These abilities that often they have are the responsible that the rest follow their actions. The study of leadership began to develop in the business world. However, thanks to other research currents such as that of Learning Organizations, it was transferred to other areas such as education.

### **Leadership and University Micro-Politics**

Influence as an inherent aspect of leadership may be due to the position (strategic or not) that occupies the leader or leaders within the organization or by the power that has within it. Power and influence are the two main factors that will characterize the relationships between the different members of an organization. At the same time, the network of relationships that emerge in any organization, a consequence of the confluence of particular interests, ideological and institutional between the different levels and even among the workers of the same rank in the institution, outline the micro politics underlying any company (ElHomrani, 2014).

The educational field, like any organization formed by a group of people with individual needs, characteristics and interests, who in turn work based on common objectives, is not an exception. The educational micro politics is a reality that must be studied in depth if the intention is knowing and analyzing the organization as an integral way. In fact, the interests and the conflicts that arise by the power and the negotiations where is the true functioning and the real identity of any institution. To detach all the

peculiarities that make it up is the best way to implement changes and to influence in the correct development of the same one.

On the other hand, human interactions and relationships between staff influence the achievement or not of the objectives or purposes pursued by the institution as a whole. Around the conjugation between the individual and group interests, certain practices or others will be developed. An analysis based on the rules established within the institution, that is, the micro-politics will identify different human groups with contradictory interests that will struggle to put their objectives before the rest. Far from a pejorative conception of conflict, they will help the organization evolve in order to achieve the best for all (Ball, 1990; Lindle, 1999, cited by El Homrani, 2014). Related to this, access to this characteristic political framework in every democratic institution is usually subject to certain options.

In the Spanish university context, for example, to give voice to the entire university community, especially those people whose opinion is usually restricted or silenced, that is, students, we find the participation bodies, which are composed of all Representatives of the University community.

Both for access and for achieving adequate performance, leadership skills gain significant added value. Good communicative skills, assertiveness, empathy, resilience, or ability to lead groups of indeterminate extent are just a few examples of skills and abilities assigned to effective leaders (Pont, Nusche and Noorman, 2009, Leithwood, 2009). Therefore, an analysis of the university and its internal functioning is unthinkable without assuming the importance of leadership on the performance of the working groups and the micro-politics that accompany it.

At the same time, within the great variability in the types of existing leadership transferred to the educational environment, the work we present we will focus on the political leadership (El Homrani, 2014; El Homrani, Conde-Lacárcel y Ávalos, 2016). Focusing on existing participation bodies within the university, in this case, the University of Granada, we will analyze the degree of leadership that student representatives exercise through their rank and the position they occupy at some point in their passage through Higher education.

### **University Students, Potential Leaders**

Although our educational system has certain limitations, such as the rigidity of organizational structures or the lack of continuity of curricula, there have been notable improvements in recent years. The promotion of participation to the entire university community has contributed favourably to the implementation of certain improvement actions on university organizational functioning and that consequently affect the teaching and learning processes themselves.

Thanks to this, the largest sector of the university, students, has a large cast of representatives distributed among the different governing bodies and University participation.

This sector, through its representatives, exerts their influence on questions related to the teaching and learning processes, the faculty, elections to Rectorate, Dean or Department, as well as more specific ones that concern the Faculty to which they belong. Although the number of student representatives is not very high (around 24%), their vote is often decisive in making important decisions, so they are participants in the micro political dynamics that take place at the university. Through their positioning on the issues raised above, students become an equal player, on equal terms with other levels (department directors, deans, faculty, management and services personnel ...), political leaders, with the ability to exercise their power (and influence) and to satisfy the interests of the population they represent within the organization.

This student leadership is a type of institutional leadership, whose arises within the University and it must be interpreted as a technical, interpretative and transformative process (Lorenzo, Hinojo, Aznar, Cáceres & ElHomrani, 2008), articulated around the characteristics and conditions that surround the context where it takes place.

The University is a micro society, where live and interacts socially different people, with different needs, interests and motivations. In turn, the university institution can also be conceived as an entity that pursues a clearly established purpose: to offer a quality education and training, to enable its graduates to insert themselves in the social and labour world satisfactorily. As for the functioning, as it happens in lower educational levels, it presents a deep hierarchical organizational structure, analogous to the private enterprise (Firestone & Riehl, 2005). The vertical arrangement of the governing bodies makes the possibility of participation in them is desirable. At the same time, it responds to the imperatives of social

justice, which highlights the need that all the groups that make up the university community have voice and vote in decisions that affect the future of their institution.

As far as the student sector is concerned, in the literature we find numerous investigations carried out in the international field, which have been endorsed by the importance of student participation (or student leadership) in the governing bodies, on the proper functioning of the institution (Pareja, López, ElHomrani & Lorenzo, 2012, Inman, 2014, Bennetts, 2009, Lorenzo, Cáceres, Hinojo & Aznar, 2013). In the same, the focus has been on different factors, such as gender (Cáceres, Lorenzo & Sola, 2009; Sola, Cáceres & Trujillo, 2010; Cáceres, Trujillo, Hinojo, Aznar & García-Carmona, 2012); The development of managerial skills in university students (Laborda, 2006); The micro politics generated in the different organs of the universities (Murphy and Curtis, 2013); The management of teachers in relation to leadership (TLópez-Yañez, 2009); The development of ethical, social and transformational values of university politics (Alvarado, Prieto & Betancourt, 2009; Terzioglu, 2011; El Homrani, 2016) or the promotion of quality (Lorenzo, Hinojo, Aznar, Cáceres & El Homrani 2008)

In this sense, it seems convenient to point out some defining characteristics of the University of Granada, in order to give more representation both to the object of study that we present and to the data and results that we have found during the study.

## METHODOLOGY

The methodological approach of this research has been designed according to the parameters offered by the object of study. With a view to providing a complete overview of the participation of university students in the various bodies of the University of Granada, we have taken as a reference the three sites subscribed to it: Granada, Ceuta and Melilla.

Specifically, this research tried to analyze the degree of participation of the university students in the different organs of government, emphasizing especially in the type of leadership that they exerted in the same ones. To unravel this crossroads, we raised a series of questions that guided the design and development of the instruments used to obtain our answers (see Table 1)

Investigation questions	Purpose
Who are the university student leaders? As they are? What are their traits and attributes?	Identification of leaders
Why have they been chosen?	Attributions of the leader
What have they been chosen for? It's duties?	Leadership Expectations
How do they perform their functions? What difficulties do they encounter? What are your responsibilities?	Leadership practice
What is your experience? How do they look? What do you think is expected of them?	Satisfaction and shortcomings

**Table 1:** Research Questions. Own elaboration

In order to respond to the questions raised, a non-experimental descriptive and interpretive design was followed, on a final sample of 80 student representatives in the University of Granada (Department Council, Center Board and Faculty Cloister), selected from the different degrees, courses and areas of knowledge applying stratified random sampling without agreeing any way to distribute the surveys for each stratum. This is due to the complex task of accessing the sample; It was more convenient to avoid a fixed number for each stratum in order to achieve greater representativeness.

The total population is 719 students. But it must be clarified that this is a very fluctuating population, which is not very helpful to the representative bodies in which they should perform their functions. There are some and some students who can hold up to 6 positions in the different representation bodies. That is why it was decided to locate and pass the questionnaire mainly to those students attending the faculty of the university (maximum governing body), whose composition is 71 members representing this sector and in which all members of the university are represented. The university community. Finally, we only obtained the participation in this research of 62 of the 71 members of the university faculty, in addition to 18 significant students in the University of Granada based on the position they occupy. Thus, we get representatives or leaders from all the Faculties of the University of Granada (El Homrani, 2016).

The collection of information was carried out through 3 instruments: the first one is the questionnaire 'Student Leadership at the University of Granada.' developed by Lorenzo, Torres-Martín, Pareja, Hinojo, López-Núñez, Cáceres, El Homrani, Moreno & Lorenzo (2007), with a reliability of 0.877 Alpha of Cronbach for 67 elements, and a Lickert scale of response of 1 to 4 where one corresponds with 'totally disagree' and four with 'total agreement'. This instrument follows a mixed structure, with a first part composed of 30 closed questions; And the second part with five open questions. For the treatment of the obtained data, we use the statistical program SPSS.

The technique of the two halves of Guttman was equally applied to him; The Spearman-Brown Coefficient test and the correlation between forms, as well as an expert judgment with the following results, as we can see in Table 2:

<b>RELIABILITY-METHOD OF THE TWO HALF-</b>			
<b>Cronbach alpha</b>	Part 1	Value	0.814
		Number of elements	34 (a)
	Part 2	Value	0.831
		Number of elements	33 (b)
		Total number of items	67
<b>Correlation between forms</b>			0.593
<b>Spearman-Brown Coefficient</b>	Length equal		0.744
	Uneven length		0.744
<b>Two halves of Guttman</b>			0.743

**Table 2:** Reliability of the questionnaire. Source: Lorenzo et al. (2007)

The second of the instruments used was a semi-structured interview, based on the different dimensions of the questionnaire, made to the most significant student regarding the position of student representation that occupies, which allowed us to follow an analytical script of the same based on our Research needs while offering the respondent sufficient freedom of response.

For the analysis of the information obtained with this instrument, we have performed biographical-narrative discourse analysis techniques (Fernández Cruz, 2008; Gijón 2010). Content analysis was crucial for the interpretation of collected data: coding, categorizing, indexing tables (categories, definition, traits, etc.).

Finally, we held a discussion group for Centers, the student representatives in the Department Council, Center Board and Faculty Cloister, since its open and flexible nature allowed us to centralize research in the most significant aspects. At the same time, it facilitated the participation and motivated collaboration, and the expression of their thoughts, attitudes, beliefs, etc. Which together with the quantitative data have allowed us to have a global and complete vision of the reality to be investigated. The script used in both semi-structured interviews and focus group, answers the following questions:

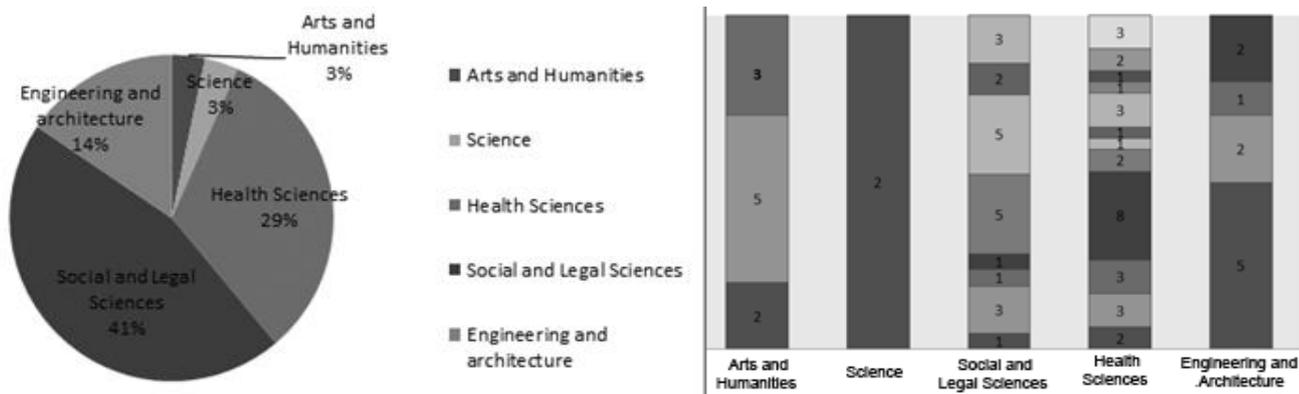
- What are the causes (personality, your way of being, the absence of candidates, etc.) for which you consider that your partners have chosen to you as their representatives?
- Do you think that the gender condition can be a conditioning factor to be elected or not? Who occupies, in currently, the higher charges that a student can reach as representative of the student body (the Governing Council)?

- What dimensions or qualities (being, knowing, doing) can be more decisive when voting for a representative?
- What is it that gets students involved in the "university micro politics", that is, in the representation functions?
- With what difficulties (confrontation with teachers, students, PAS) have you faced to develop these functions? How have you solved it?
- What does success in student representation depend on?
- What mechanisms do you use to "mobilize" your partners and the rest of students? ¿Do you think are there differences between mechanisms used by men and women?
- What learning gaps do you think should be improved to perform the task of excellence with excellence student?
- What have been your greatest satisfactions or disappointments as student representatives?
- How do you think that student participation in university life could be improved (economic remuneration, academic benefits, etc.)?
- 

In the next section, we present a summary of the most significant data found in the instruments. The results obtained from the three sources are presented to account for the similarities found and to reinforce, in the last resort, the starting hypotheses that we handled at the beginning of this study.

## **Results**

The results presented below have been analyzed according to the degree of participation of the student representatives. To facilitate their understanding, the sample has been divided by areas in areas of knowledge, as reflected in Figure 1:



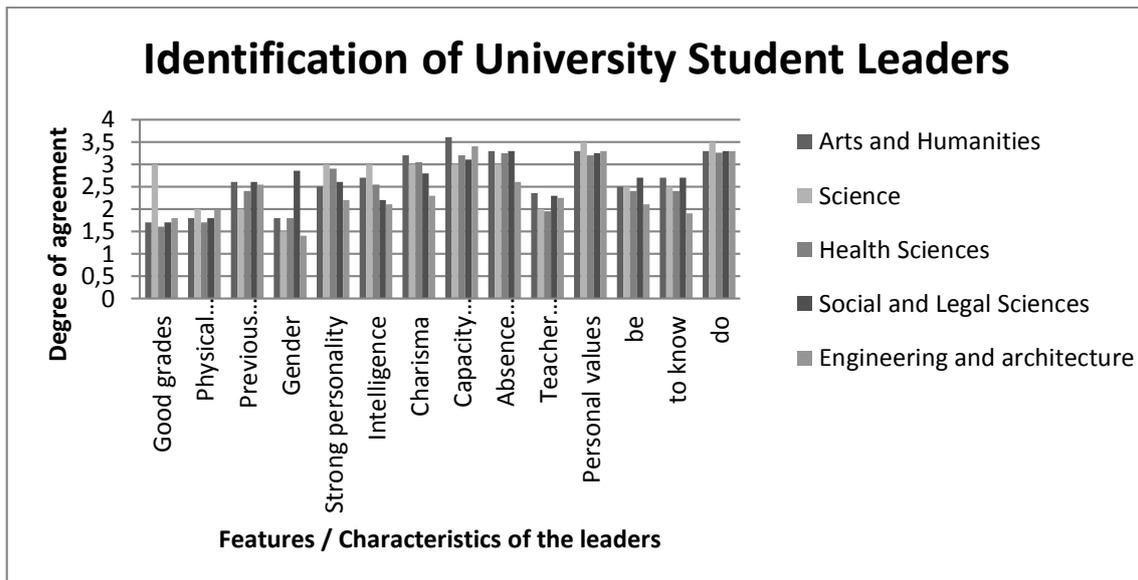
**Figure 1:** Student participation by knowledge and Centers of the University of Granada. Source: El Homrani (2014)

Once the sample obtained is delimited, by areas of knowledge, we will present the most significant findings. To do this, a Quartimax Analysis was performed, which resulted in five major conceptual components of university student leadership (see Table 1). Obtaining similar results, these same components have also been identified when we set out to analyze the discussion groups. Hence we decided to present the results together.

<b>Defining Components of Student Leadership</b>
Identification of leaders
Attributions of the leader
Leadership Expectations
Leadership Practices
Satisfaction and shortcomings

Table 1: Defining components of student leadership based on a Quartimax analysis. Source: ElHomrani (2014)

On these components will rotate the presentation of the results obtained both in the questionnaire and in the discussion groups. Thus we find that the first component of the analysis corresponds to the **"Identifying the leaders."** It contains the desirable features that a student leader must meet. According to his opinion, 'Personal values' and 'know-how' are priority characteristics that a leader must possess for all branches of knowledge, followed by the 'lack of candidates' and 'persuasiveness' of these (with scores of agreement between 3 and 3.5 on 4), as we can see in Figure 2. In turn, similar features emerge in some comments produced in the discussion groups. Some samples of this are inserted after the following graph.



**Figure 2:** Identification of University Student Leaders. Source: ElHomrani (2014)

In contrast to these results, we find a subject that underlines the importance of doing in a leader, along with consideration of the majority opinion in decision-making and its consequent, co-responsibility. Thus we extract the following passage: *"For my part, I think it was due to have prior involvement being representative of the class. My colleagues have seen that I have "worked", I asked their opinions and they have seen results. All this makes you earn the respect of others and popularity"* (Subject 6, E, lines 9-11).

In the case of students in the branch of science, we find that aspects such as 'intelligence', 'charisma', 'good grades', a 'strong personality' (with a 3 agreement on 4) or 'previous experience'. However, students in the rest of the branches of knowledge obtain inferior results in these traits.

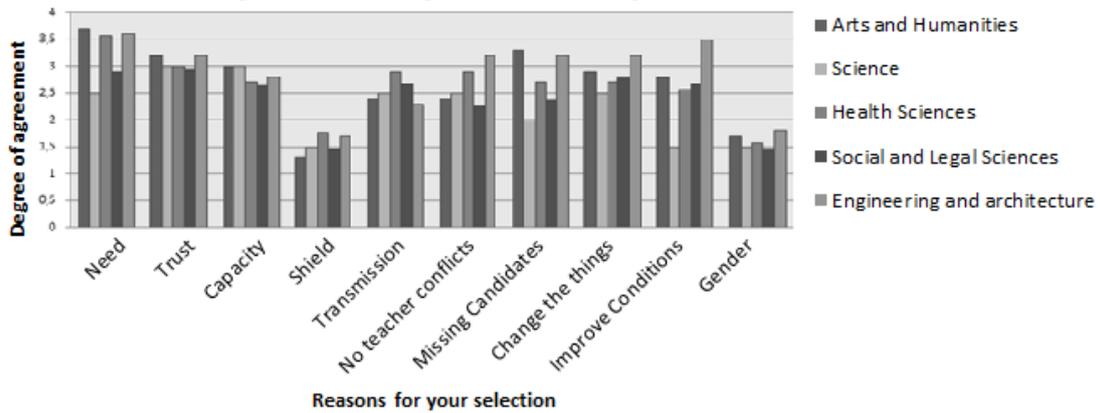
On the other hand, it is observed how the lowest scores are obtained in reference to 'gender' and 'physical aspect'. However, by analyzing the discussion groups, we see how some discourses do not quite match, with the scores of the questionnaire. Thus, for example, some participants suggest that *"there are internal and external factors influencing the gender factor. There are stereotypes that condition this situation. In the government team who is in charge is a man and has been like this all his life and the second in command is a woman and probably, who is doing the work is the woman, but never valued. It is external things that influence, but we have it so assumed that we see it normal. However, in representation, the number of women is greater than that of men, but men are still more representative than women."* (Subject 3, lines 35-37 J).

Regarding the factors that motivate the choice of some leaders or other, ie, the **"powers of the leader"**, shows that the 'need', 'trust' and 'ability' are the main reasons for choosing their Representatives/university leaders for all branches of knowledge, with very similar percentages of agreement in the answer, as we can see in Figure 3. In contrast, some of the answers obtained in the discussion groups are exposed, since according to the students :

Subject 1; A; Line 1: *There was no one who wanted to be the delegate. In my school, there is no one to get wet."*

Subject 6; E; Lines 65-68.: *I also think it's because of the popularity, though I differentiate various types. The first, the initial, is when no one knows you. It is based on the grace that you have, the physical attractiveness, the one that you go to class, ... but that does not reflect in fact if you are apt or not for the position. The other is acquired popularity, which occurs when you have already been involved, you do things, you convey your concerns to the other government bodies ... Now people know you for "this is the one who made such."*

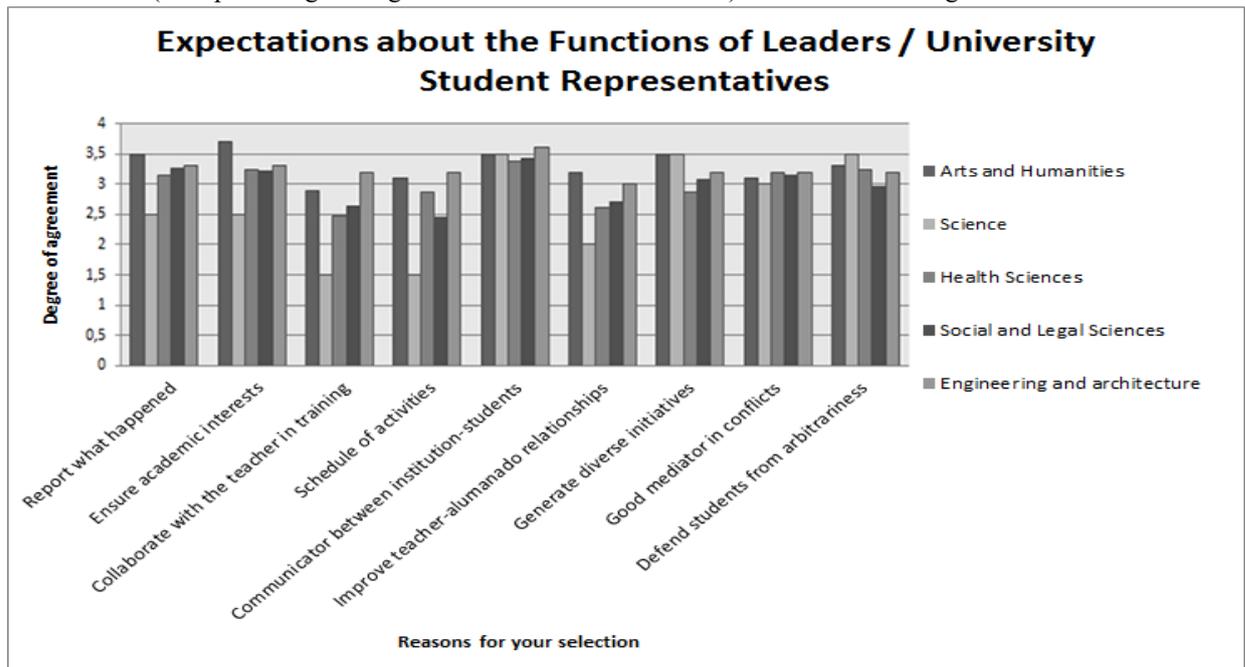
### Attributions and Beliefs about the Election of Leaders / University Student Representatives



**Figure 3:** Attributions and Beliefs about Election Leaders / University Student Representatives. Source: ElHomrani (2014)

The lowest scores in agreement on the response are obtained in 'escudo' (leaders/representatives act as 'protectors' in situations of conflict within the institution, department or with teachers mainly) and 'gender' again (with 1, 5 according to the answer on 4). The branch of Arts and Humanities also emphasizes the desire to 'improve the conditions' of students (with a 3.5 in agreement on the statement on 4); The desire to 'change things' and 'avoid conflicts with teachers', repeating the 'lack of candidates'.

Regarding the **"Expectations about leadership"** and the reasons behind the choices of students, we find unanimity in all areas of knowledge. They all advocate the importance of being 'Communicator between the institution and the students'; To be a 'good mediator in conflicts' and 'to defend the students of arbitrariness' (with percentages of agreement in the answer above 3) as we can see in Figure 4.



**Figure 4:** Expectations About the Functions of Leaders / University Student Representatives. Source: El Homrani (2014)

Significant is the branch of science, which scores with 1.5 in agreement on the answer on 4 to 'collaborate with the teacher in the preparation of the training' and that the representatives fulfill a function of 'agenda of activities'; Also aspects such as 'informing what happened' or 'ensuring academic interests' do not seem

to be a priority for this student among the functions that must be fulfilled by their representatives as opposed to the data obtained in the other branches of knowledge. For the area of Engineering and Architecture, the aspect punctuated with a lesser degree of agreement is what to make reference to 'improving the relationship between teachers and students' with a 3 out of 4. In this respect we find different answers:

Subject 2, JM; Lines 124-129): *"Since I finished high school and while in college I spent four years doing nothing of this. What prompted me to re-enter was that there was a lack of information, to see how the Bologna Plan was applied and that I did not agree at all. I was talking to all the teachers and we had many discussions in which nothing was solved. I did not even know that there was student participation and saw that nobody did anything"*.

Compared with the fourth component, "**Leadership Practice**", we see that their Higher scores, respond to 'ethical coherence, honesty, and values' on the part of university student leaders/representatives and the 'learning of representation functions through practice'. Specifically, the highest valuation is found in the branch of Arts and Humanities (with 3.7 in agreement on 4), followed by the branch of Sciences, Engineering and Architecture, Social and Legal Sciences and, lastly, the students of Health Sciences. Other aspects that score significantly high are 'the exhaustive knowledge of the university institution' and the idea that 'is not born university leader but learned to be' (with response rates around 3 out of 4).

However, more controversial aspects such as the 'partisan use of office'; 'Difficulties or facilities in subjects' or 'personal injuries' score with a scant 2 out of 4. On the basis of the results, it seems that the representatives themselves do not reach a consensus on these consequences of exercising their different positions. Proof of this is the opinion of this man, who says: *" It is true that being a student representative opens doors, teaches you to move, to better understand the institution."* (Subject 5, D Line 130). However, no evidence has been found to indicate that these advantages are reflected at the academic level.

In terms of the lowest scores, as it is observed in the graph 5, the item of 'advantages in grades' stands out (with a mean of over 4 disagreements). By branches of knowledge, Sciences does not believe that the charge involves a possible scholarship (with a 1.5 disagreement with this statement); Health Sciences emphasizes in this sense the one that supposes 'advantages in the qualifications' (with 1.62 of disagreement on 4); And Social and Legal Sciences does not believe that a 'use of the position for the interests of other groups' is made (with a disagreement of 1.7 on 4).

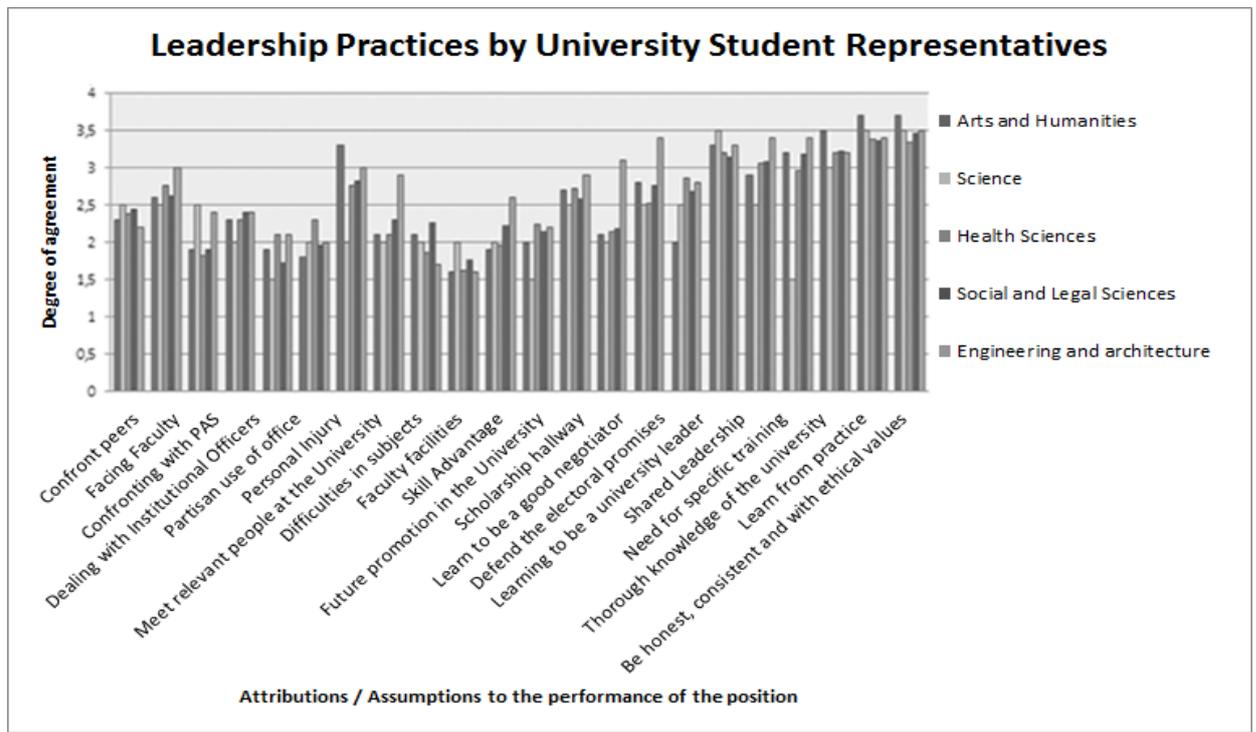


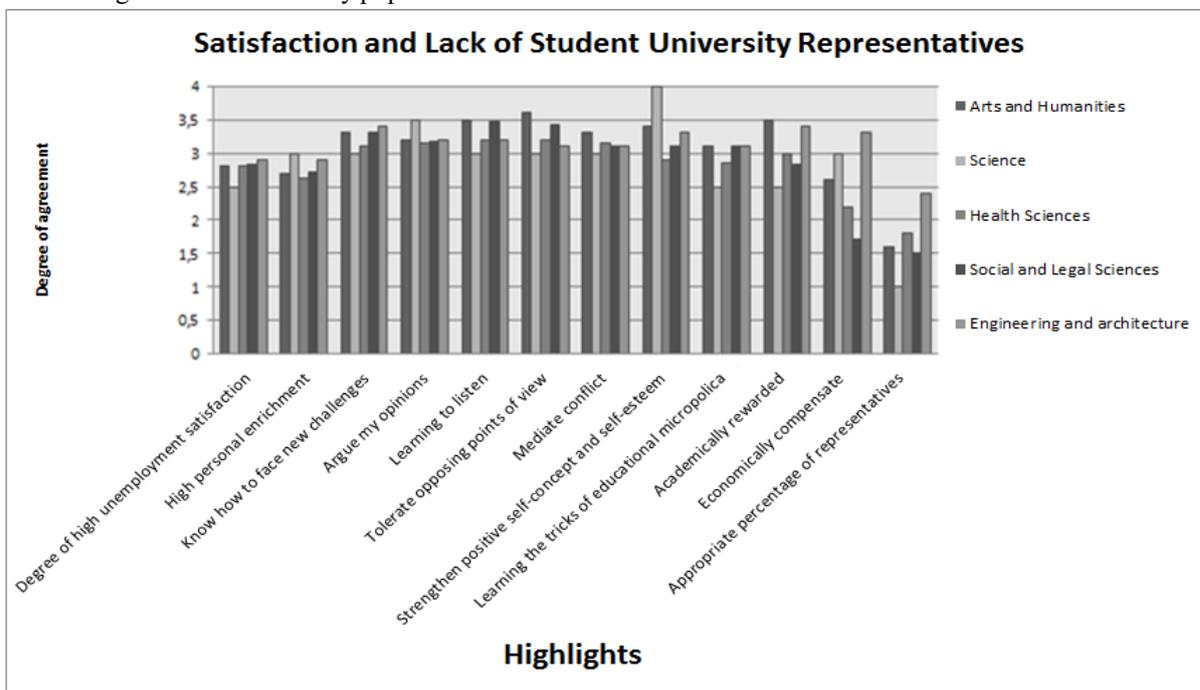
Figure 5: Leadership Practice by University Student Representatives. Source: ElHomrani (2014)

Finally, the last component analysis, "**Satisfaction and shortcomings**", we highlight some consensus on the claim that the performance of leading students has positive effects on students. In this sense, items such as 'reinforcing self-concept and self-esteem' by student leaders or students representatives of the branch of science receive a score of 4 (out of 4); Followed by 'tolerating opposing points of view' and 'learning to listen' by the Arts and Humanities branch (3.6 and 3.5 out of 4 respectively). In the same trend, although with slightly lower scores, are student representatives from the branch of Social and Legal Sciences, followed by Health Sciences, on these issues.

A controversial finding is played by the items of 'facing new challenges' and the need to 'reward academically'. While the students of the Engineering and Architecture branch score it positively (with a 3.4 out of 4 response), the rest of the branches of knowledge show great disagreement (with response rates between 1 and 2.5 according to 4).

However, all of them consider that representation should be exercised in a coherent and ethical way in which work done well on an external reward that could lead students to present themselves to these positions for academic or economic interests, not service and commitment.

The lowest scores obtained in this component correspond to the 'percentage of representatives', with scores between 1 and 2 over 4 (see graph 6). This unanimity is based on the belief that student representation is insufficient, demanding a greater number of representatives, in order to reach a certain balance between the different agents of the university population.



**Figure 6:** Satisfaction and Lack of Student University Representatives. Source: El Homrani (2014)

## CONCLUSIONS

This research has tried to answer many of the questions that accompany the figure of the student representatives as university leaders. In the same, it has been tried to establish differences between the opinions of the university representatives, subscribed to different faculties and areas of knowledge. However, based on the results, we found a convergence in most of the responses. Except for exceptions such as the "advantages of being a leader", most respondents have a similar idea about the implications, functions, duties, and compensation of being a student representative.

A collation of the results obtained in our context (University of Granada, Spain), university student leadership is outlined around a two-fold. On the one hand, the practicality of representatives who know how to carry out their tasks and possess qualities such as intelligence, charisma, persuasiveness or a strong personality; And on the other hand, with ethical and personal values, so that they can be trusted. In short, an ethical leadership.

The desire to change things is present in the election of these people as leaders within the various positions of representation of governing bodies of higher education by the students themselves. However, with reference to data analysis, we believe that collaboration between teachers and students should be strengthened, as well as the relationships between students for a better functioning and organizational climate in the different representation and government bodies.

On the other hand, participation and satisfaction respect the position they have is not very high. In this regard, we believe it is necessary to promote opportunities for training on the various aspects that make up the micro and organization at universities; and continue to set different types of recognition.

Similar investigations had contributed to making visible good practices and possibilities of action of the student's as great protagonists of the university institutions. Promoting and building participatory channels and platforms, with spaces where they are given voice, is the best way to improve the quality of universities, from the institutions that become the protagonists of their own development.

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# **Analysis of Underlying Constraints Affecting the Choice of Building as A Major Course**

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The aim of this study is to analyse the underlying constraints affecting the choice of Building as a major course. The objectives of the paper are to assess the awareness of students on Building as a course in the institution, identify the percentage of students willing to study Building as compared to other related courses, identify constraints of students who chose Building. Secondary and primary data were obtained. Data was obtained by the administration of questionnaire, and interviews of students studying building technology in Covenant University. A sample size of 150 students comprising of students from the 5 levels of the programme partook of the survey. Purposeful sampling technique was used and the data obtained was analyzed using a 5-point Likert scale.. The factors affecting the choice of building in varying degrees include Poor awareness of the course, Inappropriate advice, Method of teaching, Demands of the course, Gender differences, Tuition fees, Basic Technological skills, Learning Environment, Method of teaching, Prospects for students in studying the course. However, majority of the students' constraint was lack of awareness about the course; therefore it is recommended that proper awareness of Building Technology as a profession should be done via workshops and seminars in secondary schools so as to broaden the view of students about the course even before entering into the higher institution. . Building technology skills acquisition is declining in many institutions in the country, therefore it requires serious attention at national level. The National Institute of building (NIOB), Council of registered builders of Nigeria (CORBON) that have been tasked with a detailed assessment of the construction / building skills shortage should address these inadequacies.

**Key words:** Building Technology, Course, Institution, Profession, University

## **INTRODUCTION**

A Building can be defined simply as permanent or temporary structure enclosed within exterior walls and a roof, and including all attached apparatus, equipment, and fixtures that cannot be removed without cutting into ceiling, floors, or walls. Building can be defined as the process or business of constructing something the process of constructing, shaping, developing, or forming a particular thing (Businessdictionary). Building development in Nigeria has a long history going back to the pioneer period where arranging training in the nation is moderately recent. The provincial government for case authorized the Town Improvement Ordinance in 1863 and built up the Lagos Executive Development Board (LEDB) taking after the episode of bubonic plague in Lagos somewhere around 1925 and 1928 (Abiodun, 1985). The Board was built up amid this period to clear the ghetto zones influenced by the sickness and to

build up lodging units in Lagos. Then again, the greater part of the arrangement creators and system implementers comprised chiefly of common hirelings.

The number of students enrolling for building courses at universities has decreased substantially. The resulting reduction in the number of new graduates, along with the current and projected shortages of skilled professionals in almost all building fields, has been noted with alarm, not only by academics at universities, but by officials in various state bodies in many countries of the world. The impact of lower student numbers has resulted in some universities reducing the number of academic teaching and research positions in building departments, and even in a few cases, the closure of such departments. With such a large number of higher organizations of adapting now offering mixed bags of natural courses and this combined with the opposition in the building business, this study is set to explore the level of enthusiasm for Building Technology in students of covenant university.

The aim of this research is identifying constraints affecting the choice of building as a major with Covenant University as a case study. The objectives are given below:

- To assess the awareness of students on Building as a course in the institution
- To identify the percentage of students willing to study Building as compared to other courses relating to construction
- To identify the constraints of students who chose Building

Identifying factors which influence career choice, and the differences in the factors influencing different groups of students, will assist us in identifying underlying causes for low student enrollment. This will also allow us to make recommendations regarding how recruitment and advisory resources can be used more effectively and how campaigns can be focused appropriately in order to attract students. This study would help us realize how many building technology candidates are finding fulfilment in the course of study and how it can be improved. The various aspects considered for improvement can promote the willingness of students to study the course and the ways to reduce or totally eliminate these constraints on the long run.

## **2.0 RELATED STUDIES**

Career selection is one of many important choices a person will make in determining future plans. This decision will impact them throughout their lives. The essence of who the student is will revolve around what the student wants to do with their life-long work. It then follows that how the student perceives their environment, personality, and opportunity also will determine the career choices students make. The decision-making processes of students at the entry point to higher education have been the focus of several research projects. Studies conducted since the early 1990s have examined intrinsic motivations such as interest in an area of knowledge and related career opportunities (Sugahara, Boland, & Cilloni, 2008), as well as the more general reasons for attending a particular university: for example, reputation, campus environment, academic programs and services (James, 2001; Elsworth et al., 1998).

Some studies have been carried out on factors influencing students' choices of careers. In their study on the retail career choice, Soyeon and Goldberry (undated) identified three broad factors namely: intrinsic, extrinsic and lifestyle. The intrinsic factors include the nature of the job itself, enjoyment of the job as a whole, variety of jobs, intellectual stimulation, pleasant work environment and fit of job to personality. The extrinsic factors identified by the authors are salary, benefits, job security/stability and prestige of career field while lifestyle factors include flexibility of working hours, ability to manage home/family, time for leisure and preferred geographical location. In another study by the College of Occupational Therapists (2000), awareness was found to be a major factor in career choice. The study showed that around a third of the students made the decision to become occupational therapists while studying in years 12 and 13 (16%) or after taking A level/higher (15%). Only 5 percent made the decision before GCE/Scottish equivalent level. The study identified the respondents' friends and family (40%) as the most influential source of career advice. University prospectus, school career staff, college careers' pack and local career services are other sources.

### 3.0 METHODOLOGY

This research is based on the case study which is Covenant University. Field data was obtained by the administration of questionnaire, and interviews of students studying building technology in Covenant University. The population of Building Technology students from 100 to 5001 studying building technology in Covenant University was a total of 283. A sample size of 150 students comprising of students from the 5 levels of the programme partook of the survey. Purposeful sampling technique was used. The data was analyzed using tables and a 5-point Likert scale.

### 4.0 ANALYSIS OF DATA

The survey was carried out on the Building technology students in Covenant University. The total population of students that participated was One hundred and fifty (150) in number. The males that participated were 102 in number while females were 48. The population was a total of 283 students while 30 students per each level of 100 to 500level was the sample size.

Analysis of data was done using the Likert scale. The scores were obtained by assigning weights to the 5 – point Likert scale, that is, from strongly Agree = 5 points to Strongly Disagree = 1 point, then summing the scores for each item and then dividing by the number of respondents to each item. The mean score was then grouped as follows to arrive at consensus opinion about each item: Strongly agree= 5.0-4.50, Agree =4.49-3.0, Neutral= 2.99-2.50, Disagree= 2.49-1.5 strongly Agree=1.49-1.0.

### 4.1 BACKGROUND OF STUDENTS

The students that participated in this research are all Building technology students from all levels.

**Table 1: Students' Background.**

Variable	Characteristics	Percentage
Sex	Male	68%
	Female	32%
Was Covenant University your choice?	Yes	82%
	No	18%
Did you know about Building Technology as a course?	Yes	24%
	No	76%
Was Building Technology your first choice?	Yes	28%
	No	72%
Do you like the course Building Technology?	Yes	94%
	No	6%
Would you chose building technology over again if you had the chance?	Yes	70%
	No	30%

From the questionnaire survey carried out, majority of the respondents were male because they are in majority in all the classes. That notwithstanding the researched showed that 56% of the students that took part of the survey were not aware of Building as a course of study and 72% claimed it wasn't there first choice of study. Despite the lack of awareness of the course of study most still found it interesting, 94% of the respondents attested to the fact that they presently like and enjoy the course and major reason given for that was the lucrative nature of the course and practical nature as well. 70% of the respondents said they would choose building Technology as a course of study again, should they have to do it over. On whether the students chose Building technology as a course, 28% claimed Yes and while 72% said no, mainly because there was no awareness of building as a course.

## 4.2 STUDENT'S ATTITUDE TOWARDS BUILDING PROFESSION

**Table 2: Student's Attitude towards Building Profession**

S/ N	PERCEPTION OF BUILDING TECHNOLOGY	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)		Implication (Using the highest %)
1	Building technology is a good course	70	24	6	0	0	4.64	Agreed
2	Building technology is a tedious course	38	40	16	6	0	4.10	Agreed
3	Building Technology is a lucrative course	34	58	8	8	0	4.26	Agreed
4	There are many successful builders out there	24	38	30	4	0	3.78	Agreed
	<b>ABOUT LEARNING AND PRACTICE</b>							
5	I understand building technology concepts	38	48	8	0	6	4.12	Agreed
6	The lecturers of the course are knowledgeable	36	46	14	4	0	4.04	Agreed
7	The learning environment is conducive for learning	28	32	22	14	4	3.56	Agreed
8	Practicing building is what I will do after the university level	14	28	34	20	4	3.28	Agreed
9	Other professionals have better advantage of being established than a builder	4	10	28	36	11	2.5	Neutral

**Source: Authors' Field Work (2016)**

Table 2, shows that in spite of the fact that majority of the students were either forced into the discipline or entered into the discipline as the last resort, about 42% of them saw their future prospects as bright and promising. Only 4% of the students claimed not to find the course interesting while 34% were unsure.

High salaries are considered important therefore “good money/benefits” was noted as being important almost seven times more often than any other factor. It was also found that high salary and job security were rated most highly, and that job availability was close in importance to these top two. These are similar to findings for accounting students. Myburgh (2005) carried out a study amongst students in a various universities and found that availability of jobs, followed by job security, were top in importance.

Majority of the students, 36% of the respondents to be precise, disagreed to the fact that other professionals have a better chance of being established, while overall outcome being a neutral stand point. This a pointer to the fact that although they believe in the good of the course, there is an idea that it may not be as profitable as earlier anticipated.

#### 4.3 CONSTRAINTS AFFECTING STUDENTS' CHOICE OF STUDYING BUILDING

There are several constraints as described through oral interview which accompanied the questionnaire distribution that affect the choice of students studying building technology, ranging from

- Poor awareness of the course
- Advice
- Method of teaching
- Demands of the course
- Gender differences
- Tuition fees
- Basic Technological skills
- Learning Environment
- Method of teaching
- Prospects for students in studying the course

- **Poor awareness of the course**

The survey showed that students who left the secondary level as at 2012/ 2013 and presently in 400 to 500 level of the course (building technology) were not properly informed about the course before formal contact with the university itself. The lack of awareness made them to initially dislike the course as there was a feeling of studying a subordinate course as compared to others.

- **Advice**

Advice emanating from parental quarters contributed greatly to the decision of studying Building Technology as a course. Only a few students had advice from a professional's stand point which engendered a bit of interest in the subject itself.

- **Demands of the course**

The false idea in the minds of students who were poorly informed about the course was that it is a very tedious course, which was hard to comprehend due to the different aspects of it. They felt it would take so much out of them. So many did not choose the course for this reason,

- **Gender differences**

Generally, the construction industry is a male dominated environment, basically due to the heavy lifting and the necessity of being up and doing at all times. The terrain, location and duration of projects undertaken are significant factors as the female students are concerned.

- **Tuition fees**

The tuition fees for building like engineering courses are usually the highest. For a school like Covenant University, the cost of enrolling a student for such a course in the institution placed challenges on some families and they initially considered sending their ward/children on the study for a lower priced course and this period allowed for delays in choosing building as a course of study for their ward/children.

- **Basic Technological skills**

To study Building technology the student must be well grounded in 'Technical Drawing' and must have offered and passed it at the WASSCE stage before entering the University but not all students were privileged to be exposed to this subject, that is why some did not even consider studying the course at all.

Also IT software skills in applications such as AutoCAD, AutoCAD Revit, BIM needed to be learnt at least in its basic form as it will be used during the course of study of the students, and usually they lack any knowledge about the use of these applications.

- **Learning Environment**

The learning environment matters a lot. Not all Universities have the facilities to enroll students for this course and this limits the students' choice of universities. Students surveyed did not really have much idea of the facilities put in place for the study of Building Technology in Covenant University and some testified to have been reluctant in choosing both the institution and the course of study.

- **Method of teaching**

The method of teaching involves a lot of theoretical work and face-face method. The online model perhaps would have helped in gaining more ground as regards students that are willing to learn and understand what the course was about. Students opined that sufficient visits to factories of production and manufacture of construction products have not fully been met and in fact just started in recent years. Nevertheless, town and gown seminars have been introduced in Covenant University to take care of these challenges.

- **Prospects for students in studying the course**

Several students attested to the fact that they knew nothing about Building Technology as a course and a profession as a Builder. They were given and transferred to study the course when they could not meet up the cut off mark for the initial course of study that they chose. They had not idea concerning the prospects for the course not until they fully enrolled for the programme which helps them discover how broad the Building profession was.

#### **4.4 STUDENTS' PERCEPTION OF THE PROFESSION BASED ON INTERVIEW**

The students of Building Technology that were interviewed revealed that they had not applied for building technology originally (70%), but later retired for the course. Most of them disliked the course at first, but began to enjoy it later, a considerable number are still indifferent.

When asked about lecturers' attitude and knowledge of the course 66% claimed that the lecturers were in fact knowledgeable on the course, the only problem is the poor communication skills proper. Although some students said that they believed that the lecturer liked to get at par with the students and make sure they understood concepts, which they liked. Others lamented the approaches of certain lecturers, such as leaving students to teach themselves.

When asked if they would recommend the course to others, they generally agreed and are shown by the 70% of the respondents. They however stated that Building Technology would be recommended over Civil Engineering and other related courses because of the breadth of Building Technology in relation to other courses. These are similar to findings for accounting students. Myburgh (2005) carried out a study amongst students in a various universities. It was also found that High salaries, availability of jobs, followed by job security, were top in importance.

#### **PERCEPTIONS OF BUILDING AS CAREER**

- Although solution provision and service to the public are the reasons why some of the students would like to venture into the profession, profit or finance remained the major reason why the students would like to become professionals in the industry. Some of the students are interested in the profession in other to proffer solutions to the existing methods of construction such as the use of sustainable buildings, green buildings, dry construction, prefabricated systems, and other methods of construction.
- Many of the students perceive building as a vast and versatile profession in the sense that it is a very wide profession and has a lot of areas in which one can venture into such as; building production management, building construction, project management, facility management, feasibility and viability studies, building maintenance management, building surveying, project monitoring and evaluation, and arbitration, mediation and expert witness. More

specialized jobs are also available in the building industry, such as building services like plumbing, electrical works, wood works, iron works, tiling, painting, other finishes and many other works. This availability of so many jobs in the industry provides job opportunities for lots of individuals.

- It is an interesting and essential profession as it tends to meet one of man's basic needs which is shelter. Some students enjoy the industry because it entails working on site most times, and they love the practical aspect of the job unlike white collar jobs which entails working 24/7 in offices or on computers.
- Some students appreciate the fact that the profession is very profitable and lucrative, but also acknowledge that it could be cumbersome if one is not careful, experienced, smart and has appropriate knowledge of the rules guiding the profession.
- Students also enjoy the fact that one gets to work with lots of different professionals in diverse industries. They acknowledge that the industry cannot go to the dust, which means it will continue to grow and add values to the human life.
- The profession entails innovation, and it is very dynamic. It requires hard work, good efforts and labour. It is very tasking, stressful, demanding and most times, requires long hours of work. Some students also feel that it is a boring profession; it is redundant and very political.
- They believe that the profession is revolutionary and contains the potential to lead the way in national development and growth. It is solution driven, resourceful, and renders services to the public in different areas of building.
- It is an adventurous profession, a profession that also involves dirty works
- Many of the students who have had an experience of working in the industry or with a professional believe that, although what is taught in their classrooms relates to what is done on site, there is still lots more to the profession. To summarize, students' perception of Building Technology is mixed or generally indifferent, which may indicate that students do not yet have a well grounded idea of the course.

## **5.0 CONCLUSION AND RECOMMENDATION**

Building is an interesting and essential profession as it tends to meet one of man's basic needs which is shelter. However, majority of the students' constraint was lack of awareness about the course; therefore it is recommended that proper awareness of Building Technology as a profession should be done via workshops and seminars in secondary schools so as to broaden the view of students about the course even before entering into the higher institution. . Building technology skills acquisition is declining in many institutions in the country, therefore it requires serious attention at national level. Since the building industry is believed to be a very significant contributor, both directly and indirectly, to national economies. Several agencies, such as the National Institute of building (NIOB), Council of registered builders of Nigeria (CORBON) that have been tasked with a detailed assessment of the construction / building skills shortage and should propose initiatives to address inadequacies.

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## **Analysis on Content of Esd by Geography Textbook in Chinese Middle School**

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### **ABSTRACT**

Sustainable development (SD) is a complex idea, based on environmental, economic and social dimensions. In line with SD, education for sustainable development (ESD) is an approach to teaching that combines cognitive and affective domains and aims to build empowerment abilities. The Chinese government has not only adopted sustainable development as a fundamental national policy, but it also attaches much importance to Education for Sustainable Development and tries to deliver the concept of ESD to the future generation with a call for their action. China began its curricular reform of basic education in 2000 and the awareness of sustainable development is intended to be integrated into the existing subjects. Based on the above reasons, the research objective of this paper is to analyze the expression content of sustainable development education in geography textbooks in junior middle school with the textbooks as research objects.

### **INTRODUCTION**

At the end of the United Nations Decade of Education for Sustainable Development (2005–2014) (aka the Decade) and the beginning of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Global Action Programme (GAP) on Education for Sustainable Development<sup>1</sup> (ESD), many nations are poised to begin scaling up ESD (UNESCO, 2014). During the Decade, ESD matured and grew. Efforts began with raising awareness, moved to capacity building, then to experimentation and finally, implementation of good practice. In effect, the Decade provided proof of concept for formal education and non-formal educational settings, including public awareness and training. Now, with the advent of the GAP, UNESCO and the ESD community are aiming towards expanding successful projects and involving more schools and institutions in ESD. In spite of widespread implementation and success of ESD, the expansion of ESD in primary and secondary education will require the ESD community to provide evidence that ESD is effective and contributes to the overall quality of education.

As ESD Ten-year Plan (2005-2014) of U.N. progressed forward, it is growingly the focus of international society for education, as the impetus, to promote sustainable development reform. Also of note is that series international conferences were held frequently during 2014-2015.

As proposed in the national education conference at Muscat, Oman on May 12 to 14, 2014, ESD was one of the seven global educational goals after 2015; in November, 2014, Global ESD Road-map was issued on the World ESD Conference at Nagoya, Japan; then in May 2015, World Education Forum was convened at Incheon, South Korea, reiterating (reiterating) the objective “to cultivate the skill, value and attitude that enables public to live a healthy and satisfied life, to make wise decisions and to cope with local and global challenges, through ESD and global citizenship education”. In May 2015, World ESD Ministerial Consulting Conference was held in Paris. Unexceptionally, all these conferences have indicated an important signal: ESD is on its way becoming a new power to stimulate educational innovation.

UK, for example, one of the first countries advocating ESD, proposed 7 key concepts related to ESD at the ESD Symposium, namely integration, citizen, descendant, diversity, life quality and equality, development and bearing capacity and change, uncertainty and prevention. These concepts constitute the conceptual framework and theoretical basis of ESD in UK. Having been emphasizing the core ability cultivation, the German “ability-oriented pattern” highlights more of students’ emotion and the ability to grasp the future.

While in America, the fundamental education attaches great importance to practice and connection with real life, and its course system is perfect with clear targets and systematic evaluation and monitoring measures, which is highly worthy to be learned worldwide.

In 2005, Australia published a report named “ESD Re-positions the Sustainable Future and Australian School” for its “core course integration mode”. Due to this report, Australian educational concept and practice have made changes toward the goals specified in the sustainable development agenda. These changes are reflected on course construction on the multidisciplinary basis, teaching strategy and improvement of students’ ability of solving problems.

Then, “government-oriented pattern” in Japan: As an island country, Japan is short of resources and thus pays more attention to protecting environment, saving resource, keeping sustainable development of economy. Therefore, Japan can be said to be a successful example in ESD field throughout the world. Under this pattern, it gradually establishes an environment education system from primary school to university, and the approach to cultivate public’s sustainable development awareness through school education has effectively promoted the sustainable development of teenagers.

Obviously, ESD has become a new research field highly emphasized globally. Based on the above reasons, education for sustainable development (ESD) is an approach to teaching that combines cognitive and affective domains and aims to build empowerment abilities. The Chinese government has not only adopted sustainable development as a fundamental national policy, but it also attaches much importance to Education for Sustainable Development and tries to deliver the concept of ESD to the future generation with a call for their action. China began its curricular reform of basic education in 2000 and the awareness of sustainable development is intended to be integrated into the existing subjects.

In this case, the research problem was set as follows.

How did ESD developed in China?

why should we choose geography textbook for junior school students?

#### **DEVELOPMENT OF EDUCATION FOR SUSTAINABLE DEVELOPMENT IN CHINA**

The notion of education for sustainable development (ESD) has resulted from increasing global awareness of the decisive potential roles that the education system could play in preparing citizens, and the younger generation, for a sustainable future. Following the official request of China's State Council in 1978, environmental protection has been a selective subject in secondary education since the 1990s, and a teachers' guideline on teaching and learning for sustainable development was published 1996 by the People's Education Press, the most authoritative textbook publisher in China.

In truth, ESD in China is evolved from environmental education. Thus, it is generally classified into the following four phases.

##### **Phase 1: infancy (1973-1977)**

Environmental education sprang up firstly in western countries in 1950s-1960s. Influenced by Stockholm conference and faced with international environmental education, the environmental protection cause began advancing in China in 1972, followed by environmental education. In the meantime, Decisions on Environment Protection and Improvement (Trial) was formulated by the State Council, which symbolized the start of Chinese environmental education officially. During this period, environmental education was extended to a narrow scope with simple style and methods, and it centered on comfortable education and had a small coverage.

##### **Phase 2: developing (1980s-1990s)**

The year from 1982 to 1992 witnessed the rapid development of China in politics, society, economy and culture. It was a period of transition when education highlighted quality-oriented education for all-round development and paid unprecedented attention to environmental education. Still, environmental education largely includes publicity education for environmental protection, and education department allied with environmental protection bureau are involved in it. Although people are aware that education for environmental protection is one of the most important means, it lacks a systematic and united theory and practice guidance as a support despite of individualized education mode on different basis. As a result, education effect is unsatisfactory.

Phase 3: primary stage of ESD based on environmental education (later period of 1990s)

After experiencing a period of stable development, the curriculum offered by environmental education at China's elementary and secondary school has formed an education style that gives priority to "penetrating" courses with independent course arrangement as complementary by the later period of 1990s. It can be seen that people have realized its interdisciplinary, penetrability and correlation to other disciplines. Thus, the penetrating ESD is carried out combined with related disciplines, which is considered as an effective strategy to propel ESD. In addition to environmental protection knowledge, ESD is also added other contents such as humane sustainable development ideas and harmonious lifestyle. When it comes to education, especially school education, active actions and surefooted environmental education are likely the direction to keep global education for environmental protection forward.

Phase 4: ESD under the guidance of scientific outlook on development (the early 20th century to present)

Views, like people foremost and continually accelerating economic, comprehensive, coordinating and sustainable development, are applied to comprehend and work out development problems. ESD, by definition, is to re-position education with sustainable development as oriented so that education can better serve for sustainable development. Under the new curriculum background, education reform and development in China should furnish teenagers and all citizens with ESD on the basis of thinking over the ways to implement student-centered quality education, vigorously impel education reform and innovation and adhere to coordinated education development.

It is stated clearly in the *Outline for Ten-year Education of China* that China should take ESD seriously. In spite of its short history in China, people have soon realized importance. Some relatively developed areas have adopted ESD in relevant disciplines of elementary and secondary schools. However currently, it is only slightly applied into some extracurricular activities of primary schools, but fewer in disciplines of middle school under the strain of secondary school entrance exam. The Beijing Municipal Education Commission also sets concrete measures for the smooth regulations for implementation, undertaking school capacity for ESD intervention, undertaking theoretical enquiries and supervision for field practice, developing resource centers and encouraging extensive cooperation, maintaining accountable quality evaluation and disseminating good practice. The schools have been encouraged to relate their ESD efforts closely to the curriculum structure and learning processes, not merely with new content but also with alternative teaching and learning approaches to involve students in developing their approaches and practical skills through thematic enquiry and problem-solving procedures. Local schools found it stimulating to involve students to examining real development issues and lifestyles and their impact on sustainable development. Teachers can consult an additional document on the concrete content in each subject in relation to ESD (Beijing Municipal Education Commission 2007). This document has laid down a framework for the integration of ESD across school education. Since its release, the document has become a key guideline for ESD implementation in China.

#### **ANALYSIS OF CURRICULUM OBJECTIVES OF EDUCATION FOR SUSTAINABLE DEVELOPMENT IN BASIC EDUCATION CURRICULUM**

In this study, the practice of sustainable development begins with recognizing issues related to sustainable development. It also means that individuals realize that each individual is the subject of future generations, and that his behavior affects the sustainability of society and the sustainability of the environment, fostering the ability to foster an integrated mindset to find ways to solve a problem, and to develop an active society to create a sustainable society. But now, we are faced with the urgent need to recast our ways of living, away from ones that rely on the unsustainable consumption of resources, the degradation of ecosystems and the exploitation of people, towards a model that strives to enhance the well-being of all human beings within the limits of our planet. While the need for sustainable development is clear, the ways to approach it may differ and will evolve. It is widely held that the development of sustainable societies is a continuous learning process and one in which issues and dilemmas are commonplace and appropriate answers and solutions may not be definitive.

Education should play an important role in enabling people to live together in ways that contribute to sustainable development. However, at present, education often contributes to unsustainable living. This can happen through a lack of opportunity for learners to question their own lifestyles and the systems and structures that promote those lifestyles. It also happens through reproducing unsustainable models and practices. The recasting of development, therefore, calls for the reorientation of education towards sustainable development.

Even as education for sustainable development (ESD) raises awareness of the complexity and dynamism of issues, it also plays a key role in making sustainable development understood and that it is applied in a concrete way. ESD helps to develop the capacity for critical reflection and systemic and futures thinking, as well as to motivate actions that promote sustainable development.

Advances in sustainable development education have started as follows in the German Government's " Sustainable Development Education " concept of sustainable development education. Sustainable development is aimed at developing the ability to support human beings in the context of global perspective and to develop economically capable environments and to actively create environmentally sound environments. As a result, the Commission recognized the ability to recognize the sustainability of the school's education as one of the goals of the school's education, and to establish the ability of students to recognize the problems of education and organizational sustainability as one of the objectives of the school's education.

While schools are supplemented increasingly by other aspects of social life, they remain essential for developing young people's understanding of the world through academic learning and the promotion of the norms and values of society. Too often, however, school education fails to create a reflective ethos and a sense of responsibility for a shared humanity and the future of our planet. There is an increasing consensus today on the need to reorient education to meet the challenges of the 21st century. Our proposal is to begin by taking the concrete step of transforming textbooks – the teaching and learning resources that are most prevalent around the world and the ones closest to students.

The recent basic education reform is also the eighth curriculum reform in China since 1949. It is an extension of the popularization of the nine-year consecutive compulsory education that was undertaken by the central government in late 1980's. The former vice-minister of education Mr. Wang Zhan (2009) argued that as the leitmotiv of this reform was to improve the quality of basic education, substantial change in 'curriculum' could be the key as well as the grip to a fundamental change in education.

In June 2001, the Program on the Reform of the Basic Education Curriculum (Experimental) was launched with a concrete curriculum agenda for the nine-year compulsory education (grade 1-9). Two years later the experimental curriculum for senior secondary education (grade 10-12) was ready. The following changes were expected to be achieved through curriculum transformation (Zhu, 2007; 教育部[MoE], 2001):

- Curriculum function: from 'knowledge transmission' to 'student's active learning within a balanced triangulation of knowledge & skills, process & methodology, and emotions & values'.
- Curriculum structure: from 'compulsory and subject-centered' to 'elective and cross-disciplinary'.
- Curriculum content: from 'complicated, obscure, antiquated and difficult text-book-based' to 'integrated, social-scientific-related, interest-experience-based and lifelong learning-oriented'.
- Learning methods: from 'individual, passive, competitive' to 'autonomous, inquiry-based, collaborative'.
- Evaluation methods: from 'sole exam-based evaluation' to 'development-oriented assessment'.
- Curriculum administration system: from 'a highly centralized, two-tiered framework' to 'a distributed, three-tiered structure'.

The curriculum reform is by its nature a step towards educational modernization that empowers students with more autonomy of their own learning. It also entails more autonomy for teachers and schools in curriculum development. Zhong (2009), a prominent scholar in curriculum and instruction, explained the rationale of the basic education reform as such, the key in education reform is the curriculum; the core of curriculum reform is classroom practice reform and the crux to classroom practice reform is teacher's professional development. Therefore, the teacher as a professional should not only be a knowledge-transmitter. He or she should be able to play the role as 'learning-stimulator' and 'education-researcher'. Students are motivated by teachers to take learning initiatives through self-directed, collaborative and inquiry-based learning.

In light of the new curriculum policy, the curriculum scheme for the nine-year consecutive compulsory education and the three-year senior secondary education were proposed subsequently. In both schemes the following aspects were addressed in response to the intended changes advocated by the new curriculum (Zhu, 2007):

- The reformed curriculum retains the basic structure of past academic courses, but removes the complicated, obscure and irrelevant elements. New dimensions, such as 'knowledge & skills', 'process & methodology' and 'emotions, attitudes and values', are introduced.
- Integrated practice activity courses are added to stimulate 'learning by doing', occupying 8% of the total school hours in compulsory education and 13% of compulsory credits in senior secondary education (indicated with the grey color in Table 1).
- Local and school-based courses take 10-16% of the curriculum space (indicated with the pink color in Table 1).
- The three-level curriculum for senior secondary education contains fields, subjects and modules, which is intended to improve the integration of the learning of different disciplines and stimulate cross-disciplinary teaching.

- The elective modules provide a spectrum of choices so that student can choose to learn what they are interested in. By doing so it is hoped to increase the individual accountability of students for what they are going to do in school.

Table 1: The new curriculum scheme for compulsory education (grade 1-9)

Grade								
1	2	3	4	5	6	7	8	9
Chinese Language & Literature								
Mathematics								
Arts (Music, Fine Arts)								
Morality & Life	Morality & Society					Ideology & Morality		
						History & Society (History, Geography)		
	Science					Science (Biology, Physics, Chemistry)		
			English			English		
			Integrated Practice Activity					
Physical Education/Sports						Sports & Health		
Local & School Courses (10-16% of school hours)								

The UNESCO Strategy for ESD aims to equip people with knowledge, skills, understanding, attitude and values compatible with sustainable development. To this end it calls specifically for the development of educators' competences in order for them to engage in ESD (UNESCO, 2007).

It is as stated in the above text. After the reformed curriculum, new dimensions, such as 'knowledge & skills', 'process & methodology' and 'emotions, attitudes and values', are introduced. This is consistent with the views proposed by UNESCO.

The education for sustainable development may be as if the green ideological trend against with vital force and energy, blazes a new way and gives a fresh viewing area on the study of the new curriculum of the elementary education territory in our country and also endowed with one kind of brand-new thinking method.

#### HOW TO EMBED ESD IN GEOGRAPHY TEXTBOOK OF CHINESE MIDDLE SCHOOL

Embedding is about enabling students to develop a keen understanding of academic content and to apply their knowledge and skills to problems not just in the classroom but in their communities, careers and their civic lives. There is no school subject for which ESD is not relevant. Each subject takes its own unique approaches to embedding, showing myriad ways through which it can take place.

In recent years, a number of resource materials have been developed to provide guidance on integrating ESD and related education into school curricula. Guidance materials on integrating ESD and related education into the school curriculum abound. Helpful for the approach of developing competency-based learning units is Education for the Sustainable Development Goals: Learning Objectives (UNESCO, 2017a)

Whereas calls for 21st-century skills or transversal competencies have increased in recent years (UNESCO, 2015c), competency-based learning is neither established in all national curricula nor applied equally in all subjects. Some countries focus on academic standards, while others concentrate on topics and learning objectives. Textbook

authors will have to consider different lexicons and conventions in different educational systems. It is also important to note that the specification of ESD competencies is just one of many exercises towards more effective ESD implementation. Through an embedding approach, textbook authors can support teachers in their role as learning facilitators by incorporating cues for creating such an environment. Textbooks can be an aid for teachers to implement ESD in their classrooms while teaching core academic coursework.

It is widely understood that although ESD is applicable across all school subjects, monitoring performance and evaluating assessments may differ from subject to subject, and some disciplines may be able to address ESD more directly than others. The knowledge, skills, dispositional and behavioural learning outcomes called for by ESD and related education can be embedded in the general learning outcomes of a particular school subject.

A geography that follows the vision of SD has the power to reshape places and spaces and create alternative worlds. Whether it is through appreciating the beauty of Earth, the immense power of Earth-shaping forces or the often-ingenious ways in which people create their living in different environments and circumstances, studying geography helps people to understand and appreciate how places and landscapes are formed, how people and environments interact, the consequences that arise from our everyday spatial decisions, and Earth's diverse and interconnected mosaic of cultures and societies. Geography therefore is a vital subject and resource for 21st century citizens living in a tightly interconnected world. It enables us to face questions of what it means to live sustainably in this world. Geographically educated individuals understand human relationships and their responsibilities to both the natural environment and to others. Geographical education helps people to learn how to exist harmoniously with all living species.

Geographical investigation both satisfies and nourishes curiosity. Geographical perspectives help deepen understanding of many contemporary challenges such as climate change, food security, energy choices, overexploitation of natural resources and urbanization. Teaching geography serves several vital educational goals. Building on people's own experiences, learning geography helps them to formulate questions, develop their intellectual skills and respond to issues affecting their lives. It introduces them not only to key 21st century skills but also to distinctive investigative tools such as maps, fieldwork and the use of powerful digital communication technologies such as Geographic Information Systems.

And then, Maps and graphics can be a basis for inquiry, as well as a result of it. They are powerful tools in understanding the spatial dimension of an issue as well as synthesizing and communicating complex and sometimes contradicting data. This emphasis on the visual synthesis of geography makes a key contribution to tackling the complex issues inherent in ESD.

School geography has the potential to contribute greatly to ESD through its content and pedagogical approach. To maximize geography's potential, it is important to achieve the right blend of content and pedagogy from the outset. Subject-centred and learner-centred approaches must be considered together, not as opposing poles. The examination of the ecological-social relationship and its dynamics within space can be enhanced through a pedagogy that allows learners to question, examine, discuss and have different opinions, even on geography itself. This enables geographical education to contribute to greater democracy at local and global levels and to work to achieve ecological sustainability and peace.

Then, why should we choose geography textbook for junior school students?

This is because geography for junior is closely associated with ESD. As geography is a subject exploring geographical environment and the mutual relation between human activities and geographical environment, it should be the main platform to carry out ESD in new curriculum. Given that almost all fields involved in geography such as the nature and human have a close relation to the strategic goal of sustainable development, how can ESD be realized through geography textbook in Chinese school education?

1. From the perspective of time educated

ESD can be interpreted from its goal and contents implemented in junior high school of China. It is stipulated in geography textbook Special Topic Education Syllabus that environmental education should cover 12 lesson periods.

2. From the perspective of teaching objective

As stated in Guideline for Implementing Environmental Education in Elementary and Secondary School, environmental education encourages students "to actively participate in decision making and actions supporting sustainable development, and to be a citizen with social practice ability and responsibility", and meanwhile puts forth specific training objectives from three dimensions: emotion, attitude and value; process and method;

knowledge and ability.

It can be seen from the above objectives that current ESD in primary schools has broken through the traditional concept of environmental education, and instead, it is positioned to be “an environmental education for sustainable development”.

In the new curriculum reform, the subject of geography is required to fully promote quality education; its course arrangement should lay emphasis on students integrated and lifelong development, establish new geography learning method, construct open geography course, fully make use of modern information Techno and cultivate students’ practical geography capability and inquiry awareness.

## **FINDINGS**

In order to train teenagers to be capable of social practice and responsible, the paper analyzes how ESD content in the geography textbook is realized from three dimensions: emotion, attitude and value; process and method; knowledge and ability.

### **1. Emotion, attitude and value: reflected on the man-land sustainable development**

Refer to the “Human’s Place of Residence--Settlement” in Chapter 4, Volume 1, Grade 7.

ESD is intended to know the thought evolution of man-land relation and various sustainable development problems our mankind faces. It comes to realize that coordinating man-land relation and taking the sustainable development path is the inevitable choice for mankind. In the course of sustainable development, it’s necessary to develop an attitude and responsibility that individual should possess for sustainable development. Abundant contents pertaining to ESD are shown in the new geography textbook of PEP edition for Grade 7&8. When preparing geography lessons, teacher should fully comprehend the ESD contents in the textbook based on the actual situation, thereby flexibly applying them into teaching practice. Although ESD cannot be accomplished simply in classroom within a short time, we have reasons to believe that students will realize its importance absolutely through geography teachers’ unremitting efforts. Also definitely, a sustainable development in population, resources and environment will become a reality in the future work and life.

### **2. Process and method: reflected on the sustainable development of resource**

Refer to the related countries and regions in the geography textbook of Volume 2, Grade 7, Natural Resources in China in Chapter 3, Volume 1, Grade 8, and related materials in chapters of Volume 2, Grade 8. Chapters in the Volume 2, Grade 7 is an important part of regional geography. To build correct views on resource, environment and sustainable development, sustainable development should be learned deeply and extensively. This learning is aimed at understanding the classification of natural resources, and China’s position of total resources and personal average resources in the world so that students are able to take corresponding measures for protecting and saving natural resources and take actions; knowing the using status and distribution characteristics of Chinese land resource, and being capable of assessing the matching of land and water resources with the region; knowing time-space distribution features of water resources and effective measures adopted to resolve uneven distribution of water. Besides, the survey on using water helps foster students’ water-saving awareness. Refer to the “We Need Clean Air” in Chapter 3 themed Weather and Climate, Volume 1, Grade 7 for the contents of sustainable development of environment; related information listed in Chapter 3 themed Natural Resources in China, Volume 1, Grade 8.

The objectives of ESD are to understand the reflection of environmental problem and its global and regional characteristics; to recognize the essence of environmental problem and find out its main causes through analysis; to comprehend the mutual relation between environment, population and resource after exploration into environmental problem people faced and its serious consequences, thus enhancing students’ sense of crisis, urgency and duty.

### **3. Knowledge and ability: mainly reflected on the sustainable development of population**

Refer to Section 1 Population and Race of Chapter 4 Resident and Settlement, Grade 7; “Continent with Largest Population” in the Section 2 Cultural Environment of Chapter 6 themed The Continent We Live--Asia; Section 2 Large Population of Chapter 1 themed Know China from the World, Grade 8; “Abundant Resources and Uneven Per Capita”, etc., in Section 1 named Abundant Total Natural Resources and Uneven Per Capita, Chapter 3 China’s Natural Resources.

The goal of ESD is to enable students to have a understanding on different races in the world, population growth, distribution characteristics and population problems. By studying the heavy pressure of resource and environment caused by large Asian population, students are capable of realizing that to solve problems resulted from fast population growth, it’s imperative for mankind to control themselves and implement birth control, making

population growth adaptable to social and economic progress, and coordinated with environment and resources. Furthermore, through ESD, students are expected to grasp the total population of China and its status globally, to master general population distribution and population growth tendency, to comprehend population policy and the impact of sustainable development of population on resource, environment and social economy.

## CONCLUSIONS

ESD is involved in geography textbook for junior high school students. Included on the contents are sustainable development reflected on man-land relation, resources and population. It is intended to train students to be capable of practice and responsible from three aspects: emotion, attitude and value; process and method; knowledge and ability. Yet, it is simply imparting knowledge, making it hard to remember profoundly. In the China's Century Agenda issued by the State Council, we are easy to find that geography education should also be covered in extracurricular activity in addition to classroom teaching, considering from the fields and requirements for teenagers to participate in national and regional sustainable development. As well as involving ESD in geography textbook for junior high school, extracurricular activity should also be a crucial part in open geography teaching mode. The objectives to foster a sustainable development awareness for junior high school students cannot be achieved only relying on classroom teaching. Instead, it should combine classroom teaching with extracurricular activity so that students can master basic knowledge, improve their awareness, and have correct behavior of sustainable development. In this way, the objectives of ESD are ultimately fulfilled.

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# Analysis on the Content of MOOCs Teaching Design Checklist

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## ABSTRACT

In recent years the rapid development of MOOC has formed a new trend for e-learning. The teaching design of course is always been the greatest factor influencing the learners when using MOOC course contents. This research focuses on analyzing the existing foreign contents analysis of MOOCs teaching design checklist. We have analyzed the influences of various aspects in the checklist on the course development of MOOCs teaching design. The results show that the aspect of information gets a lower score, while the structure and design acquire higher scores which are the critical for course content development. Thus, when teachers design course content, the course structure and course content planning will be the essences of course teaching design

## INTRODUCTION

In October, 2011, professor of the University of Stanford makes the "Introduction to Artificial Intelligence" course open to public on the Internet, which attracts tens of thousands of people to register online; at the same year, the same professor also make his own courses open to public on the Internet, which also attract tens of thousands of people to register and have access to online courses. In 2012, the three online learning companies Udacity, Coursera and edX was set up by Sebastian Thrun, Andrew Ng / MIT and Harvard, and the courses established by the three online learning companies have the characteristic of large-scale, open and online, thus they are collectively referred to as "large-scale open online courses" (Massive Open Online Courses, abbreviated as MOOC (Liu Yifu, 2013)

The main spirit of MOOCs is the "leaning from everywhere", which learner use online learning find their own professional knowledge by diverse learning methods, and design their own way of individual learning by the multiple way of leaning and curriculum. In the teaching design program of MOOCs, the course is an unit system, with each unit lasts 5 to15 minutes, while online discussion, collaborative learning, online practice, real-time feedback and online simulation are available so that the learners can learn through these diverse methods. The spirit and theme of MOOCs curriculum are unlike other traditional courses or online courses: MOOCs not only enhance the interaction between learners and their co-learners, but also increase communication with the teachers through diverse courses, curriculum planning, design and teaching strategies. By discussion, communication and coordination, the learners can have a good interaction between their co-learners; the teachers can understand the learning results of the learners according to the real-time feedback and online quiz, etc.

Currently the development of the global open course is mainly based on the MIT Open Course, starting from 2002. The course of MIT has reached more than 2150 by 2013, and has attracted more than 1.25 million views from around the world (MIT OCW, 2013). The high education sector includes South Korea University, Tokyo University of Technology in Japan have also began to plan the open curriculum.

Teaching design program of MOOCs corporate the application of digital multimedia and the diversified design, and cultivates the ability of the learner's professionalism and self-learning. Through the function of the network platform and the concept of online learning, it is able to explore whether learners can effectively achieve learning independently. This study will conduct the content analysis at the existing MOOCs teaching design checklist at home and abroad to study the important facet of its teaching design. The purpose of the study is to review and discuss the important facet of the MOOCs teaching design checklist by the existing teaching design checklist abroad.

## Literature Review

MOOC (Massive Open Online Courses)

Bryan Alexander & Dave Cormier (2008) had proposed the term MOOC, which contains the open mind, socialization and online leaning. Daniel (2012) MOOCs is a large-scale open online course, which is a teaching model combining teaching technology and diverse teaching design, to cultivate the professional ability and the self-learning ability. Thus the interaction can be more interactive between the teachers/the learners, and within the learners than the traditional one way information delivery by teachers; the interaction with the peers by the internet resources is also encouraged.

Sebastian Thrun, a professor at Stanford University in the United States, makes his own course open to public on the internet, attracting 16 million people around the world to enroll. In addition, Andrew Ng (Professor Wu Enda) also made the course open on the internet, which also attracted about one hundred thousand registered from around the world. They set up the online learning companies Udacity & Coursera in 2012, respectively; MIT and Harvard University also set up Edx online courses collectively. Until now, MOOCs had been designed, planned and taught by professional professors based on the US higher education courses (Liu Yifu, 2013).

Siemens (2005) proposed that today's MOOCs can be divided into cMOOCs and xMOOCs. The xMOOCs are more stringent and systematic in their curriculum design; the designers arrange the curriculum design and portion in a systematic way, and they point out the learning objectives and teaching outline clearly so that the learners can achieve learning objectives in a systematic way. cMOOCs designed the curriculum based on the relevance; the learning objectives depend on the learning, and the learning is from the perspective of the learner, which produces different learning results and learning outcomes (Jin Jing, Feng Rui, 2009). MOOCs provide a diverse learning environment for learners to interact with each other, and to improve the outcome and the independent learning of the learners through diverse content of teaching design.

#### Teaching Design

The curriculum was planned according to the teaching design instead of teaching arbitrarily. In the curriculum, teaching design is a very important part, it is a systemized process which transforms the rules of learning and teaching into teaching materials, teaching activities and curriculum content; if there is no perfect plan and arrangement, it will continue to amend itself and affect the learning outcomes of the learners. A complete teaching design should include four elements: learning object, learning goal, learning method and learning assessment (Smith & Ragan, 2005).

Gagne (1988) proposed that the teaching design is a systemized way of arranging teaching, the systematization is the most effective arrangement of teaching resources and curriculum process. Any organization and institution can be included in the teaching, as long as it is to develop one's potential. Systematic teaching design includes: analysis, design, development, implementation and evaluation (ADDIE) (Molenda, 2003).

Each stage of ADDIE has its own task and result, sorted as follows:

**Analysis:** The process of analyzing teaching content, including the analysis of needs, learner analysis, teaching content analysis. It is mainly to determine the curriculum goal and content.

**Design:** The process of developing curriculum content activities, including the writing of teaching strategies, curriculum assessment. It is mainly to develop appropriate teaching activities.

**Development:** The process of producing curriculum, including the establishment of curriculum rules and teaching materials, etc.

**Implementation:** The teaching strategies, activities and assessment used in the curriculum design.

**Evaluation:** The formative assessment and conclusive assessment to determine whether the teaching results have achieved the desired result.

The effective development of the curriculum relies on the profession of the teachers. Based on the effective teaching design to stabilize the course, the teaching design of the course determines whether the course content is good or bad, it also affects the learning outcomes and learning motivation. This study will compare and analyze whether current MOOCs teaching design checklist at home or abroad contains the principles of the important facets based on the summarized principles of teaching design in this section.

#### Literature of MOOCs teaching checklist

The MOOCs is developing rapidly nowadays. Recently, MOOCs are a new teaching trend and indicator in this rapid development stage. Because of the rapid development of MOOCs, the teaching design and techniques of MOOCs are the key points the teachers and the designers need to re-consider. The teaching design of MOOCs will be summarized by the following three articles. The articles are as below, and the reasons for choosing these three articles are also explained.

#### How to Mooc? – A pedagogical guideline for practitioners

This article is the teaching instruction for the participants. The content of this article describes the effects of current development in this digital technology era on the digital teaching design, and the type and architecture of xMOOCs on the important aspects of MOOCs teaching design. Besides, the author mentioned the checklist aspects such as core requirements, structure, participant needs, tasks, media design, communication and resources. Thus this article was chosen as one important point.

Creating MOOC Guideline Base on Best Practices

This article is the basis for the MOOC instruction. The article analyzes the six platform: edX, Udemy, Coursera, FutureLearn, Udacity, Iversity, analyzes the content of curriculum on these six platforms, analyzes its structure, the ease of use of the mobility, task, the possibility of downloading, accepting analysis. In addition to analyzing the structure aspects, the article also compares and analyzes the problems, files and hyperlinks in the content of the curriculum. this article was chosen as one important point.

edX MOOC Development Checklist

This article is a checklist for edX development, the content of which is the requirements that the edX requires the teacher to fulfill when they are developing their curriculum regarding the curriculum content in teaching design. It includes curriculum announcements, introduction, structure, teaching materials, assessment, curriculum management and learner participation. Thus this article was chosen as one important point.

These three articles mentioned, the online large-scale courses become the largest academic trends in the recent academic community. Many Learners are attracted and improve their capability. MOOC can divided into xMOOC and cMOOC. A typical xMOOC design should include the following elements: Course structure, learning objectives, video lectures (recordings or new products), the extra learning content according to the video lectures, the possibility of heterogeneous communication (such as forums), self-assessment according to video lectures, completion of the course to obtain a certificate, information system, etc.

The Coordinating Service Center (CSC) of Northwestern University of the United States proposed a general guideline for the establishment of a online large-scale course (MOOCs). The usual course structure is to keep more students as possible as they can, while MOOC aims at teaching as much as possible in a short period of time. For this purpose, CSC suggested the curriculum duration to be about 8 weeks, and allow the MOOC curriculum to be variable. However, in the Northwestern University, there is MOOC course lasting between 6 and 12 weeks. The 8 weeks MOOC course content is no longer deemed as a burden for the learners. The average course time for the Coursera MOOCs provided recently is 8.7 weeks. CSC made a few suggestions: Each week MOOC applies single theme or single lesson to specify the learning achievement.

The content of the course materials can at all time be used and applied by the learner around the world, and will not be limited by time, place or space. Each MOOC course must be qualified by quality assurance and rigorous teaching design process Communicate clearly and specifically with learners, establish a course content that the learners are expecting. If the confusion occurs during the course of study, the learner will leave the learning environment. Forums and discussion areas can improve the content of the course and the communication and connection between the teachers and learners, the teaching materials can also be delivered.

Therefore, we will use the literature summarized as above to analyze the content, and to conclude the important aspects of the teaching design mentioned in the 3 articles, and to investigate the affects of these important aspects on the designer and the learners.

## **Method**

The study adopts content analysis, and it is an objective, systematic and quantized description towards the content of human communication (Berelson, 1954). Cartwright (1953) argued content analysis and coding could be applied to each other because they both described sign behavior in an objective, systematic and quantized approach.

Content analysis can classify the relevant research data collected by researchers, and it is usually conducted by sampling, such as random sampling. In the past, content analysis was often used in the relevant areas of journalism or mass communication where social phenomenon was explored and researched through content analysis.

Consequently, the study will use content analysis to explore and research the relevant literatures and discuss the important relevant dimensions on MOOCs instructional design.

## **FINDINGS**

After the research of content analysis, the researcher summarizes and concludes three relevant literatures of How to Mooc?- A pedagogical guideline for practitioners(1), Creating MOOC Guideline Base on Best Practices(2), and edX MOOC Development Checklist(3). Seven important dimension results are summarized through the dimensions on the instructional design checklists mentioned in the three articles. The results are as following:

**Table1:** MOOCs Instructional Design Check List

	(1)	(2)	(3)
1. Core demand			
Participants' attendance	▼	▼	
Select team member (such as TA, video producer, researcher...)			
Select proper course language	▼	▼	▼
Select suitable platform	▼		▼
Select proper tool	▼	▼	▼
Distinguish heterogeneous audience	▼		
2. Participant demand			
Course announcement (time, notice, welcome speech)	▼	▼	▼
Course objective each week	▼	▼	▼
Certificate demand	▼	▼	
Peer evaluation	▼	▼	
Provide feedback	▼		▼
3. Structure			
Course content differentiation	▼	▼	▼
Establish course objective	▼	▼	▼
Establish task	▼		▼
Establish test	▼		▼
Provide learning tool	▼	▼	▼
Test all of the learning activities, tasks and tests	▼		
4. Design			
Select media according to the course content	▼	▼	▼
Design task strategy	▼		
Design question pattern	▼		▼
Insert questions on the video	▼		▼

Establish discussion topic	✓	✓	
5. Task			
Define task according to different learning demands	✓	✓	✓
Pay attention on gender-sensitive vocabulary on the task	✓		
Define task in a clear and understandable approach	✓		✓
6. Communication			
Establish communication channel (such as forum)	✓	✓	
Encourage participants to own their own open space (such as WIKI)	✓	✓	✓
Announce relevant course information on the platform		✓	✓
Contact participants by E-mail		✓	✓
7. Resource delivery			
Devote more time to set up multimedia content and improve course quality	✓		
Ask participants to provide course feedback	✓	✓	
Use additional time to check the content of coursework and reply the demand from participants	✓		
Put videos on the internet for participants to download		✓	
Upload teaching materials onto the platform, including examination question database, articles, links and feedback		✓	

Dimensions include core demand, participant demand, structure, design, task, communication, and resource delivery; seven items in total. Among them, the two dimensions of “structure” and “design” scored the highest, followed by “core demand” and “participant demand”, and then “communication”, “task”, and “resource delivery”.

In the dimension of structure, distinguish course content, establish course objective, establish task and test, and provide learning tool scored the most because the most important learning experience during the learning process for participants are the differentiation of the objective and the establishment of the course task for course structure. In the dimension of design, select media according to course content, design task strategy, design question pattern, and design discussion topic are the most important parts because the application of media, topic and task of course discussion, and questions are closely related to the course content. Applying suitable and proper media and discussion topic helps learners get into the learning situation faster during the learning process. Tasks and questions that comply with course content guide learners familiar and master with course content during learning process and through after-class practices.

## CONCLUSIONS

The two dimensions of “structure” and “design” are found with the highest scores during the research process because structure and design are the core elements for course design. Select suitable media to match different course topic while classify the topic into clear and understandable unit and select proper discussion topics and questions according to course content to provide learner for discussion and practice during the course or after class enhance learners’ impression towards course content as well as help learners getting more familiar with the knowledge learnt from the course.

Gange' (1988) addressed instructional design was the teaching process arranged in a systematic approach, and its process was to make favorable arrangement for teaching. Systematic instruction includes five stages- analysis, design, development, implementation, and evaluation, and the five stages all have their own task and result. Structure and design are included in the design of ADDIE. During the process of design, teaching strategy, teaching objective, course regulation, teaching material, learning tool, media, task and assessment formulation, and discussion topic establishment need to be set up. These design items are very important for the course design. Teachers must consider these details during the design process in order to avoid problems appearing during development and implementation stages; the continuous revision needed will affect the learning effectiveness of learners' (Seel & Glasgow, 1990).

ADDIE proposed by Molenda (2003) included the analysis of learners and teaching content, and we can see from the checklist that the dimensions of core demand and participant demand scored the second highest. The purpose of the demand analysis is to confirm the course objective and content, select proper media and tool, understand participant demand such as analysis of certificate demand. It helps teachers to understand how to design and develop the course content better before designing the course.

We can see that the five stages of analysis, design, development, implementation, and evaluation are very important during the model of instructional design. Instructional design is to use a planned systematic approach to achieve a more smooth and target-oriented teaching. A comprehensive instructional design will enhance learners' learning effectiveness and motivation.

We found the dimension of "evaluation" is not listed on the checklist during the process of research analysis. According to the outcome of the analysis, teachers use task to replace evaluation because the task in the course can also develop the outcome of learners' learning effectiveness. According to the theory of instructional design proposed by scholars of Seel & Glasgow, Gange', and Molenda, it is an absolutely necessary dimension on the checklist. If the dimension of task is to be used to replace the dimension of evaluation, the detailed descriptions for task must be stated clearly so that teachers could evaluate learners' learning effectiveness and course content through them.

Another reason is the insufficient evidence of literature review. Due to the time restraint, only three articles are used for summary, conclusion and analysis. The dimension of evaluation is not found out probably because of the fewer articles used.

Therefore, it is suggested instructional design theory should be used when designing the course content as well as applying the structure of ADDIE for instructional design of the course. Checklist should be used to review whether the course content meets the detailed requirement of each dimension and effective evaluation method must be set up, such as learning sheet of each topic and after-class questionnaire in order to understand the suggestions and opinions from learners through the feedback after the completion of each topic. After the end of all courses, a general comment should be made and all the data should be integrated to form the database of the course. Whether the course is useful for learners and whether learners' learning effective improved can be understood through the course evaluation.

Furthermore, the content of checklist could meet the demand of instructional design more closely by referencing other relevant literatures and adding the dimensions on the checklist.

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# Analyzing the Views of the Science Teachers about in-Class Integration of Stem Applications

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## ABSTRACT

Taking into account the Science, Technology, Engineering, Mathematics (STEM) integration, it is important to investigate teachers' understandings, perceptions about STEM and how STEM practices should be incorporated into the classroom in order to explore the perceptions of science teachers on this subject and provide important information to teachers and researchers in connection with how STEM applications can be applied at high quality. The purpose of this study is to analyze the views of the science teachers about in-class integration of stem applications. 5 science teachers working in the province of Denizli participated in the study. The teachers received STEM training for 5 days in 2015-2016 school year. The training provides instructional strategies to assist Science Teachers in the implementation of STEM integration in the classroom environments and in the development of an understanding of the connection between the various STEM domains. All five teachers in this study have participated in the training given. A case study was conducted to describe the teachers' views on STEM integration and the situations related to the in-class practices on this topic. Teachers in general have described STEM integration as a way of problem solving, and stated that they also think that the STEM integration will give students a variety of 21st century skills they can develop. They think that when solving a real life problem, these skills provide them to create their own methods instead of the things given to them. Moreover, teachers have identified STEM integration as an approach that develops problem-solving skills.

**Key words:** *STEM Education, STEM Integration, Teacher Education*

## INTRODUCTION

As the scientific knowledge gradually increases, technological innovations move at a great speed, and the effects of science and technology are clearly seen in all areas of our lives nowadays, it is clear that science and technology education play an important role in the future of the societies. It is therefore seen that all societies, including developed countries, are constantly making an effort to improve the quality of science and technology education (MEB, 2005). STEM education which aims to educate students holistically and give them twenty-first century skills is one of these new approaches. In particular we can say it has been pointed out here that from the early ages the students need to be given the skills of the twenty-first century. At this point, the question whether the trainers who are going to upskill the students are sufficient for these skills becomes the main topic of conversation.

Our country's 2023 Vision and the aims of the Ministry of National Education (MEB) strategic documents demonstrate the necessity of defining science-technology-engineering-mathematics STEM education across our country (Corlu, Adiguzel, Ayar, Corlu, Ozel, 2012). However, studies done in this field are on the onset (Cavas, et al., 2013; Corlu, et al., 2012; Marulcu&Sungur, 2012). Therefore, the scope, theory and practice of science-technology-engineering and mathematics education, which is at the center of reforms aimed at raising a generation capable of innovation, should be studied at the level of schools and universities (Corlu, et al., 2012). In this sense, it may be seen important for teachers to fully understand the content and scope of the STEM and to have knowledge and experience of how to implement it in the class. Hernandez (2014) at his study towards determining the teachers' self-efficacy perceptions on STEM disciplines, he stated that teachers need professional development courses for STEM in order to give qualified STEM skills to students, such professional development courses have improved the teachers' self-efficacy perceptions and this is effective on students gaining the Stem skills. Hence, teachers' knowledge and experience in this field can be considered important both for their professional development and for their students to gain twenty-first century skills. For

example, in a study by Avery (2009) that aimed to investigate the impact of teachers participating in STEM professional development courses to their students' academic achievement, he ascertained that the students of teachers who integrate STEM activities into the curriculum have a higher perception of competence of their academic achievement and STEM disciplines than other students. In another study paralleling this one, Satchwell and Loepp (2002) reached the conclusion that when the content taught with STEM-based projects a significant increase has been seen in the learning level of students. Likewise, Thompson (2009) suggests that STEM-based learning reflects a positive change in mathematics and science education. As a result of the study done by Farior et al. (2007) it has been concluded that students experiencing design-based problems had some difficulty in transferring knowledge and that they succeeded in achieving the potential to use and retain knowledge when encountering problems through STEM-based training. Gallant (2010) concluded that if students work together in a collaborative group on real-world problems their interest towards STEM education and success would increase. Also, Fantz and Grant (2013) and Stohlman, Moore and Roehrig (2012) state that focusing on mathematics and science subjects to expand students' interests and awareness towards the school will be beneficial. In this context, when examined the studies conducted, Venville, Wallace, Rennie and Malone (2000) researched the implications of the integrative teaching of science, mathematics and technology in traditional discipline-based school environments, and the effect of integrative teaching on students' learning. Therefore, they have provided a learning environment in which the students can apply what they learn in science, mathematics and technology through "Solar Boat (Boat using solar energy)." As a result of the study, it has been revealed that the students raise their interests to learning and the integrative approaches of STEM lessons should be applied in the environments of constructivist education rather than the traditional discipline-based school environments. Bingolbali, Monaghan and Roper (2007), at their study, determined that the implementation of project-based learning activities integrated with STEM have a significant influence on the positive attitudes of students to STEM and their choices of profession in the future. The study carried out by Dewaters (2006) showed that the students are pleased with the lessons of STEM integration and these lessons assist to solve the daily life problems. In this study, the students asserted that STEM [lessons] integration have up-skilled their learning. The results showed that the students need to learn many types of advanced STEM disciplines in order to meet the engineering and technology needs in the future. Additionally, several counties, currently, by drawing attention to the students' learning environments, hope that STEM teaching can be improved with appropriate environment designs. Thus, we are in need of effective teachers. Accordingly, Cunningham, Knight, Carlsen and Kelly (2007) designed an in-service training program for teachers. Teachers have had knowledge and experience about the engineering design and then become experienced in how to use and incorporate the engineering design into the lessons plans during the program. The priority aim of STEM initiatives is to increase the number and quality of STEM teachers. In this way, well-trained teachers can help students up-skill and increase their innovativeness capacities in the twenty-first century (Corlu et al. 2014). In this regard, it is probably not possible to expect teachers to carry out activities for up-skilling the students' STEM without having their own skills or taking education for improving these skills. As a result, Taking into account the Science, Technology, Engineering, Mathematics (STEM) integration, it is extremely important to investigate teachers' understandings, perceptions about STEM and how STEM practices should be incorporated into the classroom in order to explore the perceptions of science teachers on this subject and provide important information to teachers and researchers in connection with how STEM applications can be applied at high quality. It is seen that countries such as America, England and South Korea are the leading states where the studies on the implementation of STEM education for teacher training and primary institutions are conducted. It is tried to make the concepts including in the education programs of these countries more understandable with the courses, congress and symposium activities for prospective teachers and teachers. Therefore, it can be easier to implement STEM activities in schools. In the countries having such good applications, determining the position of STEM concept in education programs, how it is reflected to teacher training, and with what kind of activities are trying to provide students with skills, attitudes and behaviors during the lesson in secondary schools will help to eliminate the problems. Taking into account teaching STEM disciplines as an integrated approach, science teachers need to develop new teaching strategies and techniques, and upskill in order to have content knowledge about STEM subjects and apply STEM integration in the classrooms. The studies show that using of integrated approach in education has a positive effect on students' success. Ozdilek and Ozkan (2009), at their study, researched the effect of instructional design prepared by an integrated approach with many teaching strategies on the students' learning levels and determined that the students who are applied to the instructional design developed as a result of the

research had a higher achievement compared to the students who are educated with the current program. Developing an integrated program and creating an environment suitable for STEM education in our schools provide students to establish a connection among disciplines, be enthusiastic about learning, increase their success of mathematics and science, and improve STEM education and learning (Gallant, 2010; Riskowski et al., 2009; Satchwell and Loepp, 2002). In a study performed by Elliot, Oty, McArthur and Clark (2001), integrating mathematics with science, technology and engineering has enabled students to create meaningful connections with these disciplines. Hartzler (2000) specified that science and mathematics which are taught based on an integrated understanding have enhanced students' success, interest, eagerness to learn and self-efficacy in a meta-analysis study that he conducted among his thirty individual studies related to effect of integrated teaching on students' achievements. In this sense, continuing vocational education of science teachers in order to gain information and experience to teach STEM integration is considered as a crucial reform emphasizing the problems about implementing Science, Technology, Engineering and Mathematics integration in the science classrooms (Loucks-Horsley, Love, Stiles, Mundry and Hewson, 2003). It is important to investigate teachers' understandings, views about STEM and how STEM practices should be incorporated into the classroom in order to provide important information to teachers and researchers in connection with how STEM applications can be applied at high quality. Other researchers placing importance on this study needed to emphasize the effects of these trainings after the education of STEM practices for teachers. In this sense, the results of this study are important with regard to give information to the future teachers with the professional development programs aiming sustained changes in science classrooms. This study focuses to answer the following two research questions:

1. What are the general views of teachers about STEM integration after receiving STEM education?
2. Is there any connection between the views of teachers about in-class STEM practices and STEM integration?

## **METHODOLOGY**

A case study was conducted to describe the teachers' views on STEM integration and the situations related to the in-class practices on this topic. Yin (2011) explains that case studies are appropriate when the research questions address a descriptive inquiry (e.g., "What is or has happened?") or an explanatory question (e.g., "How or why did something happen?").

Techniques to establish credibility consist of members checks and the triangulation of the survey instrument, focus individual interviews. Member checking consists of allowing participants to review the transcription of the interview and correct any errors in interpretation (Creswell, 1998). Triangulation of data consisted of comparing the three data sets: the survey data, interviews from individuals. Through the triangulation of sources, we can determine the consistency of the data sources (Angen, 2000). Triangulation makes it possible for the researcher to learn and fully understand what is being studied. In addition, the researcher communicated with the participant teachers to check whether the interpretations brought to themes and themes were correct in order to further enhance the reliability of the study.

The interviews were carried out, analyzed and thematically coded by the researchers.

Data collection was carried on in order as follows: 1) training teachers about STEM integration before interviews and classroom observations, 2) having pre-interviews with teachers before starting in-class STEM integration lessons, 3) making teachers' classroom observations when they start to STEM integration lessons, 4) having interviews again with teachers after completing STEM integration lessons. Two interviews, one of which is pre-interview and the other post-interview, were conducted with the participants.

Each interview lasted about 40 minutes. The pre-interview is a semi structured interview carried out before the participants start STEM integration lessons. The pre-interview questions focused on five significant areas. 1) The views about STEM (Science, Technology, Engineering, Mathematics) disciplines, 2) The views about STEM integration, 3) The past experiences on STEM integration, 4) Preparation the students for 21<sup>st</sup> century skills and 5) The challenges and obstacles of STEM integration.

The final interviews were conducted after the participants completed STEM integration lessons. The aim of final interviews is to enable teachers to explain and detail STEM integration applications in the classroom and to clear the connection between teachers' views and in-class practices.

### **Participants**

Five teachers were purposefully selected for STEM integration training. All five participants were middle school science teachers. Participant acknowledged that they did not have experience STEM integration.

### The Application of STEM Activities

A story emphasizing the STEM activities about Electrical Unit, lesson plans, worksheets and engineering design process steps at the beginning of the Unit was prepared in this study. It was provided STEM training for 5 Science teachers working in three different schools located at Denizli and was asked to integrate these applications into this unit. The applications have taken totally 48 hours, including intra-and out of lesson and intra-class observation has been conducted.

In this study, 6 different STEM activities have been used. The activities have been prepared in accordance with the engineering design process.

1. Series Circuits
2. Parallel Circuits
3. Toy Workshop
4. Wind Turbine Work
5. Electricity Saving Work
6. Poster Preparation

### Classroom observations

The principal focus of classroom observations was to observe in-class practices that the teachers used STEM integration. For this purpose, the classroom observations were made during STEM integration lessons of the participants. In order to provide the recording of classroom observation data, detailed field notes have been used. The purpose of field notes is to provide the detailed description of classroom practices including the contents such as lessons' content, and teacher-student interaction. The data analysis method in this study can be summarized briefly as follows: (1) open coding, (2) description of templates and categories and (3) setting themes and models for cross-case analysis.

During open coding, data sources were tried to be organized by taking the frequently-used words into consideration. The purpose of using open coding is to explore each participant's views about STEM integration.

### STEM Integration Training

STEM integration training has been given to 5 science teachers working in the province of Denizli. The training provides instructional strategies to assist Science Teachers in the implementation of STEM integration in the classroom environments and in the development of an understanding of the connection between the various STEM domains. All five teachers in this study have participated in the training given. The general purpose of STEM integration training is to enable teachers to understand the subjects they have taught thoroughly and analyze the relationship between STEM disciplines. STEM education lasted 5 days in 2015-2016 school year. The training activities have been designed for teachers to think deeply about what they learn during the training and to share experiences they have learned while applying in the classroom. The training subjects and content have been given at Table 1.

Table1

Title	Content
What is STEM?	STEM education in Turkey and in the world, the importance of STEM training, the nature of STEM
What is engineering? And what is engineering design process?	Engineering as a separate discipline, the relationship of engineering between Science and Mathematics and Engineering Design Process
Mathematics, Science and Design	The points making engineering different from Mathematics and Science
Problem solving, Project-based and Problem-based learning	The relationship of STEM between Problem Solving, Project based and Project based learning
Preparation of STEM lesson plan	Preparing STEM activity and its integration with current units
Technology Integration	Technology integration in teaching of Science, Mathematics and Engineering

The STEM training given to the teachers emphasizes on the integration of STEM disciplines and the quality of these disciplines.

### Study Findings

Five major themes emerged from an analysis of the interview data. These themes were the following:

1. Understanding of STEM integration
2. Challenges and obstacles
3. 21 st century skills
4. Learning outcomes
5. Implementations of STEM integration

The researcher further refined these themes, which came from textual descriptions (see Table 2).

Table 2

<i>Themes</i>	<i>Textual Descriptions</i>
Teacher's understanding of STEM integration	STEM integration is problem solving (Real world problems) STEM integration is like a way in which scientific process skills Engineering desing process Creating their own product
Challenges and Obstacles	Time constraints
	Experiences for STEM
	Students' STEM ability
21st century skills	Units
	Solving problems
	Learning from failure
	creavity
Learning outcomes	Defining, Formulating and Solving Problem
	become independent thinkers
	Use engineering design process.
	Opportunity to use their theoric knowledge
Implementations of STEM integration	Relate to real World problems
	Problem solving is a component in a STEM integration lesson
	Content knowledge is important for STEM integration Engineering design

### Teacher's understanding of STEM integration

The problem solving has become the most common concept that the teachers use to define STEM integration. As P1 stated, one of the teachers, "STEM integration is to use Science and Mathematics in order to solve the real life problems, and in my opinion, STEM integration is a way to use problem solving skills and develop these skills." On the other hand, P2 defined STEM integration as follows;"STEM integration is a solving problem which mixes the current theoretical information related to Science and Mathematics with Engineering design processes."And, P3 stated as following;"STEM integration means that different disciplines come together in order to solve an existing problem."

The teachers have associated STEM integration with the problems faced in real world. For instance, P1 mentioned about this subject as the following;

"We are speaking about a situation related to real life in a STEM activity. There is a real problem that should be solved. The students face this problem and try to produce a solution for this situation."

And, P2 said as follows:

“STEM integration brings students together with the problems of real life. It provides them to use the information of Science and Mathematics in order to produce ideas about these problems and come up with the solutions.”

Most of the teachers (P1, P2, P4 and P5) believe that solving a problem using STEM integration will assist the students to understand better about what engineers work in fact. P1 said “The engineering, all by itself, is a STEM integration. This provides students to develop a point of different views to real life problems and use the theoretical information that they have learned in the lesson.”

And P2 said “Personally I think, STEM integration is like a way in which scientific process skills are used. It exhibits almost real life situations about what the engineers do depending on their carriers since each subject of science is, indeed, a field of study of the engineering discipline.”

P2, on the other side, said “I ask the students to create a product in a STEM activity because I want them to use their imaginations and creative ability in order to create a product. The fact that the students create a product is extremely important for their permanent learning.”

And, P2 described the application method of engineering in the activities as follows; “Engineering have existed in all activities including the series and parallel circuits.” P3, also, stated about incorporating the engineering into the activities; “Engineering have been suitable for 7<sup>th</sup> grade acquisitions and is an activity including engineering design process.” And, P5 said “Engineering is in the last part which the students have created products.” P4 defined this as the following “It was important that the concepts which the students learned about the subject connected to the engineering design process.”

When asked about the focus point of STEM integration, P1, P2 and P3 mentioned about the engineering design process. P1, demonstrating Wind Turbine activity as an example, said “In my opinion, the engineering design process is highly important in teaching STEM integration. The Engineering design process allows us to solve the problem. P2 stated her opinions as follows “Using the engineering design process on behalf of organizing the information for a problem solution and allowing for testing and retesting is the basis of STEM integration.”

And, P3 said “In my opinion, the engineering design processes are pretty valuable for STEM integration. This is relatively important with regard to emphasizing the engineering discipline and presenting its relationship with the other disciplines.”

P1, P2 and P3 believe that the students should learn the engineering design process and practice on this subject. According to them, what makes STEM different is the design processes. Also, since the students are accustomed to immediate information, they have emphasized that the students should solve the problem using and applying their own views. This is also related to the fact that the teachers desire to help the students to develop their own independent thinking abilities.

For instance, P1 said “In order that the students can design their own products and transform their ideas into products and find creative solutions to the problem, the problems should be open-ended, since the students were always conducting experiments like prescription before.”

At this point, P3 said “The engineering design processes assist the students to carry out the problem solving by using their own ideas.”

On the other hand, P5 and P4 have not directly mentioned about the engineering design during the interviews. On the contrary, they have emphasized the importance of integrating the engineering into STEM integration. One of the biggest reasons that P5 believe that the activities are accomplished is to try to integrate both science and engineering into the activities. He said “I feel that the activities are successful STEM integration due to incorporating the engineering by emphasizing its difference from the other disciplines. According to P4, she also believes that engineering is a part of STEM integration. Considering the basic concepts of science in STEM integration, P4 has asserted that and the engineering integration process and mathematics are the means providing quantity assurance and the technology is the thing finally acquired. In order to conduct a STEM activity, all STEM activities should be integrated into all units. She also said “As far as I am concerned, integrating STEM completely is also to systematize it. Therefore, when talking about STEM integration, it has not only made any special effort to mention about engineering.

Studying based on product-focused is another concept including the engineering design. Most of the teachers believe that they allow the students to transform their ideas into real and concrete products by applying STEM integration. For instance, P1 said about this subject “Conducting engineering type works or doing projects are that it is because the students have to practice those again and again. In this way, they can use what they have learned about science and mathematics in order to do something related to engineering and to build something.

P2 had asked her students to create and present a poster in the activity about electricity saving. We are discussing instead of testing in the engineering design process and the students are sharing and discussing the data they have acquired. Of course, what everyone has done is not necessarily be similar to each other. Everyone can share their ideas and data. P4 thinks that existing of a problem to be solved in product-focused activities is the crucial point. According to P4, the “testing” areas, such as testing different materials or solutions, is substantially important in order to find the best solution in a project of STEM integration. She said “The students should design a product that can be tested physically for STEM integration. This provides them to learn, and in my opinion, the children should learn to think. They should touch something, play with something, and reach to a solution trying their ideas or conducting an experiment with materials.

Teachers' views of STEM integration and their application in the classroom and the role of problem solving in STEM activities are strong links. Findings also show that teachers believe that helping students to think independently and work on the project as a true engineer is a valuable feature in an STEM event. Both teachers' views and classroom practices suggest that teachers see STEM integration as one of the most important factors in problem solving.

All teachers have given an engineering design problem or challenge to their students to solve. In this case, it can be referred to as a context without problem solving. On the other hand, they also expressed that students want to be independent thinkers using their own ideas to solve a problem. For this reason, problem solving is also used as a process in STEM activities.

### **Challenges and obstacles**

We will discuss the difficulties that the teachers have faced in applying STEM activities in this theme. This theme, unlike the others, has not been presented by following the models, since the difficulties or problems that the teachers have met after applying STEM activities in this theme have been particularly discussed. This theme is related to the teachers' views, however, they have not been ever observed in the applications of STEM activities. This theme will be handled using the reflections of all teachers after practicing STEM activities. There are four issues or problems especially related to STEM integration that the teachers mentioned about after applying STEM activities. Firstly, most of the teachers (P1, P2, P3 and P5) agree that the students' abilities on STEM subjects have a big effect on how they design and apply STEM activities. Also, the same teachers suggested that the students who have a highest academic achievement have not volunteered in STEM activities; on the contrary, the students who have a low academic achievement are at the forefront in the STEM activities. P1, P2 and P3 are concerned about determining how the students ask for support in order to comprehend and complete the project of STEM integration. Secondly, all of the teachers believe that some science units/subjects such as energy, force and speed are easy to use those with STEM integration. However, the other teachers, like P1 and P5, think that the science units/subjects such as biology or chemistry are not too easy. Thirdly, most of the teachers (P1, P2 and P3) STEM integration felt uneasy because they did not have experience. They have stated that this situation is threatening the classroom management. Additionally, time, material and curriculum are the ones of biggest problems affecting the application of STEM activities.

The teachers are also worried about how they give instructions to their students in order to describe STEM activities. P1 said “The students try to correlate all the information with what they desire and do. I should directly teach all of the theoretical information required for the students. And, P2 said “Since the students are not exactly sure about what they will do in what phases, the situation is getting complicated. While introducing such an activity, mostly, I have to assist. P3, on the other side, said “The students need to be guided too much. It seems like what we do for STEM integration, even partly, depends on your students' levels. I am only a secondary school teacher. My students needed to be guided much more in order to complete their activities. Also, engineering requires to write and to design for drawing. My students do not like writing and drawing. They want to try the ideas in their mind. Another concern related to the students' abilities is that some teachers (P2 and P5) believe that some students need more time than others to complete the STEM projects. And this has made planning much more difficult for the teachers. P2 mentioned the followings “Some groups can carry out the activities early but other groups have not started yet. Therefore, I have difficulty in balancing between them. P5 said “The [students] study in different periods of time. It is quite difficult to tell them “Be fast, you fell even further behind.” Some of them cannot use the time well. And, some are unaware about what they will do. In general, STEM activities were complex. The students talked with their group friends about their designs, walked around the classroom to test their products or wasted time, and did not do anything that they had to do. One of

the contradictory subjects in STEM integration lessons was the “fun learning” factor.” The teachers thought that this factor overshadowed the students’ learning required to complete the lesson. P1 said that “The students liked STEM activities. For some reason, they did not study the worksheets despite being motivated and if they had not written their views and notes, I would not have known what they did learn on that day. I thought that they tried to join the parts together without thinking in detail.”

P2 believed that she thought the [students’] ideas in detail and did not want to move carefully. They do not want to talk about the strengths and weaknesses of the products. They like to finish the products as immediate as possible and compare their products with the other group. P3 stated that the greatest difficulty was to have the [students] do unfunny parts such as having them write their ideas. The measurement part is not funny for them. Therefore, they take half measures. The time was a big problem for the teachers to apply STEM activities. P2 asserted that she needed time rather than regular lessons for STEM integration. Time is always a difficulty for me.” She said “The students need much time than I expected from them.” In order to carry out STEM integration, much more time is required. P1, P3 and P4 stated that they really had to think how much time is needed for the lesson while planning STEM integration lessons. P3 and P4 pointed out that if they had much more time for STEM integration lessons, they could have taught the lesson more comprehensively.” P4 said “Time is a big factor. I would like to give theoretically information; however, time is the biggest problem.

The teachers have mentioned about how materials could change STEM lessons. P1 and P3 explained the subjects related to the materials. P1: “In my opinion, the most difficult part I faced in STEM integration was materials, since there are not enough materials in our school.” P3: There were not enough resources that I can use in our school. P4 particularly stated that the materials have affected what she desires to do in STEM activities. She said “The materials are a big problem for such activities. I need materials which are easy to access and use.

Also, the teachers have stated that the curriculum is complied with STEM integration. All of the teachers have agreed on this subject. They have expressed that they have to manage the curriculum and do not show tolerance on this subject, and according to this, the curriculum should be organized in order to carry out STEM integration without having a problem. Moreover, all of the teachers have stated that they will not apply STEM integration due to 8<sup>th</sup> grade TEOG exam.

### **21st century skills**

All of the teachers believed that STEM integration could teach the students a number of 21st century skills to need out of the science class. The teachers think that the students are more eager to try their ideas since they know that the students do not know the correct answer, but search the best answer. P3, P5 and P4 are of the opinion that STEM activities especially assist the students to look at their mistakes from different aspects. P3 suggested “Learning from the errors/mistakes is a 21<sup>st</sup> century skills for the students. If something does not work, it is highly important to keep going without giving up and understand that mistakes are human. A STEM activity is extremely important in teaching students not to give up when they have failed.” P5 said “The students do not realize that if things are not going well at their will, they can find out its value and benefit from this situation. This is the most crucial problem of the children, personally I think. And, STEM activity assists the students to understand the value of re-trying. P4 stated “I want [my students] to recognize that when they reach an answer they do not expect, this is an ordinary situation, and ask them to try. This is a process to assist them. These things are those that the students should understand even after finishing the school. When considering P2 and P1, they have suggested that the students feel disappointed when they cannot solve a problem. P1, on this subject, said “The students really got disappointed, but when they started to accomplish in fact, the victory they gained is the most important. P2 said “Stem integration is like life skills, such as overcoming a problem or disappointment. STEM integration is a study conducted with the levels of the students’ disappointment. P1 and P2 believe that the problem solving in STEM integration assists students to understand how to study using different ideas in spite of their disappointments.

Most of the participants stated (P1, P2, P5) that STEM integration improves the problem solving skills and creativity of the students. In this regard, P1 said, "STEM integration offers students the opportunity to solve problems through creative ideas." In short, "STEM integration suggests that students develop creative thinking." P5 says, If you want to educate a creative generation, you must achieve STEM integration in your courses. "

From the teachers' viewpoint, these themes are very closely related to helping students to think independently. Teachers have encouraged students to use their ideas and try different solutions when solving problems at all STEM events. They believe that the problem-solving part of STEM activities enables students to realize that

even the methods they think are wrong can come to the right conclusion. Students also see the value of making mistakes. They need to keep trying to be successful and not be afraid of it even if they get an answer they do not want. This is especially observed in the practice of teachers. For example, P1 said that “when designing a toy car for his students, it is completely natural and correct to create many different ideas. You will also decide on how to act your P1 students in the same activity. So check your materials well and make your decision on how to play your game. P3 also encouraged his students to examine materials provided to them before deciding how to design the Turbine in the event of the Wind Turbine. This is what he says: “If you want to look at materials before you start designing turtles, you can come here and look at the ingredients. In the redesign part of the Wind Turbine effect, he again encouraged students to think about different design methods; -Maybe your turbine is very durable, but its wings are too small to generate energy. How can you make changes to your design to produce more energy? P4 encouraged his students to think about different solutions to the Toy car event. He reminded his students that they should design their car as cheap as possible. And then - the very thoughtful group generally gets better results. You have to plan ahead and that's what you need to work on. In another example. After a group of students completed their design, P4 told the situation, and he said: “Think about how you can make changes in your design.”

In general, all teachers also think that an STEM effect naturally creates a learning environment that helps students insist on continuity and continuity while trying to solve a problem. Dealing with failures and mistakes is an important life skill that students need to master and develop, even if they do not choose an STEM area as a career in the future.

### **Learning Outcomes**

According to the participants, the integration of STEM provided many opportunities for learning to learners.

P3 raised concern about this point “One of STEM integration purposes is to provide students to really understand about what the engineers practice in their works and to become self-aware about vocational career related to this fields. And therefore, when you provide an environment which is authentic and connected about what the engineers work, you can awaken students’ interests and provide students to face to the fields of this discipline.”

P4 build STEM integration on the idea about how the students gather the information that they have learned. She, also, mentioned on this subject “In this way, the students actually practice what they have learned rather than reciting or repeating. STEM integration allows the students to use the information obtained theoretically instead of reciting them.”

The teachers think that incorporating the problem solving into STEM integration makes a big contribution to students to think independently. The fact that the students can produce their own ideas through brainstorming and respect to the ideas of their group friends has been also valuable for the teachers.

As P1 emphasized “I enable the students, on their own, to find the solution of real life problem given in the scenario at the beginning of the lesson through brainstorming.

P2, on the other side, said “I ask the students to create a product in a STEM activity because I want them to use their imaginations and creative ability in order to create a product. The fact that the students create a product is extremely important for their permanent learning.”

Also, P3 said “Using the problem-solving skills in STEM integration allows the students to try new things. The students’ learning by trial and error makes the learning more permanent. STEM integration gives students the chance to be a part of the scenario and motivates them to solve the problem.”

P4 build STEM integration on the idea about how the students gather the information that they have learned. She, also, mentioned on this subject “In this way, the students actually practice what they have learned rather than reciting or repeating. STEM integration allows the students to use the information obtained theoretically instead of reciting them.

P5 believed that the teachers should encourage the students to think autonomously and emphasized that the students should become independent and be creative instead of guiding them, and then said about this subject as follows, “While the students find solution to the existing problem, instead of giving instructions, we should tolerate and not restrict them in order to put their own ideas into practice. This provides the students to produce authentic products which are independent and different from each other.”

Teachers' views correspond to classroom practices in this theme. They want to think among different solutions for a problem that their students need to solve. In classroom practice, teachers encourage their students to try their own ideas to solve a problem / challenge. Students are asked to think about different ideas and solutions

even when they produce a product that meets or addresses the difficulty. Teachers think that thinking and experimentation, which are closely related to the engineering design of an STEM-enabled one, can help students approach their mistakes differently. These teachers' hopes helped them learn how to cope with the situations they perceived as failures in their lives by implementing STEM integration.

### **Implementations of STEM integration**

According to P1, STEM integration is a teaching strategy that students can use to teach problem solving. It focuses on problem solving skills or problem solving processes from theoretical knowledge or STEM topics. I am emphasizing in my lessons that STEM is composed of problem solving processes which are the common goal of all, not in the way that different disciplines come together.

An open-ended real-life problem is a necessary component of P5 and P4 STEM integration course. P5 says: "I do not give answers [to students] when we do problem-solving work, even though students are accustomed to doing prescription experiments. We solved the problem for them. "And at these STEM events we brainstormed about real life issues and problems and tried to solve real life problems, not just at school or textbooks.

According to P2, "The STEM integration indicated that the way of use depends on how it fits with the content that it wants to teach. The implementation of the STEM integration also required consideration of science and engineering disciplines. He said: "Look at the content I want to teach. Then I think of whether to incorporate STEM activity into "and" STEM activities or integration is a tool that can be used by me to relate the learning of my students to what I can adapt to the content. In other words, STEM integration is an approach that contains many methods and techniques and I use it as a tool to teach content."

Most of the teachers (P1, P2, P3) emphasized that the engineering design process is important for STEM integration. According to P2 "Successful completion of the application was due to the full implementation of the engineering design process" In this regard, P3 said: "The most important feature that distinguishes STEM integration from other approaches. It is necessary to follow the steps of the engineering design process to make a successful integration."

Teachers' views correspond to classroom practices in this theme. They want students to use engineering design processes at all activities.

### **Conclusions**

The purpose of this study is to analyze the views of the science teachers about in-class integration of stem applications. A series of interview questions addressed the teachers' views of STEM integration and views of teachers about in-class STEM practices.

The participants believed that problem solving real life problems played an important role in STEM integration. All of the teachers thought that engineering design process were key of STEM integration. When the researcher compared the participants' responses, the following terms were frequently identified from the analysis: STEM integration is solving real world problems, STEM integration is like a way in which scientific process skills, Engineering design process, creating their own product. For example, P1 described "STEM integration is to use Science and Mathematics in order to solve the real life problems". P2 defined "STEM integration is like a way in which scientific process skills are used." P3 defined this as the following "the [engineering design processes] are pretty valuable for STEM integration." P4 thinks that "existing of a problem to be solved in product-focused activities is the crucial point." The literature reviews supported these findings for example 3 teachers, participating in STEM program in this setting understand the STEM integration and how STEM integration is applied to the classroom (Wang, Moore, Roehrig and Park, 2011) the researchers have identified similar themes. Teacher's challenges and obstacles are time constraints, Experiences for STEM, Students' STEM ability. In support of these obstacles, time was a key factor reported by Gencer and Ozel's (2012) study, which identified problems teachers faced during the implementation of STEM instructional process.

All of the teachers believed that STEM integration could teach the students a number of 21st century skills to need out of the science class. That strategy should include all the STEM disciplines and address the need for greater diversity in the STEM professions, for a workforce with deep technical and personal skills, and for a STEM-literate citizenry prepared to address the grand challenges of the 21st century Vann (2013) contended that teachers are a critical key to preparing students for the future workforce. Therefore, teachers need practical experience with STEM integration in the form of real-life, problem solving experience, so they can better encourage the students and help them develop the 21<sup>st</sup> century skills.

According to the teachers an open-ended real-world problem, problem solving process, and Engineering design process are necessary components of STEM integration. As outlined in the literature review. Examples of relevant definitions, as determined in the literature review. The National Research Council (2011) believes increasing the visibility of engineering and technology in STEM education is vital for the interconnections of teaching and learning. The outcome of integrative teaching by using engineering design is transdisciplinary learning through an authentic context that promoting student STEM literacy and readiness for STEM-related employment, which contributes to their own economic success as well as the nation's (NRC, 2011).

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# **Anti-Conflict Behavior Training as a Technology for Preparing Medical University Graduates for Professional Activities**

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## **ABSTRACT**

The undeniable advantage of simulation technologies is the fact that their implementation allows specialists to get away from the traditional forms of the educational process (where the teacher is in the center of attention) and shifts the focus to the student, giving him the opportunity to practice skills, admit and correct mistakes, analyze the situation and draw conclusions.

The main goal of the training was to prepare graduates for non-conflict interaction with patients in a polyclinic and a hospital.

The training involved the implementation of quasi-professional activities at 3 “stations” in the simulation technologies center:

- 1) Office of a doctor-therapist in a polyclinic (verbal and non-verbal technologies of non-conflicting communication, reducing the energy of the conflict were worked out);
- 2) Inpatient department of the hospital (the skills of productive interaction, the determination of attitude to the disease type, the type of the conflict personality, and response in an unconventional situation were worked out);
- 3) Office of the chief doctor (the analysis of complaints was carried out and the skills for resolving the conflict were worked out).

The 6th year students of the Clinical Psychology Faculty played the roles of patients and professionally represented vivid images of conflict characters.

The training provided two types of results.

On the one hand, the students of the medical faculty trained the ability to distinguish behavioral manifestations of different types of attitude to the disease and to realize response manifestations in situations of communication with them in the conditions of quasi-professional activity.

On the other hand, students of the Clinical Psychology Faculty, playing the roles of both the patient and the psychologist-supervisor, expanded their representation in the field of practice and methods of counseling in a hospital.

## **INTRODUCTION**

Modern universities are focused on increase in level of graduates training. In this regard they introduce the existing mechanisms, models, techniques of an assessment of quality which allow developing various activities of the organization, to increase effectiveness and efficiency of the work. It leads to increase in competitiveness of the educational organization that, in turn, opens the new educational horizons for students.

One of the widespread teaching methods in universities of a medical profile is the method of simulation training. Simulation or modeling in education is the tool for practical teaching in the situation reminding reality. Simulation models allow students to make a mistake and to carry out the correcting actions of this mistake thanks to the feedback communications (debriefing) (Balkizov & Semenova, 2015). According to the references of Association on medical education in Europe, the simulation training is understood as “... any educational action reproducing clinical conditions for the purpose of training, mastering, estimation, repetition or research...” (Blashentseva, Boyarintsev, Balkizov & Baranova, 2013).

## **THE PRINCIPLES AND OBJECTIVES OF DEVELOPMENT OF THE MEDICAL PROFESSIONAL CLINICAL SKILLS AND SKILLS OF COMMUNICATION**

The main approach to development of the best expertise in the field of forming and strengthening the medical professional clinical skills and skills of communication in condition of performing procedures safety rising, coordination and professionalism is presented in large-scale introduction, taking into account the cultural, ethical and humanistic principles, new medical educational technologies on the basis of modeling.

The application of a medical simulation training method provides:

- Active and controlled training of medical experts.
- Formation of necessary professional knowledge, abilities and skills.
- Individualization of training process.
- Situation of training in crew.

- Possibility of modeling various extreme situations.
- Existence the feedback communications.

This is the reproduced, standardized, purposeful training aimed on prophylaxis of professional medical mistakes. The implementation of this method provides the conditions for high-quality training, professional growth, self-changing, coeducation (Loginova & Chupina, 2011). Simulation (imitating, not imitating, game, etc.) training methods give opportunities as for improvement of professional training quality, so for students' self-realization and life self-implementation in different types of educational activity. It becomes possible as this method is a way of students' joint activity in which participants of educational process interact with each other, solve problems in crew, model situations, estimate actions of each other and own behavior, plunge into the real atmosphere of cooperation in situation of solving problems (Sidorenko & Loginova, 2014; Loginova, 2017).

The list of specific training actions is being implemented for the aim of formation among future medical staff of such clinical and practical skills as manipulative, crew and communicative, as well as readiness for an occurring with unexpected clinical cases. The training actions are as follows:

1. Application of a wide range medical simulating technologies:

- Modeling of patient's systems and organs.
- Up-to-date simulators.
- Use of actors ("the standardized patient").
- Imitation of real clinical situations and typical cases.

2. Constructive discussion:

- Analysis of typical mistakes.
- Use of video registration equipment.
- Benevolent atmosphere.
- Process of training with use the simulation technologies.

As a result of the long-term data analysis it was revealed that the quantity of professional mistakes made by medical staff was sharply reduced after this type of training (Egorova, Shevchenko, Kazakov & Turzin, 2012).

In the system of medical education simulation is the cornerstone of a series of the techniques designed to reproduce clinical situations with the purpose of training, repetition and assessment. Simulation is the art to imitate reality, sequence of events and actions, or thinking process.

The efficiency of pedagogical simulation, as well as of other methods of training, depends on specific features of its application. Simulation has to be applied in combination with clinical training. It is important to define the expected results of simulation use, feedback is extra important for successful training with simulation use; it has to rely on individual educational requirements.

The indisputable advantage of simulation technology is the fact that their implementation allows to refuse from traditional forms of educational process where a teacher is in the center of teaching process and attention. But it allows shifting the focus to the student, giving him an opportunity to fulfill skill, to make and correct mistakes, to analyze the situation and to draw the conclusions.

Along with formation of medical skills during the university study, special attention is paid to so-called "flexible" skills. The anti-conflict behavior belongs to the range of such skills.

In recent years the quantity of the conflict situations arising between patients and the medical organizations which are connected with delivery of health care (medical services) has significantly increased. There is a real set of reasons for this situation: change of social and economic conditions, growth of legal knowledge of the population, increase in a share of expensive medical services, and also prevalence of psychosomatic diseases, in particular depressions and depressive states having stress in the basis. By the lack of elementary knowledge in the field of psychology, concerning mechanisms of relationship and perception effects, the population loses the health, gets into artificially exaggerated stressful situations, writes complaints to all instances, including complains on doctors of policlinics. Psychologists understand that neither doctors, nor patients are guilty as each person with adequate mentality seeks for the same: safety, health, happiness, material welfare to him/herself and to the relatives. But different people behave differently; they do as they can, because of heredity and the environment of education. For this reason the urgency of health preservation of the population, improvement of health care quality and decrease of conflict situations (and as a result decrease of complaints quantity addressed to doctors and experts of social sphere services) was specially sharpened.

### **THE EXPERIENCE OF ANTI-CONFLICT BEHAVIOR TRAINING**

The main objective of the training is preparing graduates for non-conflict interaction with patients in the conditions of an out-patient department and a hospital.

The training assumes exercise of quasi professional activity at 3 "stations" in the center the simulation technologies:

- 1) Therapist's office in an out-patient department (verbal and nonverbal technologies of non-conflict communication, decrease of the conflict energy are fulfilled),
- 2) Reception of a hospital (skills of productive interaction, skills of defining a patient's attitude towards illness, type of the conflict person, reaction in an unusual situation are fulfilled),
- 3) Office of the chief physician (analysis of complaints is carried out and skills of conflict resolution are fulfilled).

Sixth year students of the Clinical Psychology Faculty professionally represented bright images of conflict patients.

### **The first stage of the training (the therapist's office in polyclinic)**

The major objectives of this training stage are as follows:

- To understand the sources (factors) of the conflictogenic and conflict situations emergence;
- To record available for students - future therapists constructive response to conflict patients;
- To show the psychological technicians promoting decrease in “energy” of the conflict.

Within one training hour 3 conflict situations in polyclinic are given. For example, the patient came to the therapist, but aggressively reacts to the reception, long queue, to service not on time fixed according to the coupon, to side effects of drugs, or even appearance of the duty therapist, etc. After each play situation the psychological analysis is given: information provided for group discussion and the explanation of the teacher conducting group. Psychological information contains the following techniques and approaches of working in a conflict situation:

- “Psychological depreciation”;
- “Reflection of feelings”;
- “Informing with / without the choice”;
- “Yes ..., but ...”;
- The poses and the gestures of the therapist which are reducing/increasing “energy” of the conflict.

### **The second stage of the training (reception of a hospital)**

Within one training hour 3 conflict situations in office of a hospital are given. At this stage the major attention is being paid to the doctor’s abilities to take into account the fact that behavior of the patient, his internal decision to be treated or not, as well as patient’s idea of how to be treated if he is ready to receive treatment is determined by both personal features, and the type of the patient’s attitude to a disease. Both the doctor and the patient can be active parties of the “Doctor/ Patient” conflict, the guilt can be measured equal. In this case it is important to make ready the future medical university graduates for recognition of the specific features of the patient’s identity and the choice of the most effective ways of interaction in hospital conditions.

Here an example of the supervisor analysis describing the situation of interaction “Doctor/ Patient” is given.

Actions of the patient: the patient Ekaterina has headache complaints (2-3 times a day). The head aches during one or two hours, then ceases. The patient is worried and afraid that she can have a severe disease; asks for some pills that will stop the pain. The patient declares that she has visited another doctor already, but the doctor’s help wasn’t effective. The patient demands to be examined only by the best doctors. She presses to get much more doctor’s attention in comparison with other patients, as she is sure that things are going to worsen and she can suffer from a sudden stroke.

Actions of the doctor: the doctor excessively attentive to the procedure of previous treatment (who treated, where the patient was treated, why the treatment wasn’t effective). The coping strategy which was used first by the therapist wasn’t effective with this type of the patient, an attempt to calm the patient by the phrase “Don't worry, everything will be good” has just caused bigger nervousness.

The requirement of exclusive care, aversion for other patients, who are also requiring attention and care are manifestation of egocentric and anxious types of the relation to a disease. Such patients reveal their personal exclusiveness concerning a disease, are emotionally unstable and not predicted, uneasy and hypochondriac concerning an adverse course of disease, its possible complications, treatment inefficiency and even danger of treatment. They are inclined to search of new ways of treatment, additional information about a disease and methods of its treatment, frequent change of the attending physician.

Recommendations: during the anamnesis collecting it is necessary to speak in active, detailed and structured style, it is useful to perform inspection and prescribe necessary inspections. Demonstration of confidence, speaking quiet, calm voice reduces uneasiness of the patient.

Mistakes were explained to the student playing a role of the doctor; ways of effective interaction with this type of patients were recommended. They were: to occupy the leading position, to speak by a quiet, calm voice, to lead firmly and surely; to give exact instructions and to come into corporal contact (blood pressure and pulse measurement).

After discussion of interaction mistakes future doctors master the new ways of non-conflict communication with patients taking into account their type of the attitude to a disease; as well as personal features of the doctor: the doctor’s management style as a model containing a leader position in all aspects of relationship with the patient; partnership, as the behavioral model, assuming active participation of the patient in the course of treatment; the confidential relations when the doctor provides to the patient big freedom of activity, that from the other hand impose high level of responsibility on him.

### **The third stage of the training (office of the chief physician)**

While developing this stage of the training of anti-conflict behavior the most frequent reasons of conflict situations in the health care system were initially defined:

1. Insufficiently attentive attitude towards the patient;

2. Character features of a doctor and a patient;
3. Lack of coherence in actions of doctors of different specialization, as well as team nature in treatment scheduling;
4. Defects of maintaining medical documentation;
5. Lack of the informed patient's consent to treatment;
6. Professional incompetence (unreasonable extension of indications to surgical treatment).

For the purpose of mastering the effective skills of conflict situations overcoming, referring to the most frequent reasons of conflict situations, we have simulated complaints of patients to doctors. During implementation of training occupations students - psychologists played roles of both the chief physician and the patient. The task of medical students was to work out the given conflict situation as if it happened in reality and of course to try finding the compromise. Students were highly motivated and active being involved both in process of playing the role of the therapist, and in the general discussion. It is important to note that the more experience students have practical activities (for instance work in a hospital as the hospital attendant), the bigger their academic progress, the higher students' competence in overcoming different conflict situation in medical practice. Students spoke out about difficulties which haven't allowed them to lose a role and to compromise. We have received the mass of positive comments upon termination of the training implementation and request for the more prolonged training program. As one of training results the instruction for doctors concerning anti-conflict behavior was developed.

### **Ways of conflict prevention**

1. To follow the rules of health care service culture.
2. To track quality of medical documentation guiding as well documentary information on the patient is the main method of doctor's self-defense. To inform the patient on the offered treatment entity, character and possible complications, this is obligatory.
3. To agree on the plan of treatment with the patient and to make out it documentary.
4. To adhere to orders and standards of health care delivery accepted at the regional level or in specific medical institution.
5. To remember the importance of "conflict vigilance" and to carry out express diagnostics of psychological type of the patient identity
6. To try resolving the conflict on the place "here and now".
7. To carry out analysis of a conflict situation in professional team obligatory.

Summing up the work result at this training stage, it is possible to come to the conclusion that the most effective method of conflicts prevention and resolution is increase in law culture of health staff and development of the adequate behavior models of medical staff in the conflict conditions allowing not only to provide realization of the citizens' rights as patients and consumers of medical services, but also to protect conscientious experts from cases of patients' abuse of their rights.

### **THE RESULTS OF ANTI-CONFLICT BEHAVIOR TRAINING**

The general assessment of the anti-conflict behavior training efficiency contained the analysis of anti-conflict competences formation among future doctors. The following competences have been marked out for the analysis:

- Readiness and ability to reduce the energy of the clashing patient;
- Readiness and ability to inform on the actions accurately;
- Readiness and ability to coordinate actions and the plan of treatment with the patient at each stage.

The data assumed an assessment on 5-grade scale: from 1 to 5.

The test card has been developed for the assessment of future doctors' anti-conflict competences formation. The arithmetic average number on scores of all students – participants of the training was calculated and compared.

The mathematical processing of the received results was carried out by means of the software package of SPSS Statistics 21.

The dynamics of anti-conflict competences formation results among future doctors before and after the training on the basis of expert estimates is presented in the Figure 1.

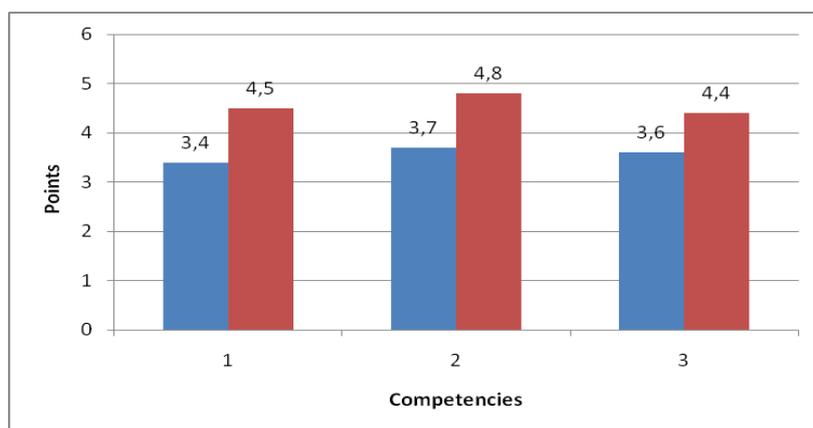


Figure 1. The results of anti-conflict competences formation among future doctors before and after the training

## CONCLUSION

Thus, the training of anti-conflict behavior provided the following result. In the conditions of quasi professional activity students of medical faculty trained abilities to distinguish behavioral implications of the patients' various types of the attitude to illness; and to realize reciprocal implications in situations of communication with them. It is revealed that this training promoted rising of anti-conflict competence that has to entail more free entry into professional sphere of medical university graduates.

On the other hand, students of the Clinical Psychology Faculty, playing roles both the patient and the psychologist-supervisor dilated their representation in the field of practice and methods of consultation in the conditions of a hospital.

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# **Application of Hadith Memorization Methods in Teaching and Learning: The National University of Malaysia's Experiences**

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## **ABSTRACT**

Memorization of hadith is one of the tasks assigned by lecturers to students in hadith-related subjects. However, an exclusive method in memorizing hadith which can be applied by the students of this subject does not exist. This paper aims to introduce a practical method in the memorization of hadith to facilitate the teaching and learning process, apart from being used as a teaching aid. It is a combination of methods conducted by selected lecturers at the Faculty of Islamic Studies, National University of Malaysia. A number of hadith subjects would include assignments involving memorization, namely those from the Department of Usuluddin and Philosophy, as well as the Department of al-Quran and al-Sunnah. The methodology of this study is qualitative, which includes field study covering interviews and observations. The findings of this study show that the students of the hadith subject from the Faculty of Islamic Studies, specifically from the Department of Usuluddin and Philosophy as well as from the Department of al-Quran and al-Sunnah, apply a variety of methods in the process of memorizing texts of hadith. The students would memorize the hadiths in their own effort and styles as well as instructed and designed by their lecturers. This paper proposes a general hadith memorization method that can be applied by each of the hadith subject lecturer as their teaching aid.

## **INTRODUCTION**

Hadith is the second source of reference for Muslims after the Quran. Therefore, the Muslims must faithfully refer to prophetic traditions (Sunnah) and authentic Hadith (al-Qaradawi 2000; Ibn Qayyim al-Juziyyah 1995), as hadith assists them to recognize Islamic rulings (*halal* and *haram*) (al-Khatib 1988).

As hadith has special position in Islam, the Muslims use various ways to preserve it. One of the methods used by early traditional Muslim scholars is the method of memorization of hadiths. This method is practiced and passed on from one generation to another. It was started by the companions of Prophet Muhammad. At first they memorized the Quran. Yet, there were a number of them who were given permission by the prophet to write and memorise hadith for an example a companion named Abdullah bin 'Amru bin al-'As. The successors of the companions (*tabi'in or salaf al-Soleh*) followed the same method of memorization of hadith (Fauzi Deraman 2012). They memorized the hadith comprehensively from the texts to the chains of transmitters.

As the method of memorization of hadith is one of the ways to preserve and learn hadith, it is practiced by many scholars and teachers in this field. This article attempts to examine the approach of teaching hadith and learning

through memorization of hadith applied by a number of lecturers at the Faculty of Islamic Studies, The National University of Malaysia. This study aims to evaluate their practice in teaching and learning hadith, their effectiveness and at the end suggest a new form of teaching hadith method which might be useful for teachers and learners.

### THE STUDY

For the purpose of evaluation, students' assignments as well as teachers/lecturers' views were gathered. Short reflection sessions of individual and group discussions were conducted. The aim of the sessions was to compile as much information and hands-on experience from the practitioners. It is discovered that the lecturers used a variety of ways in approaching their students and making them memorize selected texts of hadith relevant for their courses. The courses that involve hadith teaching are PPPH3163 The Contemporary Study of Hadith offered by the Department of Theology and Philosophy, PPPN3333 Hadith I, PPPN 3453 Hadith II and PPPN 3373 Hadith III. The last three courses offered by the Department of Quran and Sunnah Studies. Each of the courses has its own learning outcomes. For an example, the learning outcomes for the course of Hadith I aim to produce students who are able to recognize and use hadith primary sources as well as their commentaries. The students are anticipated to comprehend hadith texts related to the Muslim pillars of faith and knowledge.

### FINDINGS

It is discovered that the lecturers or teachers apply a variety of methods in teaching and learning hadith. Every lecturer interviewed prepared different types of assignments and teaching methods that are helpful for memorization of hadith process. Basically there are three categories of memorization of hadith tasks given to the students. First, the students are asked to memorize directly the selected texts of hadith for each semester. Second, the students are given with tasks in the classroom or in groups and the task is part of the processes that helps them to master the understanding of hadith as well as memorize the texts. The latter category implicitly directs the students to understand the content and the texts of hadith comprehensively. The final category discovered that the lecturers allow their students to learn selected terms (like any abnormality terms/*gharib*) in the original texts first and deliberately then comprehend the texts and context of hadith. This category of teaching and learning hadith provides students an opportunity to search for specific terms first and then memorize the whole texts.

Lecturer A, who is a senior lecturer at the Department of al-Quran and al-Sunnah studies, explains his aims and method of teaching that directly assigns and instructs his students to memorize texts of hadith in each semester. He set a target that the students or the graduates from the department at least must attain or memorise '*Matn al-Arbain*', a compilation of forty hadith book written by al-Nawawi. This task is helpful as a preparation for the graduates to master hadith teachings as a complement for Quran skills and knowledge. As an experienced academic, Lecturer A has been facilitating three courses (Hadith I, Hadith II and Hadith III) as well as science of hadith (Ulum al-Hadith) course for more than twenty years. As for the end of semester evaluation and continuous assessment, students have to sit for written and oral examinations. Instruction for memorization of hadith is given at the beginning of new semester.

According to Lecturer B who conducted other Hadith courses at the same department, teaching hadith must adopt '*tahlili*' approach that requires the lecturer to provide main course content of hadith textually and contextually. He weighs on understanding the hadith first as the objective of learning than memorizing task. He believes that the latter would be acquired by the students after understanding the texts well. To facilitate the learning, he explains the hadith first to his students and asks them to search for any abnormality or uniqueness of the texts. By doing so, his students are interacting with the texts while trying to understand the meaning of specific terms and sentences. In expounding his method, Lecturer B assists his students to seek for other narrations related to the assigned or discussed hadith. As for the assessment, the students have to sit for the final examination where a specific question on writing the texts of hadith is tested.

Lecturer C applies another method of teaching and learning hadith courses conducted at the department. Alike, her colleague Lecturer B, she does not directly assign her students to memorize hadith texts. Yet, through Jigsaw Method, she facilitates discussion and sharing among her students through systematic group work. Each group has at least 6 members and they are given with a topic or texts of hadith to work with. The groups complete small and specific tasks related to the content of the course. Yet at the end, they collaboratively contribute to the understanding of the course contents. The main aim of the application of Jigsaw Method is to fill the course and learning outcomes which are to introduce and familiarize students with variety of hadith resources, assist them to understand the hadith textually and contextually.

The students are intended to study the hadith textually in their groups. The first process involved describing and

discussing of the topic. Each group member has to understand the texts or the topic given. After that, each group must select their representatives who they called as ‘the experts’ of the team. The role of the experts is to teach other groups’ members who are assigned to approach the rest of the groups by asking question and note taking. The experts have to pitch or repeat their groups’ main points for at least 4-6 times within a specific time. During these sharing sessions, students (students who play role as listeners) ask questions, discuss issues, do notes taking and find connection with the tasks from the rest of the groups. They move from one group to another as instructed by the lecturer. At the end the listeners complete their rotation and re-group with their original members. The listeners of each group will take the turn to represent their findings to the experts of the group. The diagram aims to portray the process of teaching and learning hadith through Jigsaw Method applied by Lecturer C. The implementation of the method gives opportunity for the students either they are the presenters or group members; to remember the texts of hadith directly and implicitly. As for the on-going assessment and final examination, she made observation on the students’ progress during the sessions and in the final examination. In the final, students are asked to write down the hadith they had learnt and shared.

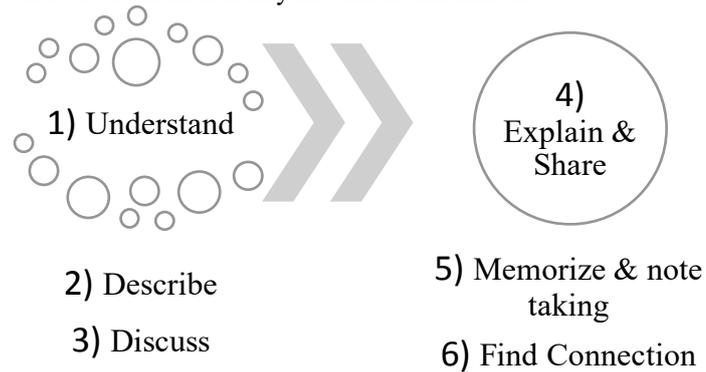


Diagram 1: The Application of Jigsaw Method and Processes of Hadith Memorization

Repetition is a basic strategy for teaching. All of the lecturers use this technique as an approach for teaching and learning. Students are instructed to complete their tasks either individually or in group. Lecturer D from the Department of Theology and Philosophy instructs his students to memorize hadith in one of the assignments given. Yet, he applied Service-Learning method of practice which is one of the high impact educational practices (HIEPs). The course he facilitates which is Study of hadith and Contemporary Issue course involves activities in selected communities. His students are exposed to community work through Problem Based Learning strategy. The students focused on children and teenagers (aged 7-17 years). Each student must assist two children or teenagers to learn and memorize hadith. S/he also navigate them to understand the hadith and teach them how to apply the texts in their daily life. In less than an hour, the teenagers can memorize nearly 60% of the texts of hadith. During the community activities the students apply their knowledge on hadith in the real life setting. Here, lecturer D complements the classroom learning with experiential learning.

Apart from the abovementioned, lecturer D combines classical and modern methods in teaching and learning hadith. According to him, there are five classic methods in preserving the hadiths from listening, understanding, remembering or repeating, recording to delivering the texts of hadith from one person to another. These methods can be re-applied with the information and technology developments such as by using of audio and listening methods effectively and practicing psychological approach through constant repetition. Additionally, his students are encouraged to make use of I-Mind, an online tool to assist the understanding the hadith contents. Lecturer D also develops an IP copyrighted website registered as (<http://hafazanhadis.wordpress.com/blog/>) as another proactive step to simplify the process of memorizing the hadith. The website provides explanation with practical recommendations on how to memorize hadith step by step. It also has audio recordings of forty Hadith of Imam Nawawi's composition with the summarized translation by I-Mind to facilitate his students and other users during the learning process.

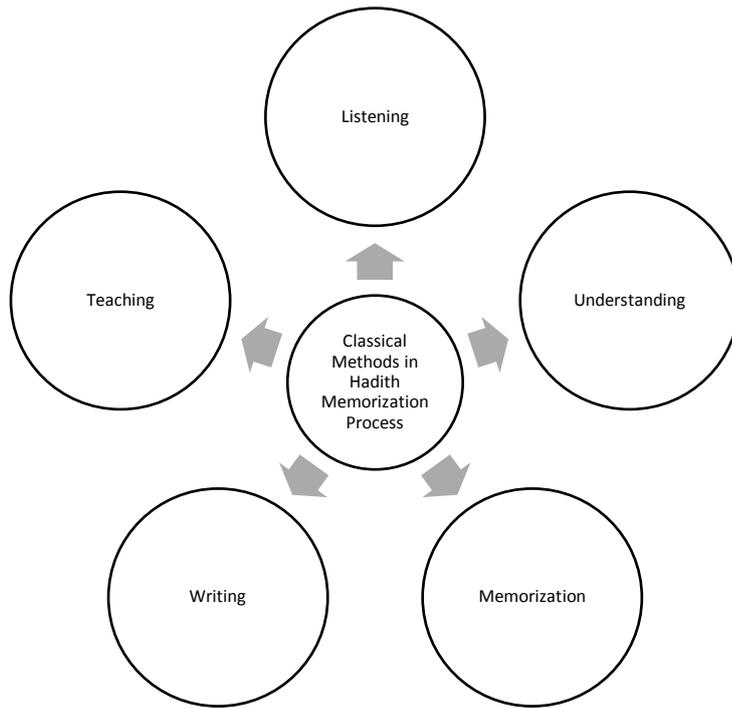


Diagram 2: Classical Methods in Hadith Memorization Process

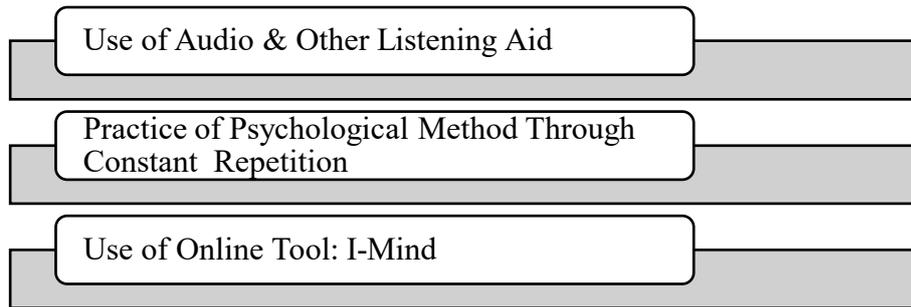


Diagram 3: Modern Methods in Hadith Memorization Process

The above discussions and diagrams clearly show multiple ways used by the lecturers to assist their students' learning and memorizing hadith. The table below summarizes their methods of memorization in teaching and learning hadith.

<b>Practitioners</b>	<b>Courses</b>	<b>Methods of Hadith Memorization</b>	<b>Assessment Strategies</b>
Lecturer A	Hadith I Hadith II Hadith III	Assign specific memorization assignments (Every year a certain number of hadith has to be memorized).	Lecture Assignments Oral Test Final Examination
Lecturer B	Hadith I Hadith II Hadith Hukum	Provide contents of hadith texts through lecture sessions and discussions. Students are assign to find the 'uniqueness' of the texts.	Assignment Final examination
Lecturer C	Hadith I Hadith II	Apply Jigsaw Method in teaching and learning that gives students the opportunities to gather, discuss, share	Group works Written Assignment Final examination

		and memorise the texts of hadith.	
Lecturer D	Study on Contemporary Hadith	Apply Service-Learning, (students learn and share the knowledge with the stakeholders/ communities) Use of audio aid Constant repetition Website source	Reports Final Examination

Diagram 4: Summary of Methods of Memorization of Hadith

## CONCLUSION

This article concludes that memorization task is an important assignment given by the lecturers as a way of preserving hadith. The assignment itself portray the identity of Islamic teaching in preparing new generation to learn and re-learn their second source of religion. Each course has specific learning outcomes. Yet most of the courses share same goal that is to empower students learning and facilitating the students to memorize their Prophet's sayings. This article has discovered that the courses' assessment strategies are vary therefore students are exposed to diverse methods of learning and memorizing the texts of hadith. This article suggests that, due to the significance of hadith in Islam and current Muslim communities' needs, students majoring in Islamic study must master hadith and the science of hadith and regard this knowledge as vital as the subject in Quran studies and sciences.

## Acknowledgement:

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# Application of the Metacognitive Strategy in Economic Education in the Czech Republic

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## ABSTRACT

The paper deals with the possibilities of applying a metacognitive strategy in the teaching of subject Economics in the environment of Czech secondary education. It is based on the research of OECD on the level of financial literacy and empirical studies. Using the model of multiple regression analysis, the dependency of school success of 138 Czech students with an above-average intellectual level on the personality of the teacher and the time preparation of students is examined. Research has led to the following conclusions: (a) the school success of students is dependent on the teacher's expertise; (b) there is a strong correlation between pedagogical skills of the teacher; (c) it is desirable to lead gifted students to deeper understanding through *analysis, problem solving and creativity*.

## INTRODUCTION

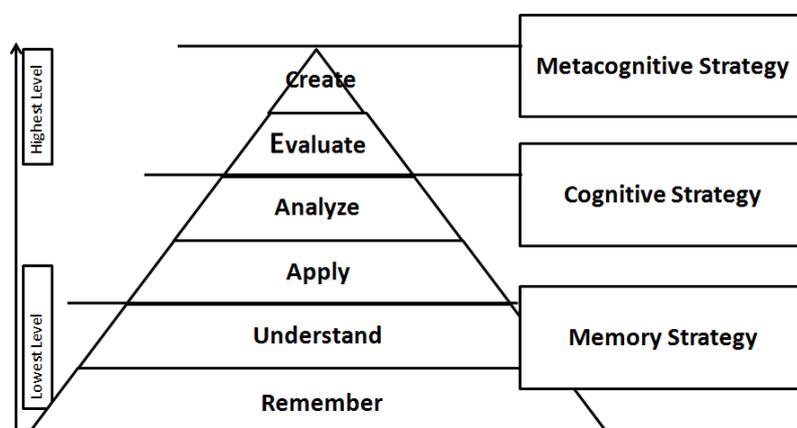
In the Czech economic education a memory learning strategy prevails and is often used by teachers of economic subjects at secondary schools. They typically lead students to memorize and understand the key facts, to find information in trusted on-line web-based portals where applications enabling working with legislation are built. The choice of one or another strategy of learning is primarily influenced by the cognitive goals we want to achieve in our students and their learning prerequisites (Ozturk, 2017). For example, if a teacher wants to develop problem solving ability for students, they need to use a meta-cognitive strategy that carries indicators appropriate to the development of this competence (Safari, Meskini, 2016). In the conditions of Czech secondary education this type of strategy has not been developed yet (Berková, Králová, 2015; Pasiar, Berková et al., 2015). The reason may be the fact that it is not taken into account that the teacher has been teaching differently capable students who have their real abilities different regardless of the current school success. The difficulty of the subject is usually adapted to the average students, and the talented individuals who are losing motivation because of the lack of deeper knowledge they ask for, they stand aside. At the same time it was proven for the Czech economic education that in the learning process students with an above-average intellectual level are motivated by getting deeper knowledge, i.e. the application of cognitive and metacognitive learning strategies, or the guidance of students to in-depth learning style (Berková, Krejčová, 2016). The teacher should take these factors into account and adapt the chosen learning strategy to their needs. This way they will lead the education process according to students' real educational needs (Little et al., 2003; Kiliyanni, Sivaraman, 2016). The topic studied is currently being discussed in expert groups of scholars, teachers and psychologists, and is one of the most pressing issues in the development of Czech education.

**The aim of the empirical study** is to study the possibilities of applying a metacognitive strategy in teaching the subject of Economics in the conditions of secondary education in the Czech Republic on the grounds that the ability to solve financial problems by realizing the thinking operations and processes and arriving at the right conclusion while engaging creative thinking was proven by the OECD (2014) survey of 15-year-old students from around the world. For these purposes the authors quantified the influence of teachers' professional competencies (i.e. communication and presentation skills, development of economic thinking, the ability to explain the curriculum and expertise) that the authors consider to be key things (Pasiar, Berková et al., 2015) and the time preparation of Czech students at the age of 16-17 with above-average intellectual level for their school success in the subject of Economics.

## LITERATURE REVIEW

Learning strategies are generally defined as determinants of learning outcomes. They can be understood as: "The procedures of a larger boom by which a student performs a particular plan in a particular way in solving a task, wants to achieve something and avoid something else" (Mareš, 1998, p. 58). The strategies of learning determine the approaches of the teachers, who influence the student's learning style, or how and by using which of the mental processes (*analysis, synthesis, generalization, concretization, abstraction, deduction, induction, observation* etc.) the student will study the curriculum.

The role of metacognitive strategy is important in education. Sternberg (2009, p. 215) defines metacognition as "the ability to think about own processes of thinking and ways to improve their thinking." The executive functions are an important neuropsychological correlate of metacognitive processes enabling the control and coordination of cognitive and behavioural processes in the implementation of a task, such as ability to concentrate and distribute attention, selective focus on key elements of the task and filtering of irrelevant factors, planning and sorting of activities or working memory (Krejčová 2013). The metacognitive strategy was dealt with by leading teachers Škoda, Doulík et al. (2016) who empirically verified the application of this strategy based on the IBSE (*a rather frequently applied strategy of directing learning activities in teaching science subjects*) in direct teaching at 332 secondary school students for five months. The highest learning outcomes were achieved in students who used active information processing. According to the authors, this result is influenced by the use of metacognitive strategies in the learning system and by leading students to meta-cognitive knowledge as opposed to memory strategies that develop learning (i.e., lower level of Bloom's taxonomy - *remembering, understanding, and applying*). Learning strategies are closely related to the revised taxonomy of cognitive levels by Bloom (Anderson, Krathwohl et al., 2001) and always develop a specific level illustrating the student's ability (Figure1).



**Figure 1:** Learning Strategies in the Revised Taxonomy of Cognitive Process Dimensions by Bloom  
Source: Authors' Modification according to Anderson, Krathwohl et al. (2001)

Figure 1 shows that memory learning strategies develop in students the lowest levels of ability - *remembering* and *understanding*; Cognitive learning strategies can develop *application* and *analysis*; the highest dimension of the cognitive process - *evaluation* and *creativity* - develops metacognitive learning strategies. The development of higher dimensions of the cognitive process is nowadays very popular abroad, where metacognitive strategies are widely used as a means to develop creative thinking and guide students to creativity in problem solving (Corgnet, Espín, Hernán-González, 2016; Karadeniz, 2016; Ras, 2014; Krpálek, Krpálková Krelová, 2016).

According to the OECD (2014), 15-year-old Czech students within the level of financial literacy through a PISA survey are above the OECD average level. Czech students are able to analyze and make decisions in normal financial situations. But they are not able to solve more complex financial problems in the long term run and creative thinking is not developed. These results show the status of students in compulsory education. Students who study economic subjects are supposed to have their economic skills being evolved continuously. In the given context, the teacher's pedagogical abilities are a factor which is a powerful element influencing the motivation and school success of the students. An empirical study, focused on the factors influencing the motivation of 277 Czech students aged 16-17 to study an economic subject, found out that different teacher's abilities have impact on students with different intellectual levels (Berková, Krejčová, 2016). Students with an above-average intellectual level are mostly motivated by the teacher's expertise, a weaker connection has been demonstrated in the ability to explain the curriculum and to develop thinking. This is because all abilities are

correlated and mutually interacting. From the point of view of the motivational potential of talented students, it is necessary to offer them deeper, more interesting knowledge of the issue by the way of active processing of information and problem solving (Cheung, Jhaveri, 2016). However, the question remains whether these pedagogical abilities of a teacher will also enhance the school success of a group of gifted students as a result of greater involvement in learning, i.e. due to an increase in their motivation potential and if a meta-cognitive strategy that includes the indicators of deeper knowledge development - *active information processing, problem solving* - a prerequisite for increasing the efficiency of the student's learning process.

When examining the relationship between the student's intellectual level and the efficiency of his cognitive processes, the definition of intelligence needs to be defined. In this study the authors understand intelligence in accordance with Sternberg's cognitive-contextual definition as "(1) the ability to achieve one's goals in life, given one's socio-cultural context; (2) by capitalizing on strengths and correcting or compensating for weaknesses; (3) in order to adapt to, shape, and select environments; (4) through a combination of analytical, creative, and practical abilities "(Sternberg, 2005, p. 189). One of the dominant functions of intelligence diagnostics is the prediction of school success, so the relationship between the intellectual level and the school assessment is the subject of a number of empirical studies. Neisser's research, Bouchard et al. (1996) demonstrated a correlation between the level of intelligence and school achievement .50, with the relationship between intelligence and school benefits being reciprocal (students with higher IQ are more motivated to school learning than lower IQ students). Rindermann and Neubauer (2004) have demonstrated in their research the superiority of the speed of information processing that influences the level of intelligence (and creativity as well) that affect school performance, so the processing speed indirectly influences school performance as well. On the basis of these conclusions, we can expect higher data processing speed for students above the average intellectual level, which is likely to place greater demands on the teacher's expertise.

#### RESEARCH METHODOLOGY AND DATA

In relation to the goal - to apply the metacognitive strategy of learning to the teaching of Economics in the conditions of secondary education in the Czech Republic - this hypothesis is verified:

H: *The school success rate of students with an above-average intellectual level in the area of abstract-visual thinking in the subject of Economics depends on the teacher's expertise.*

**The research sample** was created on the basis of deliberate selection, the main criterion of which was the above-average intellectual level of the student, regardless of the teaching strategies used by the teacher. The research was attended by 138 students of economic fields aged 16-17. (45% of the sample were 16-year-old students and 56% of the sample were students at the age of 17). Students are traced to a number of characters - the intellectual level (over 110 IQ points), the school success rate measured by the mark from the subject of Economics and weekly preparation. This age range was chosen to find adequate learning strategies in economic education for older students with above average intellectual levels, as the OECD survey (2014) shows that the results of Czech 15-year students in financial literacy are above the OECD average. The structure of respondents according to their school success and intellectual level is shown in Table 1. Among the above-average intelligent students are also those who, according to the school success in the given subject, do not conform to their prerequisites (In this group, there appear up to 40.5% of individuals with worse school success with marks 3, 4, 5)

**Table 1:** Structure of Respondents by School Success and Intellectual Level.

School success in subject economics (mark)	Students with above-average intellectual level	
	Absolute Frequency	Relative frequency
1	31	22.5 %
2	51	37 %
3	40	29 %
4	10	7.2 %
5	6	4.3 %
Total	138	100 %

For **data collection** the following methods were used (a) *method of questioning*, (b) *method of testing* (in cooperation with the *Testcentrum* organization in the Czech Republic). The method of questioning identified students' attitudes towards the personality assessment of the teacher of subject of Economics. For the measurement of the intellectual level, a *Viennese Matrices Test of pencil-paper version* was chosen. The test allows to quantify the general level of intellectual performance in the level of abstract-visual thinking, while perception, thinking, attention and memory are applied in the overall strategy (Forman, 2002, p. 8). The approximate distribution of students to groups is a matter of teacher's diagnostic competence based on the

observation, product analysis and thought strategies, etc. Students can also be distributed by means of psychodiagnostic methods. The questionnaire was structured into the following sections: (a) *student data* (gender, secondary school, student identification number, mark from the subject of Economics); (b) *weekly student preparation time* (identified by the codes on scales 1 - 5 representing the following time intervals) - not preparing for the subject at all (1), less than 60 minutes (2), 1-2 hours (3), 2 - 4 hours, (4), more than 4 hours (5); (c) *teacher's personality evaluation*. The personality of the teacher is evaluated on a scale of 1-5, followed in five categories representing the key professional competences (1) *communication* (pronunciation, engagement, pace and melody, keeping attention, giving attention, and listening); (2) *presentation* (examples from practice, good actor, eye contact, nervousness management); (3) *explanation of the curriculum* (practical meaning of the subject, acceptance of unusual ideas, explanation of mistakes); (4) *development of economic thinking* (interest in the course of work, leading to thinking); (5) *expertise* (answering correctly and consistently to all questions).

The data was analyzed with the support from the NCSS statistical program (version 2007). Verification of the zero hypothesis was performed at a 5% significance using a multiple regression model via the t-parameter test and the F-test model. For the purpose of verifying the hypothesis by statistical tests, the zero hypothesis states that there is no dependence between the variables:

$$H_0: \beta_1 = 0$$

*School success rate of students with above-average intellectual level in the level of abstract-visual thinking in the subject of Economics does not depend on the studied factors.*

The normality of quantitative data was determined by the Kolmogorov-Smirnov test. Reliability of the test increases with the number of measurements ( $n > 100$ ). This condition is met by the research. The data distribution was verified by Probability Plots. A multiple linear regression and correlation analysis method was used to verify the hypothesis. Thus, the dependence of the explained variable  $y$  (mark) on the seven explanatory variables  $x_1, x_2, x_3, x_4, x_5, x_6, x_7$ , where  $x_1$  represents the *intellectual level*,  $x_2$  *weekly preparation*,  $x_3$  *communication*,  $x_4$  *presentation*,  $x_5$  *explanation of the curriculum*,  $x_6$  *development of economic thinking*,  $x_7$  *expertise*. Selective partial regression coefficients are an estimate of the theoretical regression coefficients that can be obtained by the least squares method. Partial regression coefficients represent the average change of the dependent variable  $y$  corresponding to the unit change of the independent variable  $x_i$ , provided that the other explanatory variables are constant. The regression coefficients  $b_0$  and  $b_i$  quantify the effect of each independent variable on the dependent variable. This determines the greatest and smallest influence of the independent variables on the dependent variable and also if they are in a positive (+) or negative (-) relationship. Variables included in the multiple regression model must be as minimally dependent on one another as possible (Draper, Smith, 1998). For this purpose, *Stepwise method* will be used to determine the multi-collinearity. Furthermore, the magnitude of the correlation coefficient  $R^2$ , which shows the dependence force, will be monitored. Explanatory variables must be in a linear dependence that can be measured by a Spearman correlation coefficient which value should be greater than 0.4.

Based on a sample of 138 observations, an empirical function estimation with these parameters will be performed. The model of multiple linear regression can be mathematized in the following way (Draper, Smith, 1998; Weiss, 2012):

$$Y = f(x; b_0, b_1, b_2, b_3, b_4, b_5, b_6, b_7), \quad (1)$$

where:  $b_0$  – constant,  $b_1 - b_7$  – are the values of the empirical function (estimates of the theoretical regression function).

The estimate of the regression function can be written as:

$$Y = b_0 + b_1x_1 + \dots + b_7x_7, \quad (2)$$

providing that the conditions of the multiple regression model are met.

## RESULTS

Kolmogorov-Smirnov test at 5% significance did not confirm the normality of the dependent variable. The rate of deviation of the data distribution from normal distribution is very small, although it is not significant ( $P = 0.053$ ). Data distribution has therefore been verified by exploration analysis to determine the extent to which file data distribution is close to normal distribution (Figure 2). The data is not too deviated from the line (in the middle), which can be considered as a boundary result.

Based on the results of the normality test and the exploration analysis, the data was transformed with no significant improvement after the transformation. Despite the above mentioned results, the model residue are approximately constantly dispersed around the zero, which means they have no tendency and the model can be considered correct (Figure 3). To verify the zero hypothesis, the default data is used with respect to the boundary result of normality test.

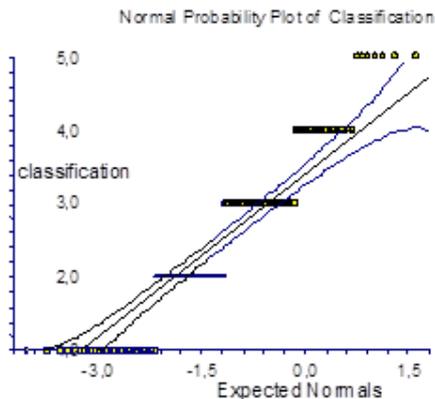


Figure 2: Exploratory Analysis.

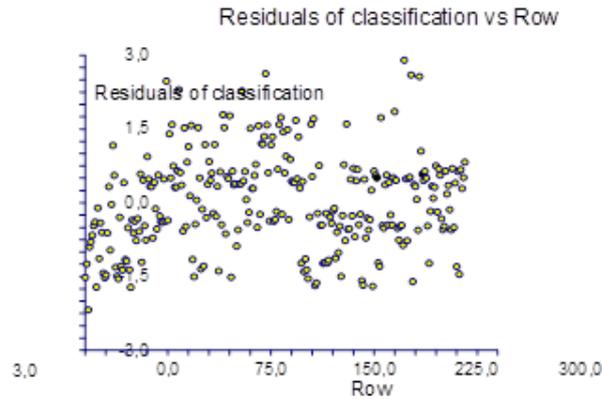


Figure 3: Residue Analysis.

### Multiple regression and correlation analysis model to apply metacognitive strategy

To verify  $H_0$ , the multicollinearity between the explanatory variables  $x_1 - x_7$  was evaluated using the Spearman correlation coefficient with using the correlation matrix. The following results were found: (a) *communication* strongly correlates with other explanatory variables (correlation coefficient was higher than 0.4); (b) *presentation* correlates with other explanatory variables (correlation coefficient was higher than 0.4), at the same time the strongest correlation between communication and presentation abilities (0.856) were found; (c) *explanation of the curriculum and developing economic thinking* are also in a strong correlation relationship; (d) *expertise* is also in the correlation relation which is the least strong and the correlation coefficient is in the range between 0.687- 0.544. At the same time, the significance of the correlation relationship for all combinations of linear dependence of explanatory variables at the 5% significance level ( $P < 0.01$ ) was confirmed. By the method of multiple linear regression analysis, the linear dependence of the school success of the above-average intelligent students on the factors studied was quantified. Estimates of partial regression coefficients  $b_i$  and regression analysis results by the Stepwise method are presented in Table 2.

Table 2: Multiple Regression Analysis Model.

	Regression Coefficient $b_i$	Standard Error $Sb_i$	T-Value to test $H_0: B(i) = 0$	Prob Level	Reject $H_0$ at 5 %
intercept	2.8924	1.6297	1.775	0.0783	No
IQ	0.0234	0.0137	-0.296	0.7675	No
time	-0.0041	0.1027	0.228	0.8199	No
communication	-1.2137	0.9484	-1.280	0.2029	No
presentation	0.3729	0.8118	0.459	0.6468	No
explanation	-0.2465	0.6040	-0.408	0.6839	No
development of thinking	-0.3608	0.6320	-0.571	0.5691	No
expertise	<b>1.0942</b>	0.4888	2.239	<b>0.0269</b>	<b>Yes</b>

The average school success of students without the influence of independent variables is 2.89. This value does not correspond to the above-average intellectual level of the students, which is due to the presence of 56 pupils (40.5%) with the subject rating of marks 3, 4, 5. Only 59.5% of students who were marked 1 and 2 are in the study group. At 95% reliability of the test, there is a positive correlation between the school success rate of students with an above-average intellectual level in the subject of Economics and the teacher's expertise ( $P = 0.0269$ ), thus by increasing the teacher's expertise there will increase the school success of these students. At the same time, with a 5% risk, it can be stated that the school success of these students is not dependent on the other variables. Less variability is explained in the model. The value of  $R^2$  is 0.0506. This means that other variables that have not been included in the model are affected by school success. The regression model of multiple dependence for  $n = 138$  can be described as follows:

$$Y_i = 2.8924 + 1.094 x_{7i} \quad (3)$$

If the expertise of the teacher of subject Economics increases by 1 rating degree, the school success rate of students with an above-average intellectual level will be improved by 1.094 (by 1 mark).

## DISCUSSION AND CONCLUSIONS

A model of multiple regression analysis found that the school success rate of 138 gifted students with an intellectual level above 110 IQ scores is achieved due to the teacher's expertise at the significance of 5%. (In the research, this ability was defined as answering factually correctly and consistently to all students' questions.) In the other variables (communication, presentation skills, curriculum explanation, development of thinking and student preparation time) no significant influence was demonstrated. This group was mostly affected by the detailed and deeper interpretation of the teacher, which corresponds to the intellectual level of students and their educational needs (Little et al., 2003; Kiliyanni, Sivaraman, 2016). The authors estimate that the value of the partial regression coefficient ( $b_7 = 1.094$ ) is significant because with 95% reliability of the test it can be stated that if the students perceive the teacher better by 1 rating degree (1 - 5 scale that was used for the research), then the school success of gifted students will increase. That means the teacher must not only maintain and deepen their economic expertise and therefore respect the didactic principle of science, but also use their expertise to work with this group of students in a problem-solving way and develop higher cognitive levels (Anderson, Krathwohl et al., 2001), thus respecting the didactic principle of active students' participation. It should not only develop so-called *situated learning* by using the memory strategies that are often used in the Czech Republic (Berková, Králová, 2015; Pasiar, Berková et al., 2015). Despite the proven dependence of school success on the teacher's expertise and the value of the partial regression coefficient, less variability is explained in the model ( $R^2 = 0.0506$ ), indicating that no other variables affecting school success have been included in the model.

The authors' study has shown that the average mark of 138 gifted students in the subject of Economics is 2.89. The value confirms that it is desirable for the teacher to use a deeper, problematic interpretation in teaching when working with this group of students, which will lead to active processing of information and attracting students to real-life situations. This can lead students to an in-depth learning style that is firmly associated with higher thinking processes that students have to use in a given context, such as *analysis, problem solving, creativity*. These indicators of development of this learning style are included in the metacognitive strategies that lead to the development of higher thinking processes and awareness of their own processes, further developing the ability to concentrate and distribute the attention, selective focus on key task elements and filtering of irrelevant factors, planning and sorting of activities and working memory (Safari, Meskini, 2016; Krejčová, 2013; Corgnet, Espín, Hernán-González, 2016; Karadeniz, 2016; Ras, 2014). Metacognitive strategies also lead to higher learning outcomes (Škoda, Doulík et al., 2016) and at the same time motivate talented students with above-average intellectual level (Berková, Krejčová, 2016). These procedures can be used for students aged 16-17, based on the very good results of financial competencies for Czech students at the age of 15 completing compulsory school attendance (OECD, 2014). The level of financial literacy of Czech students is above the average of OECD results - students are able to analyze and decide in normal financial situations. This creates a prerequisite for the development of higher cognitive levels through a metacognitive strategy - from problem solving to the level of creativity (Cheung, Jhaveri, 2016; Krpálek, Krpálová Krelová, 2016). These skills should also be included in the classification, because the reason for the relatively poor results of talented students from the subject of Economics may also be the fact that the marking is only memorising facts-oriented.

With regard to the fact that the research was not focused on the quantification of the influence of all the abilities describing the whole personality of the teacher, for the application of metacognitive strategy in the teaching of Economics in the conditions of the Czech secondary education the study brought the following practical conclusions, which can be summarized as follows:

- School success of talented students aged 16-17 with above-average intellectual level can be improved at secondary schools in the subject of Economics by increasing the teacher's expertise through the transfer to the teaching process. On the other hand, to improve the benefit of gifted students, it does not affect if the teacher will pay more attention to students if they try to keep their attention, if they improve pronunciation, the attractiveness of interpretation, if they become good actors. There is also no significant improvement in school success in improving the teacher's explanation of curriculum and the development of economic thinking and the student's preparation time.
- In spite of the above mentioned facts, the correlation of the teacher's abilities was confirmed, as evidenced by the fact that the most powerful factor influencing the marks of the gifted student in the subject of Economics is teacher's expertise. This can be explained by the fact that the teacher's expertise is an embodiment of all these abilities that are strongly correlated. To improve school success, the teacher must, however, improve all the studied pedagogical competences in order to achieve the

appropriate effect from the teaching units and thus increase the learning outcomes of students with above-average intellectual levels.

- Although these 138 gifted students surveyed have an intellectual level higher than 110 IQ points, the average mark from the subject of Economics was 2.89. This value is surprising and signals possible problems in the methodical management of lessons by Czech teachers, who rather use memory strategies of learning that develop lower cognitive levels - *remembering, understanding*. Average school success indicates this finding, as gifted students can experience a higher sense of boredom by lower cognitive levels and decrease their motivation to learning and interest in the subject.
- To remedy the conditions the authors recommend applying a metacognitive learning strategy in teaching the subject of Economics in secondary education to this group of students in a similar way that is used abroad. With this strategy the teacher will use the problem-solving method with the use of real-life stories. Students will thus be drawn to a deeper understanding of the reality they demand and they will be able to use higher thinking processes to identify and solve the problem, i.e., *analysis, evaluation, or creativity*.

Other research studies will be focused on the analysis of ways of developing higher cognitive levels of gifted students in economic education in the Czech Republic.

### ACKNOWLEDGEMENTS

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## Aspiration and Determination in College-Level Mathematics

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### ABSTRACT

The scholarly educational studies prove that there is a direct correlation between students' tracking during middle and high-school formation and success in STEM disciplines at the post-secondary education level. The present article will continue analyzing this idea while taking in consideration the students' views and aspirations toward general education formation. Sophomores and juniors are questioned in the process of knowledge acquisition as to what their career aspirations are. The majority of the students (two-thirds girls) were able to accurately assess their future goals and educational career possibilities. The undecided students, as well as the ones who knew already their future career goals, were part of the first and second semesters groups involved in Mathematics 101. This was offered by one Upstate New York college as part of the core requirements for any high-school student interested in pursuing a health, STEM, or even a liberal arts related career. Their individual endeavors and level of preparedness were quantified through exams and daily tasks throughout the course. The end of course results were interpreted and analyzed in connection to their initial career goals.

### INTRODUCTION

In a study realized in 2004, researchers proved that mathematics self-efficacy and outcome expectations are predictive of students' interest in math and science courses (Lopez, Lent, Brown and Gore, 1997). The ideas of the afore-mentioned study are conducive to the conclusion formulated by Turner, Steward and Lapan (2004); both mother's support and father's support positively affected adolescents' math efficacy, nonetheless, only mother's support affected their math outcome expectations. In conjunction with the previously formulated conclusion another major finding was highlighted; "children who perceive that math and science careers are appropriate gender-equitable pursuits have greater math self-efficacy and greater expectations that math will be useful and valuable to them in their future careers" (p.48).

There is another interesting study by Moritz Rudasill and Callahan that highlights how out of a comprehensive grades 5 to 12 study, the girls' self-perceptions of ability scores to the most important Math and English annual scores were always higher than boys' scores in these different areas. The findings illustrate the direct relationship between students' self-perceptions of ability and their future plans for careers. Although girls have the same intellectual abilities regarding 'hard core' Mathematics and Science courses as boys, they plan on taking courses leading to the careers suitable for women, such as social sciences, biology, health, and education careers.

As previously mentioned, female students chose to a great extent the health careers (76%), education specialization (83% professional choice), and social/human services (82%). "Male students as per general statistics chose professions such as computer science (83% male), engineering (86%), and manufacturing (87%)" (Conklin, as mentioned in Rudasill and Callahan, 2010, p.203).

Recent scientific evidence points out that there is a significant difference between the 'masculine' and feminine choice occupations. Engineering, technology, computer science versus accounting, social sciences, education, elementary education, in particular are strictly identified and embraced based on the student's gender. Whereas girls are more prone to choose the ones that fit their inclinations and gender interests, the boys chose occupations that resonate with their self-perceptions as being suited or adapted to their professional choices (White & White, 2006). Counting all past and present research evidence, it is proven that both average and high-ability students always consider mathematics as a 'masculine' activity (Halpern, Benbow, Geary, Gur, Hyde, and Gernsbacher, 2007).

Along the same lines the importance of self-perceptions of intellectual abilities for course choices stands as paramount in choosing a career path, especially at the high-school level (Eccles and Wigfield, 1995; Farmer, Wardrop, & Rotella, 1999).

Nonetheless, maybe, it is important to start understanding the deficit in mathematics, and scientific base knowledge from the beginning of the contemporary, last century's, seventies educational revamping efforts. The whole preparation for the STEM careers starts at the elementary level. As explained by specialists, "the basic treatment of content in the elementary grades has not changed for decades" (Wattenberg, 2014, p.22). In the report "*A Nation at Risk*", 1983, the National Commission on Excellence formulated the now famous report on education, decrying the American education that was present at the national stage level, as well as the inadequate content offered to elementary students (Wattenberg, 2014). As mentioned in the article, the US elementary schools in the 1980s were characterized by a really thin content. Since then, the change has not been done to improve. In the table provided in the article regarding minutes spent per day on science and social studies, it is specified that in 1977, K-3 social studies amounted for twenty-one minutes, 4-6 social studies accounted for 34 minutes. In 2012 the K-3 social studies totalized sixteen minutes and the 4-6 social studies accounted for twenty-one minutes. The same stats were formulated for science; K-3 science in 1977, 17 minutes and 4-6 science, 28minutes. In 2012, K-3 science meant nineteen minutes, and 4-6 science accounted for 24 minutes (Wattenberg, 2014, p.23). Indeed, not an important transformation regarding minutes dedicated to training for the most important elements of STEM practice, sciences and certainly, the defining mathematics apparatus. In the article the author mentions how the squeeze on content was prevalent for the struggling students. An impressive 60 percent of the elementary teachers recognized that students who needed extra instruction in English language arts, were pulled from social studies, or 55 percent admitted that they were excused from the science classes. The regress in explanation of basic science principles and applications could amount for the loss in interest, especially regarding STEM specialties.

In order to have a better curriculum, with improved mathematical and scientific achievable standards for all elementary, middle, and high school students, it is quintessential to work for revamped frameworks, course outlines and classroom materials amounting to extended periods of instruction.

In regard to the subject treated, mathematics achievement could be also tied to poor math skills (Beilock, and Willingham, 2014). As mentioned in another study, the authors investigated the fact that math anxiety could be related to the 'bad at math' perception. The authors expressed the idea that math anxiety implies more than being 'bad at math'. It also explains this anxiety is conducive to a loss of a portion of the working memory. The article concludes with the idea that a loss in the working memory which is important for solving problems could be addressed in the years of training for the pre-service teachers. The authors saw relevant to offer in the pre-service teaching years more instruction on how to teach math concepts rather than a course on math concepts themselves (Beilock, and Willingham, 2014, p.31). An interesting conclusion also prevails in regard to the fact that negativity about math could develop due to parents, teacher's influence, but also media. Therefore, it is important to focus on teacher training in lessening in-class anxiety through a more encompassing testing procedure, including ways in which they assess the students. It is suggested in the article to try reducing math anxiety through a writing exercise in which students have the opportunity to write about their emotions and feelings regarding testing on-course for a short period of time.

As a conclusion, it is anticipated that teachers at all levels need common planning time, targeted time built in the schedule to discuss, understand and improve student learning in any institutional formatting. Conventional and non-conventional methods of increased learning through diversification of methods of teaching might constitute the ticket to a more productive process.

## **THE STUDY**

An initial career survey was applied in the department of Mathematics and Natural Sciences at an Upstate New York College for the sophomore and junior students enrolled in the offered academic disciplines of LSK (Learning Skills) and Mat 101 during the 2016-2017 AY. The eighteen students (seventeen girls and one male student) of grade ten and eleven were initially asked what was their general option regarding future careers. Some of the students acknowledged their options with great determination, others were undecided. Out of the eighteen students asked,

two were certain about a medical (doctor) career, one aimed for architecture, one for engineering, five for nursing and health sciences, one liberal arts, one IT, one student for a teaching profession, one envisioned an accounting career option, another one opted for forensic sciences, and the rest four were undecided.

Amidst all of the LSK (learning skills for math) and MAT 101 core teaching, students were taking quizzes and mid-term exams, as well as a final exam after each section taught. Therefore, at the completion of the LSK, all of the students were tested for the assessment of knowledge level acquired. A final grade was formulated for all of the subjects in the class.

The two separate sections of LSK and MAT 101 followed the same learning and assessing structure. The students, who took LSK and finished with grades C or above, continued with MAT 101.

In the process of grading, we did not have specially formulated subjects, or individualized lessons' plans aiming for capturing the skills or interests of any individual students. All students were taught and tested the same, with the mathematical core knowledge and concepts presented on a classic blackboard/white board combination during the allotted time course for the subject.

At the completion of LSK we identified grades for all students establishing a connection between grades and professional goals. The ones aiming for the medical degrees at the conclusion of the LSK session managed A's and A minus grades. The architecture vocation student finalized the class with an A grade. The engineering option resulted in an A minus. The students aiming for health sciences and nursing professions obtained grades such as 2 Bs, A minus, B plus, and 2Cs. The IT aspirant got a B. The liberal arts finalized the LSK with a C, the accountant with a B, the aspiring teacher totalized the average for an A grade. The ones who were undecided, with the exception of one who got an A minus for LSK, and then never returned for MAT 101, all of the rest failed to pass this introductory course in skills for mathematics.

As already mentioned the students who passed the LSK section, continued with MAT 101, a college level mathematics introductory course. In analyzing their final results for the course, I came to the conclusion that all of the students who initially were prepared to take the strenuous road toward a high demand-high rewarding career such as the ones promoted by STEM, including the medical doctor field, managed to finish the college course with much desired A's and B's grades. The aspiring medical doctors finished with A minus, respectively, A grades, the architect with an A, the engineer one with an A also, the ones aiming specializing in health sciences, nursing, totalized the averages for C pluses and a D plus. The IT aspiring student got a B plus. The liberal arts failed this MAT 101, the accountant aspirant (school athlete as well) failed, and the teacher in preparation totalized the average for a B plus.

## CONCLUSIONS

In the conducted study it was obvious that the students who aimed for specializations in highly regarded careers such as the ones emphasized by the STEM disciplines, including biological and medical sciences were more able to constantly prepare to a greater extent for the demands and rigors of the mathematical requirements. They were continuously devoting time and attention to the core course requirements, being more involved in a higher mathematical knowledge and understanding. All of the students specializing in STEM and medical fields were able to acquire the best grades in both sections. The students who were undecided from the beginning dropped or failed the first level LSK class, to never return, and the ones that were aspiring to become involved with the liberal arts or accounting didn't show the high persistence in analyzing, understanding and qualifying for a passing grade in the end. The grades for the health sciences, nursing aspiring students decreased a level, whereas the accountant aspiring student failed the MAT101, probably, due to substantiated time in preparation, or re-directed interest. She was a student athlete, and, therefore, always in training for competitions at her school. The future teacher aspirant, nonetheless, with adamant determination and consistent preparation got very good results in both mathematical sections.

As it can be seen from the afore-mentioned study, the best indicators to student success in both LSK and Mat 101 courses was student initial identification of their vocational aspiration, followed by the consistent training required for the completion of mathematical core knowledge at each level.

Once that initial vocational aspiration identified, the students imbued themselves in all of the much needed study time and preparation for the desired level of mathematical accomplishment.

For a better approach to teaching and learning in class, students should supposedly be well informed about the professional path leading to their desired careers. They should certainly search for the best vocational career in accordance to their talents, inclinations, qualifications. The counseling, consultation, and orientation promoted in each level at school will help toward finding the most appropriate careers and vocations in the general student population. Once their aspiring vocation determined, the students will be able to continue with sustained effort and determination in completing the necessary training leading to the final vocational goal. In regard to increasing the level of knowledge, it is quintessential that teachers devote more time in finding ways to address the needs of testing and assessing all students through various methods so that every student will take the required tests with the anxiety and stress testing levels diminished to a minimum. All teachers may want to address the needs of diverse student population and interests in their classes, by designing individualized lessons, lesson plans for their students.

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# **Assessing Students' Mathematical Problem Solving Skill Through the Innovative Lesson Study and Open Approach**

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## **ABSTRACT**

This study aim to (a) validate the framework for assessing the mathematical problem solving skill, and (b) assess the students' mathematical problem solving skill by using the innovative Lesson Study and Open Approach in the classrooms. The samples were 520 fifth and sixth grades students from 18 primary schools in the northeastern region of Thailand. The construct modelling approach was used to develop and validate the framework for assessing the students. The data were collected and analyzed by using mixed methods design in the second semester of the academic year 2016. The qualitative design used to understand how students process mathematical problem solving and develop the assessment framework. The quantitative design used to validate and assess their mathematical problem solving skill through the 4-level learning progress map as a conceptual framework. The research tool was the open-ended questions consisted of nine items in six tasks. The framework for assessing mathematical problem solving skill is high quality evidences in validity and reliability indices which fit and appropriate in the real contexts assessment of the students provides the information for formative feedback to students how they learning progress, particularly knowing what students know and can do, and knowing what students need to know and can do. The finding is very beneficial for teachers to improve the students' learning and their instruction. The study suggests the application of the Lesson Study and Open Approach in teaching and learning management to guide the practitioners how to improve the effectiveness of their teaching and help researchers to develop the tools for assessing the students' learning progression in the future study.

**Keywords:** Lesson Study, Open Approach, Problem Solving, Mathematic Education, Rasch Model, Construct Modelling

## **INTRODUCTION**

Mathematics is complex and abstract subject, yet it is inevitably involved in daily lives. According to the Partnership for 21st Century Learning (2015), mathematical problem solving skill (MPSS) has drawn educators' growing attention

as it is required in creativity, innovation, critical thinking, communication, and collaboration that prompt students to embark on their future career path.

Also, problem solving process can stimulate students' mathematics learning (The National Council of Teachers of Mathematics (NCTM), 2000 as cited in Pizzini et al., 1989). This notion is consistent with the educational reform in Thailand mentioning that one of the mathematics learning objectives is to develop students to become effective problem solvers.

However, the result of National Achievement Test of Thailand in recent years showed that the mathematics achievement of nationwide students was below 50 percent in most contents (The Office for National Education Standards and Quality Assessment (ONESQA), 2015). Also, the result of Ordinary National Education Test (ONET) in mathematics presented that average score of students in grade 6, 9, and 12 was 43.47, 32.40, and 26.59, respectively (the National Institute of Educational Testing Service (NIETS), 2016). According to the report of the Trends in International Mathematics and Science Study, TIMSS) (2015), Thailand's mathematical achievement was ranked the 26<sup>th</sup> among the total 39 countries. Moreover, the OECD Program for International Student Assessment (2015) revealed that Thai students' mathematics literacy and problem solving were ranked the 55<sup>th</sup> among the 72 countries.

From all reports mentioned above, it can be indicated that quality of education in Thailand has declined. Problem solving skill is one of the major concern since it builds thinking process leading to solving non-mathematical problems in other subjects. Most students have difficulties in developing their mathematical solving problems (Phonapichat & Wongwanich, 2014). As a result, many educational researchers proposed alternative mathematics teaching approach to enhance students' mathematics learning achievement. For example, Sotirhos (2005) adopted lesson study approach to enhance de-privatizing teaching practice by building teacher collaborative learning communities. Furthermore, the Open Approach has been implemented in teaching mathematics to develop thinking and problem solving process based on individual student's ability (Nohda, 2000; Inprasitha, 2015). Knowing and understanding what students know and can do provides the information for formative feedback to students how they learning progress. Moreover, knowing what students need to know and can do it also very beneficial for teachers to improve the students' learning and their instruction (Wilson & Sloane, 2000). Therefore, assessment is part of learning process. It is the most important thing which educators and teachers can do to help their students.

Educators are looking for the sound framework for MPSS. Assessing MPSS not only on the product of teaching but also on the process of thinking (i.e., product-process-oriented approach). The objectives of this study are to (a) validate the framework for assessing the MPSS, and (b) assess the MPSS of 5 and 6 grades students by using the innovative Lesson Study and Open Approach in the classrooms. The MPSS was analyzed by using ConQuest 2.0 software (Wu, Adam, Wilson, & Haldane, 2007) along with the construct modelling approach (Wilson, 2005) as a conceptual framework to monitor students' learning progress as suggested by Junpeng, Wilson, Inprasitha, and Marwiang (2016). The finding from this study is important because they provide a framework for assessing MPSS with the flexibility and appropriateness for assessment in the real-world context.

## **THE FRAMEWORK FOR ASSESSING THE MATHEMATICAL PROBLEM SOLVING SKILL**

The constructing modelling approach (Wilson, 2005) was used to develop the framework for measure and assess the students' mathematics learning progress in this study. The framework comprises of the Four Building Blocks as described below:

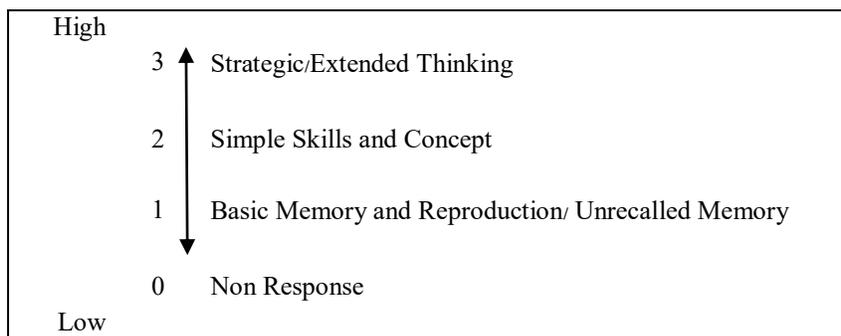
### **Progress map**

The framework for assessing the MPSS containing the progress map is based on synthesizing the definitions of

Polya (1965), Schoenfeld (1985), the National Council of Teachers of Mathematics (NCTM) (2000), and the Organization for Economic Co-operation and Development (OECD) (2012, 2016) according to this following statement:

*“Mathematical problem solving skill is a student’s ability to explore, conjecture, and reason logically in cognitive processes to understand how to solve math problems, apply and adopt appropriate strategies to solve the problems and reflect on the process used to solve the problems. It involves the acquisition and application of mathematics concepts and skills in a wide range of situations, including non-routine, open-ended, and real-world problems.”*

The progress map was developed based on the study of learning standards and indicators for mathematics learning area 1 based on the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) (Ministry of Education, 2017) to develop measurement scale of the progress map of learning which it is focused on mathematical procedures (see Figure 1).



**Figure 1** Progress map for assessing MPSS

**Item Design**

Design the items for the open-ended tasks to assess students’ skill in solving numerical and procedural mathematics problems consisted of the following 3 steps:

(a) Design the test with multiple-choice items aiming to monitor how students develop their problem solving and mathematical procedures with possible diverse answers. The items of the assessment test were developed by the 42 pre-service teachers who voluntarily participated in the study. Each pre-service teacher proposed one item; as a result, 42 items were produced.

(b) Validate the quality of the test and determine 2 sets of the test; 5 items each set. The pre-service teachers collaboratively selected 10 items out of 42 items.

(c) Finalize test with the qualified 9 items in 6 tasks.

**Outcome Space**

The stage was identify scoring guide for assessing MPSS. The score was rated in 4 levels, from 0 to 3 (see Table 1).

**Table 1** Scoring guide for assessing students’ mathematical problem solving from taking the tasks

Level	Score	Learning progress level	Description (What students know)	Examples
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Level	Score	Learning progress level	Description (What students know)	Examples
4	3	Strategic/Extended Thinking	Students require investigation, complex reasoning, developing the plan or a sequence of steps for more than one possible answer e.g. What is the equation for the sum of any set of three consecutive odd numbers? The answer is $n+(n+2)+(n+4)$ .	A man walking upstairs for 6 floors, and another 2 floors, then walking downstairs 8 floors and walking upstairs again 6 floors. How many steps did the man walk? The answer is $6 + 2 + 8 + 6 = 22$ . If one floor has 10 steps, how many steps have the man walked? Thus, the answer should be $(6 + 2 + 8 + 6) \times 10 = 22 \times 10 = 220$ steps.
3	2	Simple Skills and Concept	Students engage mental process using information or conceptual knowledge and require one or two steps to completely solve the problems in all stages. However, the misconception may be occurred e.g. students answer $2+3 \times 8 \div 4-3 = ?$ by starting from mutilation before division, then addition and subtraction which results in the wrong answer. This is explained by their misconception or miscalculation.	The man walked 6 floors, 10 steps = $6 \times 10 = 60$ , The man walked 2 floors, 10 steps = $2 \times 10 = 20$ , The man walked 8 floors, 10 steps = $8 \times 10 = 80$ , and The man walked 6 floors, 10 steps = $6 \times 10 = 60$ .  So, the man has walked in total $(6 \times 10) + (2 \times 10) + (8 \times 10) + (6 \times 10) = 60 + 20 + 80 + 60 = 220$ steps.
2	1	Basic Memory and Reproduction or Unrecalled Memory	Students can answer simple problems and seen problems from the textbook by applying one step of thinking. However, they are unable to recall appropriate concepts or rules to solve complex problems.	-Students present the incorrect procedure, resulting in the incorrect answer. e.g. The man was at the 6 <sup>th</sup> floor (10 steps each floor) and walked up 2 more floors, so the man has walked $60+2 = 62$ . Therefore, the answer is incorrect.
1	0	Non Response	Students cannot apply any related concept to answer the open-ended problem. The urgent improvement is required.	- No response on the mathematical procedure presentation - Irrelevant answer to the open-ended problem

### Measurement Model

The model used in this study is the Multidimensional Random Coefficients Multinomial Logit Model (MRCLM) (Adams, Wilson, & Wang, 1997). It is an extension of the Rash Coefficients Multinomial Logit Model (RCMLM) proposed by Adams and Wilson (1996). The RCMLM and MRCMLM allow for Rash-family models to be specified by two matrices, termed the design and scoring matrices. The RCMLM approach allows, and even encourages, a sensitivity to the real-world context and the construction of models that are built specifically for particular applications (Wilson & Adams, 1995).

Measurement model analysis using ACER ConQuest 2.0 software developed by Wu et al. (2007) was employed to analyze the learning progress of student by considering the Wright Map.

## **RESEARCH METHODS**

**Research methodology** The mixed method research was used by combining quantitative and qualitative methods to answer the research questions. The qualitative design used to understand how students process mathematical problem solving and construct the progress map. The quantitative design used to validate the framework for assessment. Moreover, the quantitative design used to cut the scores for assigning the students' skill in each level and assess their MPSS through the 4-level learning progress map as a conceptual framework. We assessed 520 students by using this framework. However, this study showed the deep finding only 7 case studies for teachers' application to real life situations and new learning.

### **The population and sample**

The population of this study was students participating in the project of advanced mathematics development in the northeastern region of Thailand. The targeted samples were 520 students in grade 5 and 6 in the second semester of the academic year 2016 of 18 primary schools participating in the project for standard setting by cutting the scores to assign the students' skill in each level. By using purposive sampling technique, 7 students were selected for deep study and discussion of the MPSS assessment in this study.

### **Research tool**

The initial tool contained seven open-ended tasks that consisted of five item bundles that share common open-ended questions. The tool was redesigned based on the feedback from teachers, content experts and an initial empirical analysis of the pilot testing, particularly the validity (Wright map, item fit, and step fit) and reliability information (SEM, internal consistency, and the split-half reliability coefficient). We deleted some items that overlapped the content knowledge between items and some that were inappropriate for 5 and 6 grades students. Consequently, this study uses 9 items that were nested in 6 open-ended questions.

### **Data analysis**

The measurement model adopted 3 models—the MRCML model (Adams, Wilson, & Wang, 1997), the Rasch model (Rasch, 1960), and the Partial Credit Model (Masters, 1982). The data were analyzed by using ACER ConQuest Version 2.0 (Wu et al., 2007).

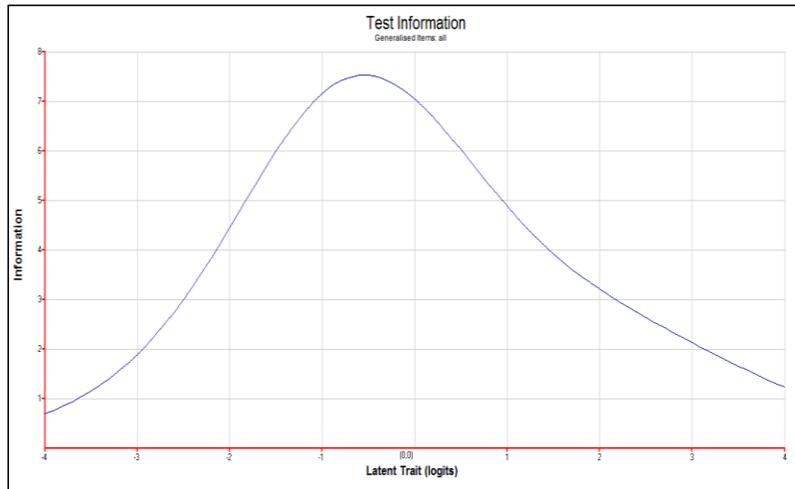
## **FINDINGS**

### **Validating the framework for assessing mathematical problem solving skill**

#### **Reliability and validity indices**

##### *Fit indices and reliability*

Based on the application of ConQuest 2.0 software (Wu et al., 2007) in this study, the result of Cronbach's coefficient alpha and Expected-A-Posteriori (EAP/PV) reliability is presented in the test information (see Figure 2).



**Figure 2** Test Information from ConQuest 2.0 Software

From Figure 2, the result of test information indicated the highest y-intercept of -0.5 meaning that the difficulty level of the test was medium to easy. The quality of the overall assessment development was tested by using ConQuest 2.0 software with the Cronbach's coefficient alpha ( $\alpha$ ) of 0.83, consistent with the result of the Expected-A-Posteriori (EAP/PV) reliability of 0.827. Therefore, the quality of the overall assessment was highly reliable. Then, the quality of the overall assessment and each item was analyzed as presented in Table 2.

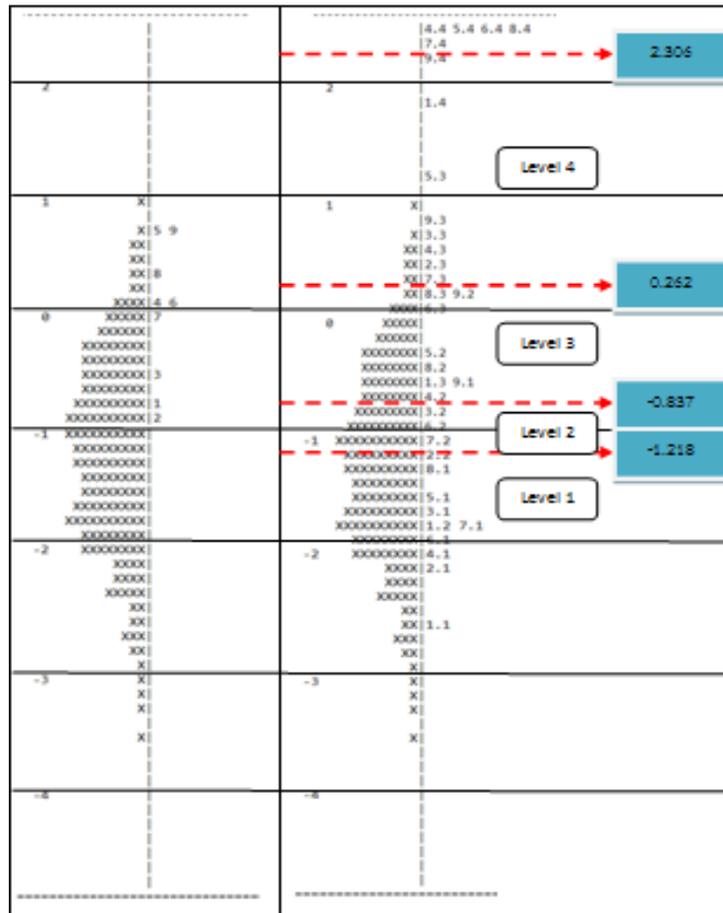
**Table 2** The result of the quality analysis of the overall assessment and each item

Domains		Quality of the assessment of each item	
		Acceptable range	Actual Value
<b>Each item</b>	Difficulty Level (Estimate: b)	-3 to 3	-0.886 to 0.761
	Discrimination level, based on Classical Test Theory (CTT)	Over 0.2	0.53 to 0.71
	Errors	MSNQ value of Weight Fit in the range of CI	7 items have MSNQ of Weight Fit in the range of CI
	Effect size	0.75 to 1.33	0.88 to 1.17
	T-Value	-3 to +3	-2.1 to 2.8
<b>Overall assessment</b>	Cronbach's coefficient alpha ( $\alpha$ )	Over 0.7	0.83

From Table 2, the assessment analysis of each item in terms of difficulty level, discrimination level, based on Classical Test Theory (CTT), errors, effect size, accepted T-Value, and Cronbach's coefficient alpha ( $\alpha$ ) of the overall assessment of 0.83 was in the acceptable range. Therefore, the quality of the assessment is acceptable that can be used as a research tool to measure students' learning progress in the proposed progress map in this study.

**Construct validity**

The assessment of students' mathematical ability must retain the standard of reliability with high-quality evidence. Thus, the construct validity was examined by using Rasch-family models. The result of the qualitative data analysis showed the cut score in Wright map divided into 5 levels; ranging from 1 to 5.



**Figure 3** Wright map with thresholds in each level for the initial assessment framework

Figure 3 presents the thresholds of the 0-1 level at -1.218, followed by the 1-2 level at -0.837, the 2-3 level at -0.262, and 3-4 level at 2.306, respectively. The cut scores at level 2 and level 3 were close to each other at -1.218 and -0.837; thus, the level 2 and level 3 were merged into one level, resulting in the progress map consisting of 4 levels in assessing an individual student's learning ability as presented in Figure 4.

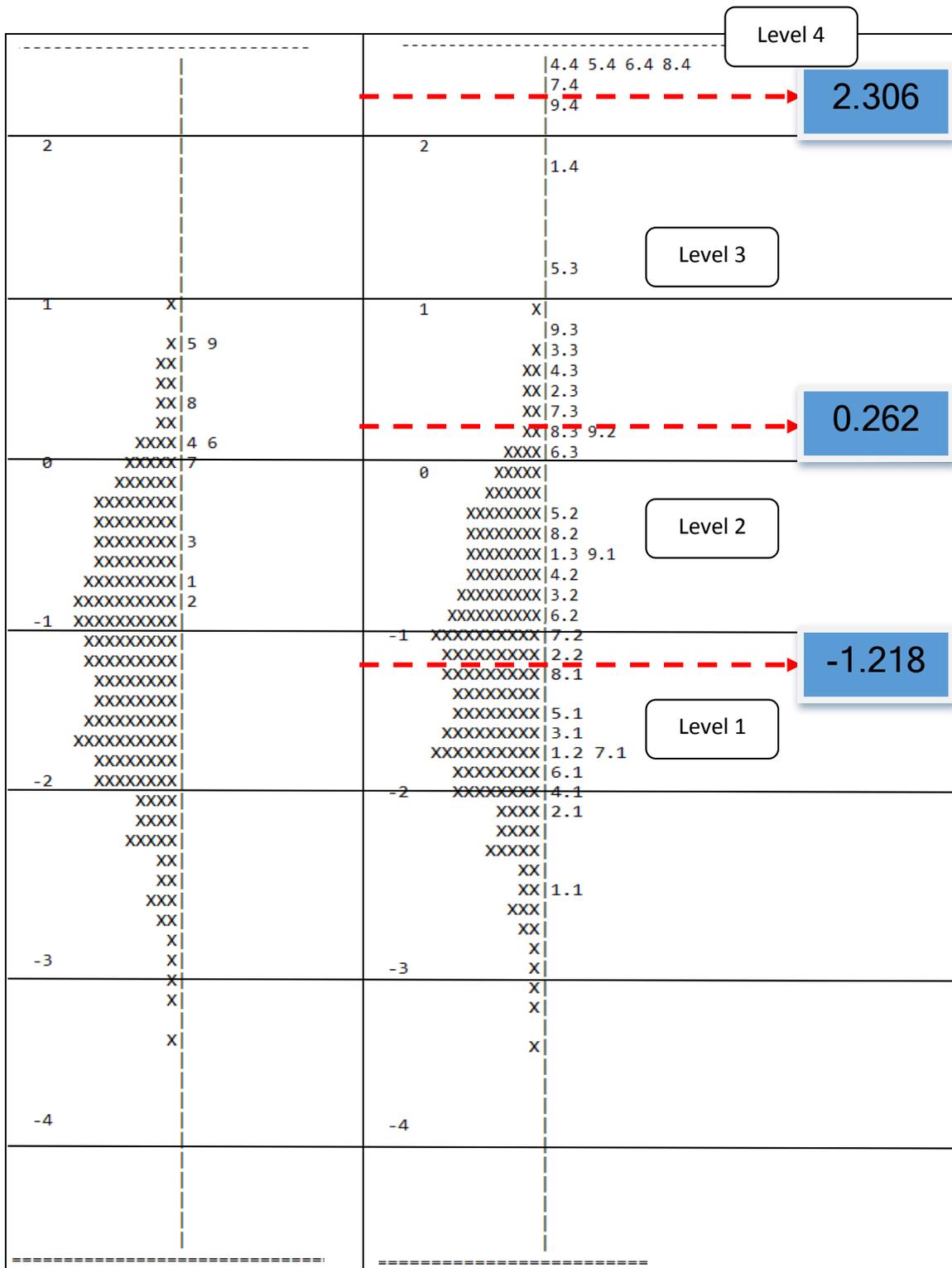


Figure 4 Wright map with thresholds in each for the redesign of assessment framework

### Assessing the students' mathematical problem solving skill: 7 case studies

Due to the assessment by using this framework, the result of the students' mathematical ability assessment presented "what students know and can do, and what students need to know and can do" to develop their ability. The finding showed the whole-class mathematical skill and individual student's mathematical skill as follows:

#### The whole-class assessment

The whole-class assessment of the solving problem ability was examined with the 7 students, 2 male and 5 female, in grade 5. The assessment had the total score of 36. The assessment result showed the average score of the whole-class solving problem ability in mathematical procedures of 13.86, falling in level 2. This can be interpreted that the level of simple skills and concept was below standard score as shown in Figure 5.

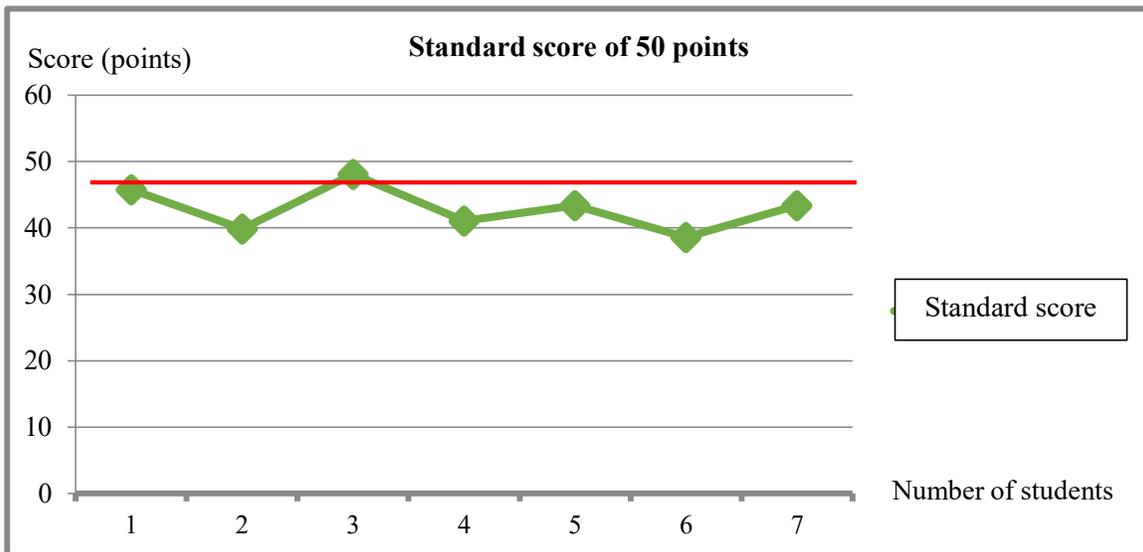


Figure 5 Examining the ability levels of 7 students with the standard score

#### The individual assessment

The assessment of the individual students' solving problem skill, reflecting their learning progress was scored by using the progress map, and analyzed by using ConQuest 2.0 software. The result showed the solving problem ability of an individual student in mathematical procedures with the average standard score of 50. This can be described that students were able to use their mathematical knowledge in solving basic mathematical problems. Thus, the result reflected that students' mathematical knowledge needed to be improved in order to solve advanced mathematical problems as well as present wider mathematical procedures in acquiring an accurate answer.

## CONCLUSION

The framework for assessing MPSS is fit and appropriate in the real contexts. The assessment of the solving problem skill based on mathematical procedures of the students was conducted by using lesson study and open approach based on the progress map as suggested by Junpeng et al. (2016). The result of the assessment showed that all 7 students had solving problem ability in mathematical procedures at level 2. This can be interpreted that the students had simple skills and understood a simple concept to solve basic to slightly complex mathematics items. Most students' learning progress reflected that they could apply taught principles and theories in explaining the mathematical procedure and use logical reasoning for the answer. They could also present the relationship of numbers by writing, drawing, and calculating various possible procedures to acquire the answer for each item. However, the students could not solve the advanced mathematical problems in all steps completely which can possibly be explained by their misconception.

The implications of this study indicate the skills that students need to be improved, so-called 'what students need to know' including (1) ability to comprehend basic knowledge, (2) ability to recall formulas, rules and basic theories, (3) ability to apply rules and basic theories in solving simple to difficult mathematical problems, (4) ability to interpret items to eliminate misconception, (5) ability to describe with logical reasoning to acquire an answer, (6) ability to recheck the answer, (7) ability to calculate precisely, and (8) ability to use number, symbols (i.e. picture, graph, diagram to develop answer).

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# **Assessing the Role of Education in Promoting Sustainable Tools: A Case Study of Public-Private Partnership**

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## **ABSTRACT**

It is no more news that the 21<sup>st</sup> century world is been driven by sustainability goals. However, this goals has not been able to permeate every nooks and cranes of the world especially the developing world. The impermeability of the sustainability drive in the developing nations can be traced to lack of knowledge of the tools through which sustainability goals can be achieved. This have however warrants the study to build facts from literatures on how education can be used to enlighten and awake the conscious mind of the populace on how sustainable tools like Public-Private Partnership (PPP) works toward achieving the sustainable goals. The study adapts the theory of environmental determinism to establish the necessity of education to promoting the sustainability drive in Nigeria.

**Keywords:** Sustainability, Education, Public-Private Partnership, Developing countries, Environmental determinism.

## **INTRODUCTION**

It is no more news that the world is driving towards sustainability as the principles of sustainability is gradually permeating all field of human endeavors. The world quest for sustainability is evidenced in the United Nations sustainable development goals which aimed at making the world a better place. Plessis (2002) refer to sustainability as a state which is concerned about man preservation and continuity. Sustainable pursuit without considering man continuity is a goal which cannot be attained. It signifies that man is the center of sustainability drive because the latter (sustainability) is initiated by the former and for the former (man). The quest for sustainability has prompt Governments across the globe to prioritize sustainable practice in their decision making. Such is evidenced in the adoption of a sustainable tool like Public-Private Partnership (PPP) by governments across the globe due to its sustainable capacity in all field of human endeavors. Public-Private partnership as the name implies define the relationship between the Public (government) and the private body (investors) towards achieving a common goal. PPP has proved to be veritable platform through which the world sustainability goals in all fields of human endeavor which includes; health, education, commerce and infrastructure among others can be attained. Its massive impact in nation building has made it attractive to countries across the globe. However, the rate of adoption of PPP does not equal its acceptance in all countries across the globe especially in the developing countries of the world. Developing country like Nigeria has been advocating for the wide spread of PPP in all areas of her society, however, there has been a low patronage of this sustainable tool in the country and such can be traced to the insufficient or lack of knowledge on how the tool works. Such has however warrants the need to use education to enhance PPP knowledge and promote it

at the local level. United Nations Educational, Scientific and Cultural Organization (2002) affirmed that education is very crucial for achieving economic awareness and empowerment. Education has been found to be a potent means of reorienting the minds of the populace towards adapting the requisite knowledge to advance humanity. The need to use education means for achieving the reorientation of the society lies in its societal acceptance and attractiveness. The historical significant of education is visible in its use to break barriers of discrimination of HIV patients and to control the pandemic in developing countries across the globe. Education contribution in sanitizing the people to controlling the widespread of AIDS and discrimination of victims has been a laudable one. Considering the education role in boosting the awareness level and knowledge on how to control the AIDS pandemic, such have however warrants the study to assess the significant of education to educating the people on the relevance of Public-Private Partnership tool to achieving the sustainable development goals.

### **APPRAISAL OF PUBLIC-PRIVATE PARTNERSHIP (PPP)**

The call for partnership is no more limited to business relationship between individuals as it has found its way into governance under the platform of Public-Private Partnership. Public-Private Partnership (PPP) simply refer to partnership between the public body (government) and private investors (people). PPP emanate from the government idea due to her inability or slow response to the peoples need. Public-Private Partnership (PPP) emergence has been a blessing to the inelastic social needs that are visible in our present world. It has been able to meet the demand in health, business, telecommunication and above all construction infrastructures. The wide coverage of PPP tool across all field of human endeavors has made it difficult to cap it into a single definition. However, the World Bank Institute (2012) define PPP as a long-term contractual relationship between private party and government agency towards public asset or service provision, in which the private party is charged with the management responsibility. In the same vein, Akhmetshina and Mustafin (2015) also define PPP as a formal agreement for a fixed or infinite period of time between the Governments and the private investors by collaborating in decision, financial and human resources towards achieving a specific goal in science, business and engineering and innovation among others. The bedrock of operation of PPP lies in the synergy between the government and the private sector to meeting the global needs. Partnerships is highly prioritize towards meeting the sustainable development agenda as it is affirmed by United Nations (2016) as a means through which sustainable development goals can be realized. The paradigm shift in procurement of infrastructures and services among others experienced globally can be attributed to world insatiable search of a sustainable route that can guarantee continuous delivery of services in the face of government's financial short fall. The innovative discovery of PPP as a sustainable tool lies in its technical-know-how and financial edge. PPP platform provides room for international collaborators and such avails the locals the benefits of adapting the technical skills and other vices. The transfer of technical-know-how via the platform of PPP no doubt guaranteed self-sustenance of the locals thereby meeting one of the vital goals of world governing body. The consistent finance and technical know-how accessible through this platform has changed the face of infrastructures, health and commerce among others that are pivotal to meeting the sustainable development agenda. Public-Private Partnership (PPP) sustainable capacity is vivid in developed nations of the world as its application contributed to the great transformation seen in their infrastructure, power generation, commerce, telecommunication and medicine among others

### **APPRAISAL OF EDUCATION AS A TOOL FOR SUSTAINABLE INFORMATION**

It is an undoubted fact that education acceptability and popularity among men is without compromise. Man and education are inseparable as the latter harness the former potentials as to positively impact its environment. Campbell (2006) opined that education provides the basic knowledge and experience crucial for human engagement in society reformation. Education has been found to be necessary for large scale transformation. This is evidenced in the inclusion of education among the key goals necessary to achieving the sustainable development agenda which aimed at transforming our world. Education necessity in meeting the sustainable development goals lies in her consistence relevance in informing the populace. Sound education is very crucial to achieving a knowledge base environment which is key to transforming our world. Knowledge acquisition has been the priority of world leaders and that has contributed to the need to advocate for quality education as pivotal tool to attaining the United Nations world sustainability drive. A quality education is the education that is dynamic in meeting the need of the environment. Education is very crucial in achieving the sustainable development goals and it is a fundamental tool which drives advancement of a society in all spheres of life. Its relevance in nation building is without limitation as it helps to awake consciousness for sustainable innovations. Bloom, Carring and Chan (2006) further affirmed that education training is second-to-none as an instrument used in promoting economic sustainability. Duncan (2011) opined that educational capacity of a society determines her prosperity, economic competitiveness and her sustainability. Education is very foundational to the transformation capacity of nations, it is a medium through which nations are informed for economic

reformation. Economic reformation reality lies in the appreciation of sustainable medium like Public-Private partnership (PPP) which is one of the deliverables of sustainable or quality education. Odia and Omofonmwan (2007) affirmed that education is the pinnacle of development in any society around the world. Education is the pride of nations across the globe due to the enormous benefits that are derived from it. Good education sharpen the mind towards sustainable thinking and appreciation of sustainable pathway. It is evidenced from the forgoing that appreciation of a sustainable tool like PPP can be achieved under a sound education system.

### **ESTABLISHING THE THEORY FOR ADAPTING EDUCATION FOR PROMOTING SUSTAINABLE TOOL (PPP)**

The scope for using education to promoting PPP in this study is rooted in the environmental determinism theory as cited by Fekadu (2014). The theory state that environment is the dominance force responsible for human attitude. Sign (2007) further buttresses the environmental determinism theory by retreating the fact that man and environment are inseparable. The connection between man and the environment is not debatable as man attitude or reaction is directly dependent on the force from the external context. Likewise, Hardin (2009) in his Doctoral study also refer to environmental determinism as the external force responsible for human behavioral shift. The theory of environmental determinism as defined by Fekadu (2014) and sustainability as defined by Plessis (2002) both have a common feature which is 'man and the external environment'. The former emphasis on man adjustment or shift as a result of external forces while the latter emphasis on man continuous existence which is attainable by maintain dynamic balance between societal conditions. It is evident from the forgoing that man cannot be separated from its environment or societal demand. It is further affirmed by Zbokova and Dvorakova (2011) that man co-existence with the society necessitate him to maintaining equilibrium with the external forces or demand which includes social, economic and environmental. The focus of the world or society is tending toward sustainability and every institutions initiated by man must recognize or prioritize environmental demand that can guarantee man sustainability. Among the various institutions initiated by man education institution has been found to be pivotal in diffusing sustainable tools to actualizing the global sustainable goals. Idunmange and Nwaeke (2008) however asserted that education should be driven by change in the external world for her to continuously impact the world and this is in consonance with the theory of environmental determinism which proved that institutions direction is as a result of external or environmental impact. Therefore, it is not normal for education institution to be indifferent to external change or forces as it form one of the fundamental reasons for its creation. As such, it is pertinent for education institutions to drive the sustainability demand (Public-Private Partnership) which is necessary in meeting the world transformation goals.

### **CONCLUSSION**

The attention and attraction of the world toward sustainability goals is visible in the drive and action of countries across the globe to attain the goals. Many countries have adopted and fully implement sustainable tools like Public-Private Partnership (PPP) in their bid to meet the proposed sustainability goals. However, the developed and developing countries perception differs on the sustainability goals pursuit as its full implementation is visible in the developed world while the developing countries are yet to imbibe the culture of sustainability in their ways of life. The need to incite the culture of sustainability in developing countries like Nigeria through the instrument of education has however been established from critical review of literatures. Education capacity to inciting the culture of sustainability in the developing countries is drawn from the theory of environmental determinism. It is however established from the theory that education institutions relevance lies its adaptation to changing society demand. Society call for imbibing culture of sustainability in all works of life cannot be promoted better without the use of education institution. Therefore, it is necessary to use education institution to promote sustainable tools like Public-Private Partnership (PPP) as to enlighten the populace on its capacity in other to encourage its adoption in developing nations across the globe.

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# Assessing the Teaching and Learning Situations in Secondary School Turkish Language and Literature and English Curricula

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**ABSTRACT:** Like in the other fields of education, the language education is continually being updated because of the changes and developments in educational theories and the opportunities provided by the improving technology. Following it, the curriculum of the Turkish Language and Literature (TLL) course that is the secondary education part of the mother tongue education was updated by Talim ve Terbiye Kurulu (Board of Education and Discipline) in 2015. Similarly, English course curricula had been revised and updated in 2014 by the board. Although the teaching of the two courses are different in nature as one is the mother tongue while the other is a foreign language, their curricula are similar in the way that teaching and learning processes focus on communication. When updated curricula are examined, the teaching process in TLL curriculum is explained as happening in three phases that are “reading, writing and oral communication” while English curriculum states that the main focus is on “the integration of functions of the language and four basic skills.” The aim of this study is to evaluate the teaching and learning processes of TLL and English curricula after the changes through the teacher opinions and find their strengths and weaknesses. The study employs survey method. The data was collected in the end of 2015-2016 academic year from 70 TLL and 41 English teachers that worked at Afyon and were chosen through convenient sampling method. The five-likert type scale that was used to collect teacher opinions was developed by Ocak, Ocak and Boyraz (2016) and consists of two parts, part one for demographic information such as age, working year, in-service training background etc. and part two for the assessment of teaching and learning situations.

**Key words:** Turkish Language and Literature curriculum, English curriculum, curriculum evaluation, teaching and learning situations, teacher opinions

## INTRODUCTION

Although the behaviors of a child that acquires his/her mother tongue -in other words the language of the place where s/he lives- gradually are not completely parallel to the behaviors of a student that intends to learn a foreign language, teaching existing languages presupposes that there is a similarity among them. These two behaviors are similar to each other in some terms as all learnings are similar in a broad sense (Kara, 2004). Mother tongue teaching lesson is not information but skill and habit based. The habit formation and mastering skills require practice and application (Özdemir, 1983). The expectations from foreign language teaching is not different either. Besides Çiftçi (1993) benefiting from the mother tongue of the child in foreign language teaching and setting a tight relation between different languages studies are among the principles to be benefited in foreign language teaching (cited by Çelebi, 2006). Therefore, teaching mother tongue and foreign language are not interrelated.

Turkish Language and Literature curriculum that was revised in 2015 employs a student-centered approach. The main aim of the curriculum is improving students’ reading, writing and oral communication skills through literary texts. In this curriculum that is based on literary genres and skills education, the relations among reading, writing, listening and speaking studies is turned into an integrated structure by carrying out literature and language-expression studies simultaneously. The reading tasks are structured in a way that supports the improvement of students’ writing and oral communication skills. For example, a student that can analyze a story successfully in reading tasks uses this cumulated knowledge while writing a story and as a result s/he can produce better quality texts (MEB, 2015).

For the majority of the people, especially for those living in foreign language contexts, language learning is a demanding and long lasting process. In this process, except from different materials and strategies used, time allocated, learning contexts, and many other affective factors are highly influential (Harmer, 2015). Widdowson (1978) states that “we do not only learn how to compose and comprehend correct sentences as isolated linguistic units of random occurrence; but also how to use sentences appropriately to achieve communicative purposes.” Once they are offered with tangible blueprints, students might be equipped with more passion and enthusiasm to

invest on oral English learning (Tao, 2017) . Following Stern (1992) curriculum refers to a comprehensive plan of language teaching which organizes the objectives, content, teacher development, teaching strategies, learning strategies, timing, and evaluation into a unified whole (cited by Ostovar-Namaghi, 2017). With the wide use of English language, various teaching methods has been emerging from one to another, among which the communicative language teaching method is deeply around because it can focus on the whole teaching environment, social and learners' needs (Ma, 2017). Another method that is widely used in the world today is Content Based Instruction and aims to help students not only learn different culture(s) and cross-cultural communicative patterns and skills, but also use the target language meaningfully, and thus accelerate acquisition (Tseng, 2017). The Ministry of National Education (MEB) in Turkey also regularly revise English curricula in order to keep up with current scientific information and trends. The main aim of the secondary school English curriculum that was revised in 2014 is explained as to engage learners of English in stimulating, motivating, and enjoyable learning environments so that they become effective, fluent, and accurate communicators in English (MEB, 2014).

### **Aim**

The aim of this study is to assess the teaching and learning situations of TLL and English curricula for grades 9-12 through teacher opinions. This assessment will present strengths, weaknesses and deficiencies of the above mentioned curricula.

### **Problem and Sub-Problems**

What are TLL and English teachers' assessments of the teaching and learning situations of their lesson's curricula that were updated in 2013?

#### **Sub-problems**

1. What is the distribution of teachers' opinions about the teaching and learning situations of the Secondary Education TLL and English Curricula?
2. How appropriate are the teaching and learning situations according to teacher opinions?
3. Is there a significant difference between teachers' assessments by field?
4. Is there a significant difference in the evaluations within the subject field depending on participating or not participating an in-service training on the curriculum?
5. Is there a significant difference in the evaluations of those who have participated an in-service training on the curriculum within the subject field?
6. Is there a significant relation between the assessments of TLL and English teachers?

### **METHOD**

Since the aim of this study is to evaluate teachers' opinions of the teaching and learning situations of the TLL and English curricula, this study employs survey method, which is usually used to measure or evaluate general characteristics of a subject, population or a program (Cohen, Manion & Morrison, 2007).

### **Data Analysis**

The teachers' assessments on their curriculum was explained through frequencies and percentages. Besides, t-test was used to determine whether there was a statistically significant difference between teachers' assessments when the data had a normal distribution and there were two variables. The normality tests were done separately for each sub-group of each variable (Can, 2014). The Kolmogorov-Smirnov and Shapiro-Wilk tests were used with groups of more than 50 and less than 50, respectively (Field, 2009). This study's data had normal distribution.

### **Population and Sample**

This study was carried out in Afyon. The study employs convenient sampling in order to reach a maximum sample. After receiving the necessary permissions from Afyon's Provincial Directorate for National Education, the researcher distributed the scale to TLL and English teachers. The scales were collected from 70 TLL and 41 English teachers.

Table-1. Demographics of the Sample

	TLL		English	
	N	%	N	%
<b>Institution</b>				
Anatolian High School	13	18.6	12	29.3
Anatolian Health Vocational High School	3	4.3	2	4.9
Multi-Program High School	7	10.0	4	9.8
Science High School	5	7.1	1	2.4
Religious Vocational High School	13	18.6	3	7.3
Vocational and Technical Anatolian High School	29	41.4	19	46.3
Total	70	100.0	41	100.0
<b>Seniority</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
1-4 years	22	31.4	9	22.0
5-9 years	22	31.4	21	51.2
10-14 years	9	12.9	7	17.1
15 years or more	17	24.3	4	9.8
Total	70	100.0	41	100.0
<b>Educational Level</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Undergraduate	38	54.3	39	95.1
Postgraduate	32	45.7	2	4.9
Total	70	100.0	41	100.0
<b>In-service Training</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Yes	31	44.3	28	68.3
No	39	55.7	13	31.7
Total	70	100.0	41	100.0

### Data Collection Tool

The validity and reliability study of the data collection instrument was carried out by Ocak, Ocak & Boyraz (2016). The scale consists of 34 items under a single factor. A statistical comparison of the scale in the development and current study can be seen in Table-2 below.

Table-2 Statistics on the Scale

	Scale Development Study	This study
<b>Sample</b>	Secondary school teachers	TLL and English teachers
<b>Sample size</b>	357	111
<b>KMO</b>	.971	.928
<b>Barlett</b>	.000	.000
<b>Cronbach's alpha</b>	.976	.978

### FINDINGS

Sub-problem-1: What is the distribution of teachers' opinions about the teaching and learning situations of the Secondary Education TLL and English Curricula?

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula

Item	Field	DA*	AA	MA	A	SA	X	Result	
1- The sample activities are student-centered.	TLL	F	3	1	18	26	22	3.90	Agree
		%	4.3	1.4	25.7	37.1	31.4		
	English	F	0	1	13	17	10	3.87	Agree
		%	0	2.4	31.7	41.5	24.4		
2- The activities are consistent with the content.	TLL	F	3	1	22	23	21	3.82	Agree
		%	4.3	1.4	31.4	32.9	30.0		
	English	F	1	2	9	16	13	3.92	Agree
		%	1	2	9	16	13		

		%	2.4	4.9	22.0	39.0	31.7		
3- The activities are at a level that can be applied.	TLL	F	4	7	28	17	14	3.42	Agree
		%	5.7	10.0	40.0	24.3	20.0		
	English	F	4	3	17	9	8	3.34	Moderately Agree
		%	9.8	7.3	41.5	22.0	19.5		

(\*DA: Don't Agree; AA: A bit Agree; MA: Moderately Agree; A: Agree; SA: Strongly Agree; X: Mean)  
 When TLL and English teachers' evaluations for the first three items are examined, it seen that while TLL teachers agree with all, English teachers agree the first two and moderately agree with the last one. TLL teachers' mean score (3.90) is higher than English teachers' mean (3.87) for the first item, it is vice versa in the second item (TLL X=3.82; English X=3.92).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	X	Result
4- The teaching and learning experiences are consistent with learning acquisitions of the curricula.	TLL	F	1	5	28	21	15	3.62	Agree
		%	1.4	7.1	40.0	30.0	21.4		
	English	F	1	7	11	14	8	3.51	Agree
		%	2.4	17.1	26.8	34.1	19.5		
5- The curricula's teaching and learning approaches suit the subject focus.	TLL	F	1	1	27	24	17	3.78	Agree
		%	1.4	1.4	38.6	34.3	24.3		
	English	F	0	3	14	18	6	3.65	Agree
		%	0	7.3	34.1	43.9	14.6		
6- The curricula's activities include outcomes such as discussion questions, field trips, observation, experimenting, summarizing and producing learning experiences that guide teachers.	TLL	F	3	7	24	19	17	3.57	Agree
		%	4.3	10.0	34.3	27.1	24.3		
	English	F	4	6	15	12	4	3.14	Moderately Agree
		%	9.8	14.6	36.6	29.3	9.8		

For the next three items, it seen that TLL teachers agree with all again (X=3.62, 3.78 and 3.57) while English teachers agree with items 4 and 5 (X=3.51 and 3.65) while they moderately agree (X=3.14) with the item number 6.

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
7- The activities support learning through practice and experience.	TLL	F	3	11	25	19	12	3.37	Moderately Agree
		%	4.3	15.7	35.7	27.1	17.1		
	English	F	2	9	19	8	3	3.02	Moderately Agree
		%	4.9	22.0	46.3	19.5	7.3		
8- The activities take students' interests, needs and desires into consideration.	TLL	F	6	15	26	11	12	3.11	Moderately Agree
		%	8.6	21.4	37.1	15.7	17.1		
	English	F	4	8	18	7	4	2.97	Moderately Agree
		%	9.8	19.5	43.9	17.1	9.8		
9- The learning and teaching process improves critical thinking skills.	TLL	F	4	12	23	19	12	3.32	Moderately Agree
		%	5.7	17.1	32.9	27.1	17.1		
	English	F	5	8	17	5	6	2.97	Moderately Agree
		%	12.2	19.5	41.5	12.2	14.6		

When TLL and English teachers' evaluations for the next three items are examined, it seen that both groups moderately agree with all three items (TLL X: 3.33-3.11 and 3.32; English X: 3.02-2.97 and 2.97). TLL teachers' mean scores are higher than English teachers' means in all three items.

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
10- The learning and teaching process improves creative thinking skills.	TLL	F	4	15	22	17	12	3.25	Moderately Agree
		%	5.7	21.4	31.4	24.3	17.1		
	English	F	2	9	19	7	4	3.04	Moderately Agree
		%	4.9	22.0	46.3	17.1	9.8		
11- The learning and teaching process improves the skill of researching, questioning, and decision-making.	TLL	F	4	15	21	19	11	3.25	Moderately Agree
		%	5.7	21.4	30.0	27.1	15.7		
	English	F	2	11	16	8	4	3.02	Moderately Agree
		%	4.9	26.8	39.0	19.5	9.8		
12- The learning and teaching process improves the skill of problem solving.	TLL	F	4	14	28	14	10	3.17	Moderately Agree
		%	5.7	20.0	40.0	20.0	14.3		
	English	F	3	7	20	6	5	3.07	Moderately Agree
		%	7.3	17.1	48.8	14.6	12.2		

According to teachers' evaluations for the next three items, it seen that both groups moderately agree with all three items (TLL X: 3.25, 3.25 and 3.17; English X: 3.04, 3.02 and 3.07).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
13- The learning and teaching process improves communication skills.	TLL	F	3	12	20	19	16	3.47	Agree
		%	4.3	17.1	28.6	27.1	22.9		
	English	F	0	7	20	9	5	3.29	Moderately Agree
		%	0	17.1	48.8	22.0	12.2		
14- The learning and teaching process improves the skill of using Turkish properly, effectively and well.	TLL	F	5	4	22	20	19	3.62	Agree
		%	7.1	5.7	31.4	28.6	27.1		
	English	F	4	7	17	10	3	3.02	Moderately Agree
		%	9.8	17.1	41.5	24.4	7.3		
15- The learning and teaching process improves entrepreneurship skills.	TLL	F	3	10	29	15	13	3.35	Moderately Agree
		%	4.3	14.3	41.4	21.4	18.6		
	English	F	3	11	12	11	4	3.04	Moderately Agree
		%	7.3	26.8	29.3	26.8	9.8		

When physics and chemistry teachers' evaluations for the next three items are examined, it seen that while TLL teachers agree with items 13 and 14 (X: 3.47 and 3.62), English teachers moderately agree with them (X: 3.29 and 3.02). Both groups moderately agree with item 15 (TLL X: 3.35; English X: 3.04).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
16- The teaching and learning process improves the skill of using information technologies.	TLL	F	2	10	21	19	18	3.58	Agree
		%	2.9	14.3	30.0	27.1	25.7		
	English	F	1	5	13	16	6	3.51	Agree
		%	2.4	12.2	31.7	39.0	14.6		
17- The teaching and learning supports the 5E Model.	TLL	F	2	7	31	21	9	3.40	Agree
		%	2.9	10.0	44.3	30.0	12.9		
	English	F	3	5	15	15	3	3.24	Moderately Agree
		%	7.3	12.2	36.6	36.6	7.3		
18 - The teaching and learning process leads to the use of discussion methods (debate, panels and open discussions).	TLL	F	2	6	24	23	15	3.61	Agree
		%	2.9	8.6	34.3	32.9	21.4		
	English	F	2	9	16	9	5	3.14	Moderately Agree
		%	4.9	22.0	39.0	22.0	12.2		

As seen above, both groups agree with item 16 (TLL X: 3.58 and English X: 3.51). While TLL teachers agree with item number 17 (X: 3.40) and 18 (X:3.61), English teachers moderately agree with both (X: 3.24 and 3.14).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
19- The teaching and learning process uses group-teaching methods.	TLL	F	1	7	31	19	12	3.48	Agree
		%	1.4	10.0	44.3	27.1	17.1		
	English	F	2	7	15	14	3	3.22	Moderately Agree
		%	4.9	17.1	36.6	34.1	7.3		
20- The curricula's methods and techniques are consistent with their objectives.	TLL	F	2	6	27	23	12	3.52	Agree
		%	2.9	8.6	38.6	32.9	17.1		
	English	F	1	4	16	16	4	3.43	Agree
		%	2.4	9.8	39.0	39.0	9.8		
21- The curricula's methods and techniques are consistent with their content.	TLL	F	2	4	26	27	11	3.58	Agree
		%	2.9	5.7	37.1	38.6	15.7		
	English	F	1	4	11	21	4	3.56	Agree
		%	2.4	9.8	26.8	51.2	9.8		

In next three items, it seen that while TLL teachers agree with item 19 (X: 3.48), English teachers moderately agree with it (X:3.22). Both groups agree with items 20 (TLL X: 3.52 and English X: 3.43) and 21 (TLL X: 3.58 and English X: 3.56).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
22- The activities can be performed in and out of school.	TLL	F	3	13	27	15	12	3.28	Moderately Agree
		%	4.3	18.6	38.6	21.4	17.1		
	English	F	4	12	15	5	5	2.87	Moderately Agree
		%	9.8	29.3	36.6	12.2	12.2		
23- Teachers direct students, guide them and improve themselves.	TLL	F	7	5	18	25	15	3.51	Agree
		%	10.0	7.1	25.7	35.7	21.4		
	English	F	4	3	11	17	6	3.43	Agree
		%	9.8	7.3	26.8	41.5	14.6		
24- Materials for performing activities are suggested.	TLL	F	2	9	27	20	12	3.44	Agree
		%	2.9	12.9	38.6	28.6	17.1		
	English	F	1	8	13	6	6	3.36	Moderately Agree
		%	2.4	19.5	31.7	31.7	14.6		

When the two groups' evaluations for the next three items are examined, it seen that both groups moderately agree with item 22 (TLL X: 3.28 and English X: 2.87) and agree with item 23 (TLL X: 3.51 and English X: 3.43). While TLL teachers agree with item 24 (X:3.44), English teachers moderately agree with it (X:3.36).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
25- The materials to be used in the teaching and learning process are easily accessible.	TLL	F	8	9	29	17	7	3.08	Moderately Agree
		%	11.4	12.9	41.4	24.3	10.0		
	English	F	2	6	15	13	5	3.31	Moderately Agree
		%	4.9	14.6	36.6	31.7	12.2		
26- The sample activities are suitable for the levels of the students.	TLL	F	4	11	30	18	7	3.18	Moderately Agree
		%	5.7	15.7	42.9	25.7	10.0		
	English	F	3	10	16	9	3	2.97	Moderately Agree
		%	7.3	24.4	39.0	22.0	7.3		
27- The learning experiences interact with other learning experiences.	TLL	F	0	11	29	19	11	3.42	Agree
		%	0	15.7	41.4	27.1	15.7		
	English	F	2	7	15	12	5	3.26	Moderately Agree
		%	4.9	17.1	36.6	29.3	12.2		

According to teachers' evaluations for the next three items, it seen that both groups moderately agree with items 25 and 26 (TLL X: 3.08 and 3.18; English X: 3.31 and 2.97). While TLL teachers agree with item 27 (X:3.42), English teachers moderately agree with it (X: 3.26).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
28- The activities can be performed in and out of school.	TLL	F	2	15	25	16	12	3.30	Moderately Agree
		%	2.9	21.4	35.7	22.9	17.1		
	English	F	3	8	15	10	5	3.14	Moderately Agree
		%	7.3	19.5	36.6	24.4	12.2		
29- The learning experiences specified support subsequent learning acquisitions.	TLL	F	3	12	24	18	13	3.37	Moderately Agree
		%	4.3	17.1	34.3	25.7	18.6		
	English	F	0	7	13	16	5	3.46	Agree
		%	0	17.1	31.7	39.0	12.2		
30- There are examples about Education Information Network usage in the teaching and learning process.	TLL	F	5	8	27	16	14	3.37	Moderately Agree
		%	7.1	11.4	38.6	22.9	20.0		
	English	F	9	9	9	10	4	2.78	Moderately Agree
		%	22.0	22.0	22.0	24.4	9.8		

When TLL and English teachers' evaluations for the next three items are examined, it seen that both groups moderately agree with items 28 (TLL X: 3.30 and English X: 3.14) and 30 (TLL X: 3.37 and English X: 2.78). While TLL teachers moderately agree with item 29 (X: 3.37), English teachers agree with it (X: 3.46).

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
31- The learning and teaching process directs teachers to use digital materials.	TLL	F	0	4	25	26	15	3.74	Agree
		%	0	5.7	35.7	37.1	21.4		
	English	F	2	3	8	16	12	3.80	Agree
		%	4.9	7.3	19.5	39.0	29.3		
32- The learning and teaching process directs students to use digital materials.	TLL	F	1	4	27	22	16	3.68	Agree
		%	1.4	5.7	38.6	31.4	22.9		
	English	F	1	6	10	14	10	3.63	Agree
		%	2.4	14.6	24.4	34.1	24.4		

When the two groups' evaluations for the items 31 and 32 are examined, it seen that both groups agree with them (TLL X: 3.74 and 3.68; English X: 3.80 and 3.63). While TLL teachers' mean is lower in item 31; the opposite is true for the item 32.

Table-3. Descriptive Analysis Results of the TLL and English Teachers' Assessments of their Curricula (cont.)

Item	Field		DA	AA	MA	A	SA	M	Result
33- Classroom seating arrangement are specified for the activities.	TLL	F	15	17	20	11	7	2.68	Moderately Agree
		%	21.4	24.3	28.6	15.7	10.0		
	English	F	8	11	12	6	4	2.68	Moderately Agree
		%	19.5	26.8	29.3	14.6	9.8		
34- The curricula include explanations about classroom management.	TLL	F	7	15	25	16	7	3.01	Moderately Agree
		%	10.0	21.4	35.7	22.9	10.0		
	English	F	6	6	15	9	5	3.02	Moderately Agree
		%	14.6	14.6	36.6	22.0	12.2		

When TLL and English teachers' evaluations for the last two items are examined, it seen that both groups moderately agree with them (TLL X: 2.68 and 3.01; English X: 2.68 and 3.02). Besides, the means of the two groups are very close to each other for the two items.

Sub-problem-2: How appropriate are the teaching and learning situations according to teacher opinions?

Table-4 Overall Assessment Results

	<b>TLL</b>	<b>English</b>
N:	70	41
Moderately Agree:	15	23
Agree:	19	11
X:	116.41	110.85
Standard Deviation:	27.98	26.25
Minimum:	38	63
Maximum:	150	155

Of 34 items, TLL teachers agree with 19 and moderately agree with 15. On the other hand, English teachers moderately agree with 23 and agree with only 11. Accordingly, the mean of TLL teachers (116.41) is higher than English teachers' mean (110.85). While the maximum scores of the two groups are close to each other (TLL: 150 and English: 155), there is a big difference in minimum scores as TLL groups' minimum is 38 and English groups' is 63. The standard deviation of the two groups are also close to each other (TLL: 27.98 and English: 26.25).

Sub-problem-3: Is there a significant difference between teachers' assessments by field?

Table-4. T-Test Results Comparing Teachers' Assessments of the Curricula by Field

<b>Field</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>d.f.</b>	<b>t</b>	<b>p</b>
TLL	70	116.41	27.98	109	1,033	.304**
English	41	110.85	26.25			

\*\*p<.05

The t-test results indicate that there is not a statistically significant difference in teachers' evaluations on the teaching and learning situations of secondary education TLL and English curricula depending on the fields ( $p=.304$ ;  $p>.05$ ) while overall evaluation of physics teachers is a bit higher.

Sub-problem-4: Is there a significant difference in the evaluations within the subject field depending on participating or not participating an in-service training on the curriculum?

Table-5. T-test Result Comparing Teachers' Assessments of the Curricula by Field and In-service Training

<b>Field</b>	<b>In-service Training</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>df</b>	<b>t</b>	<b>p**</b>
<b>TLL</b>	Yes	31	117.22	27.97	68	.215	.831
	No	39	115.76	28.33			
<b>English</b>	Yes	28	115.28	23.85	39	1.618	.114
	No	13	101.30	29.55			

\*\*p<.05

The t-test results indicate that there is not a statistically significant difference in teachers' evaluations on the teaching and learning situations of secondary education TLL and English curricula depending on attending an in-service training on the new curricula (TLL  $p=.831$  and English  $p=.114$ ;  $p>.05$ ) while overall evaluation of those who participated an in-service training is a bit higher than who did not in both groups.

Sub-problem-5: Is there a significant difference in the evaluations of those who have participated an in-service training on the curriculum within the subject field?

Table-6. T-Test Results for Assessments of the Curricula by Teachers Participating an In-service Training by Field

Field	N	X	SD	df	t	p
TLL	31	117.22	27.97	57	.285	.777**
English	28	115.28	23.85			

\*\*p<.05

The t-test results indicate that there is not a statistically significant difference in teachers' evaluations on the teaching and learning situations of secondary education TLL and English curricula depending on attending an in-service training on the new curricula ( $p=.777$ ;  $p>.05$ ) while overall evaluation of TLL teachers who participated an in-service training is a bit higher than English teachers in the same situation.

Sub-problem-6: Is there a significant relation between the assessments of TLL and English teachers?

Table-7. Correlation Results for Assessments of Two Groups

Pearson Correlation	Field	N	X	SD	r	p**
	TLL	70	116.41	27.98		
English	41	110.85	26.25		.022	.889

According to the Pearson correlation results, there is not a statistically significant relation between TLL and English teachers' assessments of their revised curricula ( $p=.889$ ;  $p>.05$ ).

## RESULTS AND DISCUSSION

While TLL teachers moderately agree with 15 items and agree with the remaining 19, English teachers moderately agree with 23 and agree with 11 items. These findings may tell that neither group thinks the teaching and learning situations in their curriculum is good enough. The items with lowest means in TLL teachers' assessments are about that the materials used in teaching and learning situations are easily reachable in every region, the curriculum presents a seating plan appropriate to the activities and provides explanations on classroom management. The last two may be because of the idea of giving teachers a freedom through the curriculum by not limiting them. The items with highest means in this group's assessments are about that the example activities are student centered and consistent with the content and teaching-learning approaches provided by the curriculum are chosen appropriate to the subject field. These results reveal that the curriculum is designed appropriate to the constructivist approach whose main principles include taking student to the center of the education and choosing subject-specific content and activities.

One of the items with lowest mean in English teachers' assessments is about that the activities can be carried out both in and out of the school. It is understandable as the opportunities of communicating in English are very limited; so activities of the course may not be done out of the school. The other two items are about that there are examples of using EBA in teaching and learning situations and that the curriculum provides a seating plan appropriate to the activities. As mentioned before, the idea behind new curricula (MEB, 2013) is to provide flexibility to teachers by giving them an opportunity to make decisions according to the conditions within the class. The items with highest means in this group's assessments are about that the example activities are student centered and consistent with the content. This result is similar to TLL teachers' assessment and indicates that the English curriculum is consistent with the principles of constructivist approach. In their study evaluating 2012 curriculum according to teacher opinions, Merter, Kartal, & Çağlar (2012) find out that the teachers moderately agree with the item "The curriculum includes student-centered activities." Another item with highest mean is about that the teaching and learning process directs teachers to use digital materials. The curriculum both states the importance of using technologic tools in teaching and includes units whose topic is technology or that includes technology within.

Although English teachers' overall assessment mean score is lower than TLL group, the difference is not statistically significant. Similarly, there is not a statistically significant difference between those who have received an in-service training and who have not in either group. Besides, the difference between those who participated in an in-service training on their revised curriculum in the two fields is not statistically significant.

Finally, there is not a statistically significant relation between TLL and English teachers' assessments. The two revised curricula should be thought over again in the light of these findings.

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# Assessment of Students' Response to and Perception of Structural Analysis as a Course of Study in Tertiary Institutions

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## ABSTRACT

When the purpose of a thing is not known, abuse becomes an inevitability. Education for Sustainability, as promoted by the United Nations is an essential tool for achieving sustainable development. This method of education is expected to foster creative thinking that will provide solutions to existing societal problems. For sustainable development to occur, there has to be the proper transfer of knowledge and technology through teaching and other classroom activities. In the teaching of structural analysis, one of the encountered challenges has to do with the students' poor performance in the course in the first place. This study sought to identify the response and perception of students of structural analysis. A survey of three institutions was carried out and data was obtained through the distribution of well-structured questionnaires to students that offered structural analysis from Covenant University, University of Lagos and Yaba College of Technology. Data obtained from this survey were analyzed using SPSS, and then the agreement ranking of responses and perceptions were determined. The results were presented in form of frequency tables using relative importance index to get a clearer view of the most significant factors. The result showed in the response of students to structural analysis, that they acknowledge the importance of the course, despite any difficulty they might be facing, and also, they approach the course with fear and anxiety. The results also showed that even though the students understand the importance of the course, they are not interested in it. It was recommended that teaching methods that build interest in the students should be adopted such as the use of software and other technologies. This will demystify the learning of structural analysis. Problem based methods of learning should be adopted to as to build up interest and problem-solving capabilities in the students.

**Keywords:** Education for sustainability, teaching, structural analysis.

## INTRODUCTION AND RESEARCH OBJECTIVE

There are several factors that have been identified as the contributor to students learning difficulties in which include, peer pressure, parental and home background, teacher's attributes, school environment, students interest in the subject, and socio-economic status of the student (Rilwani, 2014). However, most of the attention on students' academic performance has been placed on the teachers shoulders so that they are responsible for the success or failure of the students (Sabitu and Nuradeen, 2010).

According to Herr, (2013) the main challenge of structural education in architecture are the students trying to incorporate structural design into their applied design skills.

Furthermore, the school environment is also another critical factor affecting learning especially in the developing nations of the world, due to poor facilities and lack of appropriate teaching aids. for examples, there are some public schools in Nigeria that cannot afford enough chairs for their students, hence some of them have to stand for hours stretch receiving lectures, some institutions do not even have the right textbooks and resources to stimulate the interest of the student, also other environmental factors like improper ventilation, inadequate lightning and a host of them contributes to the difficulty in learning. This singular factor is what distinguishes the

performance of students in Africa to other developed nations of the world; (Rilwani, 2014). This has led to the question of what the responses of students in civil engineering and environmental sciences to structural calculations are?

The objective of this study was to assess the response of students offering structural analysis as a course.

## **LITERATURE REVIEW**

There is hardly a general definition of learning that is acceptable in all circles (Shuell, 1986). Likewise, students also vary, and hence there are differences in the difficulties encountered by them. Rebecca & Richard (2005) suggested that motivation exists at different levels for students just as students have different approaches to learning. The diversities of student's approach to learning and orientation to studying were examined by Marton and Saljo, (1976), they came up with three different approaches in which they called the surface, deep and strategic approach to learning.

There are two broad factors that affect students' academic performance. These are internal and external factors, in which the internal factors include class size, learning facilities, environment of the class, innate ability of the student, motivation, complexity of the course material, teachers' role in the classroom, technology used in the class and the exam system (Irfan and Shabana, 2012). The external factors constitute social economic factors, extracurricular activities, family problems. Further research studies show that students performance depends on others such as gender and age differences (Hansen, 2000).

From several researches done, it has been seen that attitude plays a key part in successfully learning courses (Gilbert, 2001; Brandl, 2002; Desmarais, 2002; Doherty, 2002; Murday & Ushida, 2002)

According to Singh et al., (2017) achievement goal includes obtaining good grades, being appreciated by instructors, and recognized in peer groups and the feeling of accomplishment after solving critical problems. To get the best out of their students, instructors have been motivating their students for better performance and encouraged them to be competitive.

School environment when analysed has a great role to play in difficulties students' encounter, the more conducive the environment, the lesser the difficulties students' encounter. Social environment could mean a conducive learning environment, availability of good teaching aids (computers, teachers, laboratories, libraries etc.)

Students should be provided with facilities that enhance the learning environment because according to Fencil and Scheel, (2005), the right learning environment and pedagogies used by a teacher play an important role in students learning. Learning environment is made up of instructors teaching capability, class engagement, student- teacher ratio and student-student interaction, which influences an individual's motivation towards learning (Brophy, 1998; Pintrich & Schunk, 1996). Students will tend to be more engaged and connected in the learning process when they are trained in the proper environment (Brooks & Brooks, 1999).

Studies on the effect of teacher experience on student learning have found a positive relationship between teachers' effectiveness and their years of experience. The evidence currently suggests that inexperienced teachers are less effective than the more senior teachers Rivkin, Hanushek and Kain, (2000).

External factors constitute an environment that comprises factors that significantly affect students' academic performance. These environments may be physical or socio-physical such as sports, fraternities, clubs, cults, family relationships, romantic relationships, membership of organizations, or some form of extracurricular activities. These usually have a direct or indirect effect on academic performance.

Jayanthi et al. (2014) discovered that Student involvement in extracurricular activities lead to an improvement in cumulative GPA scores while Levine et al. (2014) observed that Most student-athletes held positive personal attitudes towards academic achievement, but their peers did not

## **METHODOLOGY**

### **Area of study**

The study was conducted in Covenant University, Ota and two Lagos universities, the first one which is University of Lagos, Akoka and Yaba School of technology. The reason for choosing these other two institutions in Lagos state universities was because one represented a federal government institution while the other represented a state institution.

## **Population of study**

The targeted population for this study were students in 100-500 level studying any construction related courses basically architecture, building technology, Civil Engineering and Quantity surveying in covenant university, university of Lagos, and Yaba College of technology.

## **Data collection instrument**

Data used for this research were obtained from using multiple choice structure questionnaires to answer the question of student's response to calculation based courses. The questionnaire was adopted from a rigorous review of the literatures used. The questions were in a 5-point Likert format ranging from (SD= strongly Disagree, D=Disagree, U= Unsure, A=Agree, SA=Strongly Agree) which were used to measure the respondent response and factors affecting the learning of structural analysis as a case study. the questionnaire consists of two sections.

## **Sample size**

A sample consists of selected elements, subjects or observations from a given population. It is a finite part of statistical population of which properties are studied to gain information about the whole population. For the purpose of this research work, a survey was conducted and it was realized that all together in the three institutions there were more than a thousand students in the courses. Therefore, for this research work 195 questionnaires were distributed and 164 were retrieved which is 84.10%.

## **Research instrument for data analysis using Statistical package for social sciences (SPSS)**

Statistical package for social science (SPSS) was used to process and analyse the information obtained from the questionnaire survey. Mean and agreement ranking were used to achieve objectives 2 and 3 as stated in chapter one by the use of SPSS. The result gotten would be made in a pictorial form for example pie chart and also frequency table for clarity of the analysis of the obtained data.

## **Descriptive tools**

These are the tools used for describing the entire population or samples. This helps to show the relationships among the variables and other significant features. These tools are very useful in conveying quick impression of any clustering variations and possible trends in the value of variation. An example of such tools collected in the analysis of this data includes charts, frequency, percentages and measure of central tendency.

## **ANALYSIS AND DISCUSSION OF RESULT**

In the first section, the personal data of structural analysis students were acquired through the self-administered questionnaires. Information such as gender, institution, levels and departments were analysed. The following were discovered

Covenant University had 77 respondents; university of Lagos (UNILAG) had 47 respondents while Yaba School of technology had 40 respondents. The following data shows that Covenant University had the highest respondent for the study, owing to the fact that it was the researcher's institution.

In order to get accurate information, and views from different sides, the entire department offering structural analysis were included in the research work. From the figure above building technology had 36.27% of the respondents, followed by civil engineering with 33.33%, also Architecture had 25.49% and lastly quantity surveying with 4.90% of the total respondent. The department of building technology has the highest number of respondents for this research work.

It was also observed that 100 level respondents had the lowest percentage at 4.90%, followed by 200 level respondents with 7.84%, 300 level respondents with 17.65%, 400 level respondents at 24.51%, then 500 level respondents which carries the largest percentage at 45.10%.

The reason 500 level respondents had the largest percentage was because the researcher assumed that, the respondents had spent quite a considerable time doing structural analysis, therefore with their experience they could provide accurate information.

The gender distribution of the respondents was as follows; it indicated that the male gender has 65.69% while the females have 34.31%. From this distribution, the male gender has a greater population than the females, the reason for this is not far-fetched as the construction industry is male dominated.

**Table 1:** shows the overall perception of students to structural analysis.

RESPONSES	MEAN	RANKING
Structural analysis is important because it feeds into other	4.24	1
I feel the lecturer has adequate knowledge and understanding of the course	3.87	2
There are student tutors who help my understanding of the course	3.81	3
I look forward to attempting the assignment given to improve my knowledge	3.73	4
I belong to a study group which helps my understanding of structural analysis	3.44	5
Structural calculation classroom is conducive for learning	3.34	6
I understand the lecturer and I am able to contribute often	3.3	7
I usually anticipate the course lectures because I enjoy it so much	3.11	8
I have difficulties transferring the knowledge I gain from examples treated in class to other equivalent structural analysis problems	2.55	9
I feel that this course is only necessary at the post-graduate level not undergraduate level	1.87	12
I prefer to sit at the back of the class because I would rather not be in class	1.92	11
I approach the course with fear and anxiety	2.49	10

Table 1 shows the overall response of students to structural analysis. From the table 1 the response “Structural analysis is important because it feeds into other civil engineering, building and architecture subjects I study” has a mean item score of 4.24. this ranked the highest. It was followed by “I feel the lecturer has adequate knowledge and understanding of the course” has a mean item score of 3.87. The third ranked response was “There are student tutors who help my understanding of the course” with a mean item score of 3.81. “I look forward to attempting the assignment given in order to improve my knowledge” had a mean item of 3.73. “I belong to a study group which helps my understanding of structural analysis” had a mean item score of 3.44, Structural calculation classroom is conducive for learning had a mean item score of 3.34, I understand the lecturer and I am able to contribute often had a mean item score of 3.30, I usually anticipate the course lecturer because I enjoy it so much has a mean item score of 3.11, I have difficulties transferring the knowledge I gain from examples treated in class to other equivalent structural analysis problems has a mean item score of 2.55, I approach the course with fear and anxiety has a mean item score of 2.49, I prefer to sit at the back of the class because I would rather not be in class is with a mean item score of 1.92, finally I feel that this course is only necessary at the post graduate level not undergraduate level had the least mean item score of 1.87.

Structural analysis is important because it feeds into other civil engineering, building and architectural subjects studied, had the highest mean in the table, therefore it was the most significant response.

From the data obtained, 141 out of 164 respondents agreed that structural analysis was important to them. This did not come as a surprise because most construction programs started structural analysis from their first year, to give them a good foundation and understanding of other structural related courses. This singular reason could have helped the respondents to figure out how vital the course is to them. More so the respondents attesting to the importance of the course shows that they regard it of inestimable value to their career regardless of any difficulty or challenge they might be facing in it.

The second significant response was that, their lecturers have adequate knowledge and understanding of the course. This implies that they have well learned lecturers with the right criteria and qualifications to pass across information to them.

Coming in third place is the presence of student tutors who help the respondents' understanding of the course. The effect this has on the second response is that, the lecturer having an adequate knowledge of the course doesn't guarantee that he passes on the knowledge to the understanding of the student, due to this the students organise tutorial amongst themselves to understand better what was not understood in class. According to research student understands more from their colleagues than from the lecturer.

As there are positive responses gotten likewise also are there negative responses. These are responses that ranked least on the table, the most significant of which is fear and anxiety towards the course. This is a generally accepted notion, that most student faces anxiety and fear when it comes to calculation based courses, because they feel it is hard and hence they might not understand it, even before attending the class. The second negative response is that student prefers to sit at the back, or they would rather not come for the class. This shows that they are very uninterested in the course even though they acknowledged its importance, also anxiety and fear could cause them to want to sit at the back or not attend the class.

**Table 2:** Agreement of responses amongst covenant university respondents, University of Lagos and Yaba tech respondent respectively.

<b>Responses</b>	<b>Covenant university</b>	<b>Rank</b>	<b>University of Lagos</b>	<b>Rank</b>	<b>YABA College of Technology</b>	<b>Rank</b>
I do not see the necessity of this course in the curriculum	1.6	13th	2.07	12th	1.58	11th
I have difficulties transferring knowledge I gain from examples treated in class to other equivalent structural analysis problems	2.63	9th	2.9	8th	2.08	10th
I prefer to sit at the back of the class because I would rather not be in class	1.81	11th	2.41	10th	1.58	11th
I feel that this course is only necessary at the postgraduate level not undergraduate level	1.69	12th	2.38	11th	1.54	12th
I look forward to attempting the assignments given to improve my knowledge of the course	3.58	4th	3.34	4th	4.42	2nd
Structural analysis classroom is conducive for learning	3.33	5th	2.93	7th	3.75	7th
I belong to a study group which helps me in understanding this course	3.21	6th	3.41	3rd	3.83	5th
There are student tutors who help my understanding of the course	4.04	3rd	3.41	3rd	3.79	6th
I feel the that the lecturer has adequate knowledge and understanding of the course	4.08	2nd	3.48	2nd	3.88	4th
Structural analysis is important because it feeds into other civil engineering, building and architecture subjects I study	4.25	1st	3.97	1st	4.58	1st
I approach the course with fear	2.33	10th	2.79	9th	2.42	9th
I usually anticipate the course lectures because I enjoy it so much	2.92	8th	2.92	6th	3.58	6th
I understand the lecturer and I can contribute often	3.04	7th	3.04	5th	3.92	3rd

From the table 2, it was observed that regardless of the institution, all students accepted that structural analysis was important, as this response ranked first amongst the three institutions visited. Furthermore, in agreement Covenant University and University of Lagos, ranked their lecturers having adequate knowledge and understanding of the course in second places respectively, likewise again, both have in third places that they have student tutors who help in their understanding of the course. In conclusion Covenant University and University of Lagos have agreement of response. The table also showed the general agreements between groups from the three institutions.

## CONCLUSIONS

The study has explored the students' response and the factors affecting their learning of structural analysis. It was revealed that students are well informed of the importance of the course to their career; also, they know that their lecturers have adequate knowledge of the course, and furthermore they agree that practical examples are given in class. Students looked forward to assignments to help them do better at the course. Despite these positive responses, some students still approach the course with fear and anxiety, and prefer not to attend the classes, or sit at the back. Though this ranked least of the responses of students to structural analysis as a course. The responses were similar across all institutions surveyed.

## RECOMMENDATIONS

1. Despite the students knowing the importance of the course and the lecturer being knowledgeable in the subject area, creative methods of imparting knowledge should be employed by the lecturers despite their knowledge of the courses. This will reduce the fear experienced by the students and develop the interest students in structural analysis.
2. Students should be encouraged to attend classes more regularly and efforts should be made by instructors/lecturers to allay the fears and anxieties the students experience. More assignments should be given to help with their understanding of structural analysis.
3. Public universities should admit the number of students they have enough resources for, so as to reduce the class sizes. Should in case they want to admit quite several students they should ensure that they are divided into groups and given different lecture times.

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# **Attitudes Toward Using Mobile Devices for Learning German As Foreign Language – The Quizlet App**

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## **ABSTRACT**

The purpose of this research is to show the advantages of Mobile-Learning in the process of learning a language, using the app Quizlet. Said application is used as a resource in the elaboration of shreds of evidence of the partial feasibility of the mobile learning to support the acquisition of partial linguistic competencies of a foreign language. The Literature demonstrates that the combination of Mobil and traditional media generate favorable conditions to create a motivator and active environment which it helps strengthen learning outside the classroom. This also allows students to interact with the learning material in a different context. The present qualitative case study includes the different characteristics; observation, content analysis and self-administered questionnaire of twenty-one students in a beginner´s course in German as a foreign language.

**Keywords:** Mobile Learning, language course, higher education, attitudes

## **INTRODUCTION**

It is not a novelty that electronic media are used in German as a foreign language (GfL) and it is also known that learning and teaching (L-T) offers multifaceted opportunities for individual and collective learning. The offers to achieve a successful and sustainable learning require a didactic design with diverse means. Those means could be the starting in the process of learning and teaching (L-T) of a foreign language. The presence of electronic media such as texts, images, videos, audios, mobile applications, platforms and electronic boards were important impulses in the process of L-T and for the language acquisition. Learning management using social media for communication between participants and facilitators, or participating in open-access, mass-media courses for different practice and learning.

Despite that, there are a lot of online courses in the market for any language and particularity GfL, conventional classes of language acquisition are still common. Nevertheless, the integration of information technologies and communication are indispensables in the process of L-T for this language. There are phases, where the content is presented online or disconnected, just as you can organize and manage the class preparation program with synchronous or asynchronous. However, in order to link learning with the culture of young participants and thus motivate formal and informal learning, the inclusion of mobile applications in and outside the classroom is an option. (Biebighäuser, 2015; Strasser, 2016; Seipold, 2013)

## **Motivation, purpose and study objectives**

This study has the purpose to collect evidence of the practical feasibility of mobile learning using Quizlet to favor the acquisition of partial linguistic competencies grammar, writing and reading in the German language.

Proposes:

1. Create learning units for a deeper insight of content according to the program of the German language course, level A1, using the Quizlet application.
2. Motivate the students to use Quizlet as an autonomous learning tool of out of school activities.
3. Determine the use of the application by the participants.
4. Determine the advantages of using Quizlet in the acquisition of partial languages skill, such as grammar, reading, and writing.
5. Determine the using of mobile devices in GfL course.

The following assumption is raised: The use of the Quizlet application promotes the achievement and development of linguistic provisions in the students of A1, ALE in using grammatical structures, reading and writing.

## **THEORETICAL FRAMEWORK**

For language teaching, electronic media plays an important role. A retrospective look at the foreign language class reminds us, for example, of language laboratory technologies in the 1960's with a tape recorder, record player, overhead projector, laboratories with tape recorder cassette, educational videos, floppy disc players and DOS programs in the eighties of the last century, then multimedia programs in the 1990's in CDs, or courses that were installed on the computer for self-learning and the combination with hypermedia (Roche, 2013, 245). Times have changed, the multimedia concept has been around for more than twenty years, and the term of E-Learning in semi-virtual and virtual scenarios has given a shift to mobile learning with device portability, with its independent connectivity of place and time to cultures and languages, since the teaching of a language is closely related to a culture. Mobile devices complement the lives of many young students and learning is not limited to formal spaces (Strasser, 2016; Biebighäuser, 2015; Rösler, 2010; Keegan, 2005). The term E-Learning refers to multifaceted learning and teaching arrangements with different electronic and digital media in classroom, virtual and semi-private spaces, independent of time and place, formal and informal, with individual, participatory or cooperative learning phases, with instructional or network structure for self-determined learning. (Arnold, P. et al, 2015, position on Kindle 575-1040). Authors like Baumgartner, Häfele & Maier-Häfele (2002, 14-15) understand E-Learning as "...a superior term for software-supported learning, as well as learning through Internet." When it comes to the topic of E-Learning in foreign languages, it is not enough to "think only of the virtual place, where information is acquired, instructions are fulfilled and questions are asked to the instructor..." (Rösler, 2010, 9). The term Blended-Learning refers to mixed learning with digital media in virtual spaces, which are complemented by face-to-face phases. The presence can also be performed online with webinars or conferences. (Arnold, P. et al, 2015). With mobile devices, E-Learning evolved into the Mobile-Learning mode, which combines concepts of distance education, virtual communication and collaboration in synchronized or synchronized time, with portable and mobile technology independent of the place of students and instructors (Castaño Garrido, C. & Cabero Almenare, J., 2013, 43). Using the mobility factor, the independence of energy sources, connection to the permanent network is possible access to knowledge at any time. New possibilities are integrated in the learning and work scenarios by the comfortable access in the moments needed (De Witt, C., 2015).

The development of ICT has directly affected the way the new generations communicate and relate. The area of education has not been exempt from its effect allowing the generation of virtual and face-to-face environments rich in multimedia content. In this sense, mobile devices, being accessible, smart, small, portable and comfortable to take them anywhere at any time, are a good resource for learning in any area of knowledge and for particular languages. Students, through learning activities supported by M-Learning, have the opportunity to construct their learning actively, rather than passively waiting for the information to be received from the teachers. Mobile devices allow students to have easy access to multimedia information (images, sounds, videos, books and documents), but in the same way they attract their attention to spontaneous learning environments where he decides when, where and what to learn (Pei -Hsun, Ming-Kuan, 2013).

To generate these learning environments requires an E-A process planning. Friedrich et al suggests the six didactic vertices to plan and analyze the class. Linked to the objective of the present work, the point is to generate media-based learning contexts. The mobile device enables students and teachers to create new EA contexts in the interface that connects the convergence of internet media, real-world entertainment media, and creates bridges and communication chains between everyday life and school (Friedrich, Bachmair, Risch, 2011, 9) In this way, formal learning in the language class becomes important and informal at home or elsewhere (Strasser, 2016). But it is not always possible to motivate students to out-class activities using applications or social networks for learning and vacancies are necessary to learn anywhere and at any time. (Tran, 2016; De Witt & Reiners, 2013). It is necessary that students have positive learning attitudes to mobile learning (Chien, 2015).

## **METHOD**

This study has a mixed approach since it explores, collect and analyze evidence in a qualitative behavior of the partial feasibility in the mobile learning using the Quizlet application. In a quantitative form, it realizes the content analysis of exercises and assignments.

### **Context**

The study was conducted in a GfL-course which offers a language center within an institution of higher education. The duration of the course lasts one semester, since January until June of 2017, which gives a total of 120 hours of face-to-face classes. It is worth mentioning that the use of the application is independent of the

classroom course and the tool can provide a space for independent learning. The participants are enrolled in a GfL language course level A1 between January-June 2017 (N = 21). Students were informed of the study and the anonymity of their personal data.

#### Limitation of the study

The total of twenty-one participants presents a limitation for the study and the results cannot be generalized.

#### Instruments

The content analysis is based on the number of times in which each participant use the application. For each lesson seen in class, the participants have to carry out exercise that improves grammar and vocabulary skill that facilitate individual learning. For content analysis the simple count is used. The Quizlet application offers seven practice modes: flashcards, vocabulary writing, spelling and listening, blending terms in two forms, test and live connecting (see image 1).

#### Implementation

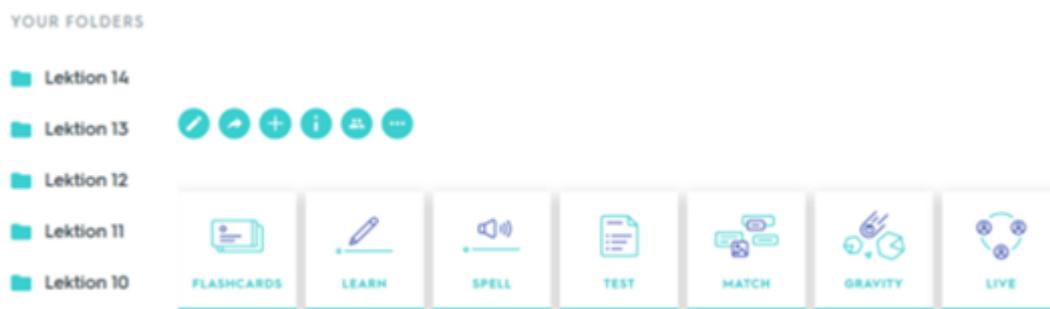
The Quizlet application is free for students and with basic functions for the teacher as well. Quizlet was executed as a supplementary device in the second phase of the course, after the first written exam. Once registered and enrolled in the course inside the Quizlet application, members choose one of the six exercise modes: learning terms, vocabulary, spelling and listening, mixing terms in two ways and a quiz like a figure 1 representation. The teacher is the bound of the content of the application and is associated with the included of the curse. Students have the opportunity to learn vocabulary in a visual and hearing was, as well as reinforces grammatical structures and finally you can go to two types of games to find pairs and sort terms with pictures and /or their descriptions. In a test type, the application allows the student to place his knowledge to the test. Each mode can be used several times and as often as is required for learning. The most representative data of the study approach will be shown below and the results are understood as preliminary.

## RESULTS

#### Objective 1: Create learning units

During the semester five folders with fourteen learning units were developed, which are only available for the participants registered in the course.

Image 1. Example of learning units and exercise modes



Source: own, <https://quizlet.com>

#### Objective 2: Motivate the students to use Quizlet

The way that all the 21 participants (100%) of different faculties were motivated to use Quizlet was thought personalized invitation in the classroom and by e-mail. To all this encouragement to motivate students to use Quizlet, only eight students (38%) respond, been registered and used in the mobile application as members of the group for level A1. Of the eight students, 50% are women, and 50% are men. The age of the participants is between 17 and 19 years. All the participants are full-time students.

#### Objective 3: Determine the use of the application

Image 1 shows the seven modes of operation, which participants can choose for more intensive learning of the content of the units in progress. Of the seven modes only five were used. An average of eighteen records per mode is displayed. The Match mode is the unit that most performed with 43.3%. The Flashcard mode for vocabulary and grammatical structures with 24.4% and Testing 22% was selected. The Writing mode was rarely chosen with 8.9%, which may have its reason in adverse conditions for specific contents on a mobile device with decreased touch screens. The Spell and listening mode was little used by students with three entries corresponding to 3.3% and finally the Gravity and Live modes were not used.

Table 1. Activities realized with Quizlet

Mode	Absolute Frequency	Relative Frequency (%)
Flashcards Vocabulary	22	24.4
Writing	8	8.9
Spell and listening	3	3.3
Test	18	20.0
Match	39	43.3
Gravity and Live	0	0.0
Total realized activities	90	100

Source: own, June 2017

Objective 4: Determine the advantages of using Quizlet

In written examinations, participants test the acquisition of partial grammar, writing and reading skills, which are assessed on the scale of 0 to 100, where high values indicate greater compliance in the test and suggest a major acquisition in competition. The results show differences in the three partial competences. In addition to a notable increase in grammar, writing and in reading (see table 2).

Table 2. Student results in Tests

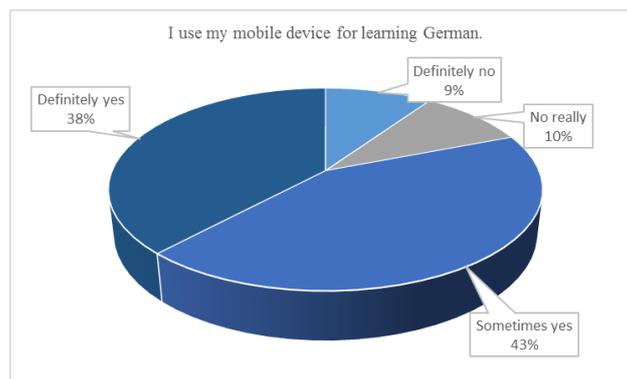
Resultados	Value	Grammar	Writing	Reading	Average
Learning with	Media	81.6	89.1	93.4	77.0
Quizlet support	N	8	8	8	8
Without support	Media	75.1	83.6	88.8	85.3
Quizlet	N	8	8	8	8

Source: own, June 2017

Objetivo 5: Determine the using of mobile devices in GfL-course.

In questionnaire 95% of students respond to use a mobile device. In figure 1 can be seen that 38% of participants used the mobile devices for learning German and this percentage corresponds with amount of students using Quizlet outside course to trained language competencies. Other 43% of learners respond to used the mobile device sometimes and 19% no used the application for learning german.

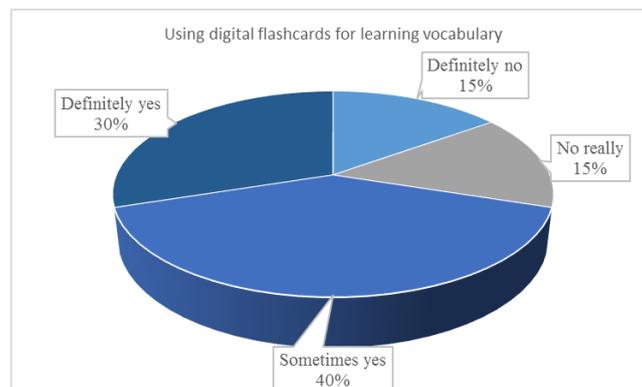
Figure 1. Use of mobile devices in GfL-course



Source: own, June 2017

Figure 2 shows how students learning vocabulary and 30% definitely are using digital flashcards and 40% sometimes there are using too. A total of 15% remain who do not use Flashcards definitely and other 15% no really do it.

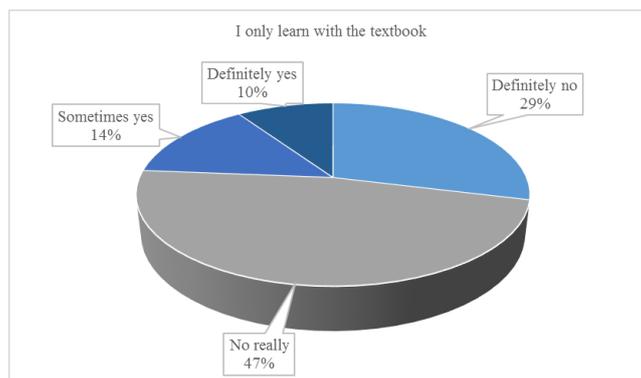
Figure 2. Learning resources for vocabulary



Source: own, June 2017

The participants were also asked if they only used the course book (figure 3) and 29% of students definitely not only learned with course book and 47% do it not really. But 10% only used the course book and 14% of participants answered that sometimes are study only with textbook.

Figure 3. Learning with textbook



Source: own, June 2017

### Discussion of results

We hoped to motivate and engage more participants in out-class activities with Quizlet, although it was not obligatory to use it. The data provides information about a specific group of students and to the extent that their participation in mobile learning with Quizlet outside of the classroom class seems to arouse little interest in them. Here the input conjecture that motivation is greater for autonomous learning in students using mobile apps, cannot be confirmed. Several students fulfill various extracurricular activities such as the training of a sport, learning other languages or dedication to the projects and exams of the career they study. Learning the German language for the participants in the course of this study does not necessarily present a priority, but is part of a medium-term project in their professional career. It may be that the material used in the classroom course is sufficient to achieve personal goals. Participants are missing information about their study habits and use of mobile and social media tools for learning, leisure time use. There is also another question about students' learning habits and teacher dependence. If the Quizlet tool is implemented formally within the course, it will be returned to a teacher-controlled, heteronomous mode. The test mode was little used for learning, since it can reveal those cracks that apparently were tried to close. It may be that the students lacked time to feel safe and sufficiently prepared to present the test. However, it is the idea of an application of this kind to show the gaps in knowledge to close. The mode of gravity, where one plays with terms like a puzzle against time at no time was chosen for learning. That the application was seldom used and can also have its reasons in the frequency of the classroom, since every day students are in the course and there is no need, not enough time to devote even more to a course that does not part of the curriculum.

### CONCLUSION

The study was based on the purpose of collecting evidence of mobile learning with the Quizlet application and the assumption that using a tool for mobile learning favors the acquisition of partial language skills grammar, writing and reading in the language German. The purpose and the assumption can be partially confirmed. It should be emphasized that the study does not cover the acquisition of partial competences as indicated by the Common European Framework of Reference for Languages for level A1, but a small part. The improvements in grammar, writing and reading allow the consideration that the Quizlet app helps to trained partial competences. However, other studies are suggested considering factors such as motivation and orientation to the future, attitude towards learning and towards the teacher, emotions in learning as the availability of time and customs of the use of devices for language learning.

### ACKNOWLEDGMENTS

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## Attracting and Retaining Female Students in Construction Related Programs

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### ABSTRACT

The number of females moving into professional field is remarkable and almost as equal as the statistics of men entering into professional field. However, anecdotal and empirical evidences show that the construction industry is still male dominated. The construction industry is experiencing serious skill shortages and the current male dominated workforce is aging. It is believed that women can be relied on to bridge the skill gap and the aging population. Tertiary institutions have been identified as gates through which future entrants enter into any industry of choice. Yet, evidences reveal that female enrollment in construction related programs is abysmally low. This paper is aimed at identifying strategies for attracting and retaining female students in construction related programs. The paper adopted a desk research approach. The major strategies for attracting females in construction related programs include: adequate career counseling, a gender inclusive learning environment, exposure to female role models and personal motivation from the student. For female students to be retained in construction related programmes there has to be obvious changes in the industry. Hence the two effective strategies for retaining female students are: improving the image of the industry and improving work life balance. The findings have implications for the construction industry. Given reported cases of skill shortages and the existing aging population, females can bridge the gap. Hence, construction stake holders and indeed educators need to adopt the identified strategies for attracting and retaining females in construction related programmes.

**Key words:** attraction, construction programs, female students, gender, retention

### INTRODUCTION

A lot of changes have taken place in the world of work. Women are now moving into professional fields once considered strictly for men particularly banking, insurance, retail trade, education and health services sectors because of perceived high level of social status (Gurjao, 2006). However, the construction industry is still dominated by men. Certain factors have been found to discourage women from the construction industry. These factors include: poor image of the industry which is portrayed as one requiring brute strength and a good tolerance for outdoor conditions (Agapiou, 2002); the culture and environment of the industry been amongst the most chauvinistic with an extremely macho culture which is hostile and discriminatory towards women (Bagihole *et al.*, 2000); work-life conflict (Wentling, 1996) and a general lack of information about the industry, the career opportunities it can offer and the qualifications required (Fielden *et al.*, 2000).

Presently, the construction industry worldwide is experiencing serious skill shortage (Watson, 2012; Darren, Mark and Christopher, 2012; Oseghale, Abiola-Falemu and Oseghale, 2015); Windapo, 2016). In many EU countries there are reports of acute skill shortages as such many contractors rely on immigrant workforce in order to meet work demand (Clarke, *et al.*, 2005). For instance, the UK construction industry ranks the second highest reported case of skill shortage among EU nations (Gurjao, 2006). Moreover, the male dominated population is aging (Attar *et al.*, 2012; Ng and Chan (2015) with fewer young people seeing construction as a career of choice. Gurjao (2006) predicted that the population of male workforce aged 65 and over will be 23% of total work force population by 2031. This prediction has serious implication for the global construction because older people are more susceptible

to musculoskeletal challenges and other occupational health hazards which can negatively affect project performance. The industry is yet to fully utilize its full competencies (*i.e. the competencies of minorities particularly women*). Engaging more women in the industry has socio-economic benefits. For instance, employing more women will reduce the cost of immigration issues involved in the use of immigrant workforce - an alternative to the problem of skill shortage. It is the belief of the author that attracting and retaining more women in the construction industry, would help in reducing the skill shortage challenge faced in many countries. Moreover, retaining more women in the industry meets with social sustainability requirement which portrays the industry as pluralistic. However, the big question remains how can the industry attract and retain female students who will someday choose to make a career in construction. Hence, the aim of the paper is to identify strategies for attracting and retaining female students in construction related courses.

## **METHODOLOGY**

The study adopted a desk research approach. It reviewed several literatures on attracting and retaining women in construction. The major findings are documented below:

### **Attracting female students into construction related programmes**

For female participation/retention in the industry to improve, more females have to be attracted into the industry. Several factors have been identified as necessary for attracting female students into the industry and they are discussed below:

**Adequate career counsels** – According to (Fielden *et al.*, 2000) there is a general lack of information about the construction industry and the career opportunities it can offer. Prospective and present students need to be adequately counseled about a career choice in construction. Firstly, it is important for counselors and teachers to be knowledgeable about construction career. It has been found that some teachers and counselors have inadequate knowledge of non-traditional disciplines like construction and are unable to advise students accordingly (Reynolds, 2014). Adequate skill is required for counseling female students into pursuing career in non-traditional disciplines. Female students can be encouraged by their teachers or counselors into non-traditional careers through verbal persuasion (Ericksen and Schultheiss, 2009). Counselors and teachers put in a lot of effort to convince students about career choices in the construction industry because of the poor image it has earned itself as a result of the prevalence of a macho culture, gender discrimination and poor work life balance. Adequate career enlightenment programmes by various construction related professional bodies and regulatory bodies to secondary schools can also promote knowledge about the construction industry thereby, attracting more female students into construction related disciplines (Adogbo, Ibrahim, and Ibrahim, 2015). Moreover, counselors and students need to be aware of the entry requirements into construction related discipline. Fielden *et al.*, (2000) noted that there is a general lack of information about the qualifications required for studying construction related disciplines. (Adogbo *et al.*, 2015) noted that the determinant for entrance into a construction discipline is to sit for and obtain credits in science subjects that include, but are not limited to, Mathematics, Physics and Chemistry. Hence, more females have to be encouraged to embrace STEM in order to choose careers in construction related courses.

**Gender inclusive learning environment** – Globally, inequalities in educational access, retention and performance still exists despite efforts to promote quality education (IREX, 2016). Learning environment refer to hard and soft facilities in a school. Hard facilities are physical facilities like classrooms, hostels, laboratory and libraries while soft facilities include teachers, counselors and other human assets in the school environment. A gender-inclusive learning environment is one that recognizes the possibility of the incidence of gender inequality and attempts to overcome it (Shevli, 2009; Du and Kolmos, 2007). Teachers have a key role to play in fostering gender inclusive learning environment which attracts and retains female students particularly in non-traditional disciplines. Some strategies for creating gender inclusive learning environment include: addressing both male and female learners a balanced number of times and for all subjects, giving both female and male learners equal opportunity to present their work to the class, giving both female and male learners equal opportunity to write on the writing board a balanced number of times, giving similar duties to both male and female learners, supporting and encouraging both female and male learners to be class leaders, possibly having one female and one male as co-leaders (IREX, 2016).

**Personal Motivation** – Female students need to be personally motivated to choose a career in construction otherwise counseling and enlightenment efforts will be wasted. According to Hazley (2016) female students who have successfully completed their study in a male dominated programme like computer science, have been able to engage in positive self-regulation strategies and committed to adaptive goals during and prior to college that helped

them succeed in this rigorous academic atmosphere. Moreover, (Schunk & Zimmerman, 2012) noted that positive performance outcomes in schools such as higher grades, adaptive behavior in the face of challenges, sustainable study habits, promotion of knowledge development and retention, and positive views of ability could be achieved by self - motivation and self-regulatory behaviors of students

**Exposure to female role models** – Same-gender role models are helpful for women who are already in non-conventional fields like STEM and construction (Drury, Siy and Cheryan, 2011). Women who are in non-conventional fields contend with negative stereotypes that inhibit their performance in these fields (Spencer, Steele, & Quinn, 1999). Female role models can inoculate women in male dominated fields against the discouraging effect of negative stereotypes (Stout, Dasgupta, Hunsinger, & McManus, 2011).

### **Retaining Females in Construction Related Programmes**

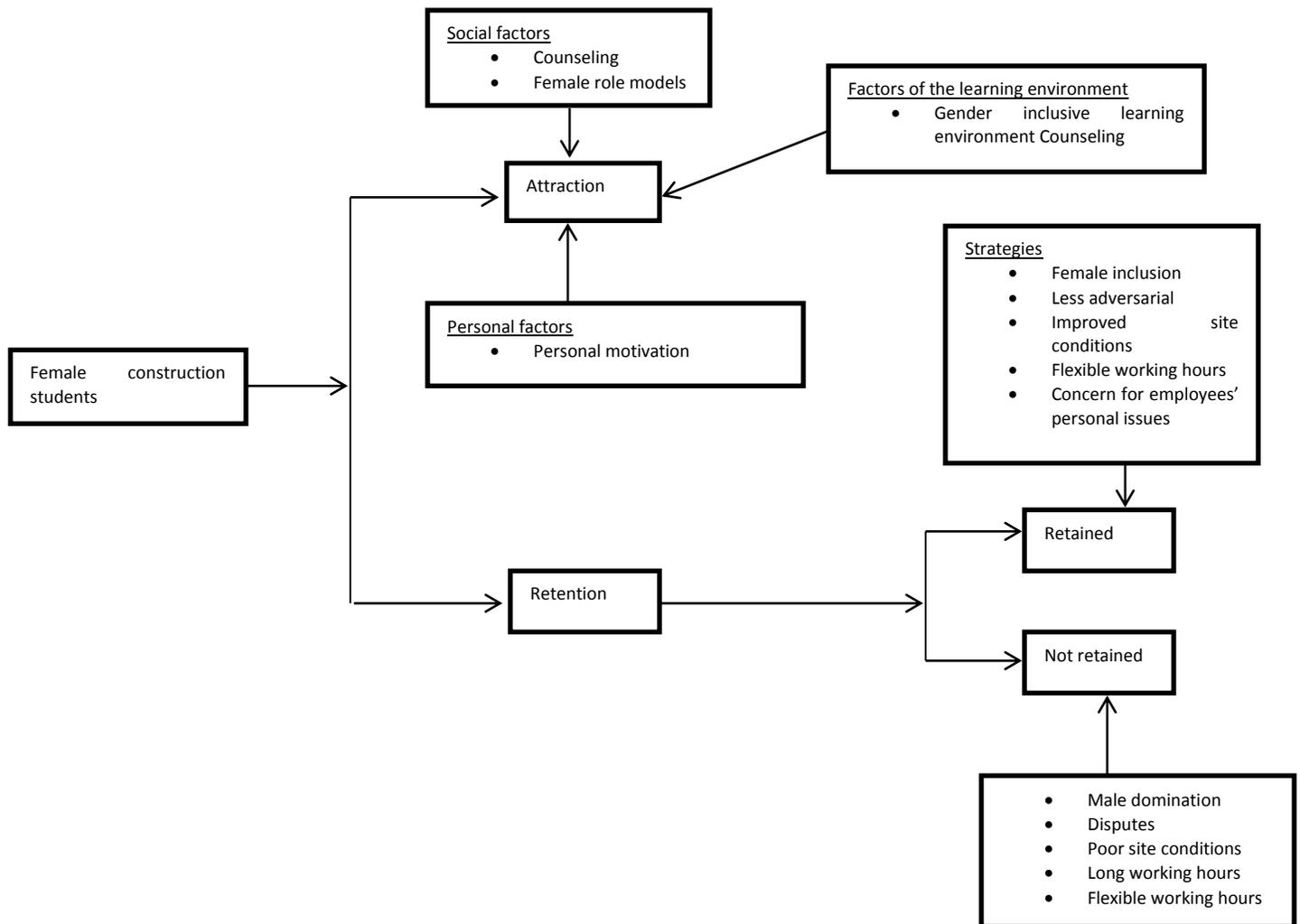
Rossiter (1982) noted that educational progress for girls, does not automatically translate into career progress for them. Gurjao (2006) raised concerns about the ease of female graduates securing work placements, ease of being incorporated into the work place and ease of the entire transition. Several strategies have been provided to encourage female retention in the industry including improving the image of the industry and improving work life balance in the industry.

**Improving the image of the industry** – Females especially new entrants into the construction industry want to see practical improvements in the poor image of the industry. The most obvious image of the industry is that of male domination. The industry is seen as one that requires brute strength with little realization that it is becoming high-tech and simply requiring mental strength, commitment and the determination to succeed (Ginige, Amaratunga and Haigh, 2007). A male dominated industry discourages new female entrants and like Gale (1994a) noted male students are more likely to consider a career in construction than their female counterparts. More females will be retained in construction if the industry takes deliberate steps to improve the masculine nature of the industry. For instance, more females should be given opportunities to supervise work on construction sites instead of keeping women in the office with believe that construction is for the brutally strong alone. Furthermore, there is a need to change the traditional perception of the industry from one that is all about manual labour to one that is process oriented (English, 2006) which incorporates high level mechanization and uses pants and equipment than a crafts industry (Ginige, *et al.*, 2007). The litigious nature of the industry needs to be improved upon. Scenes of labourers arguing with superiors over wages are common on construction sites. Poor project performance in terms of cost, quality and time further encourages disputes between construction stakeholders which portray the industry as highly adversarial. Moreover, females are generally put off by disputes. Peaceful working environments create a safe ambiance which will ultimately attract and retain more females in the industry. The adoption of relationship marketing in construction business can improve working relationship between construction stakeholders and minimize the occurrence of disputes (Ginige, *et al.*, 2007). Furthermore, the working environment on many construction sites leaves a little to be desired. English (2006) noted that on-site welfare facilities are inadequate. In addition, separate site conveniences should be provided for both male and female supervisors. Situations whereby a male worker barges into a female convenience should be discouraged. Construction stakeholders need to make conscious effort to portray an image of competent management efficiency, safety, environmental awareness and neighborliness through different media such as editorial campaigns, national construction week and exhibitions (CIB, 1999). On a project level, every project should have best practice guide with the necessary tools to eliminate or reduce the impact of construction works on the environment, neighboring residents and local businesses so as to enhance the image of construction industry among the public within the surrounding communities (Smith, 2002).

### **Improving work life balance in the industry**

Meeting the demands of work and family for women particularly those in construction can be very challenging. In the industry, employees work for long hours with demanding and inflexible work patterns. Yet, the home front must be maintained, which is a major role for most women (Lingard *et al.*, 2007). Balancing work and family thus becomes a real challenge for women with career aspirations (Wentling, 1996). Retaining women in the construction industry, require that organizations review their working policies to be more employees friendly. Family and work should not be treated as separate entities (Fielden *et al.*, 2000) instead, employees should be given the impression that their personal lives also matter. Positive gestures like showing concern for employees' personal life have been found to increase employees' organizational commitment and ultimately increase organizational performance (Harrington and Ladge, 2009; Parkes and Langford, 2008). Therefore, transforming the industry from one that is oblivious of the personal issues of workers to one that is concerned about the welfare of employees will improve the

work life balance of the industry. The industry has also been described as one where its employees work hard and long (Dong, 2005) making it difficult for workers particularly women to cope with family commitments. Developing flexible work hours can improve work life balance of employers (Francis and Lingard, 2004) especially women. Another source of work life conflict stems from assigning a task to a person below his/her capabilities (Chun, Arditi and Balci, 2009). This reduces job interest and commitment and further breeds inferiority complex and health related issues like depression (Maslach, Jackson and Leiter, 1996) because the person has been relegated to perform a duty below his/her capability. This is important for an industry like construction where women are perceived to be incapable of coping with work demands hence, many women are relegated to the background to carry out clerical activities. Such scenarios reduce the morale and commitment of women which could force them to resign or just cope unenthusiastically. It is the unenthusiastic part that affects job commitment and organizational performance (Grover & Crooker, 1995). Hence, construction organizations must treat women on their merit and give them a chance to demonstrate the skills and aptitude that they possess in order for them to develop a career and stick with the industry.



**Fig 1:** Conceptual framework or attracting and retaining female students in construction related programs Author's concept (2017)

**CONCLUSION**

Strategies for attracting and retaining females into construction related programmes were reviewed. Attracting female students will require adequate career counseling, a gender inclusive learning environment, exposure to female role models and personal motivation from the student. Retaining females in construction related programmes necessitates that the image of the industry be improved particularly in three areas: one, the male dominated industry

should be changed into one that is inclusive and pluralistic where women are well represented in all sectors of the industry. Two, the litigious nature of the industry needs to be improved upon so that it can become less adversarial thereby creating a peaceful and safe ambiance and finally, the industry should adopt flexible working hours, show more concern for workers personal issues and give females opportunity to demonstrate their skill and aptitude. This research has implications for the construction industry. Given reported cases of skill shortages and the existing aging population, females can bridge the gap. Hence, construction stake holders and indeed educators need to adopt the identified strategies for attracting and retaining females in construction related programmes.

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# **Authentic Assessment Techniques for Content and Language Integrated Learning (Clil) Classroom: A Case Study**

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## **ABSTRACT**

The major aim of the study was to examine how authentic assessment techniques utilized in Content and Language Integrated Learning (CLIL) classrooms in a Thailand public university. Since CLIL was recognized as a teaching approach that met the demands of Thailand Ministry of Education due to the exposure of using English communication thus improved their confidence in using English. In addition, this public university was called to provide CLIL professional development training. A total of 25 participants of this training and their course syllabuses were screened using content analysis. Pharmaceutical Practice II course was chosen. A total of 38 undergraduate students who attended this course were the samples. Data was collected through classroom observation. Results of this study indicated that the lecturer not only focused on the content learning but also language learning. Lecturer found to use multiple forms of assessment that reflecting student learning achievement, motivation, and attitudes on instructional relevant activities. The authentic assessment was designed to blend as part of learners' learning. The interactions between lecturer and learners, learners and judge, and among learners were found to be very good. In conclusion, lecturer should blend the classroom activities and assessment in CLIL classroom.

**Keywords:** Authentic assessment; classroom activities; Content and Language Integrated Learning (CLIL)

## **INTRODUCTION**

Popham (2008) defined authentic assessment as a process used by lecturers and learners during instruction that provides feedback to adjust ongoing teaching and learning to improve learners' achievement of intended instructional outcomes. Popham further explained authentic assessment is a planned process in which assessment-elicited evidence of learners' status is used by lecturers to adjust their ongoing instructional procedures or by learners to adjust their current learning tactics. Performance assessment is an approach to measuring a learner's status based on the way the learner complete a specified task. In other words, a performance assessment is one which the lecturer observes and makes a judgment about the learner's demonstration of a skill or competency in creating a product, constructing a response or making a presentation. There are two parts of a performance assessment namely task and systematic procedure for evaluation such as using scoring criteria and rubrics. Therefore, the term performance is shorthand for performance-based or performance-and-product (Popham, 2014).

Authentic assessment aims to evaluate learners' abilities in 'real world' environments. In other words, learners learn how to apply their skills to authentic tasks and projects. Authentic assessment does not embolden rote learning and passive test-taking. Instead, it emphasizes on learners' analytical skills, ability to integrate what they learn, creativity, ability to work collaboratively, and written and oral expression skills. It values the learning process as much as the finished product (McMillan, 2011). Chan and Sidhu (2013) defined authentic assessment as an assessment conducted at regular intervals of a learner's progress with accompanying feedback in order to help to improve the learner's performance. However, Boud (2000) reprimanded that current assessment in higher education is insufficient to the task of preparing learners for lifelong learning.

McMillan (2011) proposed a total of nine characteristics to determine performance assessment as follow: i) Learners perform, create, construct, produce, or do something; ii) Deep understanding and/or reasoning skills are

needed and assessed; iii) Involves sustained work, often days and weeks; iv) Call on learners to explain, justify, and defend; v) Involves on engaging ideas of importance and substance; vi) Relies on trained assessor's judgments for scoring; vii) Multiple criteria and standards are pre-specified and public; viii) There is usually no single 'correct' answer, and ix) if authentic, the performance is grounded in real-world contexts and constraints.

Content and Language Integrated Learning (CLIL) has previously known as 'content-based learning'. The basis of CLIL is that content subjects are taught and learnt in a language which is not the mother tongue of the learners. CLIL assumes that subject teachers are able to exploit opportunities for language learning (Pérez-Vidal & Roquet, 2015). Boud and Falchikov (2005) suggested that we have to move from summative assessment that concentrates on specifics, standards and immediate outcomes to more sustainable assessment that can support learners to become active learners not only in managing their own learning but also assessing themselves to life beyond the end of the course. To date, there is sufficient evidence in research proved by the past researchers like Nicol and Owen (2008), Nishigaki (2008), Merrill (2008), and Manbeck (2008) that authentic assessment can contribute significantly to the learning experiences of university learners and is a significant driver for transformative learning in higher education (Chan & Sidhu, 2015).

Graduates' English competence has become a major concern of higher education institutions in Thailand. Prapthal's study (2001) revealed that the English ability of Thai graduates is ranked eighth among ASEAN member countries, according to the Chulalongkorn University Test of English Proficiency (CU-TEP). One of the several factors leading to this problem is English teaching system in Thailand (Kongkerd, 2013). When the ASEAN Economic Community was officially formed in 2015, Thai people have to work and interact more with a considerable number of people from the ASEAN member countries and its counterparts. Therefore, to achieve effective communication in English as a lingua franca context, Thailand Ministry of Education launched the policy of using English language in higher education classroom.

The CLIL approach was first applied in English classes in Thailand in 2006, through the cooperation between the Thailand Ministry of Education and the British Council in efforts to improve Thai educational outcomes (MacKenzie, 2008). CLIL seems to be a teaching approach that meets the demands of Thailand situations because it provides opportunities for the learners to be exposed to English communication in the classroom that increases their confidence in using English. Thai higher education institution teachers in particular must find a teaching approach well-suited so that learners have high levels of English proficiency, are knowledgeable in subject matter, can apply all steps of thinking in cognitive processes, have the ability to communicate with others, and can present their own cultures and learn about other cultures as well as encourage the use of English as a medium of communication (Suwannoppharat & Chinokul, 2015).

The Qualification Framework for Thailand's higher education system (TQF: HEd) is planned to support implementation of the educational guidelines set out in the National Education Act, to guarantee consistency in both standards and award titles for higher education qualifications, and to make clear the correspondence of academic awards with those approved by higher education institutions in other parts of the world. The framework will assist to deliver appropriate ideas of comparison in academic standards for institutions in their planning and internal quality assurance processes, for evaluators involved in external reviews, and for employers, in understanding the skills and competences of graduates they may employ (Thailand Ministry of Education, November 2006). As a result, higher education students' learning are categorized into five domains namely ethical and moral development, knowledge, cognitive skills, interpersonal skills and responsibility, and analytical and communicative skills.

### **CLIL MODEL**

CLIL is a dual-focused educational approach in which an additional language is used for the teaching and learning of both content and language. That is, in the teaching and learning process, there is a focus not only on content but also on language. CLIL is an innovative fusion of both language and subject education. In this case, a language different from the domestic language that is Thai language is used as the medium of instruction for curricular subjects. According to Hood (2005), an analysis of case studies indicates that there are four potential models emerging in the United Kingdom.

### ***Surface cross-curricular linking (MFL Approach: Modern Foreign Languages)***

Both language and subject teachers are involved in planning together the cross curricular project. An example might be a study on different aspects of eco-citizenship or global village, fair trade or war and peace.

### ***Integrating language and recycling/deepening content***

Subject topic or syllabus are adapted in teaching the targeted language in order to explore the subject from different perspective and the same time improving the foreign language skills as well. For example Human Geography subject teaching using the French language as the medium of instruction.

### ***Integrating language and new content***

It is possible to re-conceptualize curriculum in an integrated way whereby using CLIL model consists of the study of 'water' in a foreign language which is investigated from the different perspectives such as scientific, geographical, historical, current catastrophes, water shortages, water for leisure, poetry, art, drama and music whenever possible language to space and place. A global project such as those organized by *Science across the World*, whereby the identical topics are studied by learners from various countries using different languages then the results are compared among the countries.

### ***Immersion (Content Approach)***

Language teachers develop a more content type approach to a theme. This may include taking a typical topic such as house and home and carrying out a comparative study between house and home in an African country and in an English-speaking western culture.

Therefore researcher would like to analyze the application of CLIL model in university courses which using English as a medium of instruction in one of the public universities, at Khon Kaen province, Thailand. There is no suspicion that learning a language and learning through a language are coexisting processes, but implementing CLIL requires a reconsideration of the traditional concepts of the language classroom and the language teacher. To conclude the above concepts in CLIL settings, it is necessary for learners to progress systematically in both their content learning and their language learning and usage, as argued previously. Therefore using language to learn is as important as learning to use language, both are requirements as indicated in the following as language of learning, language for learning, and language through learning.

Language of learning is defined as an analysis of language needed for learners to access basic concept and skills relating to the subject theme or topic. For example, new knowledge such as key words or phrases will be given to learners to deal with the content. However, in what way the learners will need to use them to learn should be considered simultaneously. Language for learning focuses on the kind of language needed to operate in a foreign language environment. Learning to use the language is challenging for both teacher and learners as each party has a role to play. Learners need the strategies to enable them to use the foreign language effectively. For example, they need language to assist them to write the research project report and present the findings of the research project successfully. Language through learning refers to the principle that effective learning cannot take place without active involvement of language and thinking. When learners are encouraged to articulate their understanding, a deeper level of learning is expected to take place. The challenge for teachers is how to capitalize on, recycle, and extend new language, or language progression. For example, learners need language to express their new ideas or data during their group discussion. Nevertheless learners need dictionary skills to read some academic articles and review the literature of past research while they are doing research. Additionally, Coyle, Hood, & Marsh (2010: 35-37) revealed that the CLIL classroom demands a level talk of interaction and dialogue activity which is different to that of the traditional language or content classroom.

## **LITERATURE REVIEWS**

Pérez-Vidal and Roquet (2015) seek to contribute new evidence regarding the linguistic progress achieved over one academic year by CLIL secondary education learners, enrolled in an English-medium Science course. Their study found that learners gauge the relative linguistic gains resulting from the CLIL program in contrast with a formal instruction program in the same school. Participants were followed longitudinally with a pre-test vs post-test design. Test used to produce data were modelled on the type of tasks used both in formal instruction and CLIL classrooms. They appointed into the productive and receptive skills of the learners. The sample

included two groups of bilingual Catalan/Spanish participants, English being their third language. The total number of each group is 50. The experimental group had formal instruction plus CLIL in the Science course while the control group only had formal instruction. Results obtained confirm that larger relative gains are obtained by the experimental group, however not in all domains and to the same degree; relative higher gains accrue in reading, as expected by researchers but not listening. Similarly, their writing ability, and particularly so their accuracy, shows higher relative gains, and so do their lexico-grammatical abilities. In sum, in the CLIL program analyzed, reading and grammar seem to be the most benefit.

Suwannappharat and Chinokul (2015) studied on the application of CLIL in an EFL (English as a foreign language) context, a case study in Thailand. Their study emphasized on explanation of CLIL framework and principles and how these are implemented in Thailand as guidelines for developing EFL courses or curriculum. They further examined both advantages and disadvantages of applying CLIL and the difficulties of applying CLIL in the classroom to help EFL teachers to plan their courses more effectively. Their findings revealed that successful CLIL classes not only depend on active learners but also on enthusiastic teachers to facilitate in providing scaffolding for their students. In addition, they found that if CLIL application has been well-planned and prepared for, the CLIL approach enable to produce life-long learners who learn about the real world, are motivated toward learning and have self-confidence as strong communicators and collaborators in the real world. Kewara (2016) explored the CLIL type classroom in Thailand among Thai content teacher. The aim of Kewara's case study was to identify the situation of teaching content through English in Thailand and to concrete CLIL teacher training program. Kewara's qualitative findings from the analysis of CLIL classroom observations revealed that the effectiveness of CLIL teacher development program is able to produce a further model of in-service training program. Moreover, Kewara found that a holistic understanding of content teachers on CLIL approach is important for them to manage their classrooms. In order to conduct a successful CLIL classroom, teachers ought to fulfil linguistic needs, teaching materials, and other supports. Finally, Kewara suggested that it could be useful to enhance specific aspects for successful CLIL type classroom into training and to sustainably promote English as a medium of instruction in Thailand.

Smala (2013) investigated on CLIL pedagogies in Queensland. The CLIL programs use a second language as the medium of instruction to deliver mainstream subjects, such as Science, Mathematics or History were examined. An analysis of pedagogical considerations and domains, elicited from interviews with CLIL program directors at different Queensland schools was carried out. Three concepts including fields of visibility, technical aspects of program enactment and forms of knowledge were used to guide a synthesis of CLIL pedagogies and theories of bilingual education as well as a research framework in Smala's study. Smala concluded that CLIL is a favorable teaching design model as a reaction to rehabilitated calls for languages learning in Australia. However, the demands of CLIL programs require CLIL program directors and teachers to apply a multitude of pedagogical consideration; subject-specific concepts; available teaching resources in the second language; translation and simplification of materials; students' access to learning through modified language. Therefore, CLIL programs need to be supported through resources and focused on professional development opportunities.

## **RESEARCH AIM**

The main aim was to examine how authentic assessment could be utilized in CLIL classrooms.

## **METHOD**

This is a subsequent study after the first phase of the project has been carried out. In the first phase, a total of 25 lecturers who attended the professional development program on CLIL techniques during 2015 to 2016 were required to submit their course syllabus. A rubric based on 4Cs framework (Coyle et al., 2010) was used to assess the Content (subject matter), Communication (language learning and usage), Cognition (learning and thinking processes), and Culture (developing intercultural understand and global citizenship) of the submitted course syllabus. Content analysis technique was used to identify the courses that suitable to proceed for the Phase 2. After the screening process, researcher selected Pharmaceutical Practice II for further investigation.

A total of 38 undergraduate learners from the Faculty of Pharmaceutical Sciences were purposively selected. Classroom observation was employed to collect qualitative data. The classroom activities composed of two parts namely lecturing and game-based activities. A teaching team comprised of a professor and three mentors were involved. Research instrument used was an observation form composed of three sections: Language of learning, Language for learning, and Language through learning. Each section was followed by six key issues to examine

namely i) classroom activities; ii) role of lecturer/learners; iii) task; iv) assessment; v) language used, and vi) notice of the observer. Data was analyzed using content analysis technique. The authentic activities and assessment data were categorized into three major themes: i) Language of learning; ii) Language for learning, and iii) Language through learning.

## **FINDINGS**

The initial findings are presented based on classroom observation. Observation data was collected by May 4, 2016, 2.00 to 3.30 p.m. at Room 2323, Faculty of Pharmaceutical Sciences, a public university located in Khon Kaen province, Thailand. The teaching topic was ‘Anxiety disorders and insomnia’, followed by the game-based activities. The following findings are presented according to the three major themes of authentic activities and assessment namely language of learning, language for learning, and language through learning. Other than examining the authentic learning and authentic assessment, researcher also looks into the different level of authenticity, ranged from relatively unauthentic, somewhat authentic, and authentic that related to learning objectives

### ***Language of learning***

Language of learning theme encompasses ‘key vocabulary/phrase’ and ‘language of describing or defining’. Findings of the study indicate that authentic learning and assessment in key vocabulary/phrase as such:

- a) The lecturer used power point presentation as a media of instruction.
- b) The lecturer explained the definition of each word and gave the related examples.
- c) The lecturer highlighted key words then used questions and answers to check the learners’ understanding.
- d) The lecturer used word comparison in order to clarify the meaning of the word.
- e) The lecturer used Diagram or Table to check the learners’ understanding.

For example:

The lecturer explained about five types of anxiety

- a) GAD (General Anxiety Disorder)
- b) PD (Panic Disorder)
- c) *The lecturer explained the meaning of panic, “Panic is the feeling of fear of something.”*
- d) SAD (Social Anxiety Disorder)
- e) OCD (Obsessive Compulsive Disorder)
- f) *OCD is “something do something again and again like locking the door.”*
- g) PTSD (Post Traumatic Stress Disorder)

*Traumatic means mind, physical.*

*PTSD means cannot separate the real lives from the experience, like the soldiers who were back from the war.*

Findings reveal that authentic learning and assessment in language of describing or defining as follow:

- a) The lecturer marked the circle round the important vocabulary on the slide and explained.
- b) The lecturer used Diagram to explain the process of...something...
- c) *Longterm Tx of GAD*
- d) *Lecturer: You’ve learned from lecturer Supinya. How many weeks you have to wait for...?*
- e) *Learners: 2 to 4 weeks*
- f) The lecturer gave the information in the Table as the situation then the students had to make the decision under that situation.

*“The research findings showed that the effect of using sleeping pill may cause attempted suicide in patients.”*

### ***Language for learning***

Language for learning theme composed of ‘asking and answering question evidence’. Findings of the study indicate that authentic learning and assessment in asking and answering question evidence as below:

- a) The lecturer posed questions then encouraged the learners to answer orally.
- b) The lecturer designed the assignment that students needed to fill in the form.

*What’s the differences between*

*‘Advice means give advice’*

*'Counselling means try to find individual problem and you fix it'*

*Buspirone Therapy*

*BZP discontinuation*

*What's the difference between rebound and recurrent*

*Rebound means the patient has the symptom more than last time*

*Recurrent means the patient has the symptom many times*

### **Language through learning**

Language through learning theme covers 'using feedback', 'dictionary skills', 'extending presentation skills', 'presenting evidence' or 'recycling discussion'. The lecturer used almost every element through game-based activities. Findings of the study indicate that authentic learning and assessment in using game-based activities as follow:

The game-based activities were:

- a) Learners were divided into 4 to 5 learners per group. As it was a computer-based, each group had to go to Socrative.com Room pcothers2. Each group had to fill their responses into the computer program. Then presenting their responses to the class. (*Dictionary skills, extending presentation skills, presenting evidence*).
- b) The lecturer invited another three more mentors to give the score (*Using feedback*).
- c) The lecturer provided the Situational Analysis Task so that the learners had to use their critical thinking skills during their group discussion (*Recycling discussion*).
- d) The lecturer explained the Scoring Criteria and how to fill the response in the computer (amount of ml. per dose, number of times per day, number of days per week).
- e) There was a time keeper bell.

*The given situation:*

*There is a patient with Insomnia come to see the pharmacist.*

*As the pharmacist, how could you diagnose and make a decision.*

- *Photo of drugs*
- *Sleep cycle*
- *Types of Insomnia: Onset insomnia, maintenance insomnia, terminal maintenance insomnia, and non-restorative.*
- *Calculate by divide 7 days per week, divide 3 meals per day.*

When researcher compares the Characteristics of Performance Assessments introduced by McMillan (2011) below, the overall findings prove that this game-based activities response to every characteristic. Moreover, the authentic learning activities were well designed that would lead to effective authentic assessment.

Characteristics of Performance Assessments (McMillan, 2011):

- Learners perform, create, construct, produce, or do something.
- Deep understanding and/or reasoning skills are needed and assessed.
- Involves sustained work, often days and weeks.
- Call on students to explain, justify, and defend.
- Involves on engaging ideas of importance and substance.
- Relies on trained assessor's judgments for scoring.
- Multiple criteria and standards are pre-specified and public.
- There is usually no single 'correct' answer.
- If authentic, the performance is grounded in real-world contexts and constraints.

### **Findings of authenticity based on learning objectives**

Other than considering authentic learning and assessment, the level of performance products and skills varying in authenticity that related to learning objectives would be investigated according to the three types of language learning in CLIL classroom.

Learning objectives: At the end of this unit, learners are able to:

- a) Explain the meaning of Anxiety disorder...
- b) Explain the treat of...
- c) Plan for tapering of Benzodiazepine...
- d) Explain about sleep hygiene...
- e) Comparison of anti-anxiety and hypotics...

Language of learning (key vocabulary/phrase, language of describing or defining) was identified ‘*to explain*’ as response learning. Besides, the authenticity was found at relatively unauthentic.

Language for learning (asking and answering question evidence) was identified ‘*to explain*’ or ‘*to compare*’ as response learning and the authenticity was indicated at somewhat authentic.

Language through learning (using feedback, dictionary skills, extending presentation skills, presenting evidence, or recycling discussion) was identified ‘*to plan*’ as response learning and the authenticity was found at authentic level.

When researcher compared the classroom activities with the characteristics of performance assessment (McMillan, 2011), it was proved that the game-based activities response at authentic level. This is followed by considering the learning objectives to Taxonomy of Cognitive Domain, the higher order thinking learning objectives would lead to authentic assessment. Otherwise, the well-designed authentic learning activities would lead to effective authentic assessment.

## DISCUSSION

In higher education contexts, lecturers must understand their learners’ learning and take into account of learners’ construction of meaning and reality. Reality as experienced by the learner has an important additional value. This assumption offers rich insights into the quality of the language used by lecturers and learners in CLIL classrooms, particularly during lecturer-learner and learner-learner interactions, both of which take up the largest part of instructional time. This focus can be interpreted as a process-oriented evaluation of the affordances for language-and-content learning typically emerging in CLIL environments.

Results of this study showed that the CLIL model implementation was useful for language learning in Thailand public university context. The English skills of learners were improved and had positive attitudes towards learning language. However, the CLIL practices can be shown to work effectively with the condition of lecturers’ roles in the classroom as facilitator who help to encourage learners’ learning not only content knowledge but also language learning. Learners are expected to acquire knowledge, power of perception, communication, and reasoning (Dalton-Puffer, 2011).

Furthermore, CLIL pedagogy simultaneously enables to develop concrete communication skills in English language as well as working through the main requirements for curriculum content knowledge. It therefore offers learners to a focus on both the language of academic cognition and language of communication. Result indicated that language of communication seems to be neglected by the lecturers. This CLIL model practice is only possible by adapting teaching strategies that interactively segment and build up both learners’ linguistic skills and conceptual understanding in course-specific area. As a consequence, CLIL lecturers have to face various layers of consideration in their pedagogical planning including the concepts used, available resources and materials, and assessments.

Moreover, learners’ active participation and learning engagement in classroom activities were also activated by the CLIL model. As a consequence, this CLIL model may be effective in enhancing the learners’ motivation and confidence in speaking well. In addition to this, exposing learners to speak with people from ASEAN member countries is important in particular at current situation.

In conclusion, results of this study were made very clear that CLIL model is not one method but a variety of approaches to teaching a curriculum course through the medium of English. Since CLIL model is not an easy option for Thailand Ministry of Education to introduce wholesale teaching of a course through English even in higher education institution, it must equip lecturers with the language ability and teaching skills then only to be able to do so. It is suggested that CLIL seminar or workshops for lecturers should be conducted from time to time so that they are able to implement the CLIL model in their classroom.

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# Beyond Fiction: Using Character Profiling in Screenwriting as a Tool to Explore Higher Education Teachers' Identity

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## ABSTRACT

The character profile is the first document that one prepares when one wants to write a screenplay for a film. This is based on the principle that it is characters that drive the story and not vice versa. A strongly developed character can shape an impactful story. In teaching, this parallels a teacher in his or her teaching environment. It is the teacher (and the teacher's identity) that drives the way in which students learn and how they are supported in their learning. The teacher's identity governs the way the teacher thinks, behaves in the teaching and learning environment and how the teacher perceives / treats the students. This paper describes how teachers can explore and reflect on their identity, using the character profiling tool. It reports on a small group of HE teachers' attempt to reflect on themselves and write their own character profiles during a two-day professional development programme. The perceived value of the character profile in relation to understanding teacher identity and the challenges they faced in adopting the character profile as a reflective tool will also be discussed.

**Keywords:** continuous professional development, higher education, teacher identity, reflective teaching

## INTRODUCTION

Screenwriting is the discipline of writing screenplays, that is, film scripts. Screenplays contain not just dialogues, but also the time, location and description of a scene, characters and their age, as well as action descriptions. They become the blueprint for the film director, actors and the whole production team on how the film should be executed. In essence, and most importantly, the screenplay delivers story, that is, the narrative of the film. Before a screenplay can be written, the writer needs to firstly create and develop its characters, especially the protagonist. A writer might have an idea for a story, but he cannot chart the storyline if his characters are not well-developed. This is done through a document called the *character profile*. Although only a small component in the whole writing process, it is, nevertheless, a very important document. This is because in a mainstream story, it is characters that drive the plot, not vice versa (Thomson-Jones, 2008).

### *Character Profile in Screenwriting*

Screenwriting scholars agree that there are many different approaches to writing a character profile (Mehring, 1990). A character profile is drawn from answering all the questions that help describe a character from infancy to the first pages of a screenplay (Mehring, 1990). In relation to that, Parker (1999, p. 89) explains that the character profile is used as means to come to terms with who the character is and what makes them who they are; they are created by answering the questions based on their outer and inner presence, and context. Field (2005), who calls it as "character biography", summarises character profiling as an exercise that reveals the interior life of the character, the emotional forces working on them since birth. Regardless of the slightly differing definitions and approaches to character profiling, the role of the character profile is the same: to provide an adequate description of the characters so that they will become believable on screen, in the make-believe world of cinema. In addition, the aim is always to create an exciting, multifaceted and three-dimensional character, rather than a flat, boring and a single-dimensional one.

### *Evidence on the Screen*

In film, a well-crafted character profile will result in a strongly developed character. A strong character is recognised, most importantly, from having a clear goal on what he wants in the story. A strong character will also move heaven and earth to achieve his goal, despite all the overwhelming obstacles that come his way. This is noticeable, for instance, in the character of John Keating (Robbin Williams) in the film *Dead Poets Society* (Haft, Witt & Thomas, 1989), which won the Best Original Screenplay at the 62nd Academy Awards.

Keating wants to inspire his students at the elite all-boys preparatory school, Welton Academy. He wants them to be extraordinary and seek for what they truly believe in and achieve it - to seize the day or *carpe diem*. That

becomes his goal. Why he wants it is because he believes that every person has the potential of realising their dreams and that they should make their lives meaningful. Why he is pursuing this goal now (in the film) is because he has just been transferred to that school as their new English teacher. His unorthodox ways of teaching poetry cause a conflict with the institution which has its own conservative and tradition-based high standards. It is Keating's relentless pursuit of his goal, despite oppositions from some teachers and students, which creates the essence of drama in that story – the conflict between the character's goal and his stakes. Keating exemplifies a strongly developed character, from a well-crafted profile, who remains consistent in his pursuit from the beginning until the end of the story.

In another box-office hit and critically acclaimed film series, the same pattern of character development is apparent. The character Frodo Baggins (Elijah Wood) in *The Lord of the Rings* trilogy (Jackson et. al, 2003, 2002, 2001), which won the Best Adapted Screenplay in the 76th Academy Awards with its third and final instalment *The Return of the King* (Jackson, Osborne & Walsh, 2003), also had a strong protagonist with a clear goal. All that Baggins wants is for the one ring to be destroyed so that his beloved village The Shire will be safe from all evil and tyranny. That becomes his goal. He wants it now (in the film) because he has been made the official ring bearer by the wizard Gandalf. Baggins' naivety, lack of knowledge and experience, and his small size makes him an unlikely person to undertake the journey to destroy the ring at Mount Doom and face his antagonist, Lord Sauron along the way. Baggins' continued persistence makes him successful in the end. Again, the conflict between a protagonist's goal and his high stakes becomes the perfect ingredient for drama, for what is story without drama.

#### *Parallelism between Character Profiling in Screenwriting and Teacher Development in HE Teaching*

An important aspect of teaching development in HE is teachers' ability to reflect on their teaching and make positive changes to their practise. Early work on reflective teaching can be traced to Dewey (1973), Schon (1983) and later Brookfield (2002, 2007). Schon argues for the importance of teachers to "reflect in action", that is, while they are teaching and then "reflect on action", i.e. a reflection after the teaching session. Brookfield's framework for reflective teaching appears to embrace Schon's idea but puts forward reflective action in a different way. Brookfield (2002) identifies the importance of using critical incidents in teaching as a trajectory for teacher reflection. However, in analysing critical incidents or issues in teaching and learning, an effective/complete reflection cannot rely only on one or two perspectives. Brookfield (2002) proposes 4 lenses that teachers should use to reflect on their teaching. These lenses are (1) the teachers' own experience as a learner and as a teacher; (2) the students' perspective; (3) colleague's perspectives; and (4) theory / literature.

Reflective teaching is a continuous process that goes beyond making isolated improvements to teaching practices. It centres on teachers examining their own sets of assumptions which influence their teaching practice (Samaras, 2002, as cited by Izadinia, 2014). It helps teachers to consistently clarify the assumptions that they may have about how students learn and how best to support students in their learning process (Brookfield, 2002). This, in turn, will help teachers to improve on their teaching decisions and action. If Brookfield's four lenses were to be adopted for the reflection process, the key figure in the reflection process is still the teachers themselves. They decide what elements uncovered from the four lenses that they will consider important and what elements are less important. Their perception of themselves as teachers influences the decision they make, even in the reflective process. This is one of the reasons why teachers need to have a clear understanding of their teacher identities because it is their teacher identities that govern their thinking, decision-making and their teaching and learning approaches. As such, teachers' understanding of their own teacher identity helps them make sense of themselves (Coldron & Smith, 1999). Without that understanding, reflection may be fragmented and inaccurate.

#### *What is teacher identity?*

Findings from research on teacher identity point to challenges in defining the concept and the nature of its influences to teachers' learning and work (Beauchamp and Thomas, 2009, cited in Akkerman & Meijer, 2011). Mayer (1999) defines teacher identity as a fundamental belief that teachers have about being a teacher and about teaching itself. This includes how they see themselves and how they feel about being a teacher and about teaching. Teacher identity is a composite of a number of sub-identities based on the teachers' knowledge of the subject matter, their knowledge of teaching and their skills in teaching (Beijaard, Meijer & Verloop, 2004). Teacher identity, which forms through social interaction, can be multiple in nature and can discontinue or change over time (Akkerman & Meijer, 2011, p. 308).

There is a similarity in the way that new teachers and more experienced teachers develop their teacher identity (Archer, 2008). It takes intellectual effort, criticality and professionalism to develop that identity (Archer, 2008). It is also associated with values and morality as the development of teacher identity reflects commitment and

responsibilities, and what can positively or negatively impact the teachers and the stakeholders in their teaching environment (Fitzmaurice, 2013). The evolution of teacher identity often involves internal conflicts and emotional struggles as teachers go through the process of constructing, accepting and maintaining their teacher identities (MacLure, 1993). These internal conflicts are frequently centred on the teachers themselves, i.e. the teacher they perceive themselves to be and the extent to which their situational contexts empower them to do so (Dubar, 1997, cited in Lopes et. al., 2014).

Teachers are often the first ones significantly affected by the institution's processes and values (Winter, 2009) and who face the practical implications of the contextual change (Mcnaughton & Billot, 2016). In the case institution where the action research was undertaken, there was a changing nature of the institution as it aimed for higher research outputs, increase in student number and programmes offered, stronger social impact and market presence, and higher QS and SETARA ranking (a Malaysian rating instrument for higher education institutions focused on quality teaching and learning). These increased demands added to the already heavy teaching responsibilities that academics had. The changing nature of the higher institution thus contributed to the changing nature of the teacher identity. It pointed to the necessity for the teachers to be negotiate between their past, present and future identities (Mcnaughton, & Billot, 2016, p. 656) through a holistic exploration (Hall, 2013). Teachers within the institution – although this was not necessarily unique to them – needed to deconstruct and reconstruct their teacher identities in order to find out how they fitted with the institution and how the institution fitted them (Fitzmaurice, 2013).

There was a need to provide a professional development platform that enabled teachers to reconnect with their existing teacher identity. Chee, Mehotra and Ong (2015, p. 425), in citing Walkington (2005) argue that it is insufficient for institutions to offer professional development programmes for teachers which only focus on content knowledge and the skills for teaching content knowledge. There should also be opportunities for teachers to reflect and develop their “professional ways of being” (Chee, Mehotra & Ong, 2015, p.426). A review of literature reveals that various strategies have been adopted to engage teachers to explore their teacher identities. These include journal-keeping (Joseph & Headig, 2010), teacher-narrative studies (Craig, 2013), teacher-annotated self-portraits (Woods, Barksdale, Triplett, & Potts, 2014) and teaching metaphors (Erickson & Pinnergar, 2016). Other known strategies that have been applied over a longer period include mentoring (Walkington, 2005). To the authors' knowledge, character profiling has not been used as a tool for teachers to explore their teacher identities.

## RESEARCH QUESTIONS

In undertaking this action research, the authors sought to answer the following questions:

- (i) What is the nature of teacher identities that can emerge from the character profiling exercise?
- (ii) How do teachers perceive the value of character profiling as a tool to explore their teacher identities?
- (iii) What improvements should be made in adopting character profiling as a tool to explore teacher identities?

## THE ADOPTION OF CHARACTER PROFILING AS A TOOL IN EXPLORING HE TEACHERS' IDENTITY

The authors co-facilitated a two-day workshop on reflective teaching, focused on exploring the participants' teacher identity, using character profiling as a tool. The workshop was open to all teaching staff in the institution. Participation was voluntary in nature but the number was kept at 15. Of the 15 participants, 3 were teaching in the field of arts and humanities, 9 in language studies, 1 in law and 1 in social science. Another participant was an internal facilitator for professional development programmes for HE teachers.

### *Workshop Structure*

The workshop adopted the Goldsmiths' method of character profiling. It was based on the method of character profiling applied in the highly successful and industry accredited MA in Scriptwriting programme at Goldsmiths, University of London (where the first author undertook his postgraduate studies). The Goldsmiths' method was chosen as the reflection tool as it focused only on the most essential elements that build towards a strongly developed character. Through the programme advertisement and at the beginning of the workshop, participants were informed that the reflective teaching workshop would adopt this approach. At the beginning of the workshop, participants were informed that the outcome of the two-day workshop was the production of each participant's character profile as a teacher, using screenwriting's character profile format, as adopted by the film-making industry. Ultimately, by the end of the workshop, each participant should have produced his/her own character profile in the form of a one-page document, typed in a single-spaced, Courier type font, size 12. As an introduction to the workshop as well as a modelling/scaffolding activity, Act 1 from *Dead Poet's Society* (Haft,

Witt & Thomas, 1989) was screened. Participants were asked to analyse the *want*, *need* and *stakes* of John Keating, the main character. This activity was later used to illustrate that the foundation of a character profile was built upon these three important criteria.

Participants then engaged in exploring their own teacher identity using the character profile format. They were asked to answer specific questions that were categorised into: (1) want; (2) need; (3) stakes; (4) strengths and weaknesses; (5) likes and dislikes; and (6) important biographic factors. Questions for each category, except the last, were quite similar. For example, for “want”, participants had to apply the following questions to themselves: “What does the character (the teacher) want?”, “Why does he/she want it?”, “Why does he/she want it now?” After answering the questions for each category, they were asked to support their answers for that category with a brief description of an event in the past. Each question had to be answered truthfully in order for the teacher identity that emerged to be what it was at that point. At the completion of each category or paragraph, participants were asked to post their paragraph to Padlet, a free online virtual “bulletin” board. A discussion was then held for constructive feedback so that the paragraph could be improved further. The activities for the two days followed this cycle, with a complete character profile produced at the end of the workshop.

#### *Participant Consent, Data Collection and Analysis*

Participants were informed of the authors’ intention to conduct an action research based on the workshop and the data collection methods. They were informed of their rights not to be included in the research data collection and assured that personal information would not be revealed if they chose to participate. Participants were also informed that they could choose to maintain anonymity by using a pseudonym when uploading what they had written onto Padlet. All 15 workshop participants gave their consent to participate in the action research. There was an attrition rate of 26.7% on the 2<sup>nd</sup> day of the workshop attributed to a medical procedure, marking of final exam scripts, conflicting work commitment and an unexplained absence. Data was derived from the researchers’ observation notes, the 9 character profiles and 11 formal workshop evaluation and feedback form completed by participants. A thematic analysis that focused on what was spoken and written by the participants (Riessman, 2008) was applied to the data to draw out emerging themes.

## **FINDINGS AND DISCUSSION**

### **1. Teacher identities that emerged from character profiles**

Each character profile was labelled from A to I. Each profile was analysed and emerging themes from the profiles were categorised into the following: “goals and wants”, “influencing factors” and “teacher conflicts”. The table below summarises the teacher identities that emerged from the profiles. Further discussion follows.

**Table 1: Teachers’ goals and wants, influencing factors and conflicts**

	Goals and Wants	Influencing Factors	Teacher Conflicts
A	To inspire students so that they are aware that education is more than passing exams and getting good grades, and, they can function well and contribute to society	Past experience - as a student and as a beginner teacher – focus on grades caused underdeveloped soft skills which affected job applications	Exam oriented culture <i>vs</i> inspiring students
B	For students to break out of comfort zones, be flexible, adaptable and resilient	Past experience – Unable to adapt to new colleagues, new company and its culture, knowledge of a friend who remained jobless 3 years after graduation due to lack of exposure and inadaptability	Exam oriented culture and restricted contact hours <i>vs</i> achieving <i>goals and wants</i>
C	To share with and educate others, and to have a meaningful impact on students	Past and current experience – there were friends in class who were forced to take subjects by their parents and saw the same situation with his students.	Having students who were trapped in the subject/programme of study <i>vs</i> having a meaningful impact
D	To challenge students to become autonomous and self-directed learners who are responsive and engaged in learning	Past experience as a student suppressed by institution and teachers and as a beginning teacher who was “a stickler for rules”	The need to complete the syllabus and adhere to “conventional practices” <i>vs</i> <i>goals and wants</i>
E	For students to balance the pursuit of academic goals with non-academic development	Past experience as a student too focused on studies which caused underdeveloped interpersonal skills upon graduation	Completing the syllabus and preparing students for exam <i>vs</i> carrying out activities that could help students develop themselves
F	To facilitate independent learners in their learning, not spoon-feed students what they needed to know	Current experience as someone who approaches life’ situations with the ability to think and view issues from multiple perspectives	Students’ over-dependency, the need to complete the syllabus and prepare students for examinations <i>vs</i> hands-on learning
G	For students to understand that learning is a lifelong process and that marks are not the ultimate goal; they should be able to use what they learned and contribute to “life”.	Personality as a person who tended to “overthink” things and place too much importance on others’ opinion of her teaching strategies	Students’ exam-orientation, the need to the syllabus within a time frame and prepare students for exams <i>vs</i> developing deep learners
	To provide opportunities for students to grow and get inspired so that they are	Current experience – time constraint in	Completing fixed syllabus, preparing students for exam,

	Goals and Wants	Influencing Factors	Teacher Conflicts
H	adaptable to life's stages and challenges and make positive contributions to the world	preparing good teaching that helped students develop mastery	needing to fail "students who needed to be failed" vs <i>goals and wants</i>
I	For students to be bold, confident, speak their minds and not be afraid of the surroundings; and for them to be adaptable to different environments and survive challenges at later stage in life	Past experience as a quiet and reserved student who witnessed a close friend being unable to get a job despite having excelled in examinations Current experience: inexperience caused frequent self-doubt when making teaching choices	Covering the syllabus vs. learning activities that actively engaged the students

### 1.1 "Goals and Wants"

Eight character profiles (Teacher A, B, D, E, F, G, H and I) identified the teachers' "goals and wants" to be focused on their students and the students' achievements, not on themselves or their career development. In addition, all eight teachers perceived student achievement to be focused on character development, becoming independent individuals who were able to adapt to life after graduation and overcome the challenges that they would meet along the way. "Flexibility", "adaptability", "contribute to society" were each mentioned by 3 profiles; developing "autonomy", "independence" and "interpersonal skills" were mentioned in 3 profiles as well. Only two mentioned examinations as being important but also emphasised that education was more than achieving good grades in examinations. One mentioned that students needed to achieve a mastery of skills:

*I want my students to be able to break out of their comfort zones and learn to adapt. They need to be able to adapt because they will be experiencing different phases in life which may present new challenges.* (Teacher B)

*I want to let my students understand that learning is a life-long process. Although marks are important, they are not the ultimate goal of learning... what's more important is how they can use what they have learnt and contribute....* (Teacher G)

*Getting good grades is not everything... being able to function in society is crucial – to pay debts [to society].* (Teacher A).

As the teachers' "goals and wants" were focused on holistic student development, the roles that these teachers perceived for themselves also emerged from the character profiles. These teachers felt that they needed to "inspire" their students and "challenge them to take learning beyond the classroom". To do this, it was important that they assumed the role of "facilitator" of their students' learning and ensured that students were responsive, continuously engaged and wanted to do more. As one teacher stated:

*I like it when students are responsive, excitedly asking if the tasks they have chosen are relevant and meet the lesson objectives. My sense of satisfaction is further heightened when they continue to be engaged with the lessons and want to do more. But doubt creeps in when some do not respond as positively... and I question my strategies. I dislike feeling like a failure.* (Teacher D)

A slight difference was found in the profile of Teacher C. Teacher C's "goal and wants" were focused on the teacher but it was still linked to students. Teacher C wanted to share his knowledge and educate others and have a meaningful impact on his students.

Based on the 9 character profiles that were submitted, it could be deduced that the teachers' "goals and wants" were defined in two ways. For one, they were defined through their students' achievement. For another, they were defined through their perceived roles and responsibilities in facilitating that achievement; that is, in enabling students to become well-developed individuals who later graduate with a mastery of skills, independence, ability to adapt to change, ability to overcome challenges and be able to contribute to society.

### 1.2 "Influencing Factors"

From the character profiles, factors which influenced the shaping of the teachers' identities were "past experience", "current experience" and "personality". Three teachers singled out past experience as factors which influenced who they were (Teacher A, B and E) while two others singled out their current experience (Teacher F and H). Two more teachers identified the combination of past and current experience (Teacher C) and past and current lack of experience (Teacher I) as their influencing factors. One participant identified his/her personality as the influencing factor (Teacher G).

“Past experience” that was identified by teachers as the factor influencing or co-influencing their teacher identities could be divided into the following: experience as a student, experience in trying to gain employment and experience as a beginner teacher. Three teachers mentioned that they did not want students to be like they were as students or to graduate with shortcomings similar to their own:

*I was once a university student who focused too much on marks and did not participate in any co-curricular activities which could have helped me build essential skills. (Teacher E)*

*I was once a student like them, quiet, reserved... so I don't want them to be like me... I want my students to be bold, confident, speak their mind and not be afraid of their surroundings. (Teacher I)*

*When I was working in my previous company, I could not work well with my colleagues, failed to adapt to the new competitive company culture and eventually had a nervous breakdown. I don't want my students to experience the same thing. (Teacher B)*

One teacher mentioned that her previous learning experience as a student influenced her to want to be a different teacher. Teacher D felt that she was “suppressed” because of a rule-governed university and being taught by “control freak educators”. It was this learning experience that caused her to want to encourage her students to be “autonomous” learners who could determine their own direction in learning. Interestingly enough, despite wanting to be a different teacher, she admitted to being “a rigid stickler to rules” at the beginning of her teaching career but that she had learned to be “a more flexible educator” over the years.

“Current experience” that was cited as an influencing factor was described as either the work experience of teaching in the current higher learning institution (Teacher H) or the perceived lack of teaching experience prior to joining the current institution, and hence, feeling handicapped by that lack of experience (Teacher I). Teacher H stated that being in an institution with its rules and regulations on completing the syllabus and preparing students for examinations, he felt he was spending more time on marking and grading papers, instead of analysing available data to learn how to get his students to master the skills they needed to master. He wanted his students to be adaptable to different phases of life and the changes and challenges that came with it because it was a situation that he faced in his current institution. As Teacher H stated, “I am overwhelmed by the number of hats that I must wear – teacher, parent and social worker.” Teacher I, on the other hand, felt that despite what she wanted her students to achieve (quoted in an earlier paragraph), she lacked confidence and often doubted her own capabilities to the point that she would “occasionally” come up with excuses instead of doing what she knew needed to be done.

“Personality” was cited as an influencing factor in shaping and reshaping the identity of Teacher G. For Teacher G, her tendency to “overthink” things, even “the smallest matter”, combined with caring “a bit too much” about what others thought of her, caused her to be affected when she was deemed not to have done as well as expected in her teaching. As such, despite having a clear conviction of what she wanted her students to achieve and what she needed to do to help the students, she became emotionally affected when she received contradictory feedback.

It could be deduced that the interaction between the teachers’ past experiences as students and as teachers, their current experience and the teachers’ own personality, shaped how they viewed their own “goals and wants” as teachers and the roles that they needed to undertake in order to achieve these “goals and wants”.

### *1.3 “Teacher Conflict”*

Eight of the 9 teachers identified exam-oriented culture, the need to complete the syllabus and teach the topics within a specific time-frame as sources of conflict which prevented or reduced their ability to do what they felt needed doing. All of them felt that doing what they should do in order to achieve their “goals and wants” could mean that they were seen as “non-conformist”, “deviant” and moving out of “conventional practices”. These might not be well-received by the students, parents and their institution. They were concerned that this might ultimately result in students and parents complaining about their teaching and subsequently put their job at risk.

The 8 teachers whose profiles were referred to above felt that pursuing the fulfilment of their “goals and wants” put themselves and their careers at risk. There were several outcomes which the teachers anticipated in pursuing

their “goals and wants”: inability to complete the syllabus and receiving complaints from students and parents (Teacher B, E, F, G, H, I), a damage to reputation (Teacher B, E, F, H and I), being blamed for students’ poor performance and receiving poor student evaluation of teaching (Teacher D), risking the job (Teacher A, B, E, F, G and H) and losing interest in teaching (Teacher G).

One teacher identified an existing conflict which differed from what was identified by other teachers. Teacher C identified a shared feeling of “helplessness” with his students caused by being forced to take the subject or programme by their parents. As Teacher C stated, “I know most of my students are being dictate[d] by their parents...on their future prospect without [the parents] knowing if their children are interested or have the passion [for it].” Teacher C felt that this was a significant conflict because his students struggled in the subject, causing “negativity” and “hatred” toward the subject “and probably their parents” for putting them through that experience. For himself, Teacher C worried about not making an impact on his students but his concern was more for his students:

*I listen to my students’ plight and sadness as they share their passion and interest [which] has been denied by their parents... At night while I sit on my bed reading my book,... [I] try... to figure out how I could help students in their time of need and desperation... If I were to meet their parents and explain to them about their children’s plight... parents’ decision has been made.*

With the exception of Teacher C (whose concerns were different), there appeared to be a fundamental belief among the teachers that they were limited in their ability to help students develop into well-balanced individuals who were independent, adaptable, resilient and capable of contributing to society – because they had to complete teaching the syllabus within a specific time frame. There are several possible implications that need to be explored further: (i) that teaching the syllabus is at the expense of students’ holistic development, rather than both being mutually inclusive; (ii) that teachers need to cover the prescribed syllabus during the face-to-face teaching time; and, (iii) that learning is teacher-led.

## **2. Perceived value of character profiling as a tool**

Based on the evaluation form and feedback completed by participants, 63.4% (7) found character profiling to be useful and would recommend the workshop to other teachers while 18.2% (2) did not find it useful. No answer was recorded for another 18.2% (2). Those who found that character profiling technique was useful in exploring who they were as teachers reported that they were satisfied with the character profile that they had produced and that the profile was a reflection of who they perceived themselves to be at that point. A total of 36.4% participants found the use of the tool interesting because it provided them with a new perspective or a new way of reflecting on themselves, 36.4% found that it helped them to reflect on their values as teachers and to synthesis their purpose, while 18.2% stated that the tool taught them to be specific, with the cycle of writing, thinking and writing useful for their reflection. Below are some responses:

*“I’ve learnt that I need to look deeper within myself to understand who I am.”*  
*“...have a better understanding of myself as a lecturer. I have learned that how you see yourself/experiences can influence your teaching style.”*  
*“... reflect upon teaching / persona as a teacher.... Reflect on daily lessons / achievements so far... reflect on how lessons progress throughout the semester.”*  
*“A valuable framework for analysis” which provides “clarification a round career direction.”*

From the 18.2% of participants who found the tool to be less useful, one reason was cited by one participant. The reason cited was an incompatibility between the tool or how the tool was applied with the teachers’ own identity. As stated by one teacher:

*Maybe it’s just me, but I am someone who is boring, drama-free, forgive everyone before going to sleep, let go easily so I really couldn’t dig deep into myself and relate to all of this. Plus, I can’t write that well yet. Ha ha.*

This participant’s response could be linked to the requirement that each of them identified a critical, most impactful event for each element of the character profile. A further analysis on this can be found in the next section.

### 3. Perceived challenges in using character profile as a tool in a workshop for reflective teaching

In reflecting their experience in adopting the character profile technique, most participants reported that it was challenging at varying degrees, although they also found it interesting. At the first stage of the character profiling, participants appeared to struggle with answering questions on their *wants* – what they wanted as a teacher, why and why at that particular point in their career. Providing a brief description of a past event to support their answer appeared to be difficult as well. The challenge identified at this stage was the lack of time to address the deep, self-exploratory nature of the question, which one participant considered as “philosophical”. Given that there was a time allocation for each element of the character profile, the time limit could have inhibited their thinking and reflection process.

Two other reasons were provided by participants to explain their apparent challenges. One reason was that they viewed application of the tool to themselves required not just writing skills but specifically, “creative writing skills” which they were either not good at or needed help in developing. The perception that character profiling was still a creative writing exercise – despite being focused on the participants, their own needs and wants, their past and current experiences – was unexpected but not surprising, given that the tool was borrowed from the creative writing field and the examples that were used to explain each step of the application process were also examples from films and film scripts. As one participant stated, the application of the tool could have been better achieved in the workshop if it had been “directed more to teaching rather than a dramatic fictional character.”

The third reason was the perceived inflexibility in the adoption of a screenwriting method to teachers’ exploration of themselves. One participant stated that there needed to be “more flexibility” in “moving from strict screenwriting to the present subject matter.” This view was linked to the requirement that for each element of the character profile, participants had to identify a critical incident in the past that became the turning point for the teacher. This perception was shared by a number of participants, with three participants being resistant to this step:

*“But we don’t make decisions or change just based on one incident.”*

*“You cannot pick one. One is not enough to decide, even if it is very good or very bad.”*

*“This is not who I am. If I pick one incident that was bad, does that mean I am blaming whoever... the students? The...whoever...”*

Identifying one critical incident seemed to contradict with their belief that responsible teachers should not ethically make decisions based on one incident.

The use of critical incidents in reflections on teachers and teaching is not new. For example, it can be found in Brookfields’ four lenses of reflective teaching and his use of critical incident to explore learners’ assumptions (2002). It can also be found in a study by Clavert, Bjorkland and Nevgi (2014) where participants were asked to draw their lifeline and identify critical incidents, what they describe as “meaningful events, experiences or achievements” within that lifeline. Other studies have explored the use of teacher narratives, and deriving from the narratives, a frame for tracing teacher development and professional way of “being” (Yam, Mehotra & Jing, 2015, p.426).

So why did the use of critical incident in this particular setting seemed less acceptable by the academics? There were two possible answers. Firstly, critical incident as a source of reflection and learning for teachers should not be limited to one incident. Rather, teachers should be engaging in continuous reflection based on analysis of critical incidents that occur throughout their teaching career. Secondly, critical incidents, as they have been used in reflective teaching, do not have to be a dramatic event. Instead, the incidents are deemed critical due to their significance to the students, the teacher or the teaching. For example, they could be related to a teaching strategy that worked really well or a minor conflict that led to an impactful learning for the teacher which could influence how he/she would approach a particular topic area in future. As such, how teachers would normally expect to choose critical incidents for reflective purposes contradicted with how they were asked to choose their critical incident during the workshop. Participants were asked to choose only one critical incident which had the most dramatic effect – because there is a limit to screen time and because on screen, it is the drama that captures the audience’s attention. When analysed from this perspective, some of the participants’ resistance to having to choose one dramatic critical incident could be well-understood.

## CONCLUSIONS AND RECOMMENDATIONS

Screenwriting's character profiling appears to be useful as a framework to explore the identity of a selected group of teachers teaching in a higher learning institution. Several things are evident from the analysis of the teacher identities which emerged: (1) These teachers had very specific goals and wants as teachers but that their goals and wants were viewed from the perspective of their students' holistic development, their ability to be part of and contribute to the society. (2) The teacher identities uncovered through the use of the tool concurred with research findings that they are influenced by the teachers' past and present experience and teaching context. Personality was also found to be an influencing factor in the shaping of teacher identities. (3) There appeared to be a dissonance between the teachers' perceived identity and the extent to which teachers' choices in teaching and supporting students' learning could be correlated with their identities. Teachers appeared to view themselves as being unable to or limited in their capacity to achieve their goals and wants due to perceived contextual constraints imposed by their institution and situation.

If teachers chose to focus on completing the syllabus within a specific time-frame, believing at the same time that doing so was at the expense of the necessary student development, it was likely that there were misalignments between how students needed to be supported and the teachers' adopted teaching strategies. This points to further professional development needs. Future professional development activities for these group of teachers should include a further exploration on the teachers' own perceptions about effective teaching and their conceptions of learning for students in a higher learning institution. It is worth exploring to find out if the teachers' current view of teaching is related to their levels of thinking about teaching (Biggs, 1999). According to Biggs (1999, p.2), teacher competence appears to follow three levels of focus which are *what the student is* (Level 1), *what the teacher does* (Level 2) and *what the student does* (Level 3) Available information seemed to indicate that at least some of these teachers may be operating at Level 1 or Level 2 where the emphasis is on what the student is and what the student does. This meant that teaching is based on a deficit model which either attributes student achievement or lack thereof to their differences or to the teacher input which is seen as requisite to learning.

Further professional development activities also need to include teacher reflection on their conception of teaching and learning and how to move towards level 3, where the focus is on what the student needs to do in order to learn and therefore what kinds of teaching and learning activities would support their learning process. At level 3, the teachers' role changes to be more of a facilitator. Some of the teachers involved in this study already seemed to recognise the need for adopting the facilitator role at some stage. It is most likely that they would benefit from engaging in activities that enable them to explore how to be effective at facilitating students' learning.

Finally, whether at subject, department or faculty level, it may be beneficial for academic staff to engage in interaction or development activities where they can explore and come to an understanding of the value of the syllabus, the variety of ways in which students can be guided to learn the syllabus and if indeed there was an over-prescription of syllabus, the mechanism needed to rectify this.

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# Brief as a Prerequisite For a Successful Solution to a Creative Project

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## ABSTRACT

The presented study discusses the importance of managing creative innovation processes, their understanding, effectiveness and subsequent transfer to real life. The development of concrete creative innovation processes has been observed by high-school students who actively participate in the realization of creative innovations. The aim of the study is to find and identify critical factors within the entire creative process, i.e. from assignment - brief, through individual creative artistic process to individual outputs. Goal setting is based on the assumption that the structure, quality and content of the brief is a prerequisite for a successful solution. Comparing inputs and outputs of these projects and finding answers to identified research questions, which areas of project solution are problematic (e.g. whether wording or student approach or other aspect) is also an integral part of this study.

A qualitative questionnaire survey with narrative elements was used to examine the progress of sub-creative projects, the evaluation of which is done through thematic and content analysis. Conclusions resulting from qualitative research are confronted with general project management rules, and findings will be the basis for identifying critical locations in designing creative projects. The ambition of the author is to confront the conclusions with system archetypes in relation to project management.

**Keywords:** Creative innovation processes, transfer to practice, meaning of brief, qualitative questioning, project management rules, critical places, archetype in project management.

## INTRODUCTION

The importance of expert article's topic can be seen in many sectors of the entire state economy. Currently, there is a lot of discussion on Cultural and Creative Industries including activities related to human creativity, skills and talent (Kreativní Česko, 2016). The cultural and creative industries dispose of great potential to create wealth and jobs opportunities.

The results of these sectors provide added value to other economic sectors and likewise often offers different innovation types, both in technological and non-technological fields. In addition, these results are reflected in the society development as well as in the intellect of individuals. Cultural and creative sectors include areas that are often part of the industrial and technological processes, as well as cultural, artistic, non-profit activities. These sectors include architecture, design, advertising, film and audiovisual art, music, books and press, game industry, software, new media and related IT services, radio and television broadcasts, scenic and fine arts, art handicraft, gastronomy and cultural heritage. Obviously, the effort to prepare students/graduates for successful careers in various areas of cultural and creative industries forms the main interest (apart from educational activities) of the art faculty. That is the reason why we started asking the question of cultural and creative industries at the Faculty of Multimedia Communications seven years ago (Kreativní Česko, 2016). The main impulse of this step was the need to find employment for graduates and minimize their outflow to large cities which led to creation of a platform for communication between educational, political and business sector.

An important prerequisite for employment in the creative industries is to gain knowledge and experience when dealing with specific creative projects under the tutelage of experienced teachers. These activities are maximally supported at the FMC by individual commercial projects as well as whole-faculty projects. Successfully realized projects bring financial benefits to faculties and increase the faculty prestige. Unsuccessful projects or projects which were difficult to carry out have led us to following questions: Why has this situation occurred? What are the critical parts of the project? Who or what caused the failure etc.

We researched analyzes of some individual creative projects in the past whose results were published in Design Stories (2017) or IBIMA 2016, INTE 2016.

Other researches were focused on design thinking analysis of the Art Faculty students in the project "Water for All", which had been announced as a single assignment for all faculty studios.

## THEORETICAL BASIS

### Creative project management and creative projects

Content and individual topics of this study deal with the process and realization of creative project and they are related to terms of creative project management and creative project. *Creative project management is a way how to create new value based on the unique talented personality of its creator aiming to create a quality product within specified limits* (Šviráková, 2014).

Creative project, according to Šviráková (2014), *is a temporary organization created to provide original and formally perfect products containing intellectual property delivered in accordance with a pre-agreed goal and within specified limits.*

Individual creative projects elaborated on a single subject were selected for the analysis. The project team was formed primarily by designer or pedagogue holding the position of mentor. It was not a classic project with project team and a classic project plan. Analyzed projects could be included in creative design ideas because a significant part of FMC specializations are focused on design work (graphic design, industrial design, glass design, footwear and fashion). Creative projects need to be treated as an individual solution, in which the talent and creativity of the author's solution are maximized, with certain limitations being the focus of project itself.

### Archetypes in project management

In project management theory, the system archetypes were defined in relation to project management (Senge, 2007). Archetypes are constantly repeating patterns of behavior in certain situations. They were named, for example, for behavior in nature, in marketing communications, etc. P. Senge (2007) described, for management purposes, fourteen unique archetypes. One of the research objectives of creative projects is to find similarities with archetypes for project management and, as the case may be, to complete their characteristics for creative projects. In order to generalize the research results it is necessary to carry out research surveys in several projects with a maximum number of students.

Examples of use of archetypes in project management are described in specialized literature (Senge, 2007, Sherrer 2010, Bureš 2011, Šviráková, 2014). As part of the design process analysis, see below, the individual defined behavioral patterns will be compared with the analysis results to find a typical archetype for solving the "Water for All" creative project, and subsequently generalize the results of similar analyzes for creative projects.

### Design thinking

Design is a gradual process by which the author goes through when dealing with a specific assignment. This process is usually developed in several phases which are sometimes quite individual and sometimes typical of a particular type of assignment. It is necessary to "think designedly" at each stage of creative process from the assignment to the finished work (Ambrose, Harris, 2011).

Design thinking is associated with a great deal of creativity, but this does not mean that this process does not have its rules and certain order. Design process should be perceived as a process directed in a similar way to creative project. Creativity is just as important in design as the economic, time and organizational side. That is a reason why it is necessary to perceive design process and thinking as coordinated process leading to creative, innovative and alternatively unconventional solution. In a particular design process (project), the author considers more ways of solutions and can use different methods and mechanisms contributing towards creative solutions.

### Design thinking stages

Ambrose and Harris (2011, p. 12) divided the design process into seven steps:

- a) **Specification area/brief** – in this stage it is necessary to define the design problem and its target audience. The emphasis is put on correct understanding of the design problem and its limitations. Only then we can achieve the solution complying with client's ideas.
- b) **Research area** – concerning activities related to searching for information about existing methods of similar solutions or their history, information about target group and identification of possible obstacles.
- c) **Imagination area** - is the stage of identifying interest and needs of end-user and generating ideas to satisfy them, e.g. forms of brainstorming, brain-writing, etc.
- d) **Prototyping area** – it means to materialize the ideas, present them to users, contractors and designers in order to get their view and evaluation.
- e) **Selection** - comparison of existing solutions with objectives of the assignment and selection of the most suitable ones. Some solutions may be practical but may not be the most appropriate.
- f) **Implementation** (sometimes we talk about transfer to practice) presents the realization of solution and its delivery to contracting authority.

g) **Learning area** helps the designer to develop his design thinking. Feedback from contracting authority and users provides information about satisfaction and fulfillment of the assignment goals. For designer this information is an inspiration or warning what's going to happen in the future and what he should avoid or on the contrary which way he should continue.

### **Specification area and research**

As mentioned above, the subject of this study and research is the area of specification and research. Following areas of design process will be successively analyzed within one major research project whose subject is the creative project "Water for All".

- **Specification/brief, or clarify the problem.** This first step in design process expresses client's solution requirements. Its quality or completeness is related to understanding of solution and to the successful design process solution. Anything what will allow designers to comprehend and start the design process may be a part of the assignment.

- **Research/collection of information about the given problem.** We perceive the term research as a quantitative, qualitative, secondary or primary and user research. The research aim is to get the most information about current issue, target groups of users, their behavior, habits, etc. The idea is to work out, based on obtained information, model of a typical potential user (how old he/she is, what is his/her education, interests, relations to branding and innovation, etc.)

### **Problems of implementation/transfer of innovations and new ideas into practice**

Transfer or implementation in the design field is process of introducing new solutions into practice, which means into production. Transfer in design is usually a part of new products development. And often, product design change is considered to be a significant innovation. Successful transfer is completed by selling license or rights for production and subsequent sale to the entity (the company). Experience shows that transfer process is a very complicated long-term process and it is necessary to identify critical points causing complications of the process and eliminate their impact. Research process of finding critical locations must be successively realized in all areas of design process. This systematic approach analyzing individual areas of design process will provide a partial conclusion for each part of this process. By using partial conclusions, it will be possible to identify transparently critical points of the entire design process.

In the field of design, industrial patterns are usually the most represented. Transfer of design, i.e. industrial patterns, is a very complicated process at academic ground. The significance of design and design process can be paraphrased by statement that product is sold thanks to its design because most of technical solutions have already been invented which is a product added value. Very good feedback can be seen in design awards such as Reddot design award, Design plus award, Good design, Successful design, Design for Asia award, and Plagiarius by FMC students. But these awards will not ensure a successful transfer into practice (Strážnický, 2016)

## **1. OBJECTIVE AND RESEARCH QUESTIONS**

### **Study aim**

Given that TBU is a regional university, it is very important to cooperate with companies, in other words the real world. Our cooperation with corporate sector is primarily focused on creative innovations and these are processed in creative projects.

The aim of the whole research is to find and identify critical factors within entire creative process, i.e. from the assignment - brief, through individual creative art process to particular outputs. This study deals with research of the first and second areas of design process (see paragraph Design thinking), i.e. brief and information survey.

### **Study object**

The object of study and research are partial student creative projects which were processed within a particular assignment for the whole faculty "Water for All". The faculty FMC focuses on industrial design, glass design, footwear, graphic design and 3D design and more. These specializations are very often object of cooperation from companies that is why we were interested in the influence of brief on success or failure of creative project solution.

### **The main assumption of research**

Goal setting is based on assumption that structure, quality and content of brief are basic prerequisites for successful creative project solution, resulting in, as a rule, creative innovations.

## 2. METHODS AND METHODOLOGY

As it is shown in statistics, the process of successful creative project solution and subsequent transfer into practice is complicated and long-term. In order to identify the process problems when solving creative projects it was necessary to identify problems in particular stages of project solution. The transparency of results was supported by choosing to research a project whose assignment was selected by faculty management as a collective project "Water for All".

Due to certain limitations of qualitative and quantitative inquiries, a combination of these methods has been chosen as a research method. The researchers' intention was to reach as many students involved in the "Water for All" project as possible.

### Research process is realized in three phases:

- a) In the first phase, which took place in November 2016, a questionnaire survey was carried out. So-called creative questionnaire with visual elements was presented to students. The questionnaire contained a document which helped them to concentrate on issues and phases of design thinking. Altogether 85 students were approached and we received 65 completed questionnaires.
- b) The second phase of research process will be realized in September and October 2017 in a form of individual interviews with selected students whose project has been completed, implemented and exhibited and who filled in the creative questionnaire with visual elements. Individual interviews will be evaluated in a form of thematic content analysis. We want to let the student tell his story about creative design project; we want to observe his feelings, emotions, negative and positive aspects. These interviews will be analyzed by thematic content analysis with narrative elements.  
Questions for the interview are prepared in advance in order to give him opportunity to take his own initiative. Used method is a semi-structured interview with narrative elements: the interviewer adapts himself to type of project and knowledge which is at interviewee's disposal. This way of managing interview gives the interviewer opportunity to engage his own initiative and explore topics that will appear only during the conversation. The conversation must be recorded in agreement with the interviewed person. After recording, the interview is literally registered in written form for purpose of thematic analysis. This record is in the form of a log, the record accuracy is verified by independent person who compares written recording to sound recording (Soukalová, 2016).
- c) In the third phase - October and November 2017, result synthesis will be realized, critical areas in the process of developing design process of the "Water for All" creative project will be identified. The third phase goals of research process are:
  - Identification of critical points in the design process of creative project
  - Identification of typical design process features when dealing with the creative project
  - Results comparison with defined project management archetypes
  - Completion of defined archetypes for creative projects
  - Verification of conclusions and chosen research method on the following creative project "Game" (2017-2018)
  - Results application in the dynamic of the project management system.

## 3. CREATIVE PROJECT "WATER FOR ALL"

The importance of "Water for All" project is based on a discussion about the effective use of water which has been seen as a global social problem. The project aim was to point out water saving using imaginative solutions with creative elements. This way we wanted to inspire people to use water in a effective way and to take water management issues very responsibly. The aim of this identical assignment for entire faculty was also to inspire students to deal with current issues using creative elements.

Research progress of "Water for All" project:

- a) The project was launched on 21. 9. 2016 in the form of so-called Experts Block, which was intended for all faculty students. It was more like inspirational meeting organized in the form of a conference whose main topic was water. Personalities who deal with water phenomenon in different areas gave lectures about various issues. Artists, architects, publishers and presenters, environmental experts, etc. The objective of Experts panel was to show students possibilities and limitations when dealing with project Water for all. Meetings with experts were considered as a part of project assignment.
- b) From 15 to 28 November 2016 a questionnaire survey was conducted in the form of creative questionnaire with visual elements. We wanted to find out how well are students informed about the topic, whether they understand the assignment, whether they have an idea how they will continue to work on the project.



synthesis of the research/questionnaire survey will be carried out in all design process areas. When processing evaluation of obtained results, researchers' efforts were to find a way that would be usable and appropriate for all design process phases. From the experimental point of view, a thematic analysis method combined with quantitative assessment was used for the first design process area; Specification/Brief. Individual contents were evaluated from -5 to 5, with the - sign representing negative statement and + sign for positive statements. Values from 1 to 5 reflect the topic importance for understanding the assignment (value 1 less important and value 5 very important for understanding the topic), see Fig. No 4. The overall evaluation was determined as the assessment average of all students' statements in given area. In order to maintain objectivity, the particular statements assessment was consulted with a research team member.



Fig. No 3 Common questionnaire of one studio

**Evaluation of the area of the specification Brief of the „Water for All“ project**

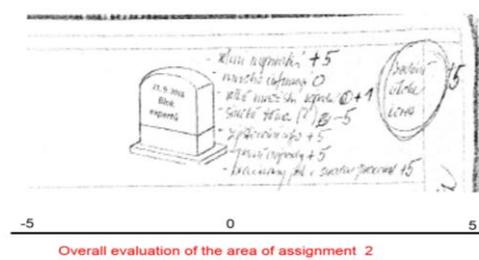


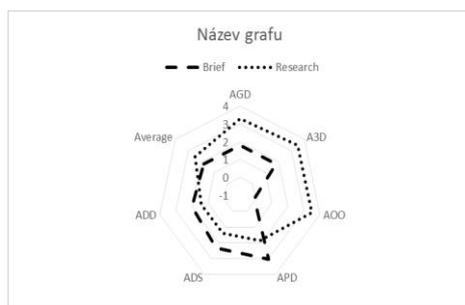
Fig. No. 4 Brief evaluation methodology

**Analysis results of visual questionnaires in Specification/Brief design process field**

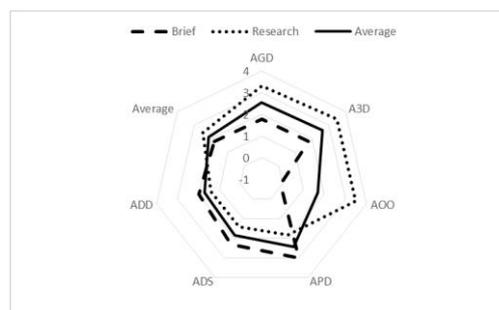
The analysis of creative questionnaires with visual elements was done according to the set methodology described in the previous chapter.

This part of analysis was conducted according to studio specialization; graphic design, product design, clothing and footwear design, industrial design, glass design and digital design. Researcher filled in one single questionnaire for each studio recording all students' statements about design process areas, specification area and research area. Evaluation was carried out according to the set methodology. All students' statements and whole design process area were recorded. Those statements which were not related to evaluated area or those recorded in another area were rated as neutral, i.e. 0, others were rated from 0 to 5 and, depending on the importance and according to the negative or positive was used a - or + sign.

The results of the studios' evaluation in the Brief and Research areas are presented in graphs 1 and 2.



Graph No.1 Brief and Research Areas of design process of "Water for All" project



Graph No.2 Average Brief and Research Evaluation of design process of "Water for All" project

The results showed that Brief area, which included Expert Block, reached the average value of 1.8. Students of Fashion and Footwear Design studios probably did not record the Expert Block at all and did not understand the first phase assignment. They began to deal with the issue only during process of obtaining information and researches. On the other hand, students of Industrial Design studio were familiarized with project immediately, and many of them had already been informed and searched before meeting the Expert Block. Due to this fact, Brief area evaluation was misrepresented in a certain way.

Based on the fact that the filled-in questionnaires were very often connected to Brief and research activities, these two areas were evaluated together. Graph No.2 also presents the average score of both

areas where it is possible to observe diametric difference in evaluation of areas in case of Fashion and Footwear Design Studio. In case of other studios, the assessment situation is fairly balanced. We can summarize that the first two design process areas were best conducted by studios which invited specific companies to deal with the project. These companies presented the particular assignment to students what was appreciated and positively evaluated. Thanks to this fact students got a concrete idea of what to solve right at the project beginning.

## **CONCLUSION**

This paper aim was to find out whether Brief quality influences the creative project success. At the same time, the goal was also to identify critical points of design process when solving creative projects. In the introductory chapters of the article, the design process description was presented as well as the particular creative project Water for All. This project is currently being researched. Together with the research team we are trying to identify development of solution process, its outputs and influence on students. Due to the fact that design process has complex and long-term development, our research was divided into several phases. The results of the first two phases are presented here. In general, we can state that for Water for All project, the first two phases were extensively interconnected and many students perceive specification and research area as one area of design process. This perception was probably caused by a very extensive assignment of Water for All project which was also pointed out by many students in questionnaires. On the other hand, what the students did not comprehend or did not understand within the Expert Block, they had to discover on their own when dealing with research. The research clearly shows that Brief area in design process is crucial for the project research solution. In case of incomplete assignment, the author/designer has to request additional assignment specification. In case of Water for All project, at the beginning many students were not well versed, but under the guidance of pedagogues, some designs were completed and prototypes and models were successfully produced. Selected outputs were exhibited at the Zlin Design Week in Czech Republic and some of them will be exhibited in Dresden and London.

## **ANNEX NO.A**

### **Water for All - procedure for filling in creative questionnaire**

1. Write WHAT you are doing, what you are working on and what your final product should be in studio. Please be specific.
2. Write down all obstacles that will not allow you to work (other tasks in the studio, exam period, preparation for final pieces of work, Christmas, etc.)
3. Write what you will be presenting under milestone 15. 12. How to create ideas 2016.
4. Write down WHAT you have already done, describe September, October and part of November.
5. Between all milestones and activities, outputs, etc., describe HOW you will proceed to be able to present and complete your planned outputs.

### **Keywords for all studios - design process phases**

#### **1. Assignment specification - we evaluate whether:**

- It was comprehensible
- We and the contracting authority understand each other
- There were any shortcomings in the assignment
- I am able to accomplish the assignment
- I know who I'm doing it for; who the target group is

#### **2. Information research/collection about the topic, area**

- Primary sources (task is to find out what worked /did not work before in similar projects)
- Secondary sources (information concerning issues from all available information sources)
- collecting information about target group what are its wants and needs, etc.

#### **3. Methodology and ideas creation**

- Brainstorming in the group/studio
- sketching
- Adaptation to already proven solution
- Know and respect the budget
- I emphasize the originality
- There are doubts in case of the first phase (which, concretely)
- formulate potential problems

#### **4. Model creation/prototype, clarification what and where to exhibit**

- Models (prototypes)
- Funding issues concerning the modeling / prototype production

- I do not know exactly what the prototype and model are

- Possible problems: how many models / prototypes to choose

#### **5. Solution/decision choice - what and where to be exhibited**

- Consultation with contracting authority

- More expert assessments/expert team

- Possible problems: whether output meets the assignment, corresponds to target group, can be realized in required time and within given budget etc.

#### **6. Implementation / delivery (model or prototype)**

- Final project solution delivery to contracting authority (technical documentation, etc.)

- Solution is approved by contracting authority

- Funding is solved

- Is manufacturing, industrial legal protection resolved?

#### **7. Output - Exhibition**

- I know the date

- I want to exhibit in...

- I know how many exhibits

#### **8. Feedback**

- Evaluation: what succeeded and what did not

- What was the target group feedback?

- was the solution successful?

- What can be improved on the solution?

- How to continue dealing with solution (the effort of serial production, industrial legal protection, etc.)

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## **Building Data Literacy in The Scientific Community**

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### **ABSTRACT**

Data generated from research activities are unique and diverse. For that, it takes an application that can analyze and represent data visually. The Indonesian Institute of Sciences (LIPI) creates various types of data in the fields of biological sciences, engineering sciences, earth sciences, and social sciences. LIPI has been provided a repository as tools to manage the data and publication using the Dataverse framework. This framework comes with Two Raven and R. Both are tools for analyzing spreadsheet or tabular data. Data visualization in the form of Bar Chart, Histogram, Gram, etc. resulted from data analysis. But this tools not yet optimally used. This caused by low awareness of the importance of data management. Data management is one of the component of data literacy. This paper will discuss the data literacy in terms of Reading, Working, Analyzing, and Arguing related to the Repository System that LIPI has developed. The literature review and questionnaire were used as a method. This research is expected to be a model to improve understanding of data literacy especially in term of data management.

### **INTRODUCTION**

Research scope that does by LIPI is consist of life science, engineering science, social science, and earth sciences. Because of that, research data that has been resulted from research are varied. LIPI's work unit are located spread over several areas in Indonesia. Many data result from research activity every year. Manage data at the integrated system is still become a challenge. From the result of the questionnaire that we were done, research data are managed by researchers or research group. Data are storage in PC/Notebook, external hard drive, USB drive, CD/DVD ROM, and cloud (Dropbox and Google Drive).

One of the barriers that often faced by the researcher for manage the data is recorded their laboratories data manually at log book. To changes manual record to digital need time and effort. This become one of the barriers when they must store their data in the digital form. A log book is an important and valued asset for researchers. A manual log book is harmful to be stolen because of the low-security system to access the data. One of security used is storage that inside the locker or personal table.

Data become qualified and useful if they are used by others to support research. If research data only stored, that data becomes useless. In order useful, data should be accessed by others. If data are open for public or open access, it will have an impact on researchers and institutions. The researcher will gain recognition in the scientific community through cited data, while the impact on the Institute will be known as a qualified research institution for the results of his research.

To manage the research data, LIPI as an institute that has authority to educate and build Indonesian researchers has been issued regulation that obligate the researchers to store their data in a repository system. The regulation are apply for researcher that used funding from the government. The ownership of the data is also mentioned in the regulation, namely: the copyrighted research data is the relevant Researcher or Research Group, the institution of the workplace, and the funders. While copyright publication is on the publisher.

Beside manage data, giving interpretation for the dataset are important. Two of them are component of data literacy (Prado & Marzal, 2013). The more researchers able to create, control and understand data, they become more powerful (Frank, Walker, Attard, & Tygel, 2016). The aim of some research are giving recommendation for the decision maker. Data literacy education helps in delineating decision domains and defining accountability for decision making (Koltay, 2016). Many paper are discuss about data literacy. Some of them discuss about designing tools for data literacy (Bhargava & Ignazio, 2015) and the others are concerning about curriculum for data literacy (Schneider, 2013). This paper will explore how to build data literacy in the scientific communities.

## THE STUDY

This study was conducted to explore and understand about data literacy in the scientific community. We explore about data literacy in LIPI researchers. We conduct analysis based on repository facilities that are provided by institution. Gap analysis about what are the element of data literacy and what skill should researchers have are discussed.

## FINDINGS

Every research activity produce data. When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information. Qualified data will produce qualified information. Because of that, caring about data quality for research data is a must. In a company, improving processes could be done by first understanding the basic procedures the companies use and then showing new ways to collect and analyze quantitative data about those procedures (Herzog, Scheiren, & Winkler, 2007).

As other companies do, LIPI develop a repository system to manage the research data. It is a started step to collect a research data from the Indonesian researchers. In order to push the researcher to put their research data (primary and secondary) into the system, LIPI made a regulation. There is no statement about punishment at that regulation. The repository system is integrated with third parties such as Dropbox, Google Drive, iCloud, OneDrive, and other cloud-based storage providers. The goal is that researchers do not reupload research data that has been stored in the storage provider. The system is integrated automatically so that both primary and secondary data can be directly uploaded to the Repository system.

To ensure the data quality, data owner are suggested to input the description of each file. LIPI using Dataverse Framework as a repository system. Different with others, Dataverse Framework not provides metadata of the document, data set, or publication but provide specific metadata of the file. With the detail description of the file, It is expected can guarantee the research data quality. Indirectly, business processes in the Repository System provide education to researchers in maintaining data quality so that it can have a positive impact on the world of research.

Koltay (2016) study about data governance, data literacy, and the management of data quality. At the conclusion, he stated that data literacy is indispensable for managing data quality. Being data literate is not only crucial for researchers but also for information professionals in order to involve in supporting data-intensive research (Schneider, 2013). Data literacy refers to the ability to understand and use data, particularly in the context of the Internet (Frank et al., 2016). Data Carpentry focuses on data literacy in particular, with the objective of teaching skills to researchers to enable them to retrieve, view, manipulate, analyze and store their and other's data in an open and reproducible way in order to extract knowledge from data (Teal et al., 2015). Data literacy is depends on the community context. For this study, we adopt definition of data literacy from Bhargava & Ignazio (2015). Data literacy includes the ability to read, work with, analyze and argue with data.

### 1. Reading

Reading data involves understanding what data is, and what aspects of the world it represents (Bhargava & Ignazio, 2015). Data obtained from the internet are not necessarily valid and qualified like as we wish. Data is divided into two categories such as quantitative and qualitative. Quantitative data are numeric data which have a continuous variable (height, weight, cholesterol) and Discrete (number of respondents, a number of children, number of library visitors). While the Qualitative Data in the form of non numeric data that has nominal variables (eye color, blood type) and ordinal (cancer stage, grade rank). The ability to read a data is needed when the data is displayed in a visual form such as Formula, Diagram, Graph, Cart, Plot, or Map. Understanding and analysis results of research data depend on the party who has provided the data. Therefore, it is necessary to consider several aspects of managing the data so that quality data are: (1) relevance, (2) accuracy, (3) timeliness, (4) accessibility and clarity of results, (5) comparability, (6) coherence, and (7) completeness. That aspect is the seven most commonly cited properties (Herzog et al., 2007).

The ability to read data for developing research and to interpret whether the data is related to the research being done is the process of data literacy. The researcher must have the ability to read and interpret collected data in the form of graffiti, drawing, numerical, or graphic. The present condition, the researchers already have the ability to read and to interpret data. Literature reading techniques have been taught when the researchers at a candidate researcher position. Training and coaching are done for 3 weeks or equivalent to 120 hours. Several papers have been published in the national or international journal globally indexed. Some of the researchers at the professor level have become a blind reviewer of an international journal. That indicates that the ability to read and to interpret data is not a barrier for researchers.

## 2. Working

There is the great potential to conduct data-driven research and address questions in all fields when the ability to digitize text and collections, automate data collection, conduct large scale surveys and generate vast genomic, geophysical or another type of data is an increase (Teal et al., 2015).

In the 21st-century, data-centric thinking becoming vital to the way work, communicate and understand. This has led to a proliferation of tools for novices that help them operate on data to clean, process, aggregate, and visualize it (Bhargava & Ignazio, 2015).

The ability in the computational and statistical analysis are required. Both are need to analyze the data appropriately. But, many researchers have limited skill. Beside that, unfamiliar with best practices and tools in the data lifecycle: most of what they know about data management, analysis, and sharing has been learned piecemeal, or not learned at all.(Teal et al., 2015). Working with data involves creating, acquiring, cleaning, and managing it (Bhargava & Ignazio, 2015).

### a. Creating

Research data management, i.e. the processing of all types of raw or primary data, that are created along every research process, will not only play a crucial role for many scientists in the next years, but will also have strong implications for library and information science (Schneider, 2013).

In Research Data Life Cycle, the role of researchers is very important when generating research data. Before creating the data, the researcher will search the source of information as supporting data. Data may come from previous research data or use other people's data. Research activity plays an important role in creating a wisdom. Data generating from research can be used to create information; information can be used to create knowledge, and knowledge can be used to create wisdom (Rowley, 2007).

The type of data generated from the research depends on the field of research science. Different field using different kinds of laboratory tools, this caused the type of the data are different. An example of original image data, viewed in the JCB DataViewer. The image shows the following: a 3D stack of a fixed HeLa cell stained with DAPI (blue), anti-INCENP (red), and anti-tubulin (green), recorded using a wide-field microscope; a time-lapse video of a *C. elegans* embryo expressing GFP-tubulin, recorded using a multiphoton microscope; a transmission electron microscope (TEM) image of bacteriophages visualized using negative stain; etc. (Curtis et al., 2010). In the other tools, digital microscopes produce data in the form of images. This primary data is stored in the storage connected to the server. For easy reading by other software, that primary data can be exported in a spreadsheet document in XLS, CSV or XML format. This primary data should be stored in the repository system.

### b. Finding

One of the big challenges become data literacy is the ability to identify a data and determine what institution is stored that data. If data posted online, we can find and download easily. But if data are not posting online, we should ask to the institutions. Knowing what institution has relevant data with our research field still becomes a problem. To fulfill that challenges, we must change the mind set about the development of online data. Giving enough understanding about data ownership, copyright, infrastructure, and how to manage them.

In Indonesia, every government research institution has data that manage in online or offline database. Commonly, data is available online in the form of publication. While, raw or primary data is not publish publicly. If need data, we should contact the institution as the owners. This become one of barriers in finding the data. Raw data can be used by other to support their research. With using others raw data can decrease resources, fund, and time. For example, questionnaire data can be used for different research purposes but still in one theme.

To increase research quality, Indonesian government provide a fund to subscribe journal, book, proceeding, research report, theses, dissertation, and other scientific publication that are provided by international scientific article providers (ex: Scopus, ProQuest, SAGE, Science Direct, Cengage Learning, etc.). Besides provided by the government, researchers also must have the ability to search information in open access database or repository that has a good reputation.

Collecting data at the repository system will make o easier to find data. This will make other institution knowing what data we have. Not all the data at the repository is open access. There are some data that must be

closed because of regulation or social reasons. If others want to use it, they must ask formally to institution or the owners.

### c. Cleaning

Data cleansing or data cleaning is the process of detecting and correcting (or removing) corrupt or inaccurate records from a record set, table, or database and refers to identifying incomplete, incorrect, inaccurate or irrelevant parts of the data and then replacing, modifying, or deleting the dirty or coarse data (Wu, 2013). Data cleansing was necessary because errors still occurred at the data entry process (Baur et al., 2015). Control the quality of the data is the purposes of data cleansing process.

Mostly doing is manual data cleansing even if very difficult and time-consuming is and vulnerable to errors (Maletic and Marcus, 2001). Machine learning for guided database repair is one of data cleaning strategies (Yakout et al., 2010), inferring and imputing of missing values (Mayfield et al., 2010) and resolving of inconsistencies using functional dependencies (Fan et al., 2008) have been described before (Baur et al., 2015).

Research data divided into many file format, ex: text, worksheet, tabular, statistics, and another format. In order to be qualified, data at worksheet format need techniques to clean it. Data inconsistency is caused by various factors such as input or ambiguous. At the data cleaning process, researchers usually use SPSS or Excel. Microsoft Excel methods to fix and prevent problems with missing leading zeros and hyphens, scientific notation format for numbers, system limitations, file delimitation while downloading, extra spaces, and non-printing characters are shown by Baur et al. (2015). The other data cleaning application like Drake Open Refine, Data Wrangler, Data Cleaner, and Wenpure Data Cleaning are not yet familiar to the researchers. To improve skills in the data cleaning process, training on how to implement that application is required.

### 3. Analyzing

Data analysis, also known as analysis of data or data analytics, is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. The analysis regardless of whether the data is qualitative or quantitative has the skill to describe and summarize the data, identify relationships between variables, compare variables, identify the difference between variables, and forecast outcomes.

Analysis refers to breaking a whole into its separate components for individual examination. Data analysis is a process for obtaining raw data and converting it into information useful for decision-making by users. Data is collected and analyzed to answer questions, test hypotheses or disprove theories (Judd & McClelland, 1989).

Determining what raw data should be analyzed and how the data will be analyzed is data analysis. This is an important aspect of data management for researchers to consider because analyzing the wrong data could lead to false results (Kalichman Michael, 2006). Many people are confused about what type of analysis to use on a set of data and the relevant forms of pictorial presentation or data display. The decision is based on the scale of measurement of the data. These scales are nominal, ordinal and numerical.

LIPi researchers produce several types of data, when they analyze the data they must have knowledge of the data itself. In the LIPi repository system, tools for analyzing data such as R, WorldMap and Two Ravens are available. Each researcher will effectively work with System Repository without opening the analytics software on PC or Notebook.

### 4. Arguing

Arguing with data involves using data to support a larger narrative intended to communicate some message to a particular audience (Bhargava & Ignazio, 2015). Data visualization is a general term that describes any effort to help people understand the significance of data by placing it in a visual context. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization software (Margaret Rouse, 2012).

One of the most arguments for value of data visualization is expressed from John W Turkey in the book *Exploratory Data Analysis*. The greatest value of a picture is when it forces us to notice what we never expected to see. Data visualization is not easy. Need of many different skills and a great deal of practice or experience.

Above all, it requires a deep and broad knowledge across several traditionally discrete subjects, including

cognitive science, statistics, graphic design, cartography, and computer science. In convey opinion or argumentation, visual data, graph, simulation, map, symbol, infographic, and diagram chart can be used (Andy Kirk, 2012).

Some software can use to data visualization from data scientific to easily understood data for general community. As researcher must can making arguments based on data analysis so the arguing be high quality. Data presentation based dirty data will false argument and can a dangerous reference.

The end of the research activity led to a paper that contains methods, discussion to argumentation to convince the research is acceptable and useful. Associated with data literacy, the researcher must have skill in searching data, filtering, cleaning data, analyzing until data visualization so that others can understand what is researched and what is its benefit.

## CONCLUSIONS

Data literacy in scientific community include the the activities of reading, working with, analyzing and arguin with data. For scientific community, especially in Indonesian Institute of Sciences, not all of the activities has done during the research process. There are many data cleaner software tools or data visualization tools. Most researchers use familiar software and simple tools to cleaning and visualizing the data. Because of that, improving the ability to use other software is needed. This is become one of the inhibiting factor in arguing result of research in the visual to society.

To increase data literacy in the scientific community, it needs to do some approaches such as training, workshop, seminar, focuses group discussion, and other activities. These efforts make research activities will produce right goals and objectives, begins from finding, collect, cleaning to data visualization. Fruitfulness in an implementation of data literacy depending on behavior and habits of a researcher in the research data management, even more, implementing the research data lifecycle.

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# **Building Practice in the New Millennium: is Building Education Ready to Meet the Challenges**

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## **ABSTRACT**

The study aimed at assessing the building practice in the new millennium and evaluated the readiness of building education in meeting these challenges. The objectives of this research are to evaluate building education and practices in the new millennium, identify the challenges building practices face in the new millennium and evaluate the readiness of building education in meeting these challenges. Secondary and primary data were obtained. Data was obtained by the administration of questionnaires, and interviews of students studying Building Technology in Covenant University and construction practitioners. A sample size of 150 students comprising of students from the 5 levels of the programme partook of the survey. Purposeful sampling technique was used and the data obtained was analyzed using a 5-point Likert scale. The factors affecting the readiness of building education in meeting the challenges of Building Practice in the New Millennium in varying degrees include Poor Educational Background, Poor curriculum, Poor Relationship Between Educational System and The Construction Industry. Lack of Prospect To Take Risk, Insufficient Building Practice, Corruption, Financial Inadequacy and Economic Recession. It was also observed that that the education sector and public lack awareness of what building millennium entails and do not have the pre requites building education that can meet up with the rapidly evolving standards of the millennium. The study therefore concluded that the building education is not ready to face the challenges of the new millennium; it recommended that the curriculum should be assessed and restructured to be able to meet up the requirements of the new millennium building construction.

**Key words:** Building Education, Building Practice, Construction, Curriculum New Millennium:

## **1.0: INTRODUCTION**

Nigeria faces many challenges in the years ahead with recent developments taking place attracting attention of the countries unstable economy which could lead to national conflict management practitioners over the next few years. Building education be described as the introduction to building in new ways of which are beneficial to both the economy and the practitioner. It is done to give enlightening insights of how the construction industry would change from time to time whilst being unique and serving satisfaction to occupants.

The new millennium is an age in which the development of construction practices would be advanced with basic principles of building made easy with the use of modern devices and facilities. New Millennium Building Systems should be encouraged to attain cheap and reliable building components for use primarily in low-rise non-residential buildings – including commercial, industrial, and government construction.

This research was done to evaluate possible challenges the building industry of Nigeria would be facing in the new millennium and proffering solutions of what to do to reduce the negative impacts that might be experienced in the

nearest future. Building education seems to be developing at a fast rate and it is from this perspective that the study examined if the Nigerian building education is prepared for the new millennium of building. The construction industry has historically been linked with the process of industrialization and urbanization, particularly since the advent of the Industrial Revolution. Transport infrastructures facilitated trade and co-operation between countries and also the diffusion of technical innovations from the most advanced to the less advanced areas of the globe. The construction industry played a key role in the reconstruction of the war-ravaged Europe.

The heavy program of construction improvement of housing and social infrastructure, beside its contribution to the national output, was also a reflex of a better re-distributive economic policy in Europe post World War II. The importance of the construction industry has also been recognized in the context of countries affected by natural hazards (Ruddock et al, 2010; Amaratunga and Haigh, 2010). Besides its multiplier effect on other sectors of the economy, a well-devised reconstruction program of building and community service infrastructure can contribute to sustainable development and protect the natural and built environments.

With regard to the relationship between construction and economic development, Turin (1973), using cross-country comparisons, found an association between construction investment and economic growth. That finding was consistent with the classical approach in growth theory in which physical capital formation is the main engine of economic growth and development. Turin's argument about the pattern of the construction industry contrasts with the argument advanced by Bon (1992; 2000).

Nigeria faces a lot of developing crisis such as economical degradation, rise and fall of currency, recession and the corruption rate we have in our economy. The construction industry is presently experiencing a huge record of construction failure, building collapse and most of the time leads to poor foundation design and construction therefore it will be of utmost interest to initiate ways of facing such challenges and proffering solutions especially in our economy which has forced the building industry to adapt to new changes triggered by an ever sophisticated society characterized by an increasing demand for customized modern buildings. The major problem facing the growth of the building industry in a depressed economy like Nigeria is poverty, unemployment, poor economy, and corruption which would eventually lead to non-compliance of the building codes as well as building laws.

The aim of this research is to design, critically identify, examine and investigate if the building education is ready to meet the challenges in the new millennium. The objectives are given below:

- To evaluate building education and practices in the new millennium
- To identify the challenges building practices faces in the new millennium.
- To evaluate the readiness of building education in meeting these challenges

This research covers the building practices in the new millennium; it also covers an investigation if the building education is ready to meet the challenges of how the new millennium works. The limitation of the study is Nigeria. The findings of this study will be beneficial to Ministry of Housing and Urban Development, lecturers, teachers, and students, Nigeria Research Council, Nigeria Institute of Building (NIOB), Council of Register Builders of Nigeria (CORBON), construction consultants, contractors and real estate surveyors/value. It will also help the building construction companies and high institution on recruiting, training and retraining of staff in the new millennium, as the information generated would serve as a database for them. The result findings would help building clients, the governments, builders, professional bodies and building team of specialists to jointly improve working conditions of building professional members in organizing seminars, workshops and conferences.

## **2.0: RELATED STUDIES**

### **2.1: What is new millennium?**

New millennium can be referred to as an age where building technology or construction has gone into the jet age where laborers are no longer needed and technicians are essentially welcome on site with the introduction of new machines and equipment which would make jobs or construction a lot easier to accomplish. Modern marvels would arise in the construction industry in a millennium from now that would lead to better efficiency and sophisticated complex programs giving rise to structures that can only lead to structures that have only been fantasized on. The future of the construction industry seems brighter than ever. Aside from providing various jobs to those seeking

careers in this field, evolving techniques have enabled different living options for people to better suit their styles and preferences.

Condos in key cities, for example, have provided people with an alternative way of living, aside from the standard residences that people are more accustomed to. As more and more buildings and condominiums in major cities are being built, the industry is also keeping in track with the latest technologies to better improve the quality of said buildings, geared towards the future of man's day-to-day living through sustainable construction practices. So what are the different technologies available to the construction market to advance the industry beyond conventional builds into ones that represent the standards of the future? What are the innovations and materials that will build the high-rise buildings of tomorrow in the world's largest cities?

## **2.2 Future construction technology**

When it comes to construction technologies, the possibilities are endless, and the current rapid innovation and technology of construction will shape the appearance of future buildings. In terms of building construction, the construction workers of the future could be robots. The Harvard School of Engineering and Applied Sciences and the Wyss Institute for Biologically Inspired Engineering have designed termite-inspired robots which can already perform construction tasks.

They can build structures without supervision and even without pre-determined roles. Four years have been allotted by the researchers to develop TERMES, the team of small robots that can build 3D structures from foam bricks. They plan to use similar robotic systems such as these for construction projects that may be too risky for humans. Italian robotics engineer Enrico Dini has said: "We might print not only buildings, but entire urban sections." This may well hold true, with architects already producing the first 3D-printed houses. Last January 2013, Universe Architecture had designs of a two-storey house that looks like a Möbius Strip and designer's plan that it will be concretely printed on site. Universe will be collaborating with Dini with his D-shape machine, which is considered the largest 3D printer in the world. In 2010, it built a single-room structure resembling a mountain hut with two windows; an interior that has a workspace, platform bed and a sink.

These kinds of printed buildings might offer a glimpse of the future of building construction, but because of its fragile parts, the buildings must be printed with supporting structures to prevent them from collapsing while under construction. The support can be removed once the concrete filling has been added. At present, the whole process has been estimated to cost around €5 million: rather prohibitive, but constantly falling as the technology is refined. ([www.constructionglobal.com/equipment-and-it/future](http://www.constructionglobal.com/equipment-and-it/future))

## **2.3 Building materials of the future: Greener, more intelligent**

Future building materials will take their cue from current scientific technologies. As reported by BBC News, a self-healing concrete developed by microbiologist Henk Jonkers and Eric Schlangen, a concrete technologist, involves the genus *Bacillus*' mixed bacteria spores. Its nutrients, when activated by water, will feed on calcium lactate to produce a primary component of limestone, which is lactate. This self-healing concrete may be available within the next few years if tests are successful. Once proven, it could eliminate concrete cracks and expensive concrete maintenance. Alongside and influencing these technologies is a greater awareness and need to build greener, with sustainable materials used at the construction phase. Malama Composites has started manufacturing foam material from plant materials like hemp, kelp, and bamboo that will be used in turbine blades, insulation, and furniture. The foam can provide high moisture and high resistance to heat, and when used can also give protection against molds and pests. It even improves the quality of living, thanks to its better insulating properties and higher thermal resistance. Plus, it can also give your living spaces the right kind of acoustics.

## **2.4 Re-defining future design**

While it may be easier to stick to familiar construction methods, the industry is changing and the new, innovative greener techniques, while challenging to develop to the point that they become standard, can be highly beneficial to the quality of the urban environment, and often ingenious.

In Indonesia, Skidmore, Owings & Mills has revealed its design for a 99-story PERTAMINA Skyscraper that is shaped like a budding flower's petals. What's interesting to note here is that to harness wind energy, the said

skyscraper will slightly open its peak to allow its wind funnel to convert high speed winds into energy sources. The design team, as part of its green architectural design plan, also took steps to minimize the solar heat, adding solar panels to the façade of the skyscraper to take advantage of the natural daylight coming from the sun, thus decreasing carbon dioxide emissions.

Elsewhere, to decrease construction costs and at the same time reduce waste, VS-A and Chartier-Corbasson unveiled their skyscraper design made from the tenants' trash. Dubbed as "The Organic London Skyscraper", it will be made of durable panels made out of plastic waste and discarded paper. The said building will grow as its initial residents produce more trash for the construction materials. The plastic casting can be completed in a year, and to be able to generate its own electricity, the hollow tubes in the embedded scaffolding will be provided with wind turbines. Recycled materials will be converted to durable panels installed across the building.

## 2.5 Seeing beyond the tall buildings

Considering the future of construction development can give us a wider perspective and fresh ideas when it comes to designing the living spaces such as condos, skyscrapers, skylines and office spaces being built in major cities around the world. ([www.constructionglobal.com/equipment-and-it/future](http://www.constructionglobal.com/equipment-and-it/future))

Architects and designers have given us exciting ideas that will define the way we live, and the kind of living that the next generation will experience. More importantly, as these buildings are constructed, experts should ensure that every material and every action taken in the construction process will minimise environmental damage, ensuring the world outside these future buildings is as pleasant as it is inside.



## 2.6 What are the new construction techniques?

Modern methods of construction the Office of the Deputy Prime Minister defines modern methods of construction as a process to produce more, better quality homes in less time. For the purpose of awarding grants, the Office of the Deputy Prime Minister uses a definition in terms of products.

- Panelized units are produced in a factory and assembled on-site to produce a three dimensional structure. Open panels consist of a skeletal structure only, whereas more advanced panels may include lining material, insulation services, windows, doors, internal wall finishes and external claddings.
- Volumetric construction involves the production of three-dimensional modular units in controlled factory conditions prior to transport to site. In Hybrid techniques combine both panelized and volumetric approaches. Typically,

volumetric units (sometimes referred to as pods) are used for the highly serviced and more repeatable areas such as kitchens and bathrooms, with the remainder of the dwelling or building constructed using panels.

- Other modern methods of construction may use floor or roof cassettes, pre-cast concrete foundation assemblies, pre-formed wiring looms, and mechanical engineering composites. They can also include innovative techniques such as tunnel form or thin-joint block work.

Modern methods of construction are about better products and processes. They aim to improve business efficiency, quality, customer satisfaction, environmental performance, sustainability and the predictability of delivery timescales. Modern methods of construction are, therefore, more broadly based than a particular focus on product. They engage people and process to seek improvement in the delivery and performance of construction

## **2.7 Reasons and challenges why we are not meeting the standards**

The global economic crisis would pose challenges to building construction in Nigeria in the following ways;

Inadequate or non-availability of building construction engineers

According to Thanni (1998) building construction details which the contribution of a team of specialist such as the engineers, architects, builder, quantity surveyors structural engineers electrical engineer and mechanical engineers whose knowledge and skill are utilized on large building projects.

According to Obiegbu (2004) building construction can no longer be the total responsibility of one person.

According to Nakashima (2010), building Contractors, site workers also are handing their hats on public work.

According to Prock (2010) other challenges was keeping key personnel gainfully employed. He says “while were got a large backlog, many of our projects are starting slow, until we got key people waiting to go to work.

According to Kobatake (2010), a constant challenge is employing experienced project and field personnel and Good Follow Bros (2010) stated that the best employees right now but they have a lot of potential demands especially if members of our families have been laid off. According to Skelton (2010), our challenge is helping them keep focused on safety we don’t want to lose sight of the overall goal, which is to work safe and be able to go back home to our “families” Skelton adds that in thought economies times, ‘people change industries just to survive and they don’t always come back. The industry loses quality people who could take it to the next level’.

According to Anaele (2000) the acquisition of building construction skill in technical colleges and other colleges depends more on the teachers. Building constructing teachers should be professionally qualified and occupationally competent as to impart the required skill to the students.



#### **2.4 What are we taught in building education?**

In Covenant University and Nigeria as a whole, building education can be said to not be ready for the new change or innovations in building construction given the fact that we are not adequately exposed to any form of innovative or creative building experiences. We do not want to advance in the construction industry because we still use conventional methods of building and are unwilling to research or input ways into which to develop our building. Moreover, we do not all have free access to the internet or connected people in high places that grant us access to relevant information with which we could improve ourselves in this field.

#### **3.0 RESEARCH METHODOLOGY**

Extensive literature review was carried out through the use of relevant textbooks, professional magazines and internet as a secondary data collection sources. The primary sources are interview and the use of questionnaires. The use of questionnaires and interview were the methodology approach use for this research. This research is based on the case study which is Covenant University. Field data was obtained by the administration of questionnaire, and interviews of students studying building technology in Covenant University. The population of Building Technology students from 100 to 5001 studying building technology in Covenant University was a total of 283. A sample size of 150 students comprising of students from the 5 levels of the programme partook of the survey. Purposeful sampling technique was used. The data was analyzed using tables and a 5-point Likert scale.

#### **4. 0: ANALYSIS OF DATA**

The survey was carried out on the Building technology students in Covenant University. A total of One hundred and fifty (150) questionnaires were distributed. One hundred and ten (110) was retrieve out of which ten were not properly filled. The males that participated were 102 in number while females were 48. Analysis of data was done using the Likert scale. The scores were obtained by assigning weights to the 5 – point Likert scale, that is, from strongly Agree = 5 points to Strongly Disagree = 1 point, then summing the scores for each item and them dividing by the number of respondents to each item. The mean score was then grouped as follows to arrive at consensus opinion about each item:. Strongly agree= 5.0-4.50, Agree =4.49-3.0, Neutral= 2.99-2.50, Disagree= 2.49-1.5 strongly Agree=1.49-1.0.

Memos and visual demonstrations of ideas provide an insight into how the final grounded theory categories were developed. The discussion on the results of the two phases of data collection and comparison of those findings with the relevant academic literature are provided as follows: The questionnaires were analyzed with the help of a content analytic summary table. The following questions for the questionnaires are as follows:

Table1: Is our Nigeria education system meeting the international standard?

	Frequency	Percentage
Yes	13	13%
No	75	75%
Probably	12	12%

Majority of the students (75%) believe our education system is not meeting the international standards

Table2: Are we restricted to information in building education?

	Frequency	Percentage
Yes	44	44%
No	37	37%
Probably	19	19%

Majority of the students (44%) emphasised that they are restricted to information in building education

Table3: Do you know what millennium building means?

	Frequency	Percentage
Yes	62	62%
No	13	13%
Probably	25	25%

Majority of the students (62%) do know what millennium buildings mean through internet.

Table 4: Are we aware of millennium practice in Nigeria?

	Frequency	Percentage
Yes	25	25%
No	63	63%
Probably	12	12%

Majority of the students (63%) are not aware of millennium practice in Nigeria

Table 5: Do we implement millennium practices in Nigeria?

	Frequency	Percentage
Yes	13	13%
No	56	56%
Probably	31	31%

Majority of the students (56%) are of the opinion that we do not 56% implement millennium practices in Nigeria

Table 6: Are Nigerian professionals involved in millennium practices?

	Frequency	Percentage
Yes	44	44%
No	44	44%
Probably	22	22%

The students are of divided opinion that Nigerian professionals involved in millennium practices

Table 7: Are their knowledge gotten from their education or personal experience?

	Frequency	Percentage
Yes	31	31%
No	69	69%
Probably	0	0

Majority of the students (69%) stated that their knowledge were not gotten from their education or personal experience

Table 8; Is the education system meeting up with the standard of the requirements needed for construction?

	Frequency	Percentage
Yes	14	14%
No	75	75%
Probably	11	11%

Majority of the students (75%) emphasised that the education system is not meeting up with the standard of the requirements needed for construction?

From the various summary tables it can be concluded and supported by the larger percentage of our respondents that the Nigerian building education is not ready to meet the challenges of the building practices in the new millennium.

For further information, the second phrase using oral interview used to ask the respondents to state the challenges that are contributing to the educational system in building. Some of the challenges highlighted are:

- Educational background of institutions

Nigeria has been plagued by frequent political unrest. This political instability has generated negative effects on the education system. Although education had been in crisis for many years, the situation has recently been made worse by frequent strikes staged by students, faculty and teachers. Much of the difficulty lies in the fact that the sector is poorly funded. These results in shortages of material and human resources for education: lack of qualified teachers; a brain drain from the public sector; few instructional inputs, shortage of classrooms, and a host of other problems.

These difficulties have been most pronounced at the foundation levels of education both Primary and secondary school levels have been negatively affected. In 1997 the Federal Minister of Education, following a nationwide tour of the schools, stated that the basic Infrastructure in schools such as classrooms, laboratories, workshops, sporting facilities, Equipment, libraries were in a state of total decay. The physical condition of most schools is reported to be pathetic.

Nigeria as a reconstituted democracy has to address issues of a dual transformation. The country needs to re-examine its past and focus on development plans that will meet the challenges of the future. The need to work out a

new developmental plan puts pressure on the political, social and economic sectors of the country. The new government has declared education as one of its priorities. The goal is to have a reformed system of education that will provide access at all levels of education and to improve the quality and efficiency of the entire education system. While these are lofty goals, the real challenge will lie in the successful implementation of them

The education sector of Nigeria does not fit a vivid representation of building education due to the lack of building practices in the institutions as well as the dire need for individuals with the understanding of the field to share valuable information that would improve the standards of practitioners in the field

- **Poor relationship between educational system and construction industry**  
The revaluation of standard in Nigeria needs to be accomplished by leaving our comfort zones and taking breaks or excursions to more developed areas or zones to determine the differences in economic stand and how we could build up to those standards so that we could attain a good relationship while trying to gain more knowledge.
- **Corruption**  
Corruption takes a great toll in the building industry due to the leadership and high ranking officials which civilians do not trust, brings a complex discussion on how we can eradicate corruption from the economy.
- **Poor curriculum**  
Poor curriculum causes a huge mess in the building sector because of economic recession as well as the industry causing us to put into consideration the integrity of our building codes.
- **Financial recession**  
Financial recession or inadequacy has led to a great toll in the construction industry due to embezzlement in the economy of the nation, fall in the value of currency as well as embezzlement of money on site which creates a brink in the downfall of the economy.
- **Insufficient practical practices in institutions**  
In Nigeria today practical practices have been rapidly declining as more theory works are being taught instead of practical practices especially in courses like engineering and building technology except from the internship programme which is conducted by all institutions and mandated by the government. However, this internship programme is not really controlled as students face a lot of challenges on sites that hinder knowledge but as discussed in class the internship programme should be taken more seriously by the school to curb the challengers on site and increase the knowledge gained by the students.
- **Lack of Risk taking**  
Taking of risk in building technology as a course and innovation has been very difficult in Nigeria because firstly from our research we found out that our building education in Nigeria is not meeting up with educational standard and also our Nigerian professionals have not been taking part in a new millennium projects which suggest that we are not fully innovative in Nigeria and come up with innovative ideas
- **Independence**  
Lack of confidence in ourselves as well as our means of construction because of conventional use of building materials using self instincts on site or being creative is unavoidably too low thus the institution is not able to grow into the new millennium.

## **5.0: CONCLUSION AND RECOMMENDATION**

### **5.1 Conclusion**

It is concluded that the building education is not ready to face the challenges of the new millennium according to the data analysis, literature review carried out on different perspective at which people saw the growth of buildings construction in a new millennium in Nigeria, mainly because it is not so practiced in Nigeria. It was also observed that that the public lack awareness of what building millennium entails and do not feel like that the building education can meet up with the required standard of the millennium.

## 5.2 Recommendations

Generally, the curriculum should be accessed and restructured to be able to meet up the requirements of the new millennium building construction, what it entails, what is required of new members or recruit entering the construction sector. The leaders in charge or the higher bodies in charge of coordinating works and construction in the industry should either be sanctioned why we not meeting up with the new millennium requirements. Concerning financial adequacy, the industry needs to be more attractive for stakeholders and investors to be interested in for us to be able to solve our financial inadequacy. Nigeria needs to be full of individuals who are ready to take risks to see how far we could go and leave our comfort zone of conventional practices in Nigeria.

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# Burnout Syndrome in Special Elementary School Teachers

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## ABSTRACT

In the paper we illustrate the problem of the burnout syndrome and describe the incidence of the burnout syndrome within teachers of special primary schools in Slovakia using the Maslach Burnout Inventory questionnaire. The burnout rate has been surveyed within 144 respondents in the area of emotional burnout, depersonalization and personal performance. The results were evaluated by Student t-test. We have found out an increased rate of the syndrome in the studied areas in the cohort of those teachers involved in educating pupils with special educational needs only in few factors.

**Keywords:** teachers, special pedagogue, special elementary school, burn out syndrome, emotional burn out, depersonalization, personal performance, stress

## INTRODUCTION

Being a teacher is on one hand very nice but on the other hand very hard, as well. Heavy workload puts this job into the hard ones. Special pedagogues, including the special elementary school teachers, are often overloaded and have to cope with a lot of various emotional situations. Pursuing a content analysis of three Slovak pedagogical journals, Hamranová (2015) found out that the most attention is paid to educational topic, to various information and reviews, but only negligible number of articles is dedicated to the teacher's mental health care. According to Vernarcová and Vancu (2016) teachers can make a world of difference for students with special educational needs and can help them to succeed by implementing certain adaptations or interventions. Special educators need to be aware and knowledgeable about the nature of the disorders, as well as the strategies effective in reaching and teaching these students. Hand in hand with this profession goes the notion overload, either emotional, mental, or sensoric. Vašek (1995) claims that the special teachers should especially have the following skills – professionalism, strong will, diligence, resolution, and systematicity. Vančová (2005) says that important things in this profession are:

- Reflective skills which are characterised by friendly, nice, and supportive behaviour
- Teacher's personality integration which is reflected by their emotional stability
- Adaptation which presents the ability to reveal changes in the outcome expectations
- Adequate level of dominance and dynamism to lead the students and manage them. Decidedness and responsibility are a part of the teacher's dominance.
- Adequacy of self-perception - teacher should feel sufficient self-confidence, ambition, power and enough energy for solving life situations in connection with the pedagogical situations.
- Adequate classification and assesment of the students

## THE STUDY

From what has been said so far, we can see that teaching is a very difficult profession with high demands put on it. Teachers are connected with high mental and physical demandingness. Special elementary school pedagogues are

special pedagogues because they work with students who require special treatment. These teachers are required to have certain skills, such as, active listening and sensitively gain information, problem solving skills, providing emotional protection, feeling of safety, acceptance and confidence, pedagogical tact, enthusiasm, certain level of spontaneousness, ability to cope with stress situations, understanding of non-verbal behaviour, ability to provide feedback and self-reflection, self-control, self-regulation, etc. Helen Sek (2004) describes the burnout syndrome as the result of the adaptation process failure (skills and abilities to cope with a difficult situation). Selk also claims that it is not a result of a long-term process. Kallwass (2007) describes burnout syndrome as a failure which affects mostly the people who are required to cope with higher working and emotional load. He also says that the burnout syndrome of teachers is connected to their certain psychical predispositions and that the burnout is also the result of incorrect self-evaluation and wrong estimate of one's own powers. Christina Maslach and Susan Jackson made a detailed characterisation of the burnout syndrome according to the one year observation of people. They describe it as a syndrome of emotional exhaustion, depersonalisation, and lower personal accomplishment. It takes place where people work with people, e.g. people give care to other people's needs. Maslach and Jackson are also the authors of the Maslach burnout inventory questionnaire. Jekl and Reitmayer (2006) tell about the internal and external risk factors. The external factors are working conditions, family, society, profession. The internal are the personal predispositions.

## FINDINGS

The research group consisted of 144 special elementary school pedagogues in Slovakia – 9 men, 135 women.

We used the Maslach Burnout Inventory (MBI) method to measure the level of the burnout syndrome. BMI defines burnout by three components – emotional exhaustion, depersonalisation, and lower personal accomplishment. According to Maslach (1997), the first element to show up in the syndrome is the emotional exhaustion as a result of the environment requirements. The exhaustion then leads to depersonalisation where an individual tries to detach from the others and falls back to loneliness. These two factors merge together and negatively affect accomplishment. This method was developed to measure level of burnout in helping professions.

MBI questionnaire, which was used in our research, consists of 22 questions to examine the three components of burnout – emotional exhaustion, depersonalisation, and personal accomplishment. Questions about personal accomplishment factor are, unlike the questions about depersonalisation and emotional exhaustion, filled in vice versa. This part of our work is focused on the research outcomes evaluation in connection to the research hypotheses which we had formulated. We created four hypotheses:

H1: We assume that in the special elementary schools, there will be higher rate of the burnout syndrome in women in comparison to men.

H2: We assume that burnout syndrome rate will rise with age in teachers/assistants in special elementary schools.

H3: We assume that there will be higher burnout syndrome rate in teachers/assistants in special elementary schools with longer work experience.

H4: We assume that there will be higher burnout syndrome rate in teachers/assistants in elementary schools who teach higher number of students.

**Table 1:** Hypotheses evaluation criteria.

	<b>Statistic date</b>	<b>Identification/code</b>
<b>AGE</b>	20-35 years	1-low
	36-50 years	2-middle
	51-65 years	3-high
<b>EXPERIENCE</b>	0-8 years	1
	9-15 years	2
	More than 16 years	3
<b>GENDER</b>	Woman	1
	Man	2
<b>NUMBER OF STUDENTS</b>	4- 8 students	1
	More than 8 students	2

Questions about personal accomplishment factor are, unlike the questions about depersonalisation and emotional exhaustion, filled in vice versa. Results of the questionnaire were processed by comparison of arithmetic average. The hypotheses were evaluated by the Student t-test. The results are shown in the table below. (Table 2,3)

**Table 2:** T-test results

Kategória	Compared groups	EE	DP	PA
<b>AGE (H2)</b>	low vs. middle	0,3683	0,4598	0,2593
	low vs. high	0,4344	0,3782	0,7226
	middle vs. high	0,1237	0,8766	0,1800
<b>EXPERIENCE (H3)</b>	low vs. middle	0,7319	0,9084	0,9855
	low vs. high	0,3900	0,0635	0,5930
	middle vs. high	0,3311	0,1964	0,6915
<b>NUMBER OF STUDENTS (H4)</b>	4 - 8 vs. more than 8	0,4743	0,5254	0,3748
<b>GENDER (H1)</b>	men vs. women	0,9129	0,1705	0,6058

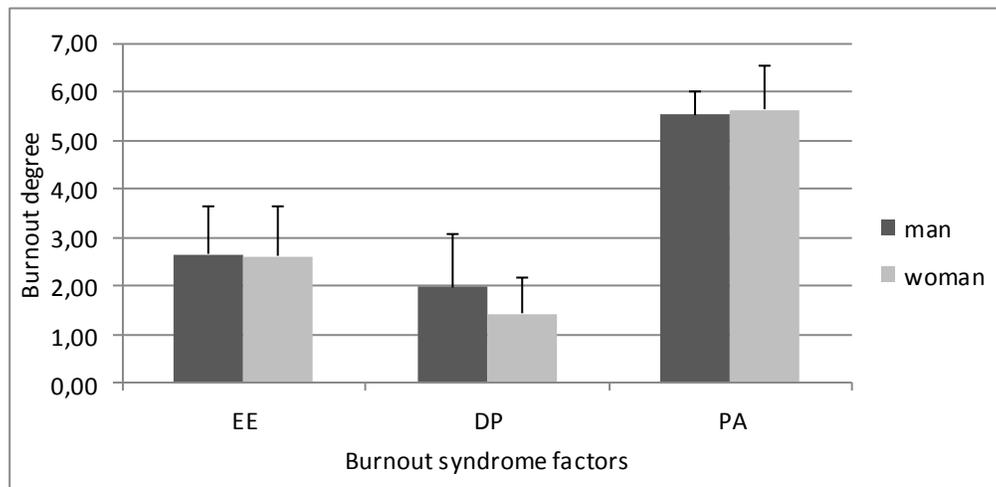
**Table 3:** Results of the answers of the questionnaire according to the EE,DP,PA average; Standard deviation

Category	Group	Average			Standard deviation		
		EE	DP	PA	EE	DP	PA
<b>AGE (H2)</b>	Low	2,65	1,55	5,56	0,9028	0,8449	0,8233
	Middle	2,48	1,43	5,74	1,0084	0,8394	0,8237
	High	2,83	1,41	5,48	1,1681	0,6333	0,9907
<b>EXPERIENCE (H3)</b>	Low	2,68	1,60	5,58	0,9855	0,9741	0,7369
	Middle	2,77	1,58	5,58	1,1677	0,9639	0,8455
	High	2,52	1,31	5,66	1,0056	0,5159	0,9709
<b>NUMBER OF STUDENTS (H4)</b>	less 8	2,66	1,43	5,66	1,0239	0,7325	0,8963
	More than 8	2,53	1,53	5,53	1,0416	0,9100	0,8153
<b>GENDER (H1)</b>	Man	2,65	1,98	5,51	0,9741	1,0929	0,5000
	Woman	2,62	1,42	5,63	1,0345	0,7575	0,8884

The first hypothesis assumes that in the special elementary schools, there will be higher rate of the burnout syndrome in women in comparison to men.

We found out that the burnout rate in the emotional burnout area was almost the same in men as in women. It is important to say that women prevailed in the research group. Our questionnaire was filled in by only 9 men and 135 women. When it comes to depersonalisation, the burnout rate is higher in men than in women, in the emotional exhaustion area, the rate is almost the same. According to the Student t-test results, we can say that our hypothesis was not confirmed as the results are higher than the limit of acceptance which is set as  $p < 0,05$ .

This hypothesis is not confirmed.



**Graph 1.** Burnout rate according to the gender

In the second hypothesis we assume that burnout syndrome rate will rise with age in teachers/assistants in special elementary schools.

The research correspondents were divided into three groups according to their age:

Low: 20-35 years

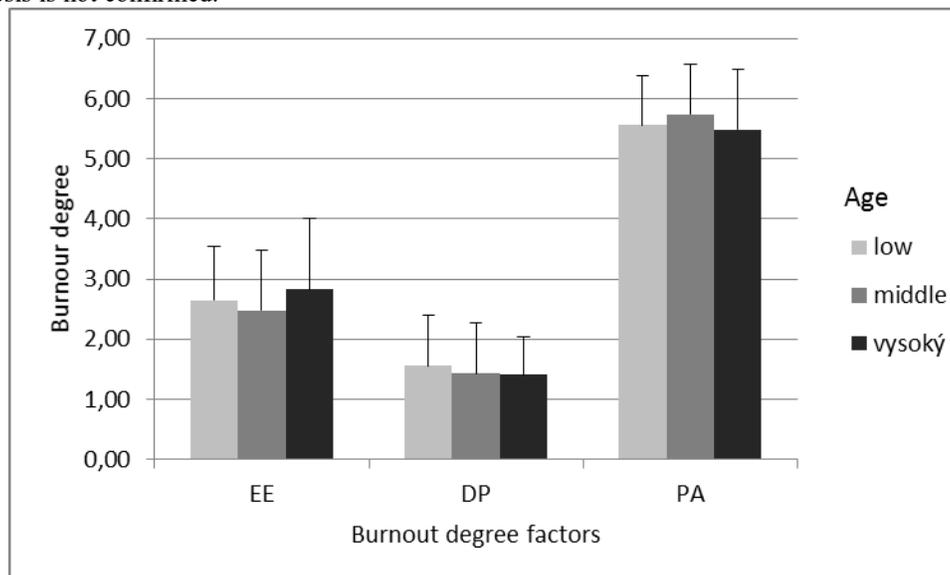
Middle: 36-50 years

High: 51-65 years

We were interested mostly in the low and high age groups.

We found out that the burnout rate is higher in the emotional burnout in high age than in low and middle age. The depersonalisation rate is the highest in the low age and the lowest in the high age. Personal performance rate is evaluated vice versa, therefore, the rate is the highest in high age, followed by low and middle age. We found out that burnout syndrome in the emotional and personal performance area rise with age in teachers/assistants in special elementary schools. The p value was higher in the all compared factors, according to which, we can assume that is higher than the limit of acceptance which is  $p < 0,05$ .

This hypothesis is not confirmed.

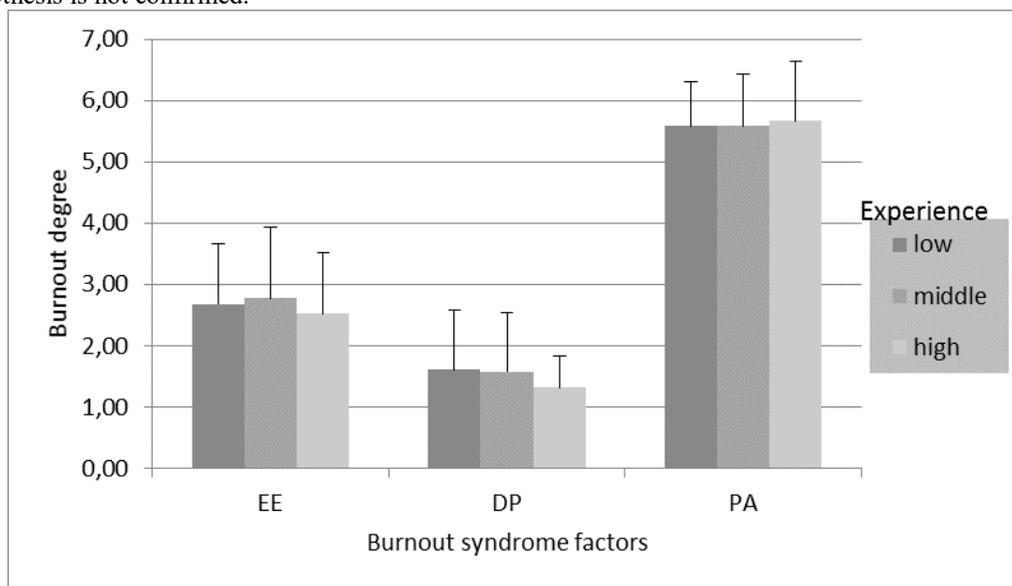


**Graph 2.** Burnout rate according to age

In the third hypothesis we assume that there will be higher burnout syndrome rate in teachers/assistants in special elementary schools with longer work experience. Comparison of the statistic average of the pair difference in the Student t-test showed us the rate of the burnout syndrome in our respondents. They were divided into three groups according to their work experience. The low group have 8 year experience in special pedagogy, middle group have 9-15 year experience, and high group have more than 16 years of experience in special pedagogy.

From the results, we can say that the burnout rate in the emotional factor is the highest in the middle group, followed by the low and the high group which means that the burnout rate is the lowest in the teachers with the most experience. The depersonalisation burnout rate is the lowest in the teachers with the most experience. The low and middle group are similar. The burnout rate was not confirmed in personal performance where the results say that the lowest burnout rate is in the teachers with the most experience. The p value was higher in the all compared factors, according to which, we can assume that it is higher than the limit of acceptance which is  $p < 0,05$ .

This hypothesis is not confirmed.



**Graph 3.** Burnout syndrome factors

In the fourth hypothesis we assume that there will be higher burnout syndrome rate in teachers/assistants in elementary schools who teach higher number of students. The research groups were divided into two parts. The first part consisted of teachers with students less than 8, the second part consisted of teachers with more than 8 students. We found out that the teachers with more than 8 students show lower rate of emotional burnout. The burnout rate in depersonalisation is higher in the teachers with more students in the class. The burnout rate in the personal performance is higher in the teachers with more students in the class. In the all compared factors was p value higher, therefore, we can say that it is higher than the limit of acceptance which is  $p < 0,05$ .

This hypothesis is not confirmed.

### CONCLUSION

We found out that in the teachers/assistants in special elementary schools, who educate students with special educational needs, there is higher burnout syndrome rate only in some factors. The higher rate of the burnout syndrome in women in comparison to men was not confirmed. The results show that workload in teaching students with special educational needs in emotional and personal performance area is almost the same in men and women. There is higher burnout rate in depersonalisation in men than women.

The results of comparison of three categories of our respondents show the highest burnout rate in teachers in the highest age when it comes to the emotional area. Depersonalisation burnout rate is the highest in lower age, and personal performance burnout rate is the highest in higher age. The research of the burnout syndrome in workload in connection with work experience of teachers in special elementary schools showed us that there is no connection between the work experience and higher burnout syndrome rate in none of the researched area. However, we can say

that higher burnout rate is present in emotional area in teachers with middle experience, in depersonalisation area is the highest rate in the teachers with low and middle experience. Personal performance burnout rate was the highest in the teachers with the most experience.

Results of the research of connection between the burnout syndrome rate and the number of students in the class with special pedagogues – teachers/assistants in special elementary schools for students with special educational needs, show that higher burnout syndrome rate is present in teachers with higher number of students in depersonalisation and personal performance area. In the emotional area was the highest burnout rate in teachers with lower number of students.

Ternényová and Vernarcová state (2016) that a right intervention will prevent the accumulation and escalation of negative symptoms of the students' disorder and finally also low quality of school life. This can significantly influence the perception of the difficulties by teachers and can create a positive environment at school.

According to our findings, we can say that, as early, as the special pedagogues choose their studies or job, they are better prepared for the workload connected with work with disabled children. This finding is definitely a challenge for next research.

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# **Business Simulation Games as an Out of Class Activity for Promoting Students Autonomous Work and Skill and Knowledge Improvement**

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## **ABSTRACT**

Labor market demands are progressively increasing and, at the same time, the skills and knowledge required by businesses and brought in by new students when they reach tertiary education are very different from those existing decades ago. In this paper, we show the process and results obtained with a methodology based on the adoption of a Business Simulation Game in a subject of Accounting and Management Control included in an SME Management course. We show how this active and game-based strategy can be efficient and effective at this learning level both in terms of learning and motivation. Using the statistical analysis of the data collected through surveys applied to the students at the end of the subject, we evaluate how they identify the contribution of the game to the improvement of their skills and knowledge. Our results show that this methodology works as a stimulus to work and study outside the classroom and that during the simulation process students identify ways of learning and evolution. This research, contributing to the literature of game applications in higher education, concludes that this is an extremely useful tool with enormous potential in the future in particular in the area of management.

## **INTRODUCTION**

Even though there is some effort by teachers in management classes at the higher education level to apply new and innovative pedagogical techniques, in most of the situations classes remain taught with a focus in a traditional way of transmitting knowledge between teacher and student. These traditional pedagogical techniques use mainly a top/down process from the one who has the knowledge (the teacher) to the one who wants to acquire it (the student), based first in transmit theory, then in a deductive way use some examples and usually finishing with the resolution of some exercises, supported by pedagogical materials such as books, manuals or power point presentations is becoming more and more outdated and urgently with need of some update in techniques.

This fact is even more urgent since the actual management environment is changing a lot in the last decade and the skills needed by the one working in this field are becoming more demanding and go further than the theoretical and even strictly technical competence. Applied knowledge, soft-skills such as the ability to work in group and the domain of other languages (English is crucial in Portuguese students) are nowadays of crucial importance. A good example of these changing world is the kind of techniques that companies are using in the internal formation programs, like theater, artworks or other pedagogical tools that can achieve these goals.

In this context some programs are starting to look at Business Simulation Games (BSG) as a good solution to apply innovative technics since they offer a great educational potential. Beyond allowing the acquisition of conventional knowledge, it also allows students to learn about decision-making, working in group and face the pressure of time, among others. Even though with an increasing trend, the number of schools and teachers adopting or thinking in adopt these tools remain considerable low. This happens mainly for three reasons, first because of the term Game in BSG that transmit the impression of a less serious approach. In second place the aversion to change that every individual has, and teachers are no different, so they have some fear of losing control of his class using this methodology when compared with traditional means, and last the need for more resources not always available, like some financial capacity to acquire paid games or the need to computer equipment.

The pathway of the future will be of a more intense use of SBG. The increasingly competitive global market-place

is no longer a phenomena of private firms but is also a reality in higher education, and universities everywhere are facing increasing pressure to prepare their students to face the labor market.

In the next chapter we will make a succinct literature review on simulating games to help contextualize the framework in which this paper is done. After this we will present the data and methodology applied followed by the chapter dedicated to the results and their analysis. The paper will end with some conclusion and future work ideas.

## **LITERATURE REVIEW**

Learning is a process by which people acquire new skills or knowledge with the objective of increase their performance. This better performance can create better products and services, reach lower costs, discover greater innovation, improve the productivity of a firm or increased the market share of a brand. But to achieve that, learning must be a continuous process, not merely a series of events, and it exceeds the classroom and the workplace. (Rosenberg, 2001) The utilization of games is the attempt to bring the classroom closer to that continuous process. The use of games for educational purposes is not new. Malone (1981) studied the motivational aspects of this type of game in the early 1980s. But since then, electronic games have faced a great development and debates about their educational potential stimulates much interest among scholars but also many doubts. Games also use simulation of the real world to engage the players. Simulation can be defined as a reproduction of reality, which is intended to display what could emerge if the same conditions would actually occur (Day and Reibstein, 1997) The games are naturally considered motivating (Mitchell and Savill, 2004) that is one of the goals we pretend to achieve with the use of this BSG, to motivate the students to class, knowledge acquaintance and autonomous work. Another important characteristic of games is that they allow players to have some feeling of control, a feeling many times absent in the environment of a school classroom, permitting the players to make choices, an important role for the students (Gunter, Kenny and Vick, 2008).

Games have many others characteristics such as rules and goals, the uncertain of outcome, they provide immediate feedback, they also allow the emergence of feelings like the feeling of victory. To Jenkins (2005) games have more qualities like their boost for exploration and experimentation, very important in a learning context, but in an environment where the risk of failure is reduced and they are designed so that players (students) can progress in difficulty levels progressing with their skills.

Simulating games can be a good approach of reality. Analyzing a BSG called MARKSTRAT, Kinnear and Klammer (1987) found that participants could become dynamically involved and actually experience decision-making in a realistic business environment. Regarding another of the most famous games, the Beer Game, Senge (1990) considers it as a reproduction of a real scenery, showing in this statement how good are becoming this type of games.

In this framework, of improvement and representativeness, several authors have also emphasized the learning principles this methodology can comprehend. To Prensky (2003) games have the capacity of the player to act, to make fast decisions founded on information from different sources, to develop strategies to overcome problems, and to understand complex systems through the experimentation and simulation.

Gee (2003) considers that games would involve students in an active, situational learning that would require the then the need to investigate different ways of learning and thinking in a context that makes sense. More specifically, educational games would enable different learning objectives to be achieved.

## **DATA AND METHODOLOGY**

In the 2014/15 academic year the Cursos Técnicos Superiores Profissionais (CTeSP) - Higher Professional Technical Course - were created, a higher education courses with the duration of two academic years (DL nº 43/2014 of March 18) corresponding to 120 ECTS. The CTeSP confers a level 5 professional diploma of the National Qualifications Framework in the areas of training and includes three preparation components: General and Scientific Education (up to 30%); Technical Training (minimum 70%); Training in Work Context (Internship in companies / public and private organizations). Taking the distribution of the three areas of preparation, the type of teaching in these courses is not expected to be a mere replication of what is practiced in the undergraduate three years' degrees (Licenciaturas) with 180 ECTS. The subject in which the BSG was applied is part of the curriculum of one of these new courses.

The students were proposed to play the game Virtonomics (<https://virtonomics.com/>), a free online simulation game that allows students to practice with a business strategy game based on real world economy, business, entrepreneurship and management principles. The game do not differ that much from other business simulation games such as SimBrand or MarkStrat. In the game, the main objective is to create a profitable and competitive business. Each player receives a starting capital, which can be used to develop the virtual company according to their own unique scenario and permit to customize their business goals, strategies and tactics.

Forming teams with three students each, in the first semester of the 2016/17 academic year, during the period of the subject, the students should play the BSG. They should do it in an environment outside of class, while the contents were being taught in the classroom. In order to be able to play the game, they have to meet or use online systems (e.g. Skype) to analyze the evolution of the virtual company, make decisions and adopt them during the game period.

At the end of the semester, students have to submit a report based on the evolution of the game, on the consequences of their decisions and on generating output such as tables, graphs and others. They should explain in an appropriate way the events they present, thus demonstrating they could perceive why certain happenings occurred and relating them to their decisions. This will demonstrate they perceive the cause and effect of the decisions, while at the same time perceive how technical and theoretical concepts could help them achieve better results. The assessment of the reports was not made taking into account the result of the virtual company managed by the team, but rather how students understood and explained how their decisions led to those outcomes (profits or losses).

The research design aimed to capture data from students' use of BSG during the duration of the semester allowing to evaluate if this activity promote students autonomous work and skill and knowledge improvement. The survey was delivered to the students at the end the semester, after their grades were published, and included two sections. One of basic demographic data: gender, age, etc. and other with sentences that should be replied using a Likert scale from "Completely disagree" (1) to "Completely agree" (5).

This paper is based on the case study of the application of a BSG in a single class of a higher education institution in Portugal. This institution is a polytechnic higher education public school (system where the new CTeSP courses can be taught). The students are similar to those in other polytechnics, that is, overwhelmingly composed of Portuguese. The participants in this study were students of the 2nd year (last) of the discipline of Management Control for SME's of the SME Management course.

In Table 1 is possible to see the profile of the student's that represents the typical student of this type of course, slightly different from the undergraduate degrees, namely at age level, that in this groups are slightly higher. From the 18 students who answered the questionnaire (from a universe of 23 students registered in the course and who participated in the BSG) we can verify that they are mostly female students (66.67%), which is characteristic of higher education in Portugal, where, especially in courses not related to engineering, there is a clear majority of women. Another curious fact is the number of students who are working or have already had a work experience exceeding 3 months, that in this course represents two-thirds. It will be interesting to realize the extent to which this type of methodology via simulation can reach individuals who have had real experience.

As mentioned previously, in relation to age, we can verify that the age average of 22.5 years is a little higher than that of the corresponding 2nd year of the traditional undergraduate students, show how this type of education can achieve a somewhat differentiated public. This could also support the idea that there is a need for differentiated techniques of learning and knowledge transmission.

**Table 1.** Students characteristics

Gender		
Male	6	33,33%
Female	12	66,67%
Work Before		
Yes	12	66,67%
No	6	33,33%

Age (avg)	22,5
Grade Average	12,78

## RESULTS AND ANALYSES

In this section we will present the obtained results and carry out an analysis of them taking into account the objectives that were intended to be achieved with the implementation of the BSG in the discipline. The summary of the results obtained in the main questions asked in the questionnaires can be observed in table 2.

From the analysis of the average values presented in the previous table, we can verify that in a global manner students consider the game as having been an extremely positive experience. In fact, considering the scale center value as the expected answer and analyzing the deviations from it, we can see that excluding two particular circumstances, in the remaining the responses have very relevant deviation magnitudes from the scale mean. These positive deviations range from 11.11% to 50%. In the case of the two particular cases where the deviation is negative, as, in the case of some other relevant questions, they will be discussed in a little more detail below.

**Table 2.** Resume main results

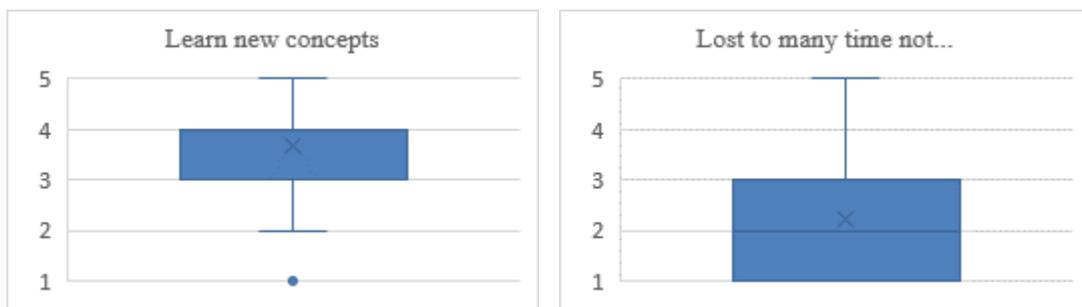
Topic	Average	% from Middle
Better understand class concepts	3,67	22,22%
Participate more attention in class	3,33	11,11%
Face labor market more comfortable	3,39	12,96%
Easy to play	2,72	-9,26%
Enjoy playing	3,83	27,78%
Learn new concepts	3,67	22,22%
Innovative class experience	4,5	50,00%
Good idea	4,11	37,04%
SBG should be demanding in classes	3,61	20,37%
SBG should be optional in classes	3,39	12,96%
Lost to many time not compensated by new learnings	2,22	-25,93%
Counseling other school colleague to play	3,89	29,63%
High level of commitment	3,94	31,48%
Better understand how different subject interact	3,72	24,07%

In Figure 1, we can observe how the students consider that the game was positive both to facilitate understanding of the concepts transmitted during classes and simultaneously allowed them to participate in the classes with more attention. In both cases, the game allowed to contribute so that the knowledge and the motivation of the students evolved in a positive way due to the simulation game.



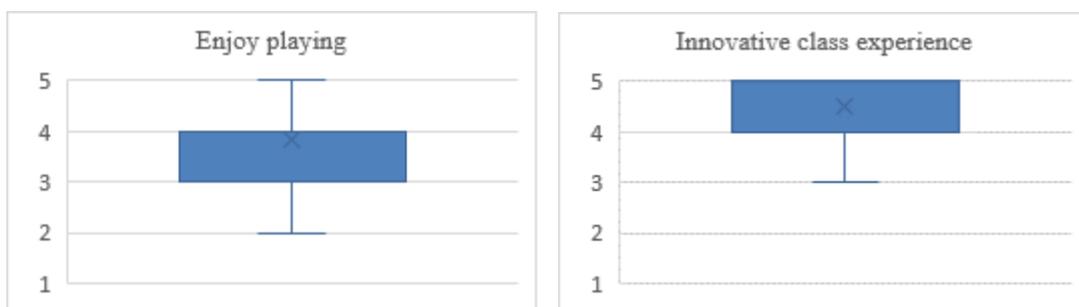
**Figure 1.** Better understand class concepts and participate more attention in class

In figure 2 we can verify that in addition to the previous positive points, the use of the game was also identified in a positive way to obtain knowledge of new concepts not addressed in classes (Average 3.67), thus showing how the game allows the acquisition of knowledge, but also be a catalyst for the autonomous work of students. We can also verify that the relationship between the time spent outside the room and the knowledge obtained is positive, since the dedicated effort in BSG is not considered a waste of time (2,22). In this case a negative deviation from the mean value is positive.



**Figure 2.** Learn new concepts and lost to many time not compensated by new learnings

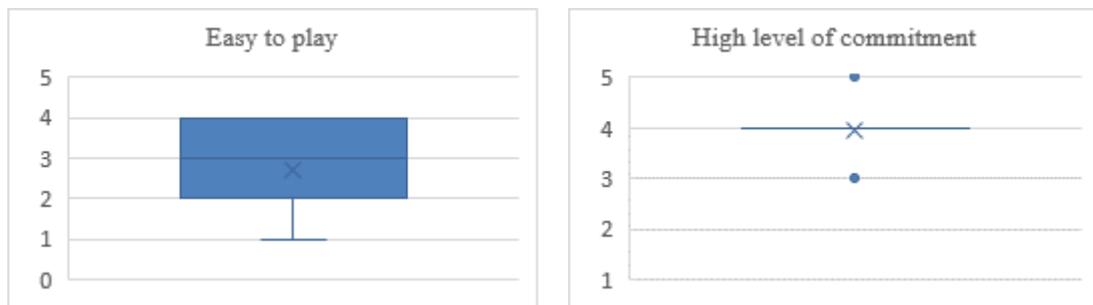
In figure 3 we can see that the students considered a game as an innovative activity, answering the highest of all questions, reinforcing the idea that the pedagogical techniques used are still quite traditional in the other subjects. The students also show that the game was very motivating for them, since they liked to participate in this pedagogical technique (avg 3.83)



**Figure 3.** Enjoy playing and innovative class experience

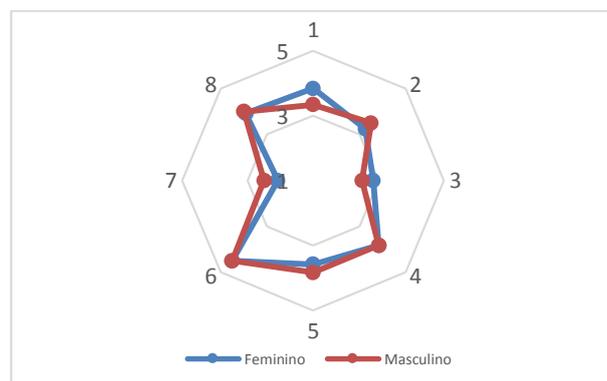
At the level of the promotion autonomous work out of class, figure 4 shows that the game is a useful tool to promote this goal. The average of the students' responses to the out-of-class commitment that the game demanded from them was 4, which represents a value 33.3% above the central one. This commitment was also required since the students considered the game not very easy (2,72). In fact, the game implies a great learning curve, not being easy to start and see results immediately by the time spent. Another fact that led the students to consider the game

difficult was the fact that at the time this simulator was used it was not available in the Portuguese language, forcing students to play in English. In any case, the fact that the game was in English was itself one of the attractions of the game and that allowed to develop one of the crucial skills for the managers of the future.



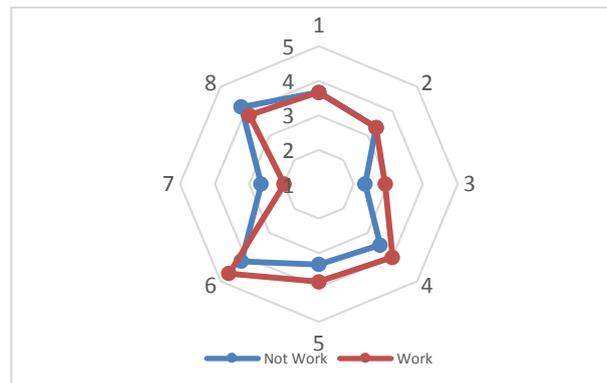
**Figure 4.** Easy to play and high level of commitment

In the always interesting analysis at the gender level, the differences in the 8 main questions analyzed in the previous figures can be observed in figure 5. There are not very significant differences between the male and the female students in the way they globally face the game in a positive way. Even though, the two most significant differences are in question 1, if the game has helped to better understand the concepts of the classes, in which women consider a higher impact of the BSG (3.83 vs 3.33), but in both cases the answers are positive, and in question 7, regarding the time lost, where again female students show a better result (2.08 vs. 2.5), but also here, being below the central value, both the responses of female and male are positive regarding the application of the BSG pedagogical method.



**Figure 5.** Gender differences

In an analysis of the differences between students that are working or have worked for a minimum period of 3 months presented in figure 6, it is curious to find that, as a rule, there are slight differences favorable to those who have experience in the field. In five of the eight issues under review, workers value the game experience more than students who have not yet done any business activity. These data further reinforce the potential of using these pedagogical techniques, since even those who have already contacted reality see their use as a value.



**Figure 6.** Working experience differences

## CONCLUSIONS

From the first application of this type of methodology in a context and in a very specific class, it is however possible, to draw enough conclusions and establish directions for the future. Overall, the use of this methodology gives, undoubtedly, an added value and is extremely positive for helping to achieve the desired objectives. Firstly, it allows consolidating the knowledge transmitted; secondly it allows arousing curiosity on students and promoting their autonomous work and their desire to know more. Finally, allows the development of some extremely relevant skills such as working in a group or the improvement of the English language.

The uses of these new methodologies are still not usually (largely) used in Portuguese and worldwide schools, especially in the area of management, but the potential in this area is tremendous and, in the future, considering that it is intended to continue to evolve with this practice, there is a need to consolidate the application of this game or other similar games.

In the future, the goal is to use this methodology not only in the CTeSP's but also in the undergraduate courses, since the potential also exists for this level of education. It is also intended to make a posteriori analysis, but also an a priori one, and to be able to compare the evolution of the student's opinions and competences regarding the use of this methodology. It's also an objective to be able to compare if the potential is equal in different levels of higher education in Portugal. Finally, in future works, we intend to go beyond the descriptive analysis and seek to use more sophisticated statistical analysis models, potentially using econometric models.

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# Cardiac Arrhythmia Classification by Support Vector Machine

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## ABSTRACT

In this paper, we introduce support vector machines (SVM) which are evaluated for application to a variety of non-separable cardiac datasets with several attributes. We implement the SVM kernel algorithm with a number of parameters associated, for to improve the accuracy of the classification. An analysis of the results of data classification is also presented to verify the effectiveness of the proposed kernel function. The method SVM used gives good classification accuracy in almost all data sets, particularly those of high dimension, and gave a recognition rate of 94%, this rate of classification exceeds the results obtained in the literature.

## INTRODUCTION

The heart is the central element of the human body, and despite its power it is vulnerable to dysfunction. Several types of diseases may affect it, such as arrhythmias (Premature Ventricular Contraction, Fibrillations, Tachycardia, etc.). According to the World Health Organization (Who, 2017), cardiovascular disease is one of the leading causes of death in the world. The mechanisms of sudden death are mainly ventricular rhythm disorders with 75% the existence of the Premature Ventricular Contraction (PVC) is noted as a possible predictive factor. For these reasons there is an urgent need for the development of new methods of prevention, detection and treatment of these diseases. Among the most commonly performed tests for the detection of these cardiovascular abnormalities is the Electrocardiogram (ECG), which is an electrophysiological signal whose plot materializes the electrical activity of the heart.

Intelligent diagnostic systems have emerged to make the best use of ECG data in large quantities and whose manual analysis is difficult. These systems improve signal quality (noise filtering), extract information that is not visible through direct visual analysis, and provide a diagnosis that can provide sufficient support for physicians to take the right decisions. However, automating the detection of cardiovascular disease from the ECG signal is not trivial, in particular because it is difficult to extract from the latter all the information used by the doctor to make a good diagnosis. In addition, providing a system with sufficient expert knowledge to automate the diagnosis is an extremely tedious task.

The presented work in this paper proposes classification of PVC beats, and is organized as follows:

In the first section, we introduced the problematic and then examined related works to classify cardiac arrhythmia in Section 2. The third section presents details works specialized in detection of the PVC pathology. The proposed approach is detailed in Section 4.

Our experimental results and a discussion are presented in Section 5. Finally, the conclusion is drawn and future work is suggested in the last section.

## RELATED WORKS

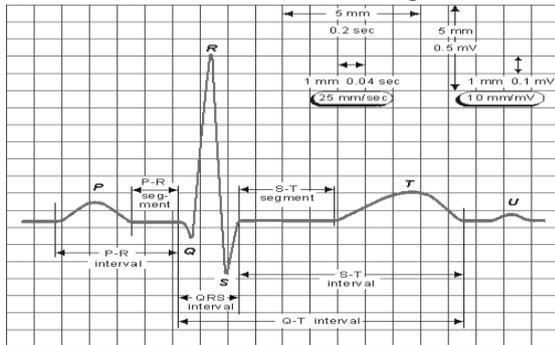
Several approaches have been tried for cardiac arrhythmia classification. For early detection of diseases, a multiclass multi-label based fuzzy associative classifier with genetic rule selection was implemented for coronary heart disease risk level prediction in curative of the diseases (Sumathi & al, 2014).

In (Chen, 2017), a carrier vector machine classifier is used to group heartbeats, using the MIT-BIH arrhythmia database with an accuracy of 93.1%. In (Herry & al, 2017), the authors used the MIT-BIH arrhythmia database

and the Association for the Advancement of Medical Instrumentation (AAMI) beat classes, by training a SVM classify. In (Hendel & al, 2016), the SVM networks were used in as a multi class classification of cardiac arrhythmias, by achieving an average accuracy of 99.73%, and showed that the SVM post-treatment outputs can improve the classification decision in terms of probability, this approach was also used to solve the multi-classification ECG problem in (Li, 2017).

## ECG SIGNAL

In [Figure 1], we have the different waves of a normal ECG, in our study we are interested in the Ventricular case that can cause sudden death in a patient.

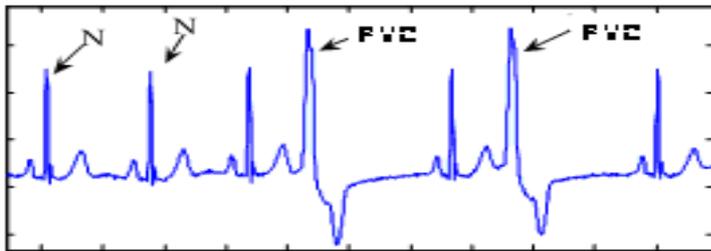


**Figure 1.** The different wave Electrocardiogram (ECG) signal.

## PREMATURE VENTRICULAR CONTRACTION (PVC)

Ventricular fibrillation is a cardiac rhythm disorder which manifests as a complete disorganization of the electrical activity of the ventricles with the immediate consequence of the loss of any effective cardiac contraction. According to (Briand, 2002) Ventricular fibrillation is characterized by the occurrence of very abnormal, widely varying, abnormally large, unequally amplitude ventricular complexes, occurring in a totally irregular and high frequency manner (Talbi, 2011).

The parameters used to try to predict the risk of PVC are relative to the QRS and P waves of the ECG [Figure 2].



**Figure 2.** ECG of a subject which has premature ventricular contractions (PVC) (Talbi, 2011).

To discriminate between the two types of beats (normal and at risk (PVC)), it is imperative to calculate certain parameters and characteristics that can constitute the input vectors of the classifier. These feature vectors are each composed of 9 elements:

- The temporal parameters, namely the duration and the amplitude of the P wave represent the two first elements of the vector and the duration of the QRS complex.
- The shape of the QRS complex.

## METHODOLOGIES

SVMs are a new type of learning algorithms, originally introduced by Vapnik (Vapnik,1998). The success of this method is justified by the solid theoretical foundations.

The SVMs are based on a learning algorithm with a decision function an optimal hyperplane in a large dimension space  $D$  [Figure 3]. For to solve some practical limitations related to data that are not linearly separable due to the nature of the generally non-linear systems and the presence of noise in these measured data, SVMs have been generalized through two tools: flexible margin and The kernel functions [Figure 4].

The flexible margin principle (Vapnik & Cortes ,1998) is to allow classification errors, which gives the SVMs the ability to manipulate aberrant values. The optimal separation problem is reformulated as follows: the optimal hyperplane separating the two classes is the one separating the data with the minimum of errors and which satisfies the following two conditions:

- The distance between the well classified vectors and the hyperplane must be maximal.
- The distance between the misclassified vectors and the hyperplane must be minimal.

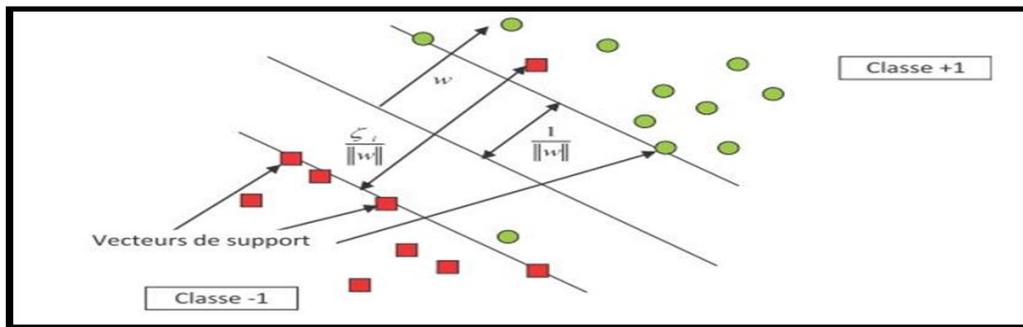


Figure 3. SVM separation.

The projection in this space is done to compensate for the nonlinearity of separation. From the learning data  $(x_i, y_i)$  where  $x_i \in \mathbb{R}^n$  and  $y_i \in \{-1, +1\}$ . The algorithm consists in representing the points  $x_i$  in this space  $D$  by a nonlinear transformation constructed from a family of functions  $\phi_k$  under certain conditions. The series  $\phi_k(x) \cdot \phi_k(y)$  converges to a function  $K$  called Core (Kernel) [Figure 4].

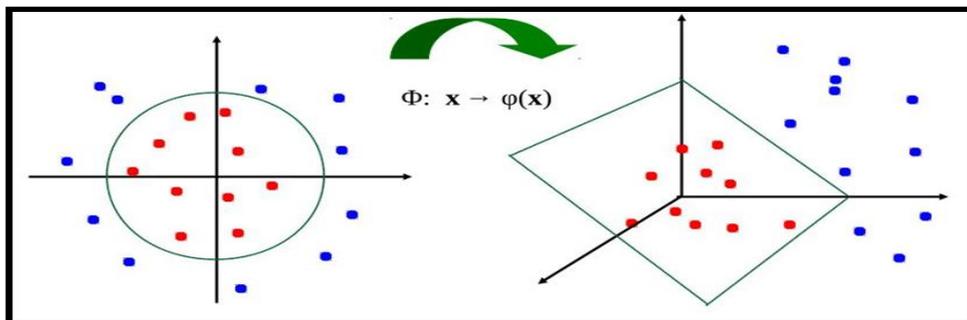


Figure 4 . Exemple de projection

The functions of the SVM method are as follows:

$$k(x, y) = \sum_{k \in N} \Phi_k(x) \cdot \Phi_k(y) \quad (1)$$

The decision function is given by the sign of the following discrimination function

$$f(x) = \sum_{i=1}^l y_i \alpha_i k(x, x_i) + b \quad (2)$$

$\alpha_i$  and  $b$  are coefficients to be determined, by maximizing the distance, called margin, between the decision boundary  $f(x) = 0$  And point cloud in  $D$ . [Figure 3] for an illustration of these concepts, the problem becomes

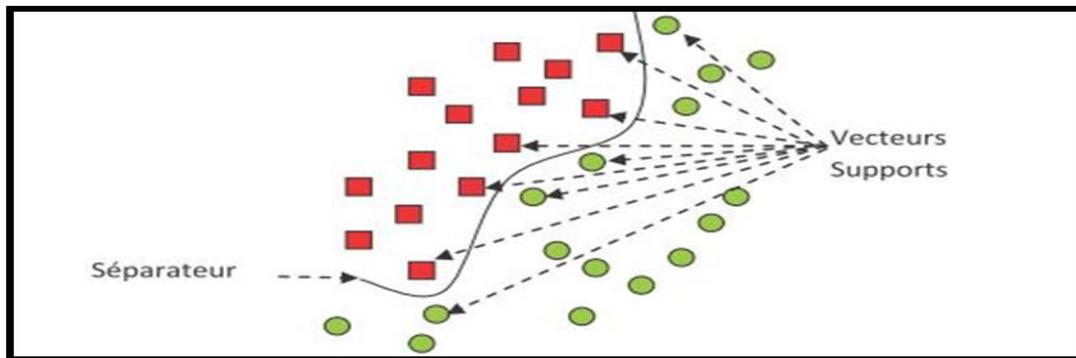
an optimization problem :

$$\min \left\{ 1/2 \|w\|^2 + C \sum_{i=1}^N \xi_i \right\} \quad (3)$$

$C$  is a constant to be determined and  $\xi_i$  is the non-negative error.

$$LD = \sum_{i=1}^l \alpha_i - 1/2 \sum_{i,j=1}^l \alpha_i \alpha_j y_i y_j k(x_i, x_j) \quad (4)$$

The [Figure 5] below illustrates the calculation of a decision surface by the kernel method in the case of non-linearly separable data (Laouti, 2012).



**Figure 5.** Support Vectors and Decision Surface Calculated by the Kernel Method (Laouti, 2012).

## EXPERIMENTATION

In this study we focus on the classification of Premature Ventricular Contraction (PVC), the 48 records of "MIT BIH Database" are used for the development and evaluation of classifier performance. Each record of this database is accompanied by an annotation file in which each ECG (cardiac cycle) beat has been identified by experts (cardiologists) (MIT-BIH, 1992). These labels (annotations) [Table 1] are used to learn the classifier and evaluate these performances during the test phase. Since this study aims to identify the PVC beat, some records of the PVC-free database were excluded from the study, leaving 35 records of interest. The cardiac cycles used for the learning of the various pathological cases were chosen randomly from several records. The advantage is of course to build a database including different forms of each cardiac arrhythmia.

Parameters	Signification
1	The moment of detection of the peak R
2	QRS onset
3	QRS offset
4	Last RR interval
5	Beat begin
6	Beat end
7	Iso electric level
8	Amplitude pic to pic
9	ST level

**Table 1.** Parameters of MIT-BIH data base.

## ECG RECORDERS

In [Table 2], we can see the few patients in the database MIT-BIH and who are coded from 106 to 234, each record to normal beats and ventricular beats.

recorder	N	PVC	Others	Total
106	1500	517	0	2017
116	2273	109	0	2382
119	1535	442	0	1977
200	1815	773	0	2588
205	2574	68	0	2642
208	1681	1216	44	1941
214	2013	235	0	2248
219	2083	57	3	2143
221	2022	393	0	2415
234	2733	3	5	2741

**Table 2.** Number of normal and abnormal beats for each signal.

## RESULTS

We extracted the characteristics on the set of signals from the MIT BIH Arrhythmia database. To adjust parameter  $C$ , we used the kernel and fixed the constants related to this kernel. First, the matrix from the MIT-BIH data block (input  $x_i$ ) was used for learning and testing. We then supplemented the test matrix with data arbitrarily taken from the study base. For the learning set used, the vector  $w$  normal to the hyperplane is 9 elements such that  $w = (0.2338, 0.7159, 0.3558, 5.4760, -0.8455, 0.9819, 2.6966, 4.6257, 0.2382)$  where each axis of the dimension of space is represented by an element of the characteristic vector  $x_i$ . The classification rate is estimated at 94%. This recognition rate is remarkable compared to classifiers of the literature.

## CONCLUSION AND PERSPECTIVES

In this paper, we examined the application of Support Vector Machines based for the recognition of cardiac arrhythmias. The learning algorithm was implemented under the Matlab environment with a kernel. Tests carried out on a database MIT-BIH database have enabled us to achieve a classification rate close to 94%.

The result is satisfactory because the database is not very rich on the one hand and the fact that some beats are very difficult to classify.

Among the prospects for this work, the expansion of the database, and the introduction of a new core may be more appropriate for our application.

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## Case Study on Social Capital in Local Elderly Drama Community

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### ABSTRACT

The purpose of this study is to understand experiences of local based community for older adults who join silver drama community in Andong city, Korea. It is the exploratory and field-based qualitative research utilizing the social capital within social constructivism. Participant observations in drama practice areas as well as in-depth interviews with 10 participants were collected and analyzed using qualitative content analysis. Four main themes were emerged as follows : 1) aging together rather than aging solo with drama members, 2) being activated with the drama community and confident on their own in living place, 3) working for one's own Andong dialect advertised in each other which is social capital through their performance, 4) having the community transformed since the formal and informal experiencing had been changed together. Based on research findings, the practical implications are suggested for enabling the local elderly to social capital in community.

**Keywords:** Elderly, localism, drama community, social capital, social construction

### INTRODUCTION: EMERGENCE OF AMATEURISM LIVING CULTURE COMMUNITY

Multilateral viewpoint of elderly is being explored, based on conversion from policy and welfare approach focusing on 'dependent being' in need of care into 'independent civilian', assuming that everybody is 'aging' (Kim & Mun, 2015; Kim, 2016). In particular, the bottom-up model of community building that ignore unique 'region-specific characteristics' and recent farming village co-housing project that uses the elderly as a tool has been criticized (Lee, 2017) while empowerment of elderly as the social capital themselves by developing various sources and treating them as a partner has been highlighted in Japan, Australia, etc. (Inaba, 2016; Winterton *et al.*, 2014) and South Korea is at the opening stage.

As of 2015, Korean population at age 65 or older was 6,570,000, as 13.2% of entire population, in which 1/5 households were the aged (householder at age 65 or older) and 32.9% of them were single aged households (Korea National Statistical Office, 2016). Since 2000 when rapid increase in elderly population has become one of the social problems, Korean society has put multilateral effort on establishment of a number of policies and welfare systems for elderly. Despite such effort, social pathological phenomena including increase in suicide, poverty and depression of the aged and elder who lives alone have not decreased (Lee, *et al.*, 2016). In other words, South Korea is remembered as one of the countries inhospitable for elderly. Furthermore, outlook for the aged population at age 65 or older to reach 15.7% (8,000,000 people) of entire population by 2020 (Korea National Statistical Office, 2013) reminds of desperate demand for new viewpoint at elderly. Beyond budget support for one-off policies and noticeable effects, recognizing existence value of elderly as 'co-existing entity' is needed. Academic movements for change in viewpoint are being partially implemented in some countries including Japan, Australia and Sweden and continuity of such movements is attracting public interest (Inaba, 2016; Winterton, *et al.*, 2014). In particular, various elderly communities of interest lead to communion with others and solidarity with local community, implying that the elderly is social capital, worthy of notice (Lee, 2017; Winterton, *et al.*, 2014).

The purpose of this study was to consider playacting of the aged as social capital in the region and analyze them at the viewpoint of social constructivism. Accordingly, the elderly drama community that autonomously performs in the city A was defined as a community of interest, of which identity and relationship were discussed in terms of individual and group.

Taking account of social constructivism that regional social capital formally and informally influences the elderly, major resources existed within the community of interest, elderly drama community, were looked into. And then, major relationships between individuals and within the community were looked into. In addition, the type and dimension of social capital presented from each relationship were analyzed.

## **SOCIAL CAPITAL AND REGION**

Social capital refers to the capital available for individual or group inherent in relationships. At this point, trust, reciprocity norm and network are the core dimensions (Halpern, 2005). Although these three core dimensions are universally recognized, how these are used or implemented differs depending on type of social capital. In other words, social capital as intangible asset is presented as network via participation and formed by mutual reciprocity value based on trust, which might be considered as a multi-dimensional term of close relationship. Social capital can be classified as the types of bonding, bridge-building and connection depending on relationship and function thereof (Eo & Kim, 2016). The bonding type of social capital refers to fellowship or trust within the homogeneous community. The bridge-building type of social capital promotes interchange and cooperation between heterogeneous communities weakly bonded each other. The connection type of social capital means vertical relationship inherent between nation and civil society.

The function of social capital in the region is to exchange opinions and suggest and implement problem solving methods via direct participation of residents. As it influences securing localness as well as citizen autonomy, cooperative governance on local problems can be realized.

Important role of special capital in activating and forming the local community has been already insisted and demonstrated theoretically and empirically. Social capital creates productive interaction for common interest between the members of society and helps easily solving problems in various collective behaviors within the community or society (Choi, 2016; Lee, 2006). This study is close to Coleman (1988) approach that addresses social capital in terms of microscopic and personal dimension. Coleman defines social capital as lost reducing and efficacy maximizing by establishment of confidential relationship and highlighted strong power of solidarity.

Meanwhile, the elderly community itself is expected to well understand their own needs and requirements as the members thereof are related to each other within the same region. The welfare system by region is an alternative paradigm for local residents and community as the main agents to improve welfare capability of the region and the community of interest is based on the core elements of social capital, high reliability and strong networking, as the members thereof have same habit or propensity. Empirical studies (Choi & Kim, 2016) demonstrated the positive effects of social capital at the regional level on elderly problem-solving, but still qualitative study on formation and pathway of regional social capital via social constructivism in the community mediated by volunteering living culture is needed.

## **METHODS**

This study was conducted in the silver drama community currently performing in the small-medium city, A. This drama community called "Watniggyeo" was a non-profit organization playing the story relevant to various tangible and intangible resources in the region including history, traditional tales, etc. by using the local dialect. The term, Watniggyeo, is a local dialect implying various meaning such as hi, hello and welcome. Watniggyeo is a non-profit organization consisting of approximately 20 members at mean age 65, one director, two music players (harmonica and accordion) and actors/actresses. Playacting career of each actors/actresses was different, ranged from several months to 3 years, as the time they first joined the drama community was different. They performed various roles in their home and region as ordinary wife, mother, self-employer, volunteering worker, etc., while having no previous experience in playing before joining the drama community. The drama community was registered in the form of cooperative union, one of social economic form and has performed 4 theatricals 20 times until now 2017.

Data were collected researcher note, photographs, and 10 participant's interviews. Data analyses were conducted using contents analysis, classification and sophisticated analysis focused via the process of review between two peers in the study (Kim, et al, 2015; Novak, 2010).

## **RESULTS: VALUE OF WATNIGGYEO AS A REGIONAL SOCIAL CAPITAL**

### **Greeting, <Watniggyeo>, the most representative Andong dialect: local dialect as a standard language**

The silver drama community "Watniggyeo" in Andong city is an amateur community of interest that was established by the elderly who used to live a life unrelated to playacting to present local history and cultural contents in local dialect language. Via theatricals played by them, youth that starts and ends from countless relations and loves was observed and one's identity was found and new relationship with others was expressed. The members of Watniggyeo played a role of messenger connecting the adolescents to the elderly as well as the past and the future in the 'local dialect and story' they were playing. For example, the themes played by Watniggyeo implies local history and identity.

① 'Walgok Bakery' - Story of joys and sorrows felt by residents moved from the submerged area to Imdong Chaetgeori marketplace. As the Andong dam became submerged, Chuja moved to Imdong Chaetgeori marketplace with her daughter and started running Walgol baking house. As her new house became submerged again when the Imdong dam burst, she was compelled to close the shop and decided to move to Seoul where the

married daughter was living. A the day before her moving to Seoul, story of the residents who moved from the submerged area, their sorrows and dear hometown is presented while having farewell drinks.

②‘Jam Jom Jasideo’ - story telling sorrows of elderly and everyday life of neighbors.

③‘Maddeulyeonga’ - Madangguk (one of traditional Korean performance) based on the tale derived from Maddeul (former name of Yongsang-dong).

④‘Geuriwoon Yeian jangteo’ - story based on recalling of residents in Seobu-ri Dosan-myeon, a musical drama showing the market day of Yeian marketplace in some year before the Andong dam was built in 1970s, with singing and dancing.

The initial play <Wolgok Bakery> is a story of the displaced persons whose home disappeared due to community development. Forgotten memories of people who were born and raised in the town were reenacted in the drama while presenting the stories inherent in the town in the local dialect. Both of <Maddeulyeonga> a play based on the tale derived from the name of region and <Yeian Jangteo> presenting relationship between people at the marketplace are addressing region-specific characteristics and contents that people at age 50 or older might empathize with but youth generation even living in the region might hardly understand in terms of language used in the play. That is what Watniggyeo pursued, usage and spread of the local language, Andong dialect. Introduction presented in the local magazine is provided below as a cue to understand identity of the residents.

The drama company, Watniggyeo, named in Andong dialect is quite familiar. Other than any modifier, the name of the drama company itself implies years of experience and region-specific characteristics at once. Gathering every day is not easy when considering age and job of each member. Although they first meet each other with an introduction of acquaintance, through the grapevine, etc. no one knew they would appear on the stage for playacting. (Andongji, June, 2015).

#### **Social capital of Watniggyeo: relaxed solidarity, vertical relationship and power of maintaining community**

As of 2017, South Korea is one of the countries paid attention for community of interest that shows the greatest dynamics during spreading of desire and expression started from 'myself'. Candlelight rallies started from political protests implicitly provide the place of action where daily life of citizens is brought into and produces various media with our community of interest that shares common value. South Korean in the past used to be known as a community with united history and culture where individual experiences are distinguishable from each other depending on physical location of region. However, smart revolution beyond contemporary digital technology has created the concept of global village, the new community of interest transcending time and space. The main agent of creation that used to be perceived as the minor now became to be ordinary citizens.

New audiences now a days have evolved to find out express countless 'myself' in terms of common emotion based on the new innovative code, amateurism. In other words, individual 'myself' with similar interest is combined as 'ourselves' with common interest at a chapter of expression. The new audiences have emotions as 'myself' and 'ourselves' at the same time and feel joy of creation in between those emotions. (Lee, 2015)

Likewise, the new audiences formed by amateurism find out common point of contact between 'my desire' and 'sociality as a community member' and share the place where imagination becomes to be realized. For example, there is living culture communities. The concept of living culture community is a new identity of participants to become producers, which enables anyone to start as an 'artist', 'designer' and 'producer' while pursuing routine culture and art.

**Table 1. Classification of Social Capital - silver drama community "Watniggyeo"**

Unit of social capital	Self-rating on regional dialect command - 'high'	Self-rating on regional dialect command - 'moderate'
Form and Structure	amateur drama company, official, vertical, open, local elite women, volunteering group, spontaneous association	amateur drama company, unofficial, horizontal, closed, spontaneous association
Intra-community social capital	<ul style="list-style-type: none"> <li>- keeping role, concentrating, revising the script into dialect (Andong dialect)</li> <li>- compliance with regulations, age, playacting career, etc.</li> <li>- responding to issues: advising, giving tips</li> <li>- characteristics of social capital: strong bond, reliability by career, mutual understanding</li> </ul>	<ul style="list-style-type: none"> <li>- revising the script into Andong dialect, additional ad-libbing</li> <li>- order of joining the drama company, age</li> <li>- responding to issues: communicative expression, refusal to do what is being told</li> <li>- characteristics of social capital: teamwork, no personal story</li> </ul>
Inter-community social capital	<ul style="list-style-type: none"> <li>- actively participating in individual activities (volunteering, resident community, etc.)</li> <li>- elderly-resident social capital</li> <li>- characteristics of social capital: weak bond, absence of reliability and mutual benefits</li> <li>- results: spread of local residents and dialect (Andong people, Andong dialect), development and re-creation of local history and cultural resources, aged generation model, improving quality of life</li> </ul>	<ul style="list-style-type: none"> <li>- being confident in what I am doing (business)</li> <li>- characteristics of social capital: improved (psychological) confidence as an Andong person</li> <li>- results: spread of Andong history, physical health, active communication, life with joy and learning, playacting to become an elegant elderly</li> </ul>

### 1) Intra-community social capital

The members of silver drama community, Watniggyeo, sublimate discomfort from social recognition of the elderly as passive and in need of help in playacting. In other words, they try to deliver their own message by reflecting "how to treat elderly" stereotype in local community to their playacting lines and concentrating on playing their role while having a command of strong and impressive Andong dialect accent.

I was bit worried about performing in front of people from Bupo-ri town. Because we are playing their story, I wanted to do well. So I practiced alone to be linked to people from the submerged district through feeling of empathy. (omitted) When hearing their real story in person after completion of performance, we were proud of becoming one mind with those people. (Jeong, HJ)

I was ad-lipping a lot. The director did not understand Andong dialect well because he was from Daegu. So, we revised the script to be in Andong dialect. (omitted) At first, the director tilted his head when hearing Andong dialect from us practicing, but now he praises us doing well and instructs us how to express specific emotion. (Jeong, SJ)

Though this process, silver drama community, Watniggyeo, put an importance of elderly role in active expression and activity that are being used as playacting-mediated personal and social resources. In addition, they try to accept new information while giving advice to each other based on trust relationship within playacting communication, or provide new information in addition to external resources in community.

We go anywhere if being called. We are neither playing just for money and nor looking to supporting projects. We think playing is like volunteering work. As we started because we like it, we just pay ten thousand won a month as a membership fee, take what is offered, and pay the director operating expenses and payroll costs. Today, I saw some acquaintances among audiences and got to have another performance unexpectedly. (Kwan, YS)

However, own identities of members that could be infringed due to implicit pecking order and authority inherent in age within community, order of joining the community are maintained by keeping science or refusal when

opinion or information exchange is required.

It has been only 2 years since I first joined the community. I think of myself lacking in ability compared to others and sometimes feel difficulty in joining conversation with others. So, I choose not to ask any private affair and rather listen to others and talk if I have to. Sometimes I am supposed to do what is being told because I am young, but I refuse to do so. Because it is uncomfortable and hard. (Kim, HJ & Jeong, SJ)

## 2) Inter-community social capital

This study was conducted with a single case of silver drama community, Watniggyeo, which made comparison with other population impossible. However, the members of Watniggyeo recognized that their daily life outside of community is directly and indirectly reflected in playacting in Watniggyeo. Especially recognizing that they attract interest of a number of local residents' interest via their process of performance, they see themselves as an important resource of social capital in local community as a local resident.

I became to use Andong dialect more frequently since I started playing performance. So, when family gathering, my daughter and grandchildren from Seoul sometimes misunderstood me using swear words (laugh). When buying some glossaries in Daegu market, people are friendlier greeting me talking in Andong dialect. It became to be all natural daily habits coming from playacting in Andong dialect. (Kim, HJ)

The part of lines from the play <Walgok Bakery> where Andong dialect is largely used by the silver drama community is summarized below.

**Table 2.** Use of Andong Dialect in Play <Walgok Bakery>

No. of use	Andong dialect	Meaning
4	Gwakjae	suddenly, unexpectedly
5	Maka	all, entirely
2	Sega bbajige	very much (extremely) strenuously
3	Mmagji geuno	in vain
1	Gaejabda	close, near

Likewise, the members try to use Andong dialect in their play as much as use in daily life for better delivery to and communication with the audience. They think, if the audience is not from Andong or young generation even from Andong they could not understand Andong dialect used in the lines of playing. Therefore, the synopsis of playing is usually ordinary story easily understandable and any Andong dialect that the audience did not understand is explained in after-performance talk concert or via personal inquiry, which all lead to positive self-rating of the members as the messenger of Andong dialect playing various roles.

## CONCLUSIONS

Identity of elderly as a person newly designed and explicitly expressed in playacting at the old age was looked into via the case of Watniggyeo. The journey of finding oneself who is playacting, not a mother, wife or parent was reflected in the playing in amusing local words, Andong dialect. In addition, relationship between the members of the drama community showed that importance of community and region specific characteristics the community had created social capital, new life experiences such active playing, making friends, etc. at the old age. It means that trust mediated by local dialect was expressed in the playing, which became to be a positive source for individual role in activating and maintaining the community, silver drama community.

Playing performance has become an imitative for the members of the drama community who used to live a life irrelevant to playacting for about 60 years to look back or state a part of their life as well as a pathway to inform the outside world of elderly drama community activities (practice and performance). Differing from public interest in environmental adjustment and supporting policy for elderly alongside with increasing the aged population, playacting as one of the elderly activities within the local community played a bridgehead role in solidarity with local community, in which what is to prospect microscopically and how in reality of daily life in the elderly. More in-depth coverage of a case of individual elderly life might be needed to find out what social capital is created in the elderly.

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## **Challenges to Instilling Virtue in the Young Generation**

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### **ABSTRACT**

A society has a system of values and norms that have been accepted and agreed upon as a social unit. The system of values and norms is based on the religious beliefs, customs and culture of a particular society. The Malay-Muslim community has its own system of values that has been agreed upon and practiced in everyday life. In this process, individual virtue should be developed and strengthened so that the system of values, norms and religious beliefs will be morally binding. However, due to challenges caused by world globalization and advancement of social media that broadcast and display other values from all over the world, the Malay-Muslim virtue that has been practiced for generations, is under threat. Hence, this paper discusses the challenges to develop and inculcate virtue in the minds of the present young generation, particularly among Malay-Muslims in Malaysia. It is vital for the present young generation to be educated, shaped and empowered due to frequent misbehavior among them. The many factors which contribute to misbehaviour need to be addressed by the society, particularly by parents, educators and the nation's leaders. By presenting the insights of past and contemporary scholars, this paper focuses on and analyzes literature research on the importance of educating, empowering and shaping the virtue of today's young generation who will be at the helm of society as future leaders. Scholars have, among other things, outlined factors contributing to misconduct which undermine youth's virtue. Among the factors discussed by scholars are the influence of media, process of socialization, rapid changes in modernization, the culture of youth's environment, the nature of adolescents who are not yet matured and stable, and their curiosity to experiment new things in the search for identity. These factors are definite challenges for parents, educators and leaders to developing and inculcating virtue in our younger generation. Therefore, it is imperative to study and analyze ideas, suggestions and views from scholars in the field of spiritual and Islamic education as a guide for society in inculcating virtue in the young generation for the future.

### **INTRODUCTION**

The Malay-Muslim civilization Malaysia is founded on Islamic aspects of culture, religion, language and values. These aspects have been underlying the thought and behaviour of the Malay-Muslim society, enabling the construction of a Malay-Muslim Virtue Model (Jawiah & et al, 2016). This Model covers three domains, namely, thought, values and adherence to religious teachings.

The present young generation, also referred to as Gen Z, is a digital era generation. Their lifestyle largely depends on technology with a lesser degree of face to face social interaction. Their communication is more virtual. The effect is that Gen Z lack interpersonal and physical communication skills as well as pay less attention to family values.(Siti Mahani & Nazlinda,2016). The lack of direct communication with people around causes Gen Z to lack practising the values of Malay-Muslim virtue such as respect, appreciation, trustworthiness, love for knowledge and adherence to religious tenets (Masliah, 2016). Gen Z are also not good listeners as they use World Wide Web to communicate and interact (Siti Mahani & Nazlinda,2016). Due to their weak values, they are easily influenced by activity which is opposed to local values due to the influence of social media (Azyyati & Fariza,2016). Some forms of such activity or behaviour are truancy, snatch theft, stealing, bullying, free sex and unwed pregnancy (Noor Amila & Fariza, 2015). Today's youth is through world social media, more exposed to other cultures and values which may differ with the values of the Malay-Muslim virtue. The effect of this is the gradual erosion of the Malay-Muslim identity based on the model of the Malay-Muslim virtue.

## **METHODOLOGY**

This quantitative research uses document analysis to study the concept of Malay-Muslim virtue and the challenges to educating the young generation in developing and inculcating Malay-Muslim virtue. Generally, the focus of this research is to evaluate and analyse through books and articles which discuss Malay virtue. Among the references in this field are al-Quran and Hadith, Ihya'Ulum al-Din by Imam al-Ghazali (1967), Tahdhib al-Akhlak written by Ibn Miskawih (1985), and writings of Hashim Musa (2012), Aminuddin Mansor (2012) and Jawiah Dakir (2016).

### **Malay-Muslim Virtue**

The Malay-Muslim virtue is a set of values agreed upon by society to be the basis for individual daily behaviour.. This set of values has been practised for generations and ultimately became social norms which are required to be observed. The Malay-Muslim virtue is derived from Islamic teachings, and Malay tradition and culture (Fariza, 1999).

There are a number of writings on the concept of virtue derived from religious sources. Among these is by Yusuf al-Qardhawi (1996) who explained that al-Quran positions the intellect in a place appropriate to its function and ranking. He also stated that intellect is related to al-Quran which is its source of knowledge by which mankind runs his life.

Al-Quran as the source of knowledge underlies the theory on human intellect as espoused by Mohd Fakhruddin Abdul Mukhti (2000) in his book, *Islam dan Akal* (Islam and Intellect). In his view, al-Quran is a book relating to intellect. Al-Quran is a contributor to human thought. That is the reason, the Islamic religion which is derived from al-Quran as its source, underlies Malay-Muslim virtue.

In addition, tradition and culture are also sources in developing Malay-Muslim virtue. According to Abdullah Hasan (1995) in a study of the Malay intellect and mind, the original and creative Malay mind is within the framework of Malay-Muslim culture. It has to be a creative mind, and lead for the sake of the State and people. The originality and creativity of the Malay mind may be preserved through the use of the mother-tongue, namely, the Malay language.

Through the mother-tongue, the Malay-Muslim virtue may be translated through literature, music, drama, dance and various forms of arts. The elements of traditional culture give rise to lofty emotions and values, both social and aesthetic values (Mohd Taib Osman,1988).

Meanwhile, Sidek Haji Fadzil (1999) in his research, viewed that the Malay-Muslim must place importance on education which is geared towards producing a quality generation. All parties must be committed to the process of developing a quality generation through the process of education.. This world exposed by new forms of social media, poses a challenge to instilling virtue in the young generation.

Hashim Musa (2012) who studied Malay probity through traditional Malay poetry (*pantun*), idioms and proverbs, found 26 core characteristics of Malay probity/rectitude implemented in action, behaviour, values, norms and thought. These said core characteristics are in Table 1 as follows:

Table 1: Core Characteristics of Malay-Muslim Probity /Rectitude

No.	Core Characteristic of Malay Probity/Rectitude
1.	Living according to Islamic teachings
2	Education to develop knowledgeable, courteous, virtuous, God-conscious and practising human beings
3	Gratitude for Allah’s favours
4	Work values(ethics) which give priority to seriousness, competence, diligence and concord for benefit in this world and hereafter
5	Obey, serve and honour parents
6	Loyalty to a just and praiseworthy leader.
7	Refined courtesy and high moral character
8	Constant consensus, mutual helping and giving priority to public welfare and community life
9	Respect and service in socializing and honouring guests.
10	Moderation in speech and behaviour, prudent and careful
11	Concerned about self-respect and dignity
12	To act wisely and appropriately.
13	Safeguard and defend truth and justice.
14	Kind and grateful.
15	Forgiving and generous.
16	Affectionate
17	Live a simple life
18	Faithful and willing to sacrifice.
19	Self –reliant.
20	Respect for others’ rights and property
21	Honesty and sincerity
22	Have kind thoughts
23	Openness, not to harbour negative feelings or be underhanded.
24	Trustworthy
25	Spend time wisely
26	Foresighted

Source: Hashim Musa & et al, 2012.

This probity/rectitude formed the Malay-Muslim identity. According to a study by Aminuddin Mansor (2012), the formation of the Malay virtue became an important basis in maintaining the Malay-Muslim identity.

From the concept of Malay probity/rectitude derived from the Islamic religion and Malay tradition and culture, the concept of Malay-Muslim virtue may be outlined. The Malay-Muslim virtue which underlies this concept may be categorized into three domains, namely, values, thought and adherence to religious teachings (Jawiah & et al, 2016). The three domains consist of constructs which show the characteristics of Malay-Muslim virtue. This is illustrated in Diagram 1 below:

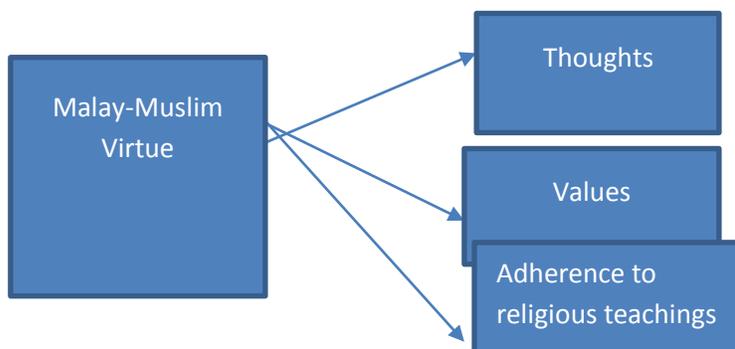


Diagram 1: Concept of Malay-Muslim Virtue (Jawiah & et al, 2016)

## CHALLENGES

The development of social media influences lifestyle, culture, values and thinking of today's generation. The culture and values adhered to for generations have begun to undergo change because the young generation are exposed to values and cultures external to Malay-Muslim society through social media such as internet, facebook, twitter, instagram, youtube and so on. This situation is happening in all Malay-Muslim societies including in Indonesia. A study by Anang Cahyono (2016), found that the influence of social media causes friction in patterns of social behaviour, in terms of culture, ethics and norms.

As a result of beginning to forsake religion, local values and culture, there occur behaviour or acts which violate the limits of Malay-Muslim virtue based on the Islamic religion. The lifestyle of the young generation begins to change from a religious to a hedonistic lifestyle, based on enjoyment and entertainment, to the extent of exceeding the limits of Malay-Muslim virtue. Referring to a study by Fariza & et al (2015) on the present lifestyle of adolescents, there are three categories of lifestyle practised by them in Malaysia: modernism, hedonism and traditionalism or conservatism. Even though the majority of them still practise a non-hedonistic modern lifestyle, the influence of hedonism has already begun to spread among Malay-Muslim adolescents.

Research findings by Veenhoven (2003) showed that youth is trapped in hedonistic behaviour which hankers for excessive fun and enjoyment. This challenge is the result of the rapid process of development and modernization, which Malaysia is also experiencing. It is also one of the reasons for changes in factors of youth socio-demography and environmental culture. This situation causes significant changes in social development and results in contemporary culture and sub-culture which interfere with the development of Malay-Muslim virtue.

In connection with the study by Veenhoven (2003), Siti Raba'ah Hamzah *et al* (2013) asserted that the formation and development of youth behaviour in Malaysia is increasingly eroding their identity. Hedonistic contemporary culture and behaviour which emphasizes importance on freedom in life is replacing traditional culture. This change is capable of preventing efforts to produce a young generation with positive attitude, lofty principles and noble character consistent with the values Malay-Muslim virtue in Malaysia. Moral education as well as nurturing of moral values in daily life is increasingly, though unintentionally, marginalized or set aside.

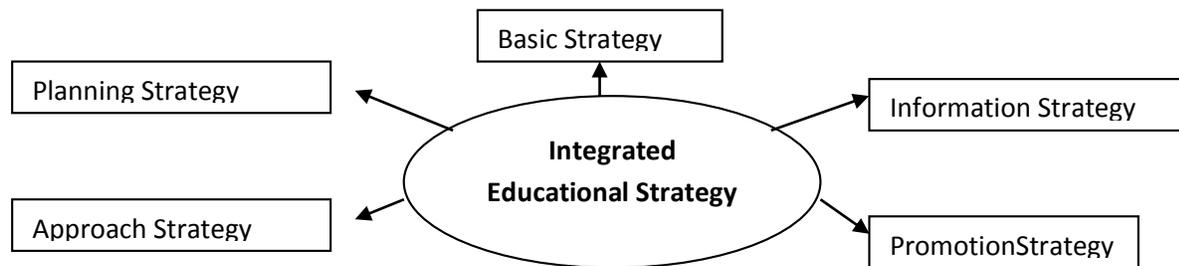
From the perspective of Islamic psychology, self-challenge also plays a role in inculcating Malay-Muslim virtue. Humans who are not instilled with values and religious instruction sometimes do not have a high level of self-esteem to deal with social challenges. Man is created having a psychological dimension (*al-nafs*). A psyche which is untutored and unbridled may tend to give in to his vain desires. Vain human desires are likely to choose matters of fun and enjoyment, even though such may not bring any good, but only harm (Hamka 2009). Thus, man needs to seriously strive and struggle in the process of self-control, but at times his mind or intellect fails to overcome his soul's desires. Hence, Hamka (2009) suggested consistent self-control training.

### Strategy to Strengthen Virtue

As a long-term strategy, a systematic effort is required to build strength in youth, mentally, emotionally, spiritually, value-wise and personality-wise as desired by religion and local society. The issue of the young generation's virtue cannot be solved by *ad hoc* steps. It requires a wise, organised and orderly educational strategy because this issue is the effect of influence from an external society, not in line with the values, culture and religion of local society.

Therefore, an integrated educational strategy needs to be devised to deal with this issue. The suggestion submitted in this research involve parents, educational organizations, school authority, leaders of society, policy makers, non-governmental organizations and government agencies. The educational module to be implemented needs to take into account its suitability for the young generation as well as the function and role of organization represented but must be based on the model of integrated educational strategy suggested. The strategy suggested in this research is to focus on the following aspects:

**Diagram 1.1: Model of Integrated Educational Strategy**



Source: Modified from Fariza & Siti Norlina, 2014

Planning Strategy is to plan, organize and formulate an educational program compatible with current youth's psyche and environment. The strategy approach is to seek, formulate and provide for the approach, *uslub* (language style), method and software of educational program compatible with youth. The promotion strategy is to promote, broadcast and advertise the educational program and exemplary group or idol which may be emulated by the present youth. Information strategy is to transform and shape youth thinking so that they are ready and willing to accept change for a better and positive direction without abandoning or sacrificing virtue.

## CONCLUSION

The values of Malay-Muslim virtue, derived from religion and Malay tradition and culture, are beginning to be undermined among the young generation as a result of changes in society. Various challenges are faced by educators, parents and society to preserve the values of Malay Muslim virtue so that the young generation may continue to internalize them. The main challenges are social media, modernization, lifestyle changes and little appreciation for Islamic teachings.

Ongoing strengthening of Malay-Muslim virtue is required so that the young generation develop the moral fibre and ability to lead the country, race and religion. If the present young generation is not properly guided, future young generations will definitely not know about courtesy and cultural values, losing their compass for direction without any religious guidance in their life.

## Acknowledgment

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# Change in the Environmental Literacy of German Students in Science Education Between 2006 and 2015

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## ABSTRACT

This empirical study intends to present core results of the change in environmental literacy of German students by analysing PISA 2006 and 2015 data. The study is carried out within the scope of environmental literacy in science education. The data are based on findings of both PISA 2006 data (N= 4891) and PISA 2015 data (N= 6504) of German students which were published in the official PISA site (<http://www.pisa.oecd.org>). In this study, a valid and a reliable 'environmental literacy' scale is developed. In addition, students' attitudes towards science affecting their environmental literacy are compared between 2006 and 2015. The study is conducted based on the paradigm of a descriptive field study survey. The validity and reliability of the 'environmental literacy' scale is tested in two stages by applying exploratory factor analysis with SPSS and confirmatory factor analysis with AMOS. In addition, parametric tests (ANOVA) and correlation are used to assess the data obtained from the analysis of quantitative data. The findings demonstrate a positive and meaningful relationship between 'environmental literacy' and the sub-factors (Environmental Awareness (EA), Environmental Responsibility (ER), and Development of Environmental Behavior (DEB)) ( $r_{EA} = 0.73$ ,  $r_{ER} = 0.43$ ,  $r_{DEB} = 0.37$ ,  $p < .01$ ). Moreover, there is an increase in the mean of the environmental literacy ( $\bar{x}_{2006} = 2,55$ ;  $\bar{x}_{2015} = 2,58$ ). According to the results, the major of students (63 % and over) indicate that 'they can describe the role of antibiotics in the treatment of disease' and 'they can predict how changes to an environment will affect the survival of certain species' easily on their own in both 2006 and 2015. However, approximately 20 % of German students point out that they cannot recognize the science question that underlies a newspaper report on a health issue' on their own. In addition, the majority of German students (80 %) point out that they have information about the consequences of clearing forests for other land use in 2006 and 2015. On the other hand, more than 60 % of German students think that they do not have sufficient knowledge about the use of GMO in 2006 and 2015. In the light of the results of this study some suggestions related to environmental issues for the development of science curricula are discussed. For instance, one of the suggestions is that the subject of genetically modified organisms and health issue should be more comprehensive in the German science curricula. In addition, critical reflection and decision making about science issues is important to educate an environmental literate citizen.

**Keywords:** Science Education, Environmental Literacy, PISA

## INTRODUCTION

In 2005, UNESCO launched its Decade of Education for Sustainable Development (2005-2014), a project by which educational institutes around the world would focus on educating more qualified individuals for a more sustainable future (Kaya and Elster, 2017). It is critical for the enhancement of the quality of future science education, especially environment education, that researchers bring to light the outcome of this educational project. One of the main purposes of this study is to present the results of the changes in environmental literacy (EL) of German students before and after implementation of this education by analysing PISA 2006 and 2015 data.

Another main purpose is to develop a model for assessing EL directly by using PISA data. It has been reported that PISA will be expanded in the scope of measurement coverage after the PISA 2015 evaluation (TEDMEM, 2017). It is the belief of the researchers that the present study will have a positive effect on this expansion, because, as Kaya and Elster (2017) mentioned, not enough research has been conducted on EL using PISA data, and although scientific literacy tasks in PISA include items related to environmental issues, it does not measure the score of EL directly.

The purpose of this research is to determine the change in the EL of German pupils from 2006 to 2015. Within the scope of this research, the development of environmental issues based on the PISA data is first presented. Next, before defining the research questions, the theoretical framework of literacy, especially science and EL, is introduced in order to reveal the importance of the research.

### **How is Environmental Education Linked to PISA?**

International organizations have reported on the development of environmental education from past to present by organizing conferences or/and meetings on environmental education (The Belgrade Charter, 1972; WCED, 1987; UNESCO-UNEP, 1976, 1978; UNCED, 1992; UNESCO, 1997; United Nation, 2002). Environmental studies and sciences programs were first established in the 1970s and gave rise to the increase of public awareness on environmental studies and issues (Coppola, 1999). In 1972, environmental education gained international acclaim with the Stockholm Declaration (Belgrade Charter, 1975; Wright, 2002). In the report of the Belgrade Charter (1975), it was explained that the six frameworks of environmental education are awareness, knowledge, attitude, skills, evaluation ability and participation. Similarly, the Tbilisi Declaration reported that there are four objectives: awareness, knowledge, attitudes, skills, and participation in environmental education (UNESCO, 1978).

At the beginning of the 1980s, the first environmental education curriculum, named “Procedures for Developing an Environmental Education Curriculum”, was published under the auspices of UNESCO-UNEP, and then revised in the mid-1980s (UNESCO-UNEP, 1994). In 1987, The Brundtland Report, also known as the Common Future, was published by the World Commission on Environment and Development. This report outlines the concept of sustainable development, which is seen as an interrelation of the concepts of environmental protection and economic growth (McCrea, 2006). The transition from the concept of environmental education to the concept of sustainable development began after it was highlighted at the international conference in Thessaloniki on Environment and Society: Education and public awareness for sustainability hosted by UNESCO in 1997 (Pavlova, 2011).

In 1997, the OECD Programme for International Student Assessment (PISA) was created by OECD member countries (OECD, 2013a), and the first PISA survey was launched in 2000 (OECD, 2000), which involves PISA assessing students every three years in three subjects (science, reading and mathematics literacy) (MoNE, 2010). Most of the countries make certain that the PISA assessment tools are internationally accepted and take into consideration the culture and curriculum of the participating countries and their economies (OECD, 2016b). The latest PISA assessment in 2015 was centred on science literacy, an area that has continued to play an increasing role in our economic and social lives (OECD, 2016a). The international organization, UNESCO, has been very active, from past to present, in the development of environmental education and will continue to support this education in the future. The educational outcomes from international assessments, especially the PISA, are important insofar as they serve to maintain the quality of this development.

### **What is Literacy?**

Literacy is a basic element of the right to education, as recognised by the Universal Declaration of Human Rights (UNESCO, 2013a). Despite there being general agreement that literacy is a human right (Keefe and Copeland, 2011), a common definition, accepted by everyone, is still lacking, as discussed in the previous section. Moreover, the idea of literacy has evolved in line with changes in cultural communicative practices and technological developments (Fellowes and Oakley, 2014). As a result, its usage has significantly expanded up to today (McBride, Brewer, Berkowitz, & Borrie, 2013). In recent years, the scope of its definition has grown to include many areas of interest, such as science literacy and EL (Monseley, 2000; Ozturk, Tuzun & Teksoz, 2013).

However, following the start of the Industrial Revolution, the concept of literacy began to be associated with the ability to read and write (Roth, 1992; Coppola, 1999; Monseley, 2000; Daley, 2003; Cambridge Assessment, 2013; McBride, Brewer, Berkowitz, & Borrie, 2013). UNESCO has had a significant role in developing literacy among its member states ever since the middle of the 20th century, and its definition of literacy has evolved substantially over time (Newman and Beverstock, 1990). In 1951, literacy was defined by UNESCO as the capability of a person to read, write, and fully comprehend a brief and uncomplicated expression in daily life (Newman and Beverstock, 1990: 45). Similarly, an alternative definition of literacy is the skill of individuals to get involved in the activities that need literacy to maintain the efficient functions of the society they live in, and to read, write and calculate for both personal and social development (UNESCO, 1978). In this sense, literacy provides a foundation for many other learning opportunities (UNESCO, 2013a), with the reason being that the innovative concept of “literacy” is concerned with the capacity of students to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of subject matter areas. (PISA, 2005). It is anticipated that in time to come this innovative concept of literacy will move beyond the skill of reading and writing and be rather described as the ability to transform knowledge into practice.

### **Framework for Scientific/Science Literacy**

Science is very significant for individuals if they are to make sense of their lives (Godek, 2002). Ultimately individuals have the desire to make daily natural events more understandable and useful for them (Agin, 1974).

The needs of individuals are therefore never-ending and continuous (Kalkandelen, 1979). In today's world, education, especially science education (Agin, 1974) is key to transforming individuals into scientifically literate persons. Scientific literacy has thus become a concept common to the basic goals of science education (Gabel, 1976). Moreover, scientific literacy has become the basis on which individuals can fully participate in society (Bybee, 2008). Through science education and the science literacy that results from it, individuals gain the ability to engage with science-related issues and scientific ideas (PISA, 2013b).

In light of the descriptions of literacy, science literacy is defined as the ability to read, comprehend, and discuss scientific matters intelligently (Shamos, 1988). In other words, it describes the ability of a person to understand scientific laws, theories, phenomena and objects and to be equipped with the necessary base of scientific knowledge to make informed decisions for their life (Dragoş and Mih, 2015). Although scientists, educators, and philosophers of science each have their own definitions of what it means to be scientifically literate, it should not be ignored that this concept is constantly evolving (Gabel, 1976). In these respects, Shen (1975 as cited in Liu, 2009) described six components of science literacy: (a) understanding basic science concepts, (b) understanding the nature of science, (c) understanding the ethics guiding scientists' work, (d) understanding interrelationships between science and society, (e) understanding interrelationships between science and humanities, and (f) understanding the relationships and differences between science and technology. In contrast, according to the Board on Science Education (2016), there are three elements of science literacy, namely, an understanding of scientific practices, content knowledge and an understanding of science. These two alternative definitions serve to demonstrate, in short, that, just as is the case for the definition of science literacy, there is no common view on the categories delimiting the concept of science literacy

In general, it can be said that scientific literacy means to have an appreciation of the basic principles of science and an understanding of what scientific research produces (Smithsonian Institution, 2011). Individuals should have some understanding of or familiarity with the social processes that accompany most environmental issues and how scientific methods work (Schneider, 1997). A scientifically literate citizen must therefore have an understanding of how the scientific and decision-making elements interact (Schneider, 1997). In support of this, Hurd (1998) stated in his study that a literate person uses science knowledge where appropriate in making life and social decisions, forming judgments, resolving problems, and taking action. Although the major advantage of being endowed with science literacy is that it provides a basis, at the school level, of the intentions of science education (Holbrook and Rannikmae, 2009), it entails much more than simply knowing the basic facts established by science (Board on Science Education, 2016). In summary, a definite answer to the question of 'what is science literacy?' should not be sought. Instead, we should seek to find an answer to the question of 'what is the scope of science literacy and how can we meet, within that scope, the expectations of societies in the future?'. In this way, we can train qualified science literate individuals accordingly.

#### *Change in Science Literacy in PISA*

The concept of science literacy is constantly being updated by PISA. In 2000, PISA defined scientific literacy as the capability of using scientific information, asking questions and making conclusions based on proof for the purpose of comprehending the natural world, making determinations about it and interacting with it. In 2006 and 2009, PISA redefined science literacy as follows (OECD, 2006: 12; OECD 2009: 128): the holding and use of scientific information to make new questions, draw new pieces of information, make sense of the phenomena related to science, and reach conclusions related to scientific issues based on proof; also the ability to access the core of unique aspects of science by regarding it as a type of human information and investigation, being conscious about the ways that science and advanced technology determine our living situations, in material, intellectual and cultural terms, and being eager to get involved in scientific subjects, as well as having personal opinions about science as a requirement of being a contemplative citizen. In 2015, science literacy was defined by OECD (2013b: 7) as the skill to question and discuss scientific matters and people's opinions related to science, a requirement to being a meditative citizen. These regular updates to the concept of science literacy by PISA are made according to the changing conditions of society.

#### **Framing the Concept of Environmental Literacy (EL)**

In 1969, Roth (1968), as cited in Roth (1992), indicated that the concept of EL was first revealed in an academic paper. In the 1990s, however, the field of environmental education underwent a maturation period within the framework of formulating the concept of EL (McBeth and Volk, 2010). Environmental education programs are designed to raise and nurture the development of EL throughout the lifetime of the human (Subbarini, 1998). Moreover, the main aim of environmental education continues to be the development of EL, and ultimately behavioural change in terms of making informed decisions related to natural resource management (Bennett and Roth, 2015). As NAAEE informs us, EL includes dispositions, knowledge, and competencies applied for the purpose of responsible environmental behaviour (Daniš, 2013).

However, as stated earlier, there is no universally accepted definition of literacy (Keefe and Copeland, 2011), especially science literacy (DeBoer, 2000) and EL (Loubser, Swanepoel & Chacko, 2001; Morrone, Mancl & Carr, 2001). Despite the fact that the concept of EL has been in use for many years, coming up with a

comprehensive description of it continues to be challenging due to its complexity. EL is still highly valued in science education, as it has allowed for many solutions related to environmental problems in science to be found. It is because of this that so many researchers have attempted to classify EL.

Researchers have argued that EL has to accord with the five categories of environmental education concepts (awareness, knowledge, attitude, skills, and participation) in order for it to develop into positive environmental behaviours (Wisconsin Department of Public Administration, 1991). In the study by Roth (1992), six major areas of EL were proposed: environmental sensitivity, knowledge, skills, attitudes and values, personal investment and responsibility, and active involvement. Many researchers have sought to provide a working definition of EL, such as the one offered by Subbarini (1998: pp. 245), which states that EL requires individuals to be able to convey and make use of the main ecological concepts and rules, make sense, on ecological grounds, of the effect of human activities on the environment, determine and do research about environment-related matters to come up with different solutions, and assert the values related to the environment that encourage the use of natural resources in a sensible and responsible manner; or the one put out by the DC Environmental Literacy Workgroup (2012), stating “Environmental literacy is the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems”.

An examination of the literature showed that there are three levels of EL: nominal, functional and operational (Chacko, 1998). According to Chacko (1998), a person who has nominal EL has the ability to recognize many of the basic terms used in discussing the environment, a person who has functional EL has a broader range of knowledge and understanding about the nature and interaction of human social systems and other natural systems, and a person who has operational EL has progressed beyond functional literacy in both the breadth and depth of understandings and skills.

Literacy, especially EL, is not a process of indoctrination of any one agenda, but rather a building of knowledge and experiences to help persons make informed decisions (TAEE, 2013). Environmentally literate people are equipped with more than just knowledge about ecology; completely literate individuals combine knowledge with values, which leads to action (Morrone, Mancl & Carr, 2001). Moreover, environmentally literate individuals are capable of individually and collectively making informed decisions concerning the environment, are willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment, and are actively engaged in social life (NAAEE, 2011). In short, EL involves the ability to adapt to changes in environmental resources and systems, and their dynamics (Scholz, 2011).

Ultimately, studies have shown that the two general concepts of science and environmental education and science and EL are related to each other; that is, environmental education is a prerequisite for qualified science literacy (O’Hearn, 1972). In viewing this relationship as such, it is possible to see how the problems related to environmental education can be overcome (Longbrake, 1974). The influence of these interrelated and interdependent concepts should be a reflection of the impact of science education on the quality of the education.

## RESEARCH QUESTIONS

To be consistent with the PISA definition of scientific literacy, assessment items are required to be designed via the application of scientific knowledge and through the demonstration of the scientific competencies within certain contexts, such as environmental issues. Although PISA was not designed specifically to assess environmental science, by taking the questions used in the PISA science assessment, it was determined that some were related to environmental science (Erbas, Tuncer Teksöz & Tekkaya, 2012). Furthermore, while PISA assesses reading, science, and mathematics literacy every three years, EL is not directly assessed, although some of the items do fall within an environmental context. As it has been argued that not enough research on EL has been conducted using PISA data (Kaya and Elster, 2017), this study seeks to do research on EL by using PISA data from 2006 to 2015. In conducting this research, the main aim was to determine the change in the EL of German pupils from 2006 to 2015. More specifically, the research questions investigated in this study were:

- What factors influence EL?
- In what way do the EL factors (development of environmental behaviour, environmental awareness and environmental responsibility) change from 2006 and 2015?
- How does the change in the influence of students’ attitudes towards science (such as enjoyment of science, interest in science) impact EL from 2006 to 2015?
- What changes occur from 2006 to 2015 in the influence of teaching methods for lessons on EL?

## RESEARCH METHODS AND DESIGN

In this section, we present the ‘type of study’, ‘the sampling and data collection’, and the analysis of data.

### *Type of study*

For this field study, descriptive research methods were employed. The basic aim of descriptive analysis is to provide the reader with the ability to summarize and interpret the findings (Yıldırım and Simsek, 2003). Specifically, a survey format was used in the context of the method of description for this research. Surveys, which are used to determine the current situation, have the advantage of allowing more quantitative data to be

gathered (Cepni, 2007). Questions related to the environmental issues in the PISA 2015 student questionnaire were included in this study. In the context of this study, the questionnaire was used with structural equation modelling to examine the factors affecting German students' development of environmental behaviour (DEB), environmental responsibility (ER) and awareness (EA).

### Sampling and data collection

In this study, the sample population was restricted to 15-year-old German students who were attending school in either 2006 or 2015. The PISA sample selection was conducted randomly by applying the two-stage stratified sampling method (Albayrak Sarı, 2015). The study sample included 4891 pupils from 2006 and 6504 pupils from 2015, determined using PISA data from both 2006 and 2015. The data were obtained via the internet from the official PISA website (<http://www.pisa.oecd.org>). In this study, the data obtained with the participation of students from Germany involved PISA data from 2006 and 2015.

### Analyses of data

This section consists of two parts, with the first part describing how the scale was developed, and the second part explaining the analysis used in this study. The Environmental Literacy scale was developed in two stages: exploratory and confirmatory factor analysis stages. .

### Theoretical framework of scale

In PISA 2006, approximately 33 percent of the context included resources and environments (Bybee, 2008), while in PISA 2015, approximately 11% of the context included environmental issues, and the number of items were found to have decreased compared to 2006-PISA. According to PISA results, the definition of EL includes environmental awareness and environmental responsibility (Kaya and Elster, 2017). When the theoretical framework of EL is examined (Figure 1), EL includes environmental behaviours. According to the scope of EL, as shown in Figure 1, the EL scale was developed using common items related to environmental issues from both 2006 and 2015. Moreover, two of the three sub-factors, namely environmental awareness and environmental responsibility, were included in the PISA data. However, the “Development of Environmental Behaviour (DEB)”, a new factor, was added to the scale of EL. DEB is used to determine whether the students in the school are given responsibilities to improve their skills in demonstrating environmental behaviours.

Scholz (2011) argues that ‘environment’ must be redefined as a co-evolving system coupled to a human system. Thus, in line with this view, he recommends that future research should be designed on the basis of human and environment systems, and he linked trans-disciplinary and disciplined interdisciplinary to the concept of EL. In this respect, the focus points are the interaction of human systems and environmental systems, how individuals learn from feedback and can avoid rebound effects, and what information they react to or ignore. Here, EL is linked to learning, and so the question of how this literacy can be transmitted to future generations receives special attention. For this reason, in this study, the DEM factor, which is related to participations and skills, is included in the EL scale, especially considering that the academic support related to the science education provided to the students is one of the most important factors in securing EL.

According to Tbilisi Declaration for EE (UNESCO, 1977)	Science Literacy (MoNE, 2005)	Environmental Literacy (Roth, 1992)	Frameworks for developing scale
Knowledge	Key Science Concepts Nature of Science	Knowledge	Environmental Awareness*
Attitude	Attitude and Values in Science Scientific Values	Sensitivity, Attitudes and Values, Personal Investment and Responsibility	Environmental Responsibility*
Skills	Scientific and Technical Psychomotor Skills Scientific Process Skills	Skills	Development of Environmental Behavior
Participation	Science- Technology- Society –Environment Interactions	Active involvement	

\*The concepts used in the PISA have been preferred so as not to cause confusion.

**Figure 1:** Theoretical framework of environmental education (EE), Science Literacy (SL), Environmental Literacy (EL), all of which underpin the framework for the developed scale.

### Exploratory factor analysis

A scale was developed for this research. The developed scale was applied on 15-year-old students who were attending schools in Germany. The total sample of this study consisted of 9833 students who were selected using PISA 2006 Data. In the first part of developing the scale, exploratory factor analysis, conducted with the SPSS Program, was used to examine the construct validity of the scale. In the second part, confirmatory factor analysis, conducted with the AMOS Program, was used to show the relationships between variables. Prior to performing the exploratory factor analysis, in order to determine whether or not to conduct a factor analysis, the KMO (Kaiser-Meyer- Olkin) Value and Bartlett's Test of Sphericity were calculated. The KMO and Bartlett measurement results are presented in Table 1.

<b>Kaiser-Meyer-Olkin Value</b>	.82
	28905.55
<b>Bartlett's Test Value</b>	105
<b>p</b>	.00

\* p<.01

A KMO Value that is over 0.50 (KMO= 0.82, p<0.01) indicates that factor analysis sampling was appropriate. The Bartlett's Test of Sphericity result of 28905.55 (p<.01) was significant in that it showed that the measuring tool could be differentiated into factor structures.

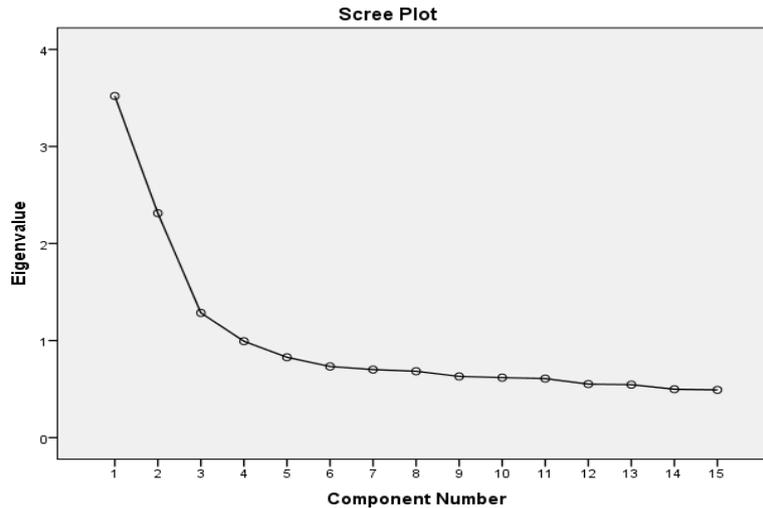
Using item-total correlation for the EL scale analysis, the reliability of test items, the t-test for the reliability of the meaningfulness of the median of the top 27% and bottom 27% groups, and the reliability of Cronbach alpha were determined. The results are shown below in Table 2.

**Table 2: Item-Total Correlation**

Item	t (Bottom 27%-top 27%) <sup>1</sup>
1	33.64***
2	36.89***
3	39.80***
4	38.34***
5	40.69***
6	34.95***
7	10.76***
8	7.48***
9	7.96***
10	11.11***
11	48.21***
12	47.58***
13	50.88***
14	49.56***
15	45.66***
<sup>1</sup> n <sub>1</sub> = n <sub>2</sub> = 2655, alpha= .78, N of Items =20, ***p < .01	

According to the initial data obtained by the exploratory factor analysis, 15 of the items (variables) included in the analysis were gathered under 3 factors and had a value greater than 1. The explanatory variance of these three factors was 47.45%. The commonalities of the 3 factors defined as related to the items should vary between 0.40 and 0.59.

According to the eigenvalue measure, the number of significant factors in the scale was determined to be 3, as clearly seen in Figure 2. While there are 3 factors in the graph with a high ascending curve, the general trend of the graph in the fourth and subsequent factors are horizontal and do not have a significant declining trend. In short, the contributions of the fourth and subsequent factors to the variance are very similar.



**Figure 2: Eigenvalue Graph**

Analysis of the scale were made on 3 factors and over 15 items (appendix 1). The analysis of converted basic item components is presented in Table 3.

**Table 3: Factor Analysis (analysis of converted basic components)**

Item	Factor Common Variance	Factor-1 Load Value	Analysis of converted basic components		
			Factor-1	Factor-2	Factor-3
3	.52	.65	<b>.70</b>	.06	.13
4	.47	.65	<b>.67</b>	.03	.13
1	.46	.62	<b>.66</b>	.04	.12
2	.45	.61	<b>.65</b>	.02	.13
6	.47	.61	<b>.65</b>	.00	.22
5	.40	.58	<b>.61</b>	.11	.11
15	.40	.52	.05	<b>.75</b>	.04
12	.51	.51	.05	<b>.71</b>	.06
11	.49	.11	.06	<b>.67</b>	.06
13	.44	.17	.10	<b>.65</b>	.07
14	.56	.22	.04	<b>.63</b>	.02
9	.59	.16	.12	.09	<b>.75</b>
10	.56	.26	.12	.00	<b>.74</b>
8	.43	.53	.21	.01	<b>.62</b>
7	.45	.50	.25	.09	<b>.61</b>
<b>Explained Variance Total 47.45 %, Factor-1: 23.47%, Factor-2: 15.42%, Factor-3: 8.57 %</b>					

Through factor analysis, an attempt was made to bring together variables that measure the same structure with a small number of factors (Buyukozturk, 2009). Item loads larger than 0.61 were chosen and included in the scale. The remaining 15 items were loaded on the 3 factors labelled Environmental Responsibility (ER), Development of Environmental Behavior (DEB), and Environmental Awareness (EA). These factors, along with the number of items attached to them are as follows (see appendix 1):

- Factor-1: Environmental Responsibility (between 1 and 6 items)
- Factor-2: Development of Environmental Behaviour (between 11 and 15 items)
- Factor-3: Environmental Knowledge (between 7 and 10 items)

In summary, although different researchers have preferred to form different EL categories, in this research, three categories (EA, ER, DEB) were established.

**Table 4: Correlation of Factors**

		<b>EL</b>	<b>ER</b>	<b>DEB</b>	<b>EA</b>
<b>EL</b>	r	1			
	p				
	N	9833			
<b>ER</b>	r	.43**	1		
	p	.00			
	N	9833	9833		
<b>DEB</b>	r	.37**	-.44**	1	
	p	.00	.00		
	N	9833	9833	9833	
<b>EA</b>	r	.73**	.114**	-.02	1
	p	.00	.00	.07	
	N	9833	9833	9833	9833

\*\* p<0.01

As can be seen in Table 1, there is a positive relationship between EL and the sub factors (p < .01).

### **Confirmatory factor analysis**

Structural validity was tested by confirmatory factor analysis, as described above. According to the initial results obtained by confirmatory factor analysis, some of the values were not within the acceptable limits. For this reason, covariance was created between the error terms of the items within each latent variable in the model. The findings are listed in Table 5. Each correction should be made on a theoretical basis (Meydan and Sesen, 2015; Karagoz, 2016). The error terms of the items in each factor were therefore identified (Karagoz, 2016) before performing the confirmatory factor analysis for a second time. The corrected confirmatory factor analysis appeared to be a good fit in general. The notions of good fit and acceptable fit are taken at different value ranges. It is possible that a model may fit the data despite having one or more fit measures that are of a bad fit (Schermelleh-Engel & Moosbrugger, 2003).

**Table 5: Fit Criteria (Schermelleh-Engel, Moosbrugger & Müller, 2003) and Model Fit Measures**

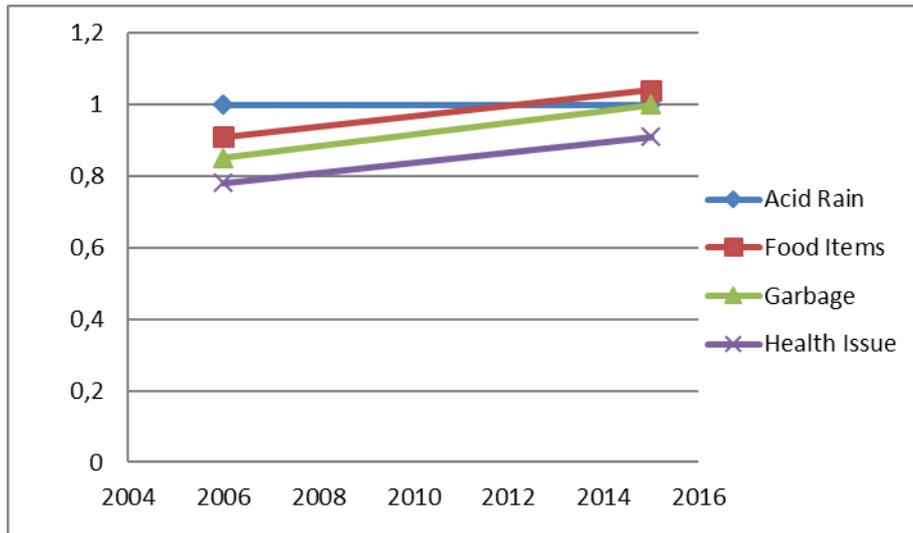
	<b>Good Fit</b>	<b>Acceptable Fit</b>	<b>Model Fit</b>
<b>c2/sd</b>	$0 \leq c^2/sd \leq 2$	$2 \leq c^2/sd \leq 3$	29.49
<b>P</b>	$0.05 \leq p \leq 1$	$0.01 \leq p \leq 0.05$	.00
<b>RMSEA</b>	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	.05
<b>NFI</b>	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$	.91
<b>TLI</b>	$0.95 \leq TLI \leq 1.00$	$0.90 \leq TLI \leq 0.95$	.88
<b>CFI</b>	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI \leq 0.97$	.91
<b>RFI</b>	$0.90 < RFI < 1.00$	$0.85 < RFI < 0.90$	.87

As shown in Table 5, the significance value was .00. Moreover, the P-values as well as most of the other values indicate that the model had a good fit.

## **FINDINGS**

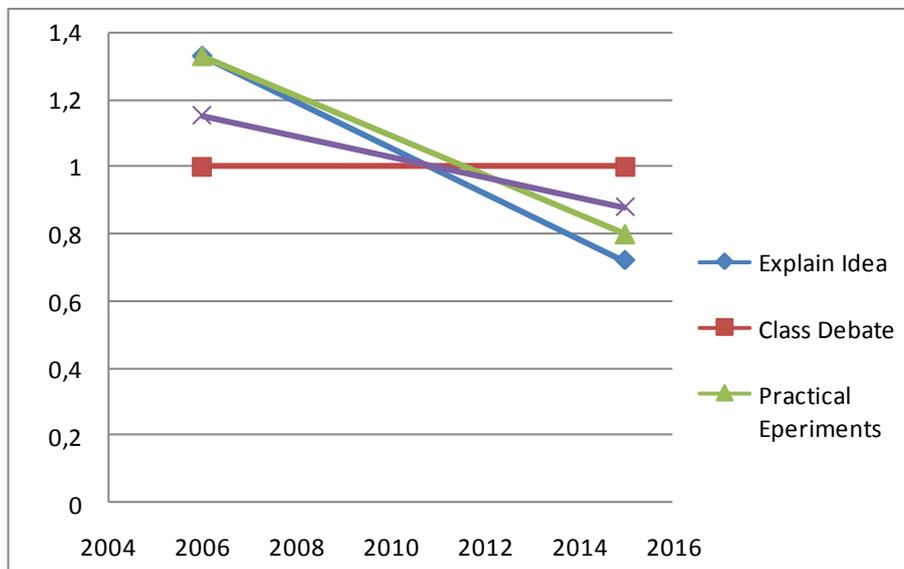
### *Factors influencing Environmental Literacy*

In this research, parametric tests (t test) were applied in evaluating the data derived from the analysis of quantitative data. ANOVA, T-test and descriptive statistics were used. The change in ER is included in Figure 3. In Figure 3 and appendix 2, it can be seen that among the factors related to the ‘environmental responsibility’ – acid rain, food items and garbage – of the German students, the factor of “acid rain”, with a coefficient of 1.00, had the highest factor value in 2006. However, in 2015 the highest factor was “food items” with a coefficient of 1.04. The factor, “health issue”, had the lowest factor value in 2006, with a coefficient of .76 and in 2015, with a coefficient of .91.



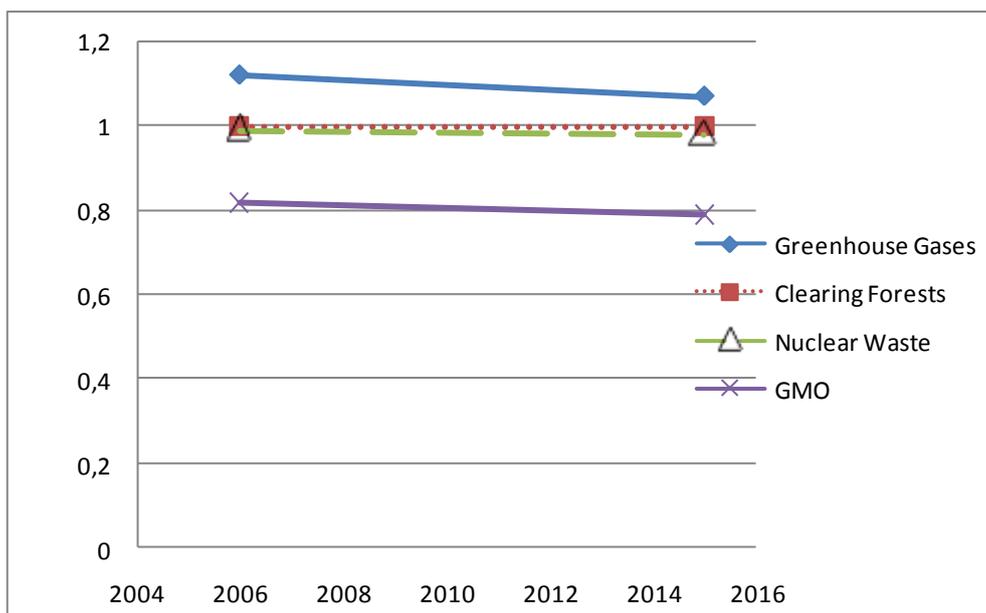
**Figure 3:** Change in ER based on PISA 2006 data and PISA 2015 data

In Figure 4 and in appendix 2, it can be seen that among the factors related to "development of environmental behaviour" (DEB) in the German students, the factors of "explain ideas" and "practical experiments" had the highest factor value, with a coefficient of 1.33, while the factor of "class debate" had the lowest factor value, with a coefficient of 1.00 in 2006. However, in 2015 the highest factor was "class debate", with a coefficient of 1.00.



**Figure 4:** Change in EDB based on PISA 2006 and PISA 2015 data

In Figure 5 and in appendix 2, it can be seen that among the factors related to the "environmental awareness" of the German students, the factor of "greenhouse gases" had the highest factor value in 2006, with a coefficient of 1.12, and in 2015, with a coefficient of 1.07. In addition, the "use of genetically modified organisms (GMO)" had the lowest factor value in both 2006 (with a coefficient of .82) and 2015 (with a coefficient of .72).



**Figure 5:** Change in EA based on PISA 2006 and PISA 2015 data

In the questionnaires, the students' views regarding environmental responsibility (ER) were obtained. The responses are shown in Table 6.

**Table 6:** Views on Environmental Responsibility (questionnaire results)

Year	Environmental Responsibility	I couldn't do this	I would struggle to do this on my own	I could do this with a bit of effort	I could do this easily
		f (%)	f (%)	f (%)	f (%)
<b>2006</b>	Health Issue	929 ( <b>20.4</b> )	2640 ( <b>57.9</b> )	796 (17.5)	193 (4.2)
<b>2015</b>		700 ( <b>20.8</b> )	1712 ( <b>51.0</b> )	631 (18.8)	316 (9.4)
<b>2006</b>	Antibiotics	375 (8.2)	1246 (27.3)	1894 ( <b>41.6</b> )	1041 ( <b>22.8</b> )
<b>2015</b>		285 (8.6)	818 (24.5)	1424 ( <b>42.7</b> )	806 ( <b>24.2</b> )
<b>2006</b>	Garbage	336 (7.4)	1391 (30.6)	2204 (48.4)	619 (13.6)
<b>2015</b>		374 (11.3)	998 (30.2)	1517 (45.9)	419 (12.7)
<b>2006</b>	Certain Species	378 (8.3)	1034 (22.7)	1978 ( <b>43.4</b> )	1165 ( <b>25.6</b> )
<b>2015</b>		273 (8.2)	745 (22.5)	1505 ( <b>45.5</b> )	788 ( <b>23.8</b> )
<b>2006</b>	Food Items	421 (9.2)	1335 (29.3)	1897 (41.7)	901 (19.8)
<b>2015</b>		398 (12.1)	983 (29.9)	1349 (41.1)	555 (16.9)
<b>2006</b>	Acid Rain	536 ( <b>11.8</b> )	1105 (24.2)	1719 (37.7)	1199 (26.3)
<b>2015</b>		556 ( <b>17.0</b> )	894 (27.3)	1201 (36.6)	626 (19.1)

As shown in Table 6, the majority of the students (63% and over) indicated that 'they can describe the role of antibiotics in the treatment of disease' and 'they can predict how changes to an environment will affect the survival of certain species' easily on their own in both 2006 and 2015. However, approximately 20 % of the German students pointed out that they could not recognize on their own the science question underlining a newspaper report on a health issue. Moreover, more than half of the students mentioned that they struggled to understand the health issue. An increase was seen in the percentage of students who stated they could not identify the better of two explanations for the formation of acid rain, from 2006 (11.8%) to 2015 (17%).

In the questionnaires, the students' views regarding academic development support were obtained. The responses are shown in Table 7.

**Table 7: Views on Development of Environmental Behaviour (questionnaire results)**

Year	Development of Environmental Behaviour	Never or hardly ever f(%)	In some lessons f(%)	In most lessons f(%)	In all lessons f(%)
2006	Explain Ideas	1004 (22.2)	1683 (37.2)	1394 (30.8)	441 (9.8)
2015		1394 (30.3)	1843 (40.0)	1024 (22.2)	345 (7.5)
2006	Practical Experiments	1135 (25.1)	2406 (53.3)	819 (18.1)	157 (3.5)
2015		1254 (27.4)	2333 (50.9)	808 (17.6)	186 (4.1)
2006	Draw Conclusion	378 (8.4)	1212 (27.0)	1933 (43.1)	958 (21.4)
2015		484 (11.0)	1315 (29.8)	1775 (40.2)	842 (19.1)
2006	Design Own Experiments	2776 (62.0)	1106 (24.7)	454 (10.1)	145 (3.2)
2015		2837 (64.0)	1026 (23.1)	402 (9.1)	168 (3.8)
2006	Class Debate	705 (15.6)	2038 (45.1)	1254 (27.7)	526 (11.6)
2015		972 (22.0)	1753 (39.6)	1286 (29.1)	414 (9.4)

As shown in Table 7, in 2006, 62% of the students reported that in science lessons they were never or hardly ever allowed to design their own experiments, and 25 % mentioned that they never or hardly ever spent time in the laboratory doing practical experiments as part of the science lessons. Furthermore, 22 % indicated that they never or hardly ever were given opportunities in the science lessons to explain their ideas. However, in 2015, 64% of the students reported that they never or hardly ever were allowed to design their own experiments in science lesson, 30% reported that they never or hardly ever were given opportunities in the science lessons to explain their ideas, and finally, 27% mentioned that never or hardly ever spent time in the laboratory doing practical experiments as part of the science lessons.

In the questionnaires, the students' views regarding environmental awareness were obtained. The responses are shown in Table 8.

**Table 8: Views on Environmental Awareness (questionnaire results)**

Year	Environmental Issue	I have never heard f(%)	I have heard about this but I would not be able to explain what it is really about f(%)	I know something about this and could explain the general issue f(%)	I am familiar with this and I would be able to explain this well f(%)
2006	The increase of greenhouse gases	465 (10.2)	1376 (30.1)	1823 (39.9)	901 (19.7)
2015		464 (11.1)	949 (22.8)	1686 (40.5)	1066 (25.6)
2006	The use of GMO	817 (17.9)	2005 (44.0)	1410 (30.9)	329 (7.2)
2015		968 (23.4)	1683 (40.7)	1114 (27.0)	366 (8.9)
2006	Nuclear waste	311 (6.8)	1457 (32.0)	1958 (43.0)	832 (18.3)
2015		317 (7.7)	1111 (27.0)	1804 (43.8)	888 (21.6)
2006	The consequences of clearing forests	248 (5.4)	676 (14.8)	1716 (37.6)	1925 (42.2)
2015		230 (5.6)	620 (15.1)	1753 (42.7)	1501 (36.6)

As shown in Table 8, in 2006 and 2015, the majority of the German students (80%) pointed out that they had information about the consequences of clearing forests for other land use. More than 60% of the German students indicated in 2006 and 2015 that they had knowledge about nuclear waste. On the other hand, in 2006 and 2015, more than 60% of the German students believed that they did not have sufficient knowledge about the use of GMO.

Table 9 presents the mean of the German students' EL (environmental literacy) and sub-factors.

**Table 9:** Mean of German students' EL and sub-factors

	2006		2015	
	Mean	Participant	Mean	Participant
<b>EL</b>	2.55	4891	2.58	4942
<b>ER</b>	2.20	4891	2.28	4942
<b>EDB</b>	2.72	4891	2.73	4942
<b>EA</b>	2.72	4891	2.73	4942

As shown in Table 9, the means of EL were 2.55 in 2006 and 2.58 in 2015. Therefore, there was an increase in the mean of the EL from 2006 to 2015.

*Environmental Literacy and Interest in Science*

The results of ANOVA, as related to EL and having fun when learning science, were obtained. The responses are shown in Table 10.

**Table 10:** The results of ANOVA, as related to EL and having fun when learning science

	View	N	$\bar{X}$	Source of Variance	Sd	Mean Square	F	p	Sig dif
<b>2006</b>	Strongly agree(a)	1145	1.87	Between groups	3	1.90	24.82	.00	a-b, a-c, a-d
	Agree(b)	1850	2.15	With-in group	4702	.08			
	Disagree(c)	1273	2.41	Total	4705				
	Strongly disagree(d)	438	2.73						
<b>2015</b>	Strongly agree(a)	899	2.57	Between groups	3	.176	1.93	.12	-
	Agree(b)	1499	2.58	With-in group	4058	.091			
	Disagree(c)	1044	2.60	Total	4061				
	Strongly disagree(d)	620	2.57						

The results of the analysis show that there was a meaningful difference in terms of EL averages and having fun when learning science topics in 2006 ( $F_{2006}(3, 4702) = 24.82, p < .01$ ), whereas in 2015 there was no meaningful difference ( $F_{2015}(3, 4058) = 1.93, p > .01$ ). According to the results of the Scheffe test, the EL of the students who strongly disagreed with the fun of learning science (d) ( $X = 2.73$ ) was stronger than that of the other students in 2006. Moreover, while there was a significant increase from 2006 to 2015 in the average of the students who strongly agreed with the fun of learning science ( $X = 1.87$ ) ( $X = 2.57$ ), there was a decrease in the average of the students who strongly disagreed with the fun of learning science ( $X_{2006} = 2.73; X_{2015} = 2.57$ ).

Table 11 shows the results of ANOVA as related to EL and the interest in learning about science.

**Table 11:** The results of ANOVA as related to EL and the interest in learning about science

	View	N	$\bar{x}$	Source of Variance	sd	Mean Square	F	P	Sig Dif
2006	Strongly agree(a)	1015	2.51	Between groups	3	2.45	32.03	.00	a-c, a-d
	Agree(b)	1799	2.53	With-in group	4699	.08			
	Disagree(c)	1331	2.57	Total	4702				
	Strongly disagree(d)	558	2.64						
2015	Strongly agree(a)	794	2.56	Between groups	3	.379	4.13	.006	-
	Agree(b)	1492	2.57	With-in group	4023	.092			
	Disagree(c)	1032	2.60	Total	4026				
	Strongly disagree(d)	709	2.60						

The results of the analysis show that there was a meaningful difference in terms of EL averages and interest in learning about science between 2006 and 2015 ( $F_{2006} (3.4699) = 32.03$ ,  $F_{2015} (3.4023) = 4.13$ ,  $p < .01$ ). According to the results of the Scheffe test, the EL of the students who strongly disagreed with interest in learning about science was stronger than that of the other students in 2006 ( $X_{2006} = 2.64$ ) and 2015 ( $X_{2015} = 2.60$ ). However, by 2015, the averages of those who strongly disagreed with the interest in learning science decreased, while the averages of those who strongly agreed with the interest increased.

#### *Environmental Literacy and Reading Science*

The results of ANOVA, as related to EL and like reading science, were obtained. The responses are shown in Table 12.

**Table 12:** The results of ANOVA, as related to EL and like reading science

	View	N	$\bar{x}$	Source of Variance	sd	Mean Square	F	p	Sig Dif
2006	Strongly agree(a)	1421	2.51	Between groups	3	2.34	30.52	.00	a-b, a-c, a-d
	Agree(b)	585	2.52	With-in group	4704	.08			
	Disagree(c)	1921	2.55	Total	4707				
	Strongly disagree(d)	781	2.62						
2015	Strongly agree(a)	518	2.55	Between groups	3	.787	8.67	.00	d-a, d-b, d-c
	Agree(b)	1128	2.57	With-in group	4031	.09			
	Disagree(c)	1453	2.58	Total	4034				
	Strongly disagree(d)	936	2.62						

The results of the analysis show that there was a meaningful difference in terms of EL averages and like reading science between 2006 and 2015 ( $F_{2006} (3.4704) = 30.52$ ,  $F_{2015} (3.4031) = 8.67$ ,  $p < .01$ ). According to the results of the Scheffe test, the EL of the students who strongly disagreed with like reading science was stronger than the EL of the other students in 2006 ( $X_{2006} = 2.62$ ) and 2015 ( $X_{2015} = 2.62$ ). However, by 2015, the averages of those who strongly disagreed with like reading science stayed at the same value, while the averages of those who strongly agreed with like reading science increased.

*Environmental Literacy and Teaching Methods*

The results of ANOVA, as related to EL and teacher's explanation about how a school science idea can be applied were obtained. The responses are shown in Table 13.

**Table 13:** The results of ANOVA, as related to EL and teacher's explanation about how idea can be applied

	View	N	$\bar{X}$	Source of variance	Sd	Mean Square	F	P	Sig Dif
<b>2006</b>	All lessons (a)	792	2.44	Between groups	3	8.67	116.25	.00	a-b, a-c, a-d
	Most Lessons(b)	1797	2.52	With-in group	4483	.08			
	Some lessons (c)	1463	2.60	Total	4486				
	Hardly ever (d)	435	2.71						
<b>2015</b>	All lessons (a)	749	2.43	Between groups	3	12.73	160.71	.00	a-b, a-c, a-d
	Most Lessons(b)	1720	2.54	With-in group	4387	.08			
	Some lessons (c)	1471	2.65	Total	4390				
	Hardly ever (d)	451	2.74						

The results of the analysis show that there was a meaningful difference in terms of EL averages and teacher's explanation about how idea can be applied between 2006 and 2015 ( $F_{2006} (3.4483) = 116.25$ ,  $F_{2015} (3.4387) = 160.71$ ,  $p < .01$ ). According to the results of the Scheffe test, when students were never or hardly ever informed by the teachers in the science lessons (d) ( $X_{2006} = 2.71$ ;  $X_{2015} = 2.74$ ), the EL average of the students was stronger than that of the other students. From 2006 to 2015, the literacy average increased when the teacher never or hardly ever offered explanations during their science lessons.

The results of ANOVA, as related to EL and teacher's provision of an explanation of the relation of science concepts to our life, were obtained. The responses are shown in Table 13.

**Table 13:** The results of ANOVA, as related to EL and teacher's provision of an explanation of relation of science concepts to our life

	View	N	$\bar{X}$	Source of Variance	Sd	Mean Square	F	p	Sig Dif
<b>2006</b>	All lessons (a)	417	2.40	Between groups	3	8.81	118.49	.00	a-b, a-c, a-d
	Most Lessons(b)	1296	2.49	With-in group	4456	.074			
	Some lessons (c)	1972	2.57	Total	4459				
	Hardly ever (d)	775	2.67						
<b>2015</b>	All lessons (a)	457	2.39	Between groups	3	12.10	153.16	.00	a-b, a-c, a-d
	Most Lessons(b)	1175	2.52	With-in group	4380	.08			
	Some lessons (c)	1745	2.61	Total	4383				
	Hardly ever (d)	1007	2.69						

The results of the analysis show that there was a meaningful difference in terms of EL averages and teacher explaining the relation of science concepts to our life between 2006 and 2015,  $F_{2006} (3.4456) = 118.49$ ,  $F_{2015} (3.4380) = 153.16$ ,  $p < .01$ . According to the results of the Scheffe test, when students are never or hardly ever informed about the relevance of science concepts to our lives by teachers in the science lessons (d) ( $X_{2006} = 2.67$ ;  $X_{2015} = 2.69$ ), the EL average of the students was stronger than that of the other students. The EL average was found to increase when the teacher never or hardly ever provided explanations about the relevance of science concepts to our lives during their science lessons.

## DISCUSSION

According to 2006 and 2015 data, the students constituting the study had more knowledge about greenhouse gases than about other items. More than half of the German students had knowledge on the greenhouse gases, the consequences of clearing forests for other land use, and nuclear waste, in 2006 and 2015. In line with this finding, in the research conducted by Yurttas and Sulun (2010), second-grade primary school students specified global warming, ozone layer depletion and acid rain to be the biggest environmental problems in the world. In another study which reported similar results, elementary students were shown to be mostly aware of the environmental problems stemming from environmental contamination, air pollution and waste materials (Demirbas and Pektas, 2011). To continue, in a study by Negev et al. (2010), it was reported that most of the twelfth-grade student participants indicated solid waste, or air pollution, to be major environmental issues. In general, studies have shown that students view air pollution, global warning and greenhouse gases as the most important environmental issues. People tend to have more knowledge about matters that have a concrete impact on their lives. Moreover, social media has helped to draw attention to global problems, including of course those related to environmental issues. The study by Incekara and Tuna (1991) give support to the role that social media plays in spreading environmental knowledge, as they reported that secondary students tended to have sufficient information on issues such as air pollution, desertification and climate change. Similar results have been observed in research conducted on the environmental awareness of teacher candidates. In a study conducted by Artun, Uzunoç and Akbas (2009), teacher candidates pointed to global warming and air pollution as important environmental problems. Diken and Sert Cibik (2007) suggested that teacher candidates have cognitive and sensitive dimensions of environmental consciousness. However, these dimensions are not sufficient in terms of reflecting the environmental knowledge they have onto their behaviours (Diken and Sert Cibik, 2007; Kaya et al., 2009). This could be attributed to their lack of environmental awareness (Güven and Aydoğdu, 2012; Ercengiz, et al., 2014). According to the study by Kahyaoglu et al. (2008) environmental behaviour is influenced environmental knowledge and awareness. Therefore, teacher candidates, especially science teachers, should be provided the necessary support to increase their level of environmental awareness, and they should be encouraged to translate their environmental awareness into environmentally responsible behaviour. For the sake of securing our future, it is crucial that students be taught a high level of environmental awareness. The German students in the present study had the lowest awareness of “use of GMO” in 2006 and 2015. However, interestingly, more students in 2015 seemed to have never heard of this concept. When the opinions of the students were taken to determine their knowledge level on this subject, the German students reported that they did not have sufficient knowledge about GMOs. Similarly, in a separate study, it was found from the opinions taken of students that they had insufficient information and misleading concepts about greenhouse gases (Bahar and Aydın, 2002). These results were in line with those from Darcin et al. (1991), who reported that the levels of knowledge elementary students had on the greenhouse effect were too low. In another study, it was indicated that biology teacher candidates had incorrect ideas about the greenhouse effect (Selvi and Yildiz, 2009). Regarding the subject of GMO, Gurbuzoglu Yalmanci (2016) reported that both high school students and teacher candidates had some misunderstandings about GMO. University students too have been shown to not have enough knowledge about GMO (Temelli and Kurt, 2011). In a study conducted by Cankaya and Filik Iscen (2015), however, it was stated that science teacher candidates had sufficient information about the meaning of the concept of GMO, although, they did have incorrect knowledge about the production of GM crops, the use of GMO in their country, and their effects.

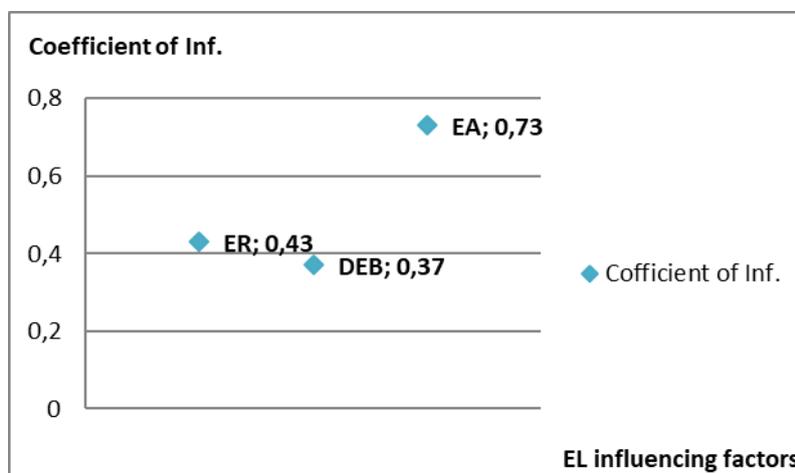
Despite the increase in the health coefficient from 2006 to 2015, it was nonetheless seen that health issues are still not given importance (appendix 2). In support of this finding, approximately 20% of the German students, in both 2006 and 2015, revealed that they were unable to recognize a health problem. Moreover, more than half of the students mentioned that they struggled to understand the health issue. Research shows that overuse of antibiotics poses a threat, not only to human health but also to the environment (Yesil Aski, 2013).

Individuals need to be taught greater awareness about health issues in order to create a healthier public in the future. In addition to the lack of understanding of health issues, it was also found that there was an increase in the percentage of the students who indicated that they were unable to explain acid rain. Therefore, acid rain and health issues should be emphasized in future science curricula.

While in 2006 the students stated that they were not able to express themselves enough in science classes, in 2015, the students mentioned class discussions and their expectations regarding the planning of science lessons so as to allow for the discussion of different opinions. On the other hand, in both 2006 and 2015, approximately 25% of the students reported that they never or hardly ever spent time in the laboratory doing practical experiments as part of their science lessons. Furthermore, more than half of the students noted that they never or hardly ever were allowed to design their own experiments in the science lessons. It can be seen from the students expressed expectations that they would like their science lessons to be more student-centred. In other words, they want to actively participate in the process by taking responsibility in lessons. When the teacher never or hardly ever provides explanations showing the relevance of science concepts to our lives or/and explanations about how a school science idea can be applied during a science lesson, the average rate of EL increases. In fact, it can be

argued that teacher-centred education has a negative effect on EL. Therefore, student-centred lessons should be applied to provide more academic support for the improvement of EL skills. A student-centred approach also provides opportunities for students to increase their interest and attitude towards science. If these are increased, the students will have a chance to improve their literacy. Interest and positive attitude towards science, academic development support and EL are concepts that affect each other.

Last but not least, in this study, there was a positive relationship determined between EL and ER and ADS and EA (Figure 6). Otherwise stated, when EA, ER and DEB are positively supported, this will provide a positive contribution to the students' EL development.



**Figure 6:** Environmental Literacy (EL) influencing the factors of Environmental Awareness (EA), Environmental Responsibility (ER), and Development of Environmental Behaviour (DEB).

## IMPLICATIONS

First, when PISA 2006 and 2015 data were compared, it was initially anticipated that the increase in the average of EL would positively impact environmental education and thereby, in turn, contribute positively to EL between these years.

*What are the challenges and solutions for school education?*

According to the results gathered in the study, it might be said that the subjects of genetically modified organisms and health issues should be more comprehensively taught as part of the science curricula in Germany. Teachers should allow students to access new information instead of simply sharing information with students. The students' interest and attitudes towards science should be improved, and students should be encouraged to read science books.

Students should be informed about the effect of these on the environment, and in social terms, individuals should have raised awareness of these issues. Furthermore, teachers especially science and biology teachers, should be informed about these issues through in-service training.

In addition, science teachers should design classroom environments in which

- students can express their thoughts,
- students can engage in class discussions, and
- students have access to new knowledge during environmental education.

Ultimately, it is important that teachers are aware of the changing roles of environmental education, that they design student-centred education and/or that they facilitate inquiry-based learning in the classroom environment. Moreover, it is important that improvements be made to secure the professional development and science process skills of the students. Lastly, the importance, scope and competencies of EL should be determined more clearly to ensure a higher quality of science education.

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**Appendix 1: Items on the Scale**

Factor Name	Code	Items
<b>Development of Environmental Behavior</b>	ST098Q01TA	Students are given opportunities to explain their ideas.
	ST098Q02TA	Students spend time in the laboratory doing practical experiments.
	ST098Q05TA	Students are asked to draw conclusions from an experiment they have conducted.
	ST098Q07TA	Students are allowed to design their own experiments.
	ST098Q08NA	There is a class debate about investigations.
<b>Environmental Awareness</b>	ST092Q01TA	How informed are you about this environmental issue? The increase of greenhouse gases in the atmosphere
	ST092Q02TA	How informed are you about this environmental issue? The use of genetically modified organisms (<GMO>)
	ST092Q04TA	How informed are you about this environmental issue? Nuclear waste
	ST092Q05TA	How informed are you about this environmental issue? The consequences of clearing forests\other land use
<b>Environmental Responsibility</b>	ST129Q01TA	Recognise the science question that underlies a newspaper report on a health issue.
	ST129Q03TA	Describe the role of antibiotics in the treatment of disease.
	ST129Q04TA	Identify the science question associated with the disposal of garbage.
	ST129Q05TA	Predict how changes to an environment will affect the survival of certain species.
	ST129Q06TA	Interpret the scientific information provided on the labelling of food items.
	ST129Q08TA	Identify the better of two explanations for the formation of acid rain.

**Appendix 2: Structural Equation Modeling of Environmental Literacy (Appendix 1)**

Sub-Factor	PISA	The First Important Item	Coeff	The Second Important Item	Coeff	The Third Important Item	Coeff.	The Last Item	Coeff.
ER	2006	Acid Rain	1,00	Food Items	,91	Certain Species	,88	Health Issue	,78
	2015	Food Items	1,04	Garbage	1,00	Acid Rain	1,00	Health Issue	,91
DEB	2006	Explain Ideas	1,33	Practical Experiments	1,33	Design Own Experiments	1,19	Class Debate	1,00
	2015	Class Debate	1,00	Draw Conclusion	,88	Practical Experiments	,80	Explain Ideas	,72
EA	2006	Greenhouse Gases	1,12	Clearing Forests	1,00	Nuclear Waste	,99	GMO	,82
	2015	Greenhouse Gases	1,07	Clearing Forests	1,00	Nuclear Waste	,98	GMO	,79

# Changing Hong Kong Students' National Identity: Do Mainland Exchange Programmes Matter?

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## ABSTRACT

The purpose of this study is to explore the possible impact of short-term Mainland exchange programmes on the Hong Kong youths' national identity. A study using both quantitative and qualitative methods was conducted in 2016/17 to investigate the students' national identity. There were over 600 secondary school students completed a survey and subsequent focus group interviews were conducted to examine whether there was any difference in their national identity after they returned from the Mainland exchange programmes. The results show that students had diverse perceptions of national identity and various dimensions of changes on national identity after participating in Mainland activities. This paper provides insights for schools to enhance meaningful Mainland exchange activities and inform policy makers' ways of formulating effective strategies for promoting such activities.

**Keywords:** Hong Kong youth, national identity, mainland exchange programme, study tours, ethnic identity

## INTRODUCTION

This concept of "national identity" is referred to multiple meanings involving territory and ethnicity (Kearney, 1997). It is complex with little consensus on its theoretical underpinnings (Carey, 2002). It comprises a number of interrelated components including ethnic, cultural, territorial, economic and legal-political (Smith, 1991). The components signify bonds of solidarity among members of communities united by shared memories, myths and traditions. This may or may not find expression in states of their own, but are entirely different from the purely legal and bureaucratic ties of the state. Joireman (2003) argues that national identity develops when an ethnic group adopts a common political identity while their ethnicity is not limited to cultural or social aspects. Studying students' national identity is important because it is an expression of a way of life. It presents what people think, what people feel, how people behave, and the pattern of all social relationships (Burr, 2003). Therefore, national identity has become a vital focus promoted by the government of Hong Kong Special Administrative Region (HKSAR) since the resumption of Chinese sovereignty in 1997.

It is expected that student participation in exchange programmes and study tours provides the possibility of new formulations of national identity. Hence, the HKSAR government has been actively expanding the funding and numbers of Mainland exchange programmes since 2000. Feasibility of these programmes to enhance our youths' understanding of Chineseness was explored to strengthen their national identity (HKSAR, 2008). Both primary and secondary schools have been sponsored or subsidized with the costs of Mainland exchange activities through various grants and channels from government or other sponsors. Hong Kong students who participated in these Mainland exchange programmes have been significantly increased. Despite the programmes and participation, a poll conducted by the University of Hong Kong's (2017) Public Opinion Programme consistently shows that the young people, aged between 18 and 29, have the least and decreasing recognition of their Chinese identity. Considering this contrasting findings, influences of these activities on students' national identity is understudied. This study aims to examine students' perceptions of their national identity and evaluate whether or not the Mainland exchange programmes cum study tours have influences on students' perceptions of national identity.

## YOUTHS' NATIONAL IDENTITY IN HONG KONG

Historically, Hong Kong people's sense of Chinese identity is more cultural and ethnic than political (Tse, 2007). Many Hong Kong people distance themselves from the mainland socially and politically, but show a cultural attachment to mainland China (Tse, 2014). Similar to Quebeckers, as a 'distinct society' of Canada, dual identities – regional and national, has been emerged within a single nation-state (Guibernau, 2006) and pan-Canadian is promoted in the society (Fletcher, 1998). According to the poll by the University of Hong Kong's (2015) Public Opinion Programme, only an average of 20.4% of Hong Kong people saw themselves as 'Chinese', while 13.6% regarded themselves as "Chinese in Hong Kong" during 2010 to 2015. "National Identity" has become one of the seven key learning goals stressed by the HKSAR government in primary and secondary education since the return of sovereignty to China (Education Bureau, 2015). The HKSAR government has launched many military summer camps and training programmes for secondary students to strengthen the political national identity. Meanwhile, it aims at cultivating a sense of cultural national identity through understanding elements of Chinese history and culture through formal and informal school curriculum (Tse, 2014).

### *POSSIBLE INFLUENCES OF EXCHANGE PROGRAMMES ON NATIONAL IDENTITY*

Past research has evidenced that students' participation in exchange programmes and study tours could lead to outcomes such as personal development, increased global mindedness, cultural understanding and enhanced national identity (Dolby, 2007; Cheng, 2011). These exchange programmes often provide the possibility of new formulations of national identity (Dolby, 2004). Some Hong Kong studies also show that students would readjust their sense of national identity with the change in their frame of reference when studying abroad (Cheng, 2010; Lo & Merryfield, 2008; Wong, 2012). It is also found that Hong Kong students' travel experiences had influences on their attitudes and views of the nation in Fairbrother's (2003) study. Many existing short-term Mainland exchange programmes and activities for secondary students, for example, the "Funding Scheme for Youth Exchange in the Mainland" aims at enhancing Hong Kong youth's awareness and understanding of their home country, fostering exchange with the Mainland people, and strengthening their sense of national identity through sponsoring community organisations to organise exchange tours to the Mainland (Commission on Youth, 2015). Yet, there is relatively little research on the perceptions of national identity and any possible changing after secondary students' participation in these short-term Mainland exchange programmes or study tours. To fill this gap, it specifically aims to address the following research questions.

1. What are the Hong Kong secondary students' perceptions of their national identity?
2. Is there any change in students' national identity after participation of Mainland exchange programmes or study tours?

### **THE STUDY**

Mixed methods approach were adopted to understand secondary students' perceptions of their national identity, evaluate how various types of Mainland exchange programmes and study tours may have influences on their national identity, and identify what factors attribute to their change in national identity. Mixed methods, including questionnaire survey and focus group interviews were employed to collect their first-hand perspectives of the issues. To examine whether there was any difference in their national identity after they returned from the Mainland exchange programmes, there were 7 secondary schools with over 600 students completed the survey and 180 of those students had participated in those subsequent focus group interviews. The interviewed students went to various mainland exchange programme or study tours in different provinces in China with duration from one day to 10 days. These participants were ethnic Chinese studying from Form 1 to Form 6, which is equivalent to Grade 7 to Grade 12 in the American education system. To explore in greater depth the influences of the students' national identity, semi-structured focus group interviews were conducted after the students return from the Mainland exchange programmes or study tours. Each group consist of five to seven students, and each interview lasted about half an hour. The interview questions include: What do you think about your national identity? Is there any difference in your feelings about being "Chinese" after participations of the Mainland exchange programmes? If so, what are the reasons for this change? Thematic analysis of the transcripts was conducted as a tentative set of coding themes (Strauss & Corbin, 1998) to classify students' perceptions of their national identity and to categorize the changes. Then, constant comparisons were conducted (Yin, 2014). In so doing, we could identify the patterns and the second round of analysis led to further examination of the themes of various patterns. To examine the in-depth meanings of the students' responses, this article focuses on reporting the qualitative findings of the study.

### **FINDINGS**

#### ***DIVERSE PERCEPTIONS OF NATIONAL IDENTITY***

Students' perceptions of national identity are diverse. Some of them declared that they were proud of being Chinese, some regarded that they were not feeling proud of being Chinese, others emphasised that Hong Konger is not Chinese.

#### ***PROUD OF BEING CHINESE***

On the one hand, some students had very strong Chinese national identity and felt being proud of it naturally, "*I'm a Chinese. That's why I'm very proud of being a Chinese*" (School 1, Gp 3). Among them, some reasoned their Chinese identity as "*Hong Kong belongs to China. Therefore, I'm also a Chinese*" (School 2, Gp 5).

#### ***NOT FEELING PROUD OF BEING CHINESE***

On the other hand, some students did not feel proud of being Chinese although they did not deny their Chinese identity. One student stated that, "*No matter what, I'm definitely Chinese. This won't change, but I don't feel proud of it.*" (School 3, Gp 4). This student seemed to be compelled to be Chinese. Another student stressed that, "*I tend not to mention my Chinese identity because people from other countries always have negative images on China*" (School 1, Gp 2). It indicates that the student admitted as a Chinese, yet he was reluctant to reveal this identity in front of others.

#### **REGARDING HONG KONGER IS NOT CHINESE**

Another type of students only admit their Hong Konger's identity, but denied to be Chinese. "I only know that I'm a Hong Konger, but not a Chinese." (School 5, Gp 4) This student reasoned her choice as Hong Kongers because of the independent legal system of Hong Kong, "I am a Hong Konger since Hong Kong is not completely under the rule of law of China yet" (School 3, Gp 1). Some students identified themselves as Hong Konger accounted for the differences in social values between Hong Kongers and mainland Chinese, "the values of Hong Kongers and Chinese are very different. I am definitely inclined to be a Hong Konger than to be a Chinese" (School 2, Gp 2).

#### **VARIOUS DIMENSIONS OF CHANGES ON NATIONAL IDENTITY AFTER PARTICIPATING IN MAINLAND ACTIVITIES**

Students' perceptions of national identity changed at various dimensions and levels after participating in Mainland exchange activities or study tours. Their changes included "increased pride of being Chinese", "denial of being Chinese" and "no change on national identity but increased interest in learning more about China".

#### **INCREASED PRIDE OF BEING CHINESE**

Many students felt prouder of the long history and culture of China after participating in Mainland activities. A student who went to Guangdong province reflected that, "I have learnt that China was the first country that made porcelain after visiting the museum. I feel so proud of being Chinese" (School 4, Gp 1). With the educational activities, some students increased their pride of being Chinese after they reflected what they had discovered during the trip. One group shared their reflected that:

*...[B]efore we went to the trip, our teacher said that we, the Chinese, are very smart. We saw a lot of different exhibitions. Those Chinese crafts were not only exquisite, but made with high technology. For example, the dragon boats we saw were constructed by merely fitting pieces of wood together. It was perfectly made without any leak. We have also learnt many excellent Chinese woodworking skills from the exhibitions. I am so proud of our great history after we visited the museums from many provinces and I am convinced that Chinese are very smart. (School 1, Gp 3)*

Another group of students revealed were impressed that "Chinese is tough. I saw how Chinese had pulled through during the Second World War at the 9.18 Historical Museum in Shenyang. I feel particularly proud of this Chinese character" (School 6, Gp 2).

#### **DENIAL OF BEING CHINESE**

Some students had already had negative image of Mainland Chinese before they participated in mainland exchange activities. "I don't want to be called Chinese since I have seen so many bad images of Chinese people." (School 3, Gp 3). Another student commented that, "Chinese are obstreperous." (School 1, Gp 3). Their mainland exchange experiences merely further confirmed these negative views about being Chinese. "Mainland Chinese and do not follow the rules. For example, I saw some people smoking in non-smoking areas again during this trip." (School 5, Gp 2). Students in one schools recalled that "we had really bad experience during the trip. A lot of people occupied our paid seats by force on the express train. They're not willing to move or leave even we asked them politely. So, we had to stand on the train for the whole time. They eventually left because the teacher urged them to. In China, this is not an unusual occasion" (School 7).

#### **NO CHANGE ON NATIONAL IDENTITY BUT INCREASED INTEREST IN LEARNING MORE ABOUT CHINA**

Although many students had no change on their national identity, the most benefit of the mainland exchange programmes that many students learnt was increasing their interest in learning about China. "After participating in the exchange programme, I wanted to learn more about Chinese traditional culture, but my national identity was not enhanced" (School 1, Gp 3). One group of students not only limited their interest in Chinese culture, but also extended their interest in China's economic development: "we are excited not only learning about different cultures in China, but also the economic development in current China as the economy of China has already become the second largest in the world" (School 7, Gp 2).

#### **DISCUSSION AND CONCLUSIONS**

This study has examined Hong Kong secondary students' perceptions of their national identity and if there is any change in students' national identity after participation of Mainland exchange programmes or study tours. On the one hand, the results show that students had diverse perceptions of national identity including "proud of being Chinese", "not feeling proud of being Chinese" and "regarding Hong Konger is not Chinese". On the other hand, the findings illustrate that students had various dimensions of changes on national identity after participating in

Mainland activities, “some increased pride of being Chinese”, “some denied of Chinese identity”, while some had “no change on national identity but increased interest in learning more about China”. Generally, the students thought that the exchange activities had helped them understand the culture of China and look forward to have more similar exchange activities. One student concluded that, “*I hope there will be more activities like these in future*” (School 5, Gp 2). This part of the findings can enhance our understanding of various aspects of the students’ national identity and their influences on their development. It aims to inform policy makers how to formulate effective strategies for promoting national identity through future Mainland exchange activities. In addition, it can provide significant feedback for secondary schools to organize meaningful Mainland exchange activities or study tours. Ultimately, it may enhance Hong Kong youths’ national identity.

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## Children's Ethical Thinking: The "Melarete" Project

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### ABSTRACT

MelArete is an educative and research project promoted by the Center of Educational and Didactic Research of the University of Verona in Italy. The project is aimed at educating children to virtue ethics and exploring their ethical thinking. The theoretical background is grounded in the Socratic and Aristotelian ethical visions. Important references are also found in the philosophy of care and in Ricoeur's definition of ethics. The project involves children attending kindergarten (5-6 y.o.) and primary school (9-10 y.o.). The experience is aimed at encouraging children to reflect about the concepts of good and care, about the general idea of virtue and about some specific virtues, such as courage, generosity, respect and justice. The activities designed to reach these educative aims and collect data for the research are the following: Socratic conversations, stories, vignettes, games. Another important activity is the diary of virtues, a journal where children reflect on their ethical experience. The qualitative data analysis is still in progress. However, we can already present some specific examples that show the richness of children's ethical thinking.

### INTRODUCTION

Authentic educational research in schools develops new educative experiences and investigates their effectiveness to foster the flourishing of children. On the basis of this presupposition, that concerns the politics of research, the Center of Educational and Didactic Research at the University of Verona, Italy, proposed MelArete, an educative and research project designed to promote and study activities aimed at encouraging the development of children's ethical thinking (Mortari and Mazzoni, 2014). During 2016-2017, the project involved children attending kindergarten (5-6 years old) and primary school (9-10 years old). In this paper, we present MelArete by highlighting the theoretical background and the epistemological framework in which it is rooted. We describe the general structure of the educative path we proposed for the children by clarifying the educative and heuristic valences of the activities we organised and the instruments we used. In order to demonstrate the effectiveness of the MelArete project to promote children's ethical thinking, we present data that show the richness of the children's reflections. Furthermore, we quote some of the teachers we interviewed who highlighted in their opinion the strong points of the project.

### THEORETICAL BACKGROUND

In order to present the theoretical background, it is appropriate to start with the title of the project. The word MelArete originates from the union of the Greek terms *meléte* (which means care) and *areté* (which means virtue); the ethics of care and the ethics of virtue are the fundamental theoretical references of the project.

First, it is necessary to highlight that we define MelArete as a project for ethical education because we embrace the definition of ethics given by Ricoeur (1992), who describes it as 'aiming at a good life lived with and for others in just institutions' (p. 172). Additionally, we agree with Ricoeur (1990) by maintaining that the concept of aiming is too generic and it should be substituted with the concept of care, so that ethics becomes a discourse that deals with the care for oneself, for others and for institutions. Starting from this vision of ethics, it is therefore legitimate to state that ethics is caring.

Human being is not self-subsistent and, for this reason, he experiences to be vulnerable. Vulnerability of the other contains an appeal to responsibility (Pulcini, 2009), and the necessity to act for the other in a responsible way is the generative root of ethics. A human is a constitutively relational being (Heidegger, 1996), and for this

reason, experiences a need for others: care is the answer to this ontological need. Co-existing with others makes it necessary to take care of them.

According to the ethics of care (Mayeroff, 1990; Noddings, 1984; Held, 2006; Tronto, 1993; Mortari, 2015), to care for others means to search for the good. Since the core of caring is made of virtues (Mortari, 2006a; Mortari & Saiani, 2014), an education in ethics in the light of care is an education in virtue.

MelArete is grounded in the Socratic view of moral development. Indeed, for Socrates, what is particularly important is to reason on virtue because to know the essence of a thing is the condition for the right action. For example, in the *Charmides*, Socrates tells his interlocutor, ‘say what, in your opinion, temperance is’ (159a).

Another important reference is the Aristotelian ethics, according to which virtues are learned by doing them. Indeed, in the *Nicomachean Ethics*, Aristotle specifies, ‘We become just by doing just actions, temperate by doing temperate actions, brave by doing brave actions’ (Book II, 1103b, 1–2).

The philosophy of the MelArete project is in dialogue with the two main approaches of ethical education: *character education* and *moral reasoning*. In order to highlight the major similarities and differences with the philosophical conception at the basis of our project, here we present a simplified vision of character education and moral reasoning even if we know that there are many authors who present a more complex position where the two approaches can dialogue (Mortari & Ubbiali, 2017). Similar to the *character education* position (Lickona, 1978, 1993, 1997; Howard et al., 2004; Watson et al., 1989; Battistich et al., 1991; Solomon et al., 1992), MelArete considers virtue to be a key concept for ethical education; however, we do not confuse ethics with mere socialisation. Aligned with *moral reasoning* (Kohlberg, 1981, 1984; Turiel, 1998, 2002, 2010; Smetana, 1995, 2006; Nucci, 1981; Nucci & Narvaez, 2008; Killen & Smetana, 2010), MelArete gives importance to the development of reasoning and cultivation of analytical, critical and deliberative thinking; however, we are careful to avoid abstractionism and rationalism.

In MelArete, the acquisition of virtues does not follow an adaptive-passivating model, but passes through a radical critical analysis of every aspect of the experience. In its educative valence, the project had two purposes: cultivating in children passion for research of the good and developing in them the capability to examine ethical questions analytically and critically.

## **EPISTEMOLOGICAL FRAMEWORK**

As research, MelArete assumes the epistemological background of ‘naturalistic inquiry’ (Lincoln & Guba, 1985), according to which, the phenomenon under study should be investigated in the context of where it appears. Therefore, this study was conducted in the primary school and kindergarten classes.

Setting the research in a naturalistic context requires the capability to design the research method on the basis of the specific characteristics and necessities of the context that hosts the research. Since the educative context is unpredictable, because each classroom is unique and original, it is useful to avoid a formulistic and aprioristic conception of the method in favour of an emerging and evolutive one. This entails deciding in advance some key epistemological tenets, and then rethinking and redesigning the method by considering what occurs in the field (Mortari, 2006b, 2007, 2009a).

In pedagogy, it is possible to find two typologies of empirical research: the recognitive-constatative one, which aims to increase scientific knowledge by investigating not yet explored aspects of a phenomenon; and the experiential-transformative one, which promotes and investigates new experiences in order to enhance people flourishing and improve the educative contexts (Mortari, 2007, 2009b). MelArete can be described as experiential-transformative research because it aims to design new activities for ethical education and then to investigate their educative effectiveness in schools. Furthermore, the project can also be defined as ‘research *for* children’ (Mortari, 2009b) and not merely as ‘research *with* children’, because it is designed to offer positive and significant experiences to the children involved. This purpose arises from the application of the care ethics to the research: the core principle is the necessity to promote the good of the participants.

Coherent with the characterisation of educative research, MelArete has both educative and heuristic aims by encouraging and exploring children’s ethical thinking. For this reason, instruments are designed to have an educative and a heuristic valence: promoting children’s ethical reflection and collecting data about their ethical ideas. All the data we collected through the different instruments were of a qualitative-type.

## **THE EDUCATIVE EXPERIENCE**

The project was implemented for the first time eight years ago. Since this time, several different classes in Italian primary schools were involved, and the educative path was progressively developed with new activities. In the last year (2016–2017), the project involved six fourth-grade primary school classes (106 nine- to ten-year-old children) and eight kindergarten classes (57 five- to six-year-old children) in two cities in the north and centre of Italy. The educative experience was aimed to encourage children to reflect on the concepts of good and care, about the general idea of virtue and about some specific virtues (in particular courage, generosity, respect and justice). The educative path was designed with a structure of twelve meetings between the researcher and the children. In the kindergartens and primary schools, the project had the same general structure: the activities had

the same educative and heuristic aims, even if they were implemented in different manners on the basis of the age of the children involved. We present below the different typologies of the main activities we promoted in the classes by highlighting their educative and heuristic valences.

### Socratic Conversations

Conversations in class were promoted to facilitate the children to reflect on some ethical concepts. This activity started from an eidetic question, which is a question about the essence of a phenomenon. These conversations are defined as Socratic because they find their main reference in the maieutic method exemplified in the Platonic dialogues. Like in the Socratic Circles (Copeland, 2005), this activity stimulates intersubjective thinking. The researcher guided the conversation in a non-directive manner, helping the children to examine in depth their thoughts about phenomena that are relevant from an ethical point of view.

An example of this type of activity is a conversation about good and care that was promoted during the first meeting of the project. In both the kindergartens and primary schools, the conversations were introduced by the presentation of a story concerning the idea of acting with care in order to search for what is good. After the presentation of the story, some questions were proposed to the children; two of these questions were:

- The word 'good' is a beautiful word. What comes to your mind when you hear this word?
- The word 'care' is another beautiful word. What comes to your mind when you hear this word?

These questions functioned as the stimulus to activate Socratic conversations on the concepts of good and care. In the kindergartens, after the conversations, the children were also invited to draw the moment of the story that they liked most and then explain to the researcher what they drew and what the word good meant according to them.

The educative valence of these conversations about good and care is to facilitate the children to reflect on some important ethical concepts that are at the core of the entire educative project. From the heuristic point of view, the activity allows us to collect data about what good and care are according to the children involved.

### Stories

Another typology of the activities is the presentation of stories concerning the following virtues: courage, generosity, respect and justice. For each virtue, we invented two stories, focusing on two possible declinations of the same virtue, as represented in the table below.

Virtue	First declination of virtue	Second declination of virtue
Courage	Defending the other	Being able to express one's own thoughts
Generosity	Giving time to the other	Giving something to the other who needs it
Respect	Respecting those who are different	Respecting the nature/respecting the effort and the work of another
Justice	Giving to each one according to his/her own needs	Repairing the damage

We asked the teachers from the classes involved in the project to choose for each virtue, which one of the two stories was more adequate from an educative point of view for their children.

Stories were set in the *Wood of virtues*, a place where animals act and reflect about ethical choices and behaviours. In the kindergartens, the stories were told and presented using puppets, while in the primary schools the stories were illustrated, given to the children and read by the researcher in class.

After the presentation of the stories, the children were asked to answer some questions we highlight in the following table:

Questions in kindergarten	Questions in primary school
- What did [name of the animal who acted virtuously] do?	- What is the virtuous action of [name of the animal who acted virtuously]?
- If you were [name of the animal who received the virtue action], what would you think?	(In the case of the first story on justice, where two characters make different choices based on their different conceptions of justice, in the first question we asked the children to say which of the two characters they thought was right).
- If you were [name of the animal who acted virtuously], what would you do?	- In your opinion, what thought guided the protagonist?
- Why?	

<p>(In the case of the first story on justice, where two characters make different choices based on their different conceptions of justice, at the end of the conversation we asked the children to say which of the two solutions they thought was better).</p>	<ul style="list-style-type: none"> <li>- What effects did the protagonist's action produce?</li> <li>- What did the protagonist feel inside him/herself after having acted?</li> </ul>
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In the kindergartens, the children were asked to answer these questions orally, while in the primary schools, the children were asked to answer these questions in written form.

After answering the questions, the primary school children were also asked to produce a narrative on the basis of the story they had listened to; they carried out this task either individually, in pairs or in a group. They could narrate an episode of their real life or invent a fantasy story.

The educative reason for this activity is to lead the children's attention to a specific virtue (in particular courage, generosity, respect and justice) and to begin constructing the meaning of it. The heuristic reason for the activity is to understand the children's thoughts about that specific virtue.

### **Vignettes**

Another activity was the vignettes. We showed the children three different situations representing three different particular behavioural answers to a same general context or experience that functioned as a starting point for reflection. Then we asked them to describe the three situations, to choose which one in their opinion realised a particular virtue and to explain their choices. The kindergarten children performed this activity in oral form, while the primary school children performed this activity in written form. We designed the vignettes for the virtues of courage, generosity, respect and justice.

Below, we present as examples, the vignettes about generosity (see Figure 1).

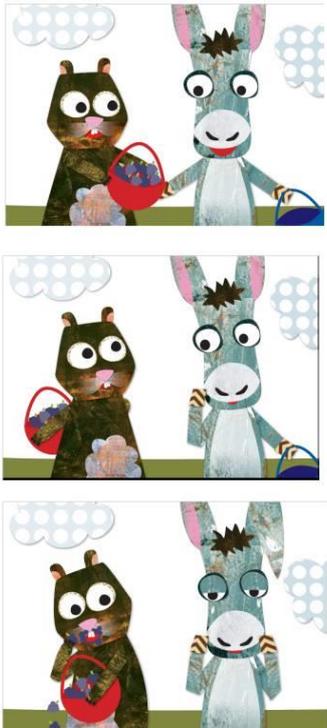
In kindergarten	In primary school
<p style="text-align: center;"><i>Start point</i></p> 	<p style="text-align: center;"><i>Start point</i></p> <p style="text-align: center;"><b>'If the classmate does not have a pen...'</b></p>
<p style="text-align: center;"><i>Three different situations</i></p> 	<p style="text-align: center;"><i>Three different situations</i></p> 

Figure 1

After the children had completed the activity, they were involved in a conversation about their choices. After the conversation, they were required to draw a situation representing the specific virtue, which was the object of the activity (they could invent a new situation or draw one of the vignettes).

The educative valence of this activity is to offer the children an experience through which they can reflect again on the concept of a specific virtue (courage, generosity, respect and justice), thereby deepening its meaning and having the opportunity to learn other possible interpretations of it. The heuristic valence of the vignettes is represented by the possibility to collect data that allows us to understand:

- the reasoning that children develop to identify and define virtuous situations (in particular situations of courage, generosity, respect and justice);
- the ideas about a specific virtue (courage, generosity, respect and justice) that exist in the children's thinking.

### Games

We also organised some games, aimed to encourage the children to reflect on the virtues of courage, generosity, respect and justice. The games were activities that stimulated thought and/or move actions. Their structures and the related educative reasons were different, based on the specific virtue that was the object of the activity.

As examples, we present below the game on courage organised in the kindergartens and the game on courage organised in the primary schools.

### *The game on courage in kindergarten*

The game about courage, organised in the kindergartens (see Figure 2) was titled ‘Courageous cards-actions for the squirrel Theaetetus’. The researcher provided two typologies of cards: the S-cards (in which some problematic situation was represented) and the O-cards (in which some objects were represented). Each child was asked to blind-select an S-card and an O-card, and invent a courageous action that the squirrel, Theaetetus, could carry out in order to solve the problematic situation represented in the S-card by using the object represented in the O-card.

The educative reason for this activity is to stimulate the children’s reflection on courage by engaging them in the construction of micro-stories, while the heuristic reason is to collect data about what type of actions the children considered as courageous.



Figure 2

### *The game on courage in primary school*

The game about courage organised in the primary schools (see Figure 3) was titled ‘The pathway in the wood of courage’. Two concentric circles were represented on a game board: the outer circle contained the locations of the wood and the inner circle the animals. For the first turn, each child was required to throw a die, advance in the outer circle with a pine cone, and write on a leaf the location represented in the box that the pine cone stopped on. For the second turn, each child was required to throw the die again, advance in the inner circle with the pine cone, and write on the leaf, under the location, the animals represented in the box that the pine cone stopped on.

Then, the children were asked to invent a story about courage by setting it in the location and with the animals written on their leaves.

The educative reason for this activity is to stimulate the children to reflect on the virtue of courage, while the heuristic reason is to collect data about what experiences the children considered as courageous.



Figure 3

### **An Experiential Diary**

Another activity was the *diary of virtues* where children narrated virtuous actions (in particular actions of courage, generosity, respect and justice) they carried out or saw carried out by others. In the primary schools, the children were required to write the virtuous actions in a normal notebook, while in the kindergartens, the children were required to draw the virtuous actions in a notebook with leaf-shaped pages (a leaf-diary). In the kindergartens, the teachers were invited to write the explanations given by the children about their drawings.

The children were required to do this activity at least once a week (in the primary schools after the third meeting of the educative path and in the kindergartens after the second meeting).

In the primary schools, whenever the children wrote in their diary of a virtuous action, they were also invited to attach a leaf on the *tree of virtues* (see Figure 4) that was drawn at the beginning of their copybooks. The leaves had different colours based on the different virtues they represented (yellow for courage, red for generosity, blue for respect and purple for justice). Furthermore, whenever the children narrated a virtuous action in their diary and attached the leaf of the relative virtue to the tree in their copybook, they also attached another leaf, identical to the first one, to the *tree of the trees* (see Figure 5) in the classroom.



Figure 4



Figure 5

The theoretical background of this activity was to integrate the Aristotelian theoretical-theory and the Socratic *paideia*: the resulting idea was that virtues are learned both by practicing and examining them. The engagement of keeping a diary finds its educative reason by offering the children a space to reflect on their experience. The heuristic valence of this activity is that it allows us to understand:

- what actions children identify as virtuous;
- what meaning children attribute to these actions and
- if over the course of time the type of the narrated experience changes.

### Introduction and Concluding Activities

At the beginning of the educative path (during the second meeting in the kindergartens and during the second and the third meetings in the primary schools) we organised introduction activities, designed to collect data to understand what virtues are according to children and how children define courage, generosity, respect and justice (i.e. the specific virtues on which the entire path focuses). In the primary schools, we also asked them how it is possible to learn virtues in their opinion.

At the end of the project, during the last meeting, we organised concluding activities, through which we proposed the same questions as for the introductory activities, in order to understand if and how the children's thinking had changed.

### COLLECTED DATA

From a preliminary analysis, and after a deep dialogue with the teachers involved, we can state that the project helped the children understand the concept of virtue as a framework they assumed in order to reflect on actions and looking for the good. The children were able to recognise the different components of a virtuous action (thoughts, emotions and consequences) and to recognise the ethical call inside dilemmas of everyday life.

The capacity of analysis and reflection was so increased that the children became able not only to name a specific virtue and choose a coherent action in critical situations but also to understand the complexity of some situations and actions, so that they could identify different nuances in the same situation and different virtues in a single action.

The analysis process, with reference to the specific heuristic valence of the different activities, is still ongoing. However, we can already say that the data we collected show the richness of children's ethical thinking. If adequately stimulated through activities aimed to give them a possibility to reflect, children can also surprise adults with their reasoning and statements about ethical concepts and issues. The reading of our data confirms what we had already discovered through precedent research, that is, children are capable of deep reflection on ethical themes.

As examples, we present in the table below some of the children's thoughts we collected through the MelArete project.

<b>Typology of data</b>	<b>Kindergarten</b>	<b>Primary school</b>
Children's thoughts about good	<ul style="list-style-type: none"> <li>- 'Playing in a good way... when nobody hurts himself'.</li> <li>- 'The good is to be friends, giving embraces and kisses each other'.</li> <li>- 'The good is when somebody loves you and embraces you'.</li> <li>- 'The good is when you feel good at the seaside'.</li> </ul>	<ul style="list-style-type: none"> <li>- 'For me, the word "good" means also [that] when someone feels bad or needs help, you help him'.</li> <li>- 'The word "good" means when we all feel good and not only one feels good'.</li> <li>- 'According to me, it means to feel good with others and share our friendship'.</li> <li>- 'According to me, the word "good" is not only love, a kiss, a caress, brotherhood, but it is also feeling good with our heart, with others'.</li> </ul>
Children's thoughts about care	<ul style="list-style-type: none"> <li>- 'Giving a kiss on the bump of my pregnant mommy is a gesture of care, even if she is not ill'.</li> <li>- '[The word "care" means] to kiss, to smile at, and to caress [someone]'.</li> <li>- '[The word "care" means] to give happiness'.</li> <li>- 'To care for plants: giving them water...'</li> <li>- 'To help a child'.</li> </ul>	<ul style="list-style-type: none"> <li>- 'According to me, the word "care" means taking care of the city, people, animals and other things'.</li> <li>- 'When someone hurts himself, someone comes to console him'.</li> <li>- 'According to me, "care" means also to take care of people by medical doctors, but it doesn't mean only that. Also mums, teachers, all people take care of us, by giving us food and making us learn new things. To care means many things'.</li> <li>- 'According to me, the word care means also taking care of plants, do not tear off leaves, branches...'</li> </ul>
Children's thoughts about courage	<ul style="list-style-type: none"> <li>- 'The [word] courage means that you are not afraid of anything'.</li> <li>- 'If you are on a tree and you are afraid of falling, you must tell to yourself: «it is nothing! You are not a baby!»'.</li> <li>- '[To have] courage means that when you are afraid of something, you wait for a while; after the fear has passed you can start again'.</li> </ul>	<ul style="list-style-type: none"> <li>- 'Not to be afraid of something'.</li> <li>- 'Facing the difficult moments of life'.</li> <li>- '[Courage is] a quality that serves to overcome obstacles, such as: saying something personal; telling a truth'.</li> </ul>
Children's thoughts about generosity	<ul style="list-style-type: none"> <li>- '[Generosity is] when you give a caress to somebody'.</li> <li>- '[Generosity is] when a tall person helps somebody that cannot reach something because it is posed in a high position and takes it for him'.</li> </ul>	<ul style="list-style-type: none"> <li>- 'Generosity is, for example, if a child hurts himself I help and embrace him; [generosity is] also to love a mum, a sister, a brother'.</li> <li>- 'When someone has no snack and you share yours with him'.</li> <li>- 'Helping others and lending them the things they need'.</li> </ul>
Children's thoughts about respect	<ul style="list-style-type: none"> <li>- '[To have respect for somebody means that] you have to listen to</li> </ul>	<ul style="list-style-type: none"> <li>- 'Caring for someone; also for your own things and for others'</li> </ul>

	<p>him’.</p> <ul style="list-style-type: none"> <li>- ‘[To have] respect means that you have to wait for your turn for talking: when the others have finished talking then you can talk’.</li> <li>- ‘[To have] respect means to respect the rules: for example the rules of the games’.</li> <li>- ‘[To have] respect is when I listen to the teacher’.</li> </ul>	<p>things’.</p> <ul style="list-style-type: none"> <li>- ‘Listening to teachers, parents, grandfathers and grandmothers, older brothers’.</li> <li>- ‘Having respect for a person means treating that person well and not excluding her’.</li> </ul>
Children’s thoughts about justice	<ul style="list-style-type: none"> <li>- ‘For example, you have to attend your swimming course but you don’t want to: you have to attend it anyway because it is your duty. That’s because duty and justice are the same thing’.</li> <li>- ‘When you are tired and you would like to relax, somebody tells you to do something, you say: «there is no justice!»’.</li> </ul>	<ul style="list-style-type: none"> <li>- ‘Finding a solution to problems in a right way’.</li> <li>- ‘Protecting world, poor people, ourselves, animals...’.</li> <li>- ‘Doing the right thing for the good of everyone’.</li> </ul>

### THE EFFECTIVENESS OF THE PROJECT IN THE TEACHER’S VOICES

The teachers we interviewed at the end of the project were enthusiastic not only about what had happened during the activities but also in everyday class life. Some of them said that the children had internalised virtue ethics and they had become able and confident to analyse everyday life through the lens of virtue.

The effectiveness of the educative path emerged in the teacher’s reflections. A kindergarten teacher said, ‘it was an interesting experience’ and ‘certainly the children had benefited from this path’. Another teacher demonstrated that she already knew the potentialities of children: ‘The path carried out did nothing but reinforce the certainty that children can do really a lot and always amaze us’, and she added, ‘we must not limit ourselves in offering them new opportunities, above all, when these [opportunities] are tailored for them, respectful of them and strongly formative, exactly like the MelArete project’. The reflections of these teachers confirmed for us that the project design really represented a research *for* (and not merely *with*) children.

In addition, the primary school teachers expressed enthusiasm for the project. One of them said that the path ‘led the children to grow a lot interiorly’ and specified that they had become ‘much more reflective’. Another teacher pointed out that ‘the path was very positive for the children, they had a moment of particular growth’. In particular she specified that ‘it is a project that helps children to have a different vision of themselves, and only when you know yourself in a little bit more depth, you can also relate yourself with others’. Another teacher highlighted that the project helped the children to learn the language of virtue; in this regard, she said MelArete is a path ‘connected to the knowledge of new words for children’.

### CONCLUSION

The richness of our data demonstrates the effectiveness of the project to promote children’s ethical thinking. Furthermore, the enthusiastic feedback from the teachers confirmed to us that our project can be authentically perceived as ‘service research’ (Mortari, 2009b), that is, research that can promote something good in the context that hosts it.

Coherent with the inspired approach of the ‘research *for* children’, the activities we promoted were designed to have both educative and heuristic relevance as we have explained and exemplified in this paper.

From an educational point of view, the results we collected through interviews with teachers show that teachers who are interested in promoting ethical education can find effective suggestions in the project activities and its instruments. Furthermore, the data make evident that this project can really contribute to increasing knowledge about children’s ways of reasoning on ethical issues. Indeed, when it is completed, the analysis process will allow us to understand in depth the qualification of children’s ethical thoughts with reference to the different research questions connected to the different activities we organised during the MelArete path project.

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# **Children's Group as an Alternative Form of Preschool Care for Children in the Czech Republic: An Example From a Particular Region**

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## **ABSTRACT**

The authors of the study describe a relatively new service in the Czech Republic – children's daycare in children's groups. They describe the legislation connected to this service and its main features, they discuss its strongest and its weakest links. The authors present results that emerged from the pilot research, carried out in a particular region of the Czech Republic in three selected children's groups, all of them situated in the city of Zlín.

Data was gathered from controlled interviews with providers of children's daycare in children's groups, and from the analysis of publicly available information about children's groups. The questions aim at obtaining information about both visions of particular providers and practical information about such service, its functioning and known limitations from the perspective of children's groups' establishers.

**Key words:** kindergarten in the Czech Republic, children's group, preschool education, the Zlín region

## **INTRODUCTION**

The pressure of society and emancipation of women bring demands for placing two-year-old children and even younger children in some kind of preschool institution. Many countries make preschool education more available for children by making it free-of-charge, however, in some regions the demand is much higher than the offer when it comes to the youngest children. On European scale, Early Childhood Education and Care is characterized by a variety and complexity that depend on circumstances, conditions and possibilities, or historical context of given countries. Quality markers include level of personell qualification, differences in the content of educational curriculum and the existence of a divided system of education and care. Countries with a combined approach are for example Sweden, Denmark and Finland. Some states of the southern Europe prefer divided system of care, for example Greece or Portugal. A country that can serve as an example is for example Finland, where the main emphasis is on quality of preschool teachers' training and the evaluation of preschool education and care. Portugal, where ECEC is included in the educational system, has divided system for children up to three years of age, but there the education of such young children is perceived as a natural thing to do, considering the specific development of human brain, whose most important parts develop in the first years of life.

The Czech Republic belongs among the countries with the longest paid parental leave and where traditional woman's role as a caregiver and man's role as a breadwinner worsens women's position on job market, especially due to a very long time, during which they care for their child on a daily basis. Compared to other countries, in the Czech Republic it is typical that after parental leave a woman returns to a full-time position. The offer of preschool institutions and their opening hours reflect this fact.

## **PRESCHOOL INSTITUTIONS IN THE CZECH REPUBLIC**

In the Czech Republic there are kindergartens that normally accept children between the age of three and six. Presently, there is a livid discussion about accepting children younger than three in public preschool institutions. In the Czech Republic opposing opinions are emerging regarding this issue, even though it is a known fact (from the foreign studies, such as Lenroot, Giedd, 2011, Zeng, 2016 or Gregoridiase, 2015) that in foreign countries this is a regular practice in educational strategies of particular states.

In the following chart we present an overview of accepting children younger than three in preschool institutions in three selected countries – Finland, Greece and Portugal. From the chart it is clear that in these countries it is possible for a child younger than three to attend so-called care centers, which are a part of preschool institutions.

*Chart 1: Situation in the selected European countries*

Country	Type of institution	Children's age	Auspice	Problem	Advantage
Finland	Kindergarten Care Centers	6 years 0-6 year	Finnish National Agency for Education.  Early Childhood Education and Care Policy.  National Core Curriculum for Pre-primary Education.		Emphasis on quality of education for future preschool teachers Work with the whole professional path of a child from the very beginning Every preschool teacher has a master's degree Precise inspection and evaluation of preschool education Questionnaires ascertaining parental satisfaction Emphasis on children's play
Portugal		3- start of school attendance 0-3 years	Ministry of Education  Ministry of Labour, Solidarity and Social Security		Support of group education for children from an early age, based on the knowledge from cognitive psychology
Greece	Kindergarten Care center	4-6 years 2.5-5 years		Lack of financial backing	Obligatory bachelor's degree A possibility to use Greek nature in lessons

Even in the state documents there is some space for meeting kindergarten educational objectives with children younger than three, also from the perspective of future preschool teachers' training (Gavora, Wiegrová, 2017). Kindergartens in the Czech Republic oppose accepting children younger than three. That was a partial reason why new institutions emerged, and were later named children's groups. The main reason for their existence, according to data from the Czech Statistical Office, is that there was an increase in the number of children born. Consequently, kindergartens could not manage the demand, as there were more children than their capacity could accept, and they were forced to reject even three-year-old children. We will mention the status of children's groups in the Czech educational system further.

A novelty in Czech preschool education since 2017 is obligatory education for five-year old children. So far, obligatory school attendance was initiated with the first year of elementary school, as a rule when the child is six. Presently, even the final year of kindergarten is obligatory for children. However, every parent can ask for a so-called home-schooling for their child, which means that the child is registered in the school nearest to his/her home, or any other school, and every quarter of a year the child is tested on the aspects of his/her maturity. Introducing obligatory final year of kindergarten is one of the objectives of a long-term strategy of education and development in Czech educational system for years 2015-2020. One of the objectives is to decrease the inequality in education and to have the possibility to educate children in kindergarten is supposed to help with it. The plan is to reach given objectives by creating space which supports, stimulates, includes and motivates children to learn their whole life – so-called life-long learning. The strategy includes steps to improve the quality of preschool education and improving teachers' pedagogical skills. The importance of kindergarten is emphasized, as are its educational functions, especially for children from socially disadvantaged environment,

where successful preschool education helps to eliminate the shortcomings in the family. According to Hejlová and co. (2013), preschool education includes the aspects of education and upbringing and its theoretical basis is General Educational Program for Preschool Education (2004), which respects child's needs and is based on objectives of upbringing and individually oriented model of educational activity and of upbringing. Aspects that play the role in parents' choice of preschool institutions are – availability of daily meals, closeness to home, number of persons who care for children and the qualification of the caregiver. Then the fee and other activities that kindergarten offers, pedagogical activities, among which belong also educational program and preparation for elementary school.

Children's group is a service that offers daycare for children from one year of age till the age when the child must go to school. It emerged as an educational alternative in kindergartens in 2014, when the problem with kindergarten's capacity peaked. Every children's group must be registered in the register of providers of daycare in children's group, whose establisher is Ministry of Labour and Social Affairs. Obligatory document, which every children's group must have, is educational plan and a plan for children's daycare in children's group, which is attached to the contract of children's care. The aim of children's group is improving parents' conditions on job market and satisfying the demand for placing children younger than three in preschool institutions.

Children's group offers parents, and especially mothers, a possibility for earlier return to work and thus improves their status on job market. With regard to priorities of European Union, defined in Strategy Europe 2020, establishers of children's groups have the possibility to obtain grant support via operational programmes.

Children's group can be a new opportunity for all people interested, be it children, parents or teachers and it can enrich the community, in which it represents another modern service that can accompany children in their childhood and the proces of learning about the environment to which they were born. Children's group represents another option in the wide offer of preschool institutions (various alternative approaches that are used in children's groups) and also offers parents, especially mothers of children younger than three, the possibility to place a child in the institution and return to work either as a full-time or part-time worker. This enables women to find the balance between family life and professional life.

In our research we focused mostly on educational priorities in children's groups and their strong and weak links.

## FINDINGS

The Zlín region is one of the Czech regions, situated in Moravia county. Presently, ten children's groups have been established in the Zlín region, and new ones are still emerging. We decided to carry out our research in three of these institutions that are situated directly in Zlín, county town.

*Chart 2: Overview of selected children's groups*

		The Zlín region – children's groups			
Place	The name of the children's group	Number of groups	Capacity	Started in	Establisher
Zlín	Kamarád Nenuda	1	12	2016	Kamarád - Nenuda z.s.
	Šťastné dítě	1	12	2017	Centrum Šťastné Dítě, z.s.
	Aktiváček	1	12	2016	Aktivně životem o.p.s.

The aim of the research was to understand and describe the existence and functioning of these selected institutions (children's groups) in Zlín.

## RESEARCH METHODS AND DATA COLLECTION

We contacted every children's group by telephone and arranged a meeting in order to carry out an in-depth interview. Then we set the date. The criteria for our selection of children's groups were: they must be situated in the Zlín region, they must be willing to participate in our research and share their knowledge and experience, and they must agree with data processing for the purposes of this study. Three groups met with these criteria.

For our research we chose qualitative research design and decided to use the interview and content analysis of promotion materials from each institution.

Interviews were always recorded on voice recorder and consequently transcribed.

Interviews were always carried out with establishers of children's groups and parents. Another source of information that enabled us to create a children's group profile were web pages of particular children's groups. All three chosen groups are financed from operational programme employment.

### **PILOT RESULTS OF RESEARCH**

The main problematic (or potentially problematic) areas regarding children's groups are:

- a.) qualification of the carer
- b.) status of children's group in the system of preschool education
- c.) insufficient legislation regarding children's group

Even in professional psychological debates there is a vivid discussion on the age of children in children's groups. According to Mertin (2014), from the psychological perspective, there is not much to object to regarding children's groups, especially because many young children at that age are already in the care of grandmothers, nannies, aunts and other helpers the families use if they need them. It is untrue that only family members care for children, even though it is expected that until the age of six, the child will be predominantly in the care of family, and not other forms of daycare. Mertin sees in children's groups an alternative form of daycare that can supplement kindergarten, but he suggests that it is inappropriate to compare these two forms of daycare. Instead of increasing the capacity of collective daycare institutions for youngest children he suggests that the support from parents' employers would be a better solution – employers should offer part-time jobs for parents. He would support children's groups as a temporary solution and in the long run he considers financial support of kindergartens by the state, professional growth, investment in teachers and improving the prestige of their jobs as a sustainable solution.

Obligatory attendance, provided by the establisher of children's groups, is required by the law and it should be at least six hours a day. In reality it does not mean that parents have to use the whole six hours. Most institutions offer two or three varieties of the attendance, usually morning, afternoon or whole-day shift. This is reflected also in the price. As we can in the chart, opening hours are different for each children's group, probably because of different parents' needs and the type of establisher. In case when the service is financed from a grant and it is, therefore, a public service, the establisher is obliged to keep the attendance record for each child in an electronic form. Attendance sheet needs to be signed at the end of each month by child's parents. Child's attendance is one of the significant project indicators. Typical opening hours of a kindergarten, established by the town council, is from 6:30 – 16:30.

There are huge differences between children's groups, when it comes to promotion of children's group's activity. It is necessary to mention that the transformation process of the institution is not simple. Understandably, promotion on the internet and via media commercials is marginal. Parents learn about the institutions mostly from:

- a.) webpages
- b.) leaflets, promotional materials with pictures
- c.) facebook

Children's groups in Zlín have educational background. Parents want to know what children's group is, they are generally interested in alternative daycare services. They make their choice based on many criteria. From what we know so far, we perceive the future of children's groups in the Zlín region as promising. New institutions are constantly emerging and the capacity of the already existing ones is fully used and parents have to either wait for a place for their child, or to seek another institution.

### **MAIN ADVANTAGES OF CHILDREN'S GROUPS AS A DAYCARE INSTITUTION FROM THE PERSPECTIVE OF THEIR ESTABLISHERS**

Research of the establisher's opinions on the advantages of children's groups brought many interesting points. Advantages are presented in two central categories.

#### **Main Advantages of Children's Groups from the Perspective of the *Establishers*:**

- possibility to create trustworthy family atmosphere
- friendly environment that enables easy adaptation of newly admitted children
- smaller number of children per carer
- possibility to use individual capital of a carer

- small work team
- formation of a professional portfolio of a carer
- variety of carers that ensures variety of influences on children
- possibility to include aspects of alternative preschool pedagogy
- freedom regarding interest-based learning in children's group (canistherapy, hippoterapy, English lessons, yoga for children, speech-therapy games)
- possibility of individual treatment of children
- possibility to adjust the equipment according to children's needs
- easier diagnostics of a child in smaller group
- closer and more intimate relationship between the carer and the child
- smaller number of children in the group
- individual treatment
- open communication with parents
- parents can participate in children's group activity
- openness towards parents and cooperation with them
- parents can combine children's group with attendance to other institutions, for example so-called forest kindergartens
- they are financially convenient and enable time flexibility
- parents can choose from a variety of preschool care
- flexible opening hours that meet parents' needs half way

**Main Advantages of Children's Groups from *Parents' Perspective*:**

- they are a natural environment for adaptation to groups of children
- parents participate in the process of child's adaptation
- children look forward to going to children's group
- there are no meltdowns in the morning because child does not want to go kindergarten
- stress-free environment
- family atmosphere
- peaceful environment for child's sleep (smaller group, reading stories)
- better balance between professional and family life
- possibility to go to work when the new employer needs it
- possibility to place a child in children's group even in the middle of the school year, therefore immediately after parents start working
- when the child is happy, other relationships in the family improve as well
- mother can dedicate more time to a younger sibling, herself of other members of family
- child is happy in the group
- cooperation that aims to improve progress of autistic children
- understanding of children with autism spectrum disorders (ASD)
- child with specific needs is in a smaller group and is capable of greater progress

Each of researched institutions is specific and has a certain advantage that the other one does not have. Nenuda, for example, is situated in the city centre and its principal is very flexible. She enables attendance of two-year old children and older. Children's group Aktiváček has a principal who is very open to innovation, is enthusiastic about the daycare system in children's group, moreover, it is situated close to the city centre and welcomes children as young as 18 months. Štastné dítě has the advantage of an inclination towards aesthetic alternative activities, musical therapy, artherapeutical activities combined with yoga for children. It seems that the activities are adjusted to specific interests of carers who work there and parents choose the institution because of that. The existing users of the daycare service, therefore parents, are greatly satisfied, which is proved by the fact that there are no free places in children's groups at the moment. When one institution does not have a place for yet another child, they inform parents about the other children's groups. A logical outcome of this communication is emergence of Association of Children's Groups in the Zlín region. This association would facilitate providing the service to parents in the Zlín region, simplify the process of accepting children to children's groups based on actual and individual needs of parents and improve the quality of care in children's groups.

## CONCLUSIONS

In the Czech Republic, according to statistics of the Ministry of Labour and Social Affairs, in April 2017 289 children's groups were registered and they provide places for 3,822 children. At the beginning of 2017 a new appeal to support children's groups was issued by European Union. However, an increasing number of children is not expected and moreover, even kindergartens are more open to possibility of accepting two-year-old children now. Czech Statistical Office expects decreasing tendency in years 2016-2022 among 3-5 year-olds by 12.5% (City of Zlín). It is not expected that the problem with capacity of preschool institutions and impossibility to place a child there would recur any time soon. Measures have been taken in order to improve the situation. However, the opposite extreme can be expected – new institutions would be established, but there will not be enough children to fill their capacity. Since 2014, several commercial institutions in the Zlín region closed down, because so-called babyboom is over now. The number of children born will decrease more and more and we can expect that the interest in 'alternative pedagogy', be it a private kindergarten or public children's group (public as long as it is financed from a grant) will decrease as well. Many children attend these institutions either because they are too young, or because the city kindergartens were full and could not accept them. Time will show what the actual situation with children's groups in the Czech Republic will be like. We will see if the reason for their existence has already passed or not.

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## **Clinical Communication Skills Scale (CCSS): Invariance Study**

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## **ABSTRACT**

Background: Communication between health professionals, the health team, patients and families, benefits the adherence and success of the treatment, the reduction of anxiety and the satisfaction with the received care. Therapeutic communication is a challenge for nursing students, being an integral part of the nursing curricula since the initial training. Objective: This study is aimed to adapt the Clinical Communication Skills Scale (CCSS) by Ferreira, Silva and Duarte (2016), gathering evidence of their factorial validity and internal consistency, as well as the factorial invariance of this measure for nursing students. Methods: This is a descriptive, cross-sectional and correlational study performed in a non-probabilistic sample by convenience, consisting of 374 nursing students from two health schools of the central part of the country, aged between 18 and 21 years old (68.2%), mostly female (82.4%) and attending the 5<sup>th</sup> semester of the course (24.9%). The collection instrument consists of 30 items organized in a Likert's scale from 1 "I do not agree" to 5 "I totally agree", and the higher the quotation the better the communication skills. Results: The results of the confirmatory factorial analysis provided evidence for the validity of the scale, presenting very adequate values for ( $\chi^2 / df = 3,198$  RMSEA = 0.077; RMR = 0.023; SRMR = 0.053 and satisfactory for CFI = 0.834 and GFI = 0.870) when applied to students. In the internal consistency study of Cronbach's alpha, the values are very good oscillating between  $\alpha = 0.943$  and  $\alpha = 0.946$ , being the overall alpha of ( $\alpha = 0.946$ ). Conclusion: The results of the present study support the psychometric adequacy of the clinical communication skills scale, indicating that it can be used in future trials in order to understand the communication skills of nursing students.

## **INTRODUCTION**

Communication skills are the basis of nursing care and a differentiating care of excellence (Alves, 2011). The development of these skills is an evolutionary process established in five stages: beginner, advanced beginner, competent, proficient and expert. The impression of necessary skills becomes more evident at each level. For the author, the more advanced levels of qualification could only be achieved by experience in practical work situations (Andrade, 2014), the professional development of communication skills depends on the people and their knowledge needs, as well as on learning situations.

Communication skills integrate three major types of essential skills in the nurse-patient interaction: *content*-related competencies that translate what health professionals communicate (for instance, the information they collect, treatment they suggest, etc.); *process*-related competencies, that is, how they communicate (for example, how they establish the relationship with the patient, how they organize information) and *perceptual* competencies, referring to what health professionals think and feel (for instance, decision-making process, attitudes, perception of the patient's feelings and thoughts) (Grilo, 2012). Nurses who are effective communicators make patients verbalize expectations and emotions and reveal their information needs. As a result, patients have higher rates of satisfaction and compliance, and lower levels of anxiety (Grilo, 2012).

It is concluded that the quality of nursing care will be predominantly marked by the attitudes and behaviours of the caregivers, that is, the nurse, and that competent professional performance requires a know how to mobilize, integrate and transmit the acquired knowledge in the scope of training. In nursing, *know-how* integrates relational *know-how*. Care takes place in a context of interpersonal relationship, which requires nurses to have complex skills centred on humanistic principles (oneness, a tendency of updating, autonomy, evolution) and a helping relationship (acceptance, authenticity, empathy, warm respect, congruence, active listening) (Lopes, Azevedo & Rodrigues, 2012).

In a health organization, communication between health professionals and users of health care is essential to promote their health and safety as well as satisfaction with the care provided. Therefore, it is necessary for health professionals to have communication skills so that they can effectively develop care for users (Alves, 2011). There is evidence that a high level of emotional competence brings benefits to the health of the users to the extent to which there is an increase in adherence to the therapeutic regimen, higher patient satisfaction and better health outcomes (Schoenthaler, Chaplin, Allegrante et al., 2009).

In this context, a number of representatives of professional organizations and education of health professionals met in 1999 in Kalamazoo, United States of America, within the scope of the "BayerFetzer Conference on Physician-Patient Communication in Medical Education". They outlined a set of essential guidelines for professional health/patient communication. The therapeutic relationship as a fundamental instrument of professional health/patient communication is also evidenced here (Peixoto, Simões, Teles et al., 2012), which should contemplate several phases - a) Open the discussion b) Obtain information c) Understand the patient's perspective d) Share information e) Reach an agreement on the problems and plans f) Finish the interview. These stages should be adapted to the different specialties, scenarios and health problems, becoming an effective tool for the acquisition of clinical communication skills for nursing students. Given this problem and after the validation of an instrument capable of evaluating **clinical communication skills for nurses, we propose to adapt the scale of Clinical Communication Skills (CCS) by Ferreira, Silva and Duarte (2016), gathering evidence of their factorial validity and internal consistency, as well as the factorial invariance of this measure for nursing students.**

Methods: This is a descriptive, cross-sectional and correlational study performed in a non-probabilistic sample by convenience, consisting of 374 nursing students from two health schools of the central part of the country, aged between 18 and 21 years old (68.2%). They are mostly female (82.4%) and attending the 5<sup>th</sup> semester of the course (24.9%). The collection instrument consists of 30 items organized in a Likert's scale from 1 "I do not agree" to 5 "I totally agree" and the higher the quotation the better are the communication skills.

## RESULTS

### Psychometric study of the Clinical Communication Skills Scale

Scales and all measuring instruments should be valid and reliable. Validity refers to the ability of the instrument to measure the construct it wishes to quantify, and the trust or reliability relates to the property of demonstrating analogous, error-free results in repeated measurements. In this work, the reliability and validity study for the scale under way was carried out.

Reliability makes it possible to evaluate the temporal stability and the internal consistency or homogeneity of the items by determining Cronbach's alpha coefficient and the Split-Half coefficient or halves method, which is a way to verify if one of the halves of the scale is as consistent in measuring the construct as the other half. The values of the Cronbach coefficient can range from 0 to 1, in which the higher the value the better. A good internal consistency should exceed an alpha of .80 (Marôco, 2014). The same author and Pestana and Gageiro (2014) allude as reference values: higher than 0.90 very good; between .80 - 0.90 good; between 0.70 - 0.80 average; between 0.60 - 0.70 reasonable; between 0.50 - 0.60 mediocre; and less than 0.50 unacceptable.

Reliability is a necessary condition, but it is not enough to guarantee the validity of the instrument (Marôco, 2014).

As for reliability studies, the results in Table 1 show the statistics (means and standard deviations) and the correlations obtained between each item and the overall scale. The correlation coefficients of the item-total correlation vary between 0.422 (item 4) and 0.708 (item 23), being the correlations above 0.20 (reference value). Regarding the mean values and respective standard deviations of the different items, they indicate that, overall, they are well centred and above the expected average index, registering the lowest mean value (M=3.34) in item 28: "Give bad news" and the highest mean value (M=4.49) in items 17: "Use of plain language with the patient" and 18: "Check if the patient understood what I wanted to say." As far as Cronbach's alpha values are concerned, they range from  $\alpha=0.943$  to  $\alpha=0.946$ , with alpha ( $\alpha=0.946$ ) being classified as very good for the whole scale.

**Table 1.** Internal consistency of the items of the Clinical Communication Skills Scale and interpersonal relationship

Item No.	Items	Mean	Sd	r/item total	$\alpha$ sem item
1	Establish rapport with patient Encourage	4,25	,553	,563	,945
2	a partnership with the patient	4,23	,542	,564	,945
3	Accept active patient participation in decision making	4,35	,561	,493	,945
4	Open a discussion in a clinical interview	3,68	,731	,422	,946
5	Allow the patient to complete his/her reasoning	4,39	,556	,494	,945
6	Encourage the patient to talk about his/her concerns	4,52	,598	,563	,945
7	Establish or maintain the clinical relation	4,33	,582	,667	,944
8	Collect the necessary information about the patient	4,33	,635	,653	,944
9	Properly post open and closed questions	4,07	,686	,641	,944
10	Integrate, clarify and structure information provided by the patient	4,16	,585	,661	,944
11	Perform active listening using non-verbal techniques (e.g., eye contact, body position) and verbal techniques (e.g., words of encouragement)	4,43	,575	,594	,944
12	Understanding patients and perspective on the disease and problems	4,30	,586	,690	,943
13	Explore contextual factors in the patient's life (e.g., family, culture, gender, age, disease perspective, socioeconomic level, spirituality)	4,11	,667	,582	,944
14	Explore beliefs, concerns, and expectations about health and disease 15	4,07	,649	,641	,944
	Consider the patient's ideas, feelings and values and respond to them 16	4,23	,647	,645	,944
	Share information with the patient	4,09	,650	,439	,946
17	Use of plain language with the patient	4,49	,547	,631	,944
18	Check if the patient understood what I wanted to say	4,49	,561	,640	,944
19	Encourage patient questions	4,24	,660	,666	,944
20	Negotiate an agreement with the patient about problems and plans	4,04	,705	,663	,944
21	Encourage patient participation in decision-making as long as he/she wishes this	4,21	,645	,697	,943
22	Check the willingness and ability of the patient to comply with the therapeutic plans	4,23	,612	,688	,943
23	Identify and activate resources and support for the patient	4,07	,697	,708	,943
24	Finish a clinical interview or a consultation	3,70	,738	,485	,946
25	Ask the patient if he/she has more concerns/complaints	4,39	,565	,617	,944
26	Summarize and agree with the patient on the therapeutic plans 27	4,13	,701	,683	,943
	Discuss and schedule the follow-up	3,89	,718	,627	,944
28	Give bad news	3,34	,873	,535	,945
29	Deal with complaints from patients	3,70	,797	,590	,944
30	Be able to communicate with the patient (I had enough training and practice)	3,91	,723	,379	,947
<b>Overall Cronbach's alpha coefficient</b>				<b>0.946</b>	

## CONFIRMATORY FACTOR ANALYSIS

Following the study carried out for communication in nursing, we sought to know if the factor structure remained invariant for communication in nursing students. In this sense, we subjected the penta-factorial solution resulting from the first study to confirmatory factorial analysis (CFA), using the software AMOS 23 (Analysis of Moment Structures). We considered the covariance matrix and also adopted the maximum likelihood estimation (MLE) algorithm for parameter estimation. The normality of the items was evaluated by *asymmetry (Sk)* and *flatness (Ku)* assuming as reference values of asymmetry  $\leq 3$  and flatness  $\leq 7$  respectively, and the validity of the construct evaluated by the factorial, convergent and discriminant validity values.

As indicators of overall adjustment quality, we used the ratio of  $\chi^2/df < 5.0$  the CFI (Comparative Fit Index)  $> 0.90$ , the GFI (Goodness of Fit Index)  $> 0.90$ , the RMSEA (Root Mean Square Error of Approximation)  $< 0.08$ , the RMR (root mean square residual)  $< 0.08$  and the SRMR (Standardized root mean square residual)  $< 0.08$ .

In the quality of the local adjustment of the model, the composite validity obtained through the individual fidelity item ( $\lambda$ ) was also considered, being the reference factor weight greater than 0.50, the individual reliability of the items ( $\delta$ ) with coefficients equal to or greater than 0.25. In exploratory studies, factorial weights of 0.40 are acceptable.

For composite fidelity (CF) that estimates the internal consistency of the items relative to the factor, reference values are above 0.70 (Marôco, 2014) and the convergent validity is evaluated by the average variance extracted (AVE). This allows us to verify the way the items belonging to a factor, saturate in this factor, have reference values of 0.50 (Marôco, 2014).

Discriminant validity (DV), which is considered when the AVE value for each construct is greater than the square of the multiple correlations between this construct and another, was analysed.

The first step was to evaluate the normality of the items through the values of asymmetry and kurtosis, and it was verified that all items present skew indices ranging from 0.003 to 0.890 and kurtosis between 0.043 and 1.808, which is a normal distribution.

**Table 2.** Asymmetry and kurtosis values

Variable	min	max	skew	c.r.	kurtosis	c.r.
cr24	1,000	5,000	-,251	-1,978	,293	1,155
cr16	1,000	5,000	-,562	-4,439	1,424	5,620
cr9	2,000	5,000	-,335	-2,649	-,043	-,169
cr4	1,000	5,000	-,162	-1,280	,237	,937
cr1	2,000	5,000	-,059	-,465	,144	,568
cr18	2,000	5,000	-,617	-4,870	-,115	-,453
cr17	3,000	5,000	-,401	-3,169	-,975	-3,850
cr11	3,000	5,000	-,383	-3,021	-,763	-3,012
cr20	2,000	5,000	-,336	-2,652	-,131	-,516
cr15	1,000	5,000	-,736	-5,811	1,808	7,137
cr14	2,000	5,000	-,124	-,980	-,429	-1,693
cr13	2,000	5,000	-,188	-1,487	-,567	-2,240
cr12	3,000	5,000	-,171	-1,348	-,591	-2,334
cr2	2,000	5,000	-,003	-,023	,301	1,187
cr26	1,000	5,000	-,564	-4,455	,661	2,609
cr19	2,000	5,000	-,415	-3,278	-,260	-1,026
cr10	3,000	5,000	-,039	-,307	-,258	-1,020
cr8	2,000	5,000	-,525	-4,145	-,031	-,124
cr7	1,000	5,000	-,525	-4,145	1,776	7,012
cr6	2,000	5,000	-,890	-7,028	,188	,744
cr5	2,000	5,000	-,275	-2,169	-,270	-1,067
cr3	3,000	5,000	-,133	-1,051	-,753	-2,974
cr30	1,000	5,000	-,715	-5,643	1,329	5,247
cr29	1,000	5,000	-,329	-2,597	-,099	-,389

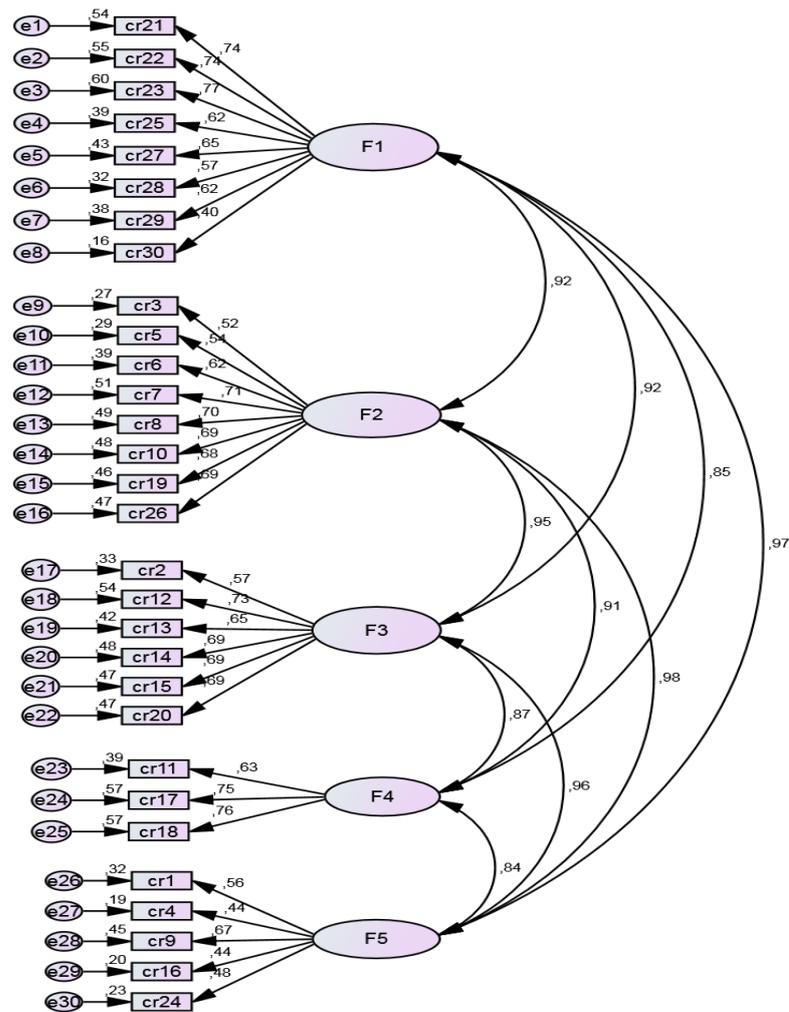
Variable	min	max	skew	c.r.	kurtosis	c.r.
cr28	1,000	5,000	-,068	-,535	-,267	-1,055
cr27	2,000	5,000	-,313	-2,469	-,011	-,045
cr25	2,000	5,000	-,509	-4,022	,880	3,475
cr23	1,000	5,000	-,527	-4,159	,748	2,953
cr22	2,000	5,000	-,382	-3,018	,458	1,806
cr21	2,000	5,000	-,461	-3,642	,369	1,457
Multivariate					238,632	52,660

Table 4 presents the critical ratios of the trajectories between the manifest and latent variables denoted by the values of p that are statistically significant, which evidences the maintenance of all items. The same table notes that the factor loads ( $\lambda$ ) are greater than 0.50 except for items cr4, cr16 and cr24, which in a more conservative analysis should be withdrawn.

**Table 4.** Critical ratios and lambda coefficient

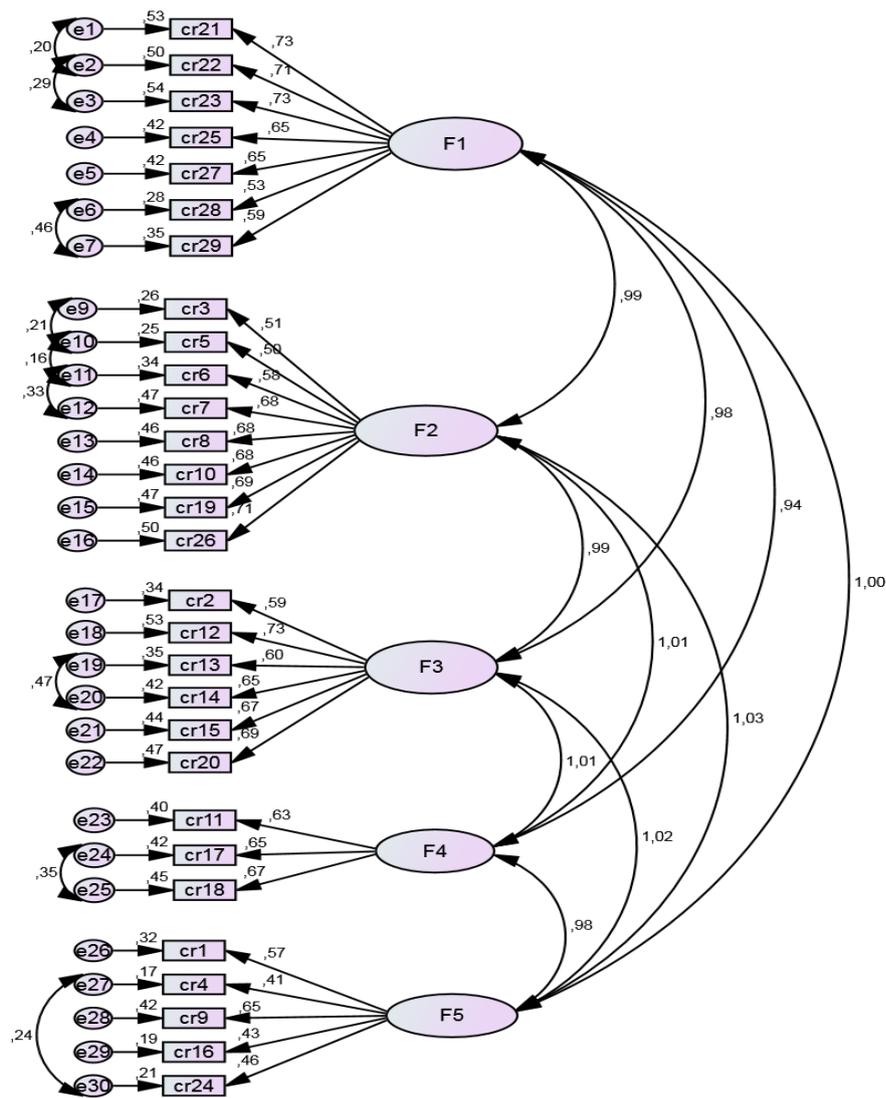
Trajectories			C.R.	P	$\lambda$
cr21	<---	F1			,738
cr22	<---	F1	14,406	***	,744
cr23	<---	F1	14,813	***	,773
cr25	<---	F1	11,717	***	,622
cr27	<---	F1	12,340	***	,652
cr28	<---	F1	10,474	***	,565
cr29	<---	F1	11,610	***	,619
cr30	<---	F1	7,397	***	,397
cr3	<---	F2			,518
cr5	<---	F2	8,180	***	,535
cr6	<---	F2	8,876	***	,622
cr7	<---	F2	9,600	***	,711
cr8	<---	F2	9,524	***	,697
cr10	<---	F2	9,515	***	,691
cr19	<---	F2	9,400	***	,681
cr26	<---	F2	9,444	***	,687
cr2	<---	F3			,572
cr12	<---	F3	10,627	***	,732
cr13	<---	F3	9,602	***	,646
cr14	<---	F3	10,078	***	,693
cr15	<---	F3	10,185	***	,689
cr20	<---	F3	10,294	***	,686
cr11	<---	F4			,626
cr17	<---	F4	10,834	***	,754
cr18	<---	F4	10,808	***	,757
cr1	<---	F5			,562
cr4	<---	F5	7,235	***	,438
cr9	<---	F5	10,012	***	,668
cr16	<---	F5	7,473	***	,444
cr24	<---	F5	7,842	***	,485

Figure 1 shows the item saturations and the individual reliability that we may consider suitable for subscales f1, f2, f3 and f4, but as previously mentioned only items cr1 and cr8 have saturations greater than 0.50. The overall adjustment indices in this initial model presented a satisfactory adjustment in relation to the indices CFI=0.814, GFI=0.789 and RMSEA=0.084, but adequate with respect to  $\chi^2/g.l. = 3.610$ ; RMR=0.026 and SRMR=0.059.



**Figure 1.** Initial model with all items and factor loads

The model was adjusted using the modification indices proposed by the programme and some errors were correlated (see Figure 2). It was verified that the error 2 belonging to item cr22 of factor 1 correlated simultaneously with errors 1 and 3 of the same factor. Similarly, error 10 of item cr5 is related to errors 9 of item cr3 and item 11 of item cr6 recorded in factor 2. After recording all modification indices, the model obtained improved slightly for the ratio of  $\chi^2/g.l.=2.972$ ; RMSEA=0.073; RMR=0.022; SRMR=0.052, although it continues to maintain unviable indices for GFI=0.832 and CFI=0.871.



**Figure 2.** Model with modification indices

To avoid multicollinearity problems resulting from the association of some errors, we eliminate items cr22 of factor 1, and cr5 of factor 2. Because item cr4 has a saturation lower than 0.40, we also eliminated it. The overall adjustment quality indices maintain the GFI (0.834) and CFI (0.870) as suffering. Only items cr16 and cr24 do not present regression weights greater than 0.50, but are statistically significant ( $p < 0.001$ ), which demonstrates the relevance of the factor to predict the items (see Figure 3). The individual reliability of the indicators ( $\delta$ ) presents coefficients ranging from 0.18 in item cr6 to 0.74 in item cr23.

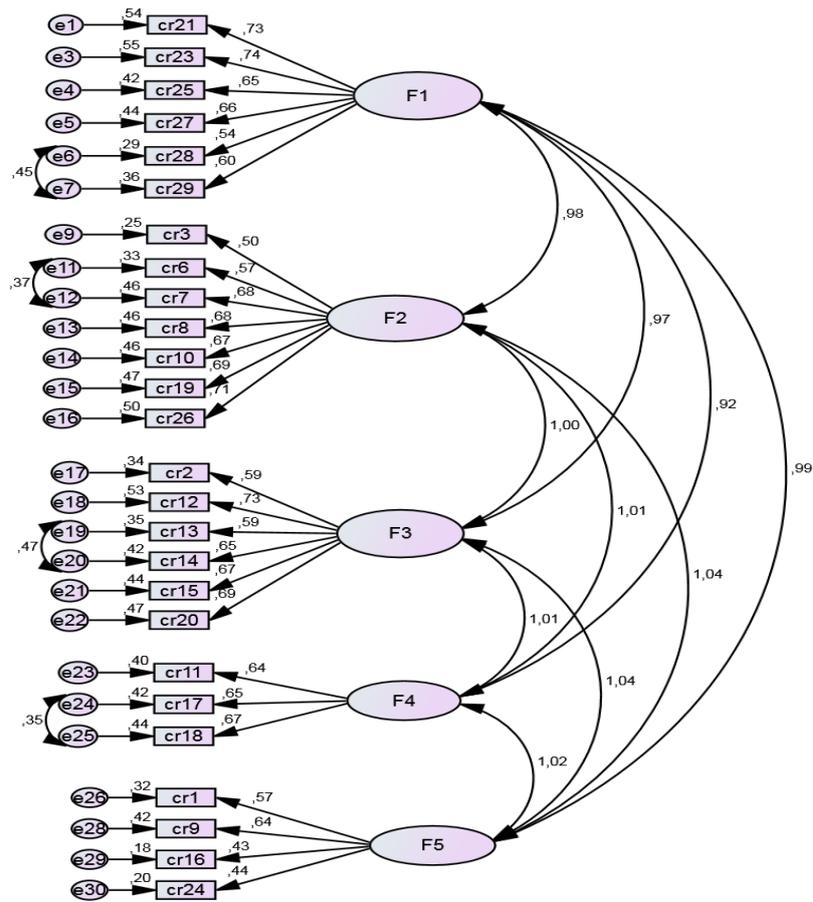


Figure 3. Relevance of the factor to predict the items

We proposed a hierarchical structure with a 2<sup>nd</sup> order factor that we called **communication in nursing students**, since the correlational values found appear to be quite high. Figure 4 illustrates the model with the 2<sup>nd</sup> order factor.

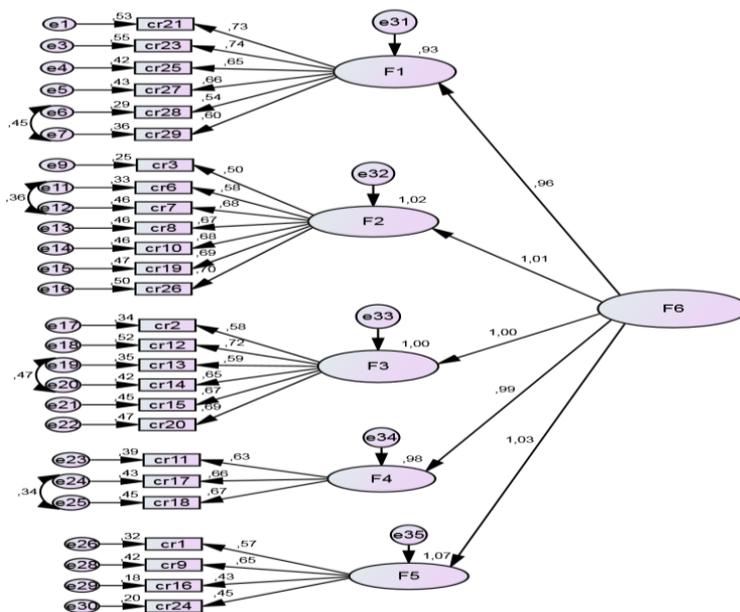


Figure 4. Model with the 2<sup>nd</sup> order factor

In this second-order hierarchical model, the adjustment quality values remain adequate for the  $\chi^2/df = 3,198$  RMSEA = 0.077; RMR = 0.023; SRMR = 0.053 and satisfactory for CFI = 0.834 and GFI = 0.870, which demonstrates factorial validity of the communication scale for students. Table 4 summarizes the overall adjustment indices obtained at the different moments of the study.

**Table 4 .** Quality indices of the adjustment of all models

Model	$\chi^2/df$	GFI	CFI	RMSEA	RMR	SRMR
Model 1 initial	3.610	0.789	0.814	0.084	0.026	0.059
Model 2 with modification indices	2.972	0.832	0.871	0.073	0.022	0.052
Model 3 with modification indices	3.230	0.836	0.870	0.077	0.023	0.053
Model 2 <sup>nd</sup> order	3.198	0.834	0.870	0.077	0.023	0.053

Regarding the composite reliability (CR), the results reveal adequate indices for factors 1, 2 and 3 because they are above 0.70, but are not enough for factors 4 and 5. The average variance extracted (AVE) presents lower values 0.50 in all factors, registering the lowest in factor 5. In none of the factors discriminant validity is noted.

**Table 5.** Composite reliability, average variance extracted and discriminant validity

Factors	CR	AVE	Discriminant validity			
			F2	F3	F4	F5
F1-	0.818	0.432	0.960	0.940	0.846	0.980
F2 -	0.832	0.417	-	1.00	1.020	1.081
F3 -	0.816	0.426	-	-	1.020	1.081
F4 -	0.687	0.422			-	1.040
F5 -	0.601	0.280				--

Table 6 presents the statistics and the internal consistency of the items by subscale. For **Factor 1 - Involve the patient**, the correlation value of the corrected total item varies between 0.506 in item 25 "Ask the patient if he/she has more concerns/complaints" being also this item that expresses less variability (30.4%) and ( $r=0.667$ ) in item 23 "Identify and activate resources and support for the patient" with an explained variance percentage of 47.7%. Cronbach's alpha values can be classified as reasonable and good.

In **Factor 2 - Facilitate the dialogue**, the correlation of the total corrected item has its maximum expression in item 7 "Establish or maintain the clinical relation" ( $r=0.669$ ) with a variability of 50.2% and the minimum in item 3 "Accept active patient participation in decision making" ( $r=0.457$ ), with an explained variance of 22.6% and Cronbach's alpha values classified as good.

Regarding **Factor 3 - Understanding the concerns**, the correlation value of the corrected total item varies between 0.460 in item 2 "Encourage a partnership with the patient" being also this item that expresses less variability (24.3%) and ( $r=0.669$ ) in item 14 "Explore beliefs, concerns and expectations about health and disease" with an explained variance percentage of 53.5%. Cronbach's alpha values can be classified as reasonable and good.

For **Factor 4 - Communicate assertively**, it is of all factors the one which reveals the correlation value of the lowest corrected total item, varying between 0.547 in item 17 "Use of plain language with the patient", and this item also expresses less variability (46.3%) and ( $r = 0.575$ ) in item 11 "Perform active listening using non-verbal (e.g., eye contact, body position) and verbal (e.g., words of encouragement) techniques" with a percentage of variance explained by 46.3%. Cronbach's alpha values can be classified as reasonable.

In relation to **Factor 5 - Conduct the interview**, it can be said that the correlation value of the total item ranges from 0.553 in item 1 "Establish rapport with the patient", which expresses less variability (37.3%) and ( $r=0.738$ ) in item 24 "Finish a clinical interview or a consultation" with an explained variance percentage of 38.2%.

**Table 6.** Internal consistency of the items by factors of the Clinical Communication Skills Scale

Items	Factor 1 – Involve the patient	Mean	Sd	r/item total	r <sup>2</sup>	$\alpha$ sem item
21	Encourage patient participation in decision-making as long as he/she wishes this	4,21	0,645	0,563	0,411	0,806
23	Identify and activate resources and support for the patient	4,07	0,697	0,667	0,477	0,785
25	Ask the patient if he/she has more concerns/complaints	4,39	0,565	0,506	0,304	0,817
27	Discuss and schedule the follow-up	3,89	0,718	0,635	0,418	0,791
28	Give bad news	3,34	0,873	0,590	0,453	0,805
29	Deal with complaints from patients	3,70	0,797	0,648	0,478	0,788
<b>Factor 2 – Facilitate the dialogue</b>						
3	Accept active patient participation in decision making	4,35	0,561	0,457	0,226	0,834
6	Encourage the patient to talk about his/her concerns	4,52	0,598	0,568	0,429	0,818
7	Establish or maintain the clinical relation	4,33	0,582	0,669	0,502	0,803
8	Collect the necessary information about the patient	4,33	0,635	0,645	0,452	0,806
10	Integrate, clarify and structure information provided by the patient	4,16	0,585	0,620	0,412	0,810
19	Encourage patient questions	4,24	0,660	0,589	0,368	0,815
26	Summarize and agree with the patient on the therapeutic plans	4,13	0,701	0,581	0,373	0,817
<b>Factor 3 – Understanding the concerns</b>						
2	Encourage a partnership with the patient	4,23	0,542	0,460	0,243	0,827
12	Understanding patients and perspective on the disease and problems	4,30	0,586	0,635	0,404	0,795
13	Explore contextual factors in the patient's life (e.g., family, culture, gender, age, disease perspective, socioeconomic level, spirituality)	4,11	0,667	0,648	0,507	0,791
14	Explore beliefs, concerns, and expectations about health and disease	4,07	0,649	0,669	0,535	0,786
15	Consider the patient's ideas, feelings and values and respond to them	4,23	0,647	0,604	0,378	0,800
20	Negotiate an agreement with the patient about problems and plans	4,04	0,705	0,584	0,361	0,806
<b>Factor 4 – Communicate assertively</b>						
11	Perform active listening using non-verbal techniques (e.g., eye contact, body position) and verbal techniques (e.g., words of encouragement)	4,43	0,575	0,463	0,217	0,775
17	Use of plain language with the patient	4,49	0,547	0,638	0,441	0,573
18	Check if the patient understood what I wanted to say	4,49	0,561	0,607	0,420	0,607
<b>Factor 5 – Conduct the Interview</b>						
1	Establish rapport with patient	4,25	0,553	0,373	0,142	0,545
9	Properly post open and closed questions	4,07	0,686	0,446	0,199	0,482
16	Share information with the patient	4,09	0,650	0,345	0,124	0,560
24	Finish a clinical interview or a consultation	3,70	0,738	0,382	0,151	0,537

Table 7 summarizes the Cronbach alpha values per subscale obtained in our study. It is emphasised that it is Factor 2 that presents a better internal consistency ( $\alpha=0.837$ ), with an alpha classified as good. In contrast, Factor 5 is what reveals a lower Cronbach alpha, considered reasonable ( $\alpha=0.603$ ).

**Table 7.** Cronbach's alpha values for subscales of Clinical Communication Skills Scale

Subscales	N° items	Cronbach's alpha
Factor 1 – Involve the patient	6	0.827
Factor 2 – Facilitate the dialogue	7	0.837
Factor 3 – Understanding the concerns	6	0.829

Factor 4 – Communicate assertively	3	0.741
Factor 5 – Conduct the interview	4	0.603

We conclude the study of this scale alluding to the Pearson correlation matrix established with the scale factors. We have verified that the correlations are positive and significant.

**Table 8.** Pearson Correlation Matrix among the factors of the Clinical Communication Skills Scale

Subscales	Factor 1 – Involve the Patient	Factor 2 – Facilitate the dialogue	Factor 3 – Understanding the concerns	Factor 4 – Communicate assertively	Factor 5 – Conduct the interview
Factor 2 – Facilitate the dialogue	,760 **	--			
Factor 3 – Understanding the concerns	,746 **	,802 **	--		
Factor 4 – Communicate assertively	,638 **	,745 **	,709 **	--	
Factor 5 – Conduct the interview	,710 **	,714 **	,698 **	,614 **	--
<b>Total of the factors</b>	<b>,899 **</b>	<b>,925 **</b>	<b>,909 **</b>	<b>,809 **</b>	<b>,833 **</b>

\*\* p<0.001

## CONCLUSIONS

Reflecting on the skills of clinical communication and interpersonal relationships of nursing students is fundamental for the path as students and for the process of building professional identity. Nursing students, especially in clinical teaching, are in a privileged situation of developing reflection *on* and *about* action. Clinical communication skills are very relevant for the construction of professional knowledge, which implies the development of innovative experiences in this field, in order to improve practices and respond to the challenges that quality health care raises. The Clinical Communication Skills Scale consists of 26 items, which allow to know the **communication skills** of nursing students/nurses in 5 domains or factors: **Involve the patient** with an explained variance of 47.7%, **Facilitate the dialogue** with an explained variance of 22.6%, **Understanding the concerns** with an explained variance of 53.5%, **Communicate assertively** explained variance of 46.3%, and **Conduct the interview** with an explained variance of 38.2%.

After the first study of clinical communication skills in nurses, we sought to know if the factorial structure remained invariant for communication in nursing students. We carried out the penta-factorial solution resulting from the first study, the factorial analysis, the covariance matrix and the maximum likelihood algorithm, and we conclude that after eliminating items 22 and 30 of factor one, item 5 of factor 2 and item 4 of factor 5, the scale has good reliability and validity indices with a dimensional structure close to the initial one. The results of the present study support the psychometric adequacy of the scale indicating that it can be used in future trials in both nursing students and nurses.

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# **Clinical Teaching in Emergency Medicine as A Stress Generator in Students of the Licentiate Degree in Nursing - The Reality in A School in the Centre of the Country**

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## **ABSTRACT**

Performing clinical teaching in an emergency service is a significant step in the student's learning process, which requires adapting to a diverse and complex context of healthcare provision that inevitably generates anxiety and stress. The objective was to verify if the socio-demographic and academic variables interfere in the stress of nursing students in clinical teaching in emergency medicine; to evaluate the stress factors; to verify the relation of sociodemographic, academic and stress factors in clinical teaching with depression, anxiety and stress. A quantitative, descriptive-analytical and cross-sectional study was performed in a non-probabilistic sample for convenience, made up of 74 former nursing students. A self-completion questionnaire was used, consisting of a socio-demographic and academic characterization questionnaire, the Scale of Anxiety, Depression and Stress by Lovibond and Lovibond, adapted by Pais-Ribeiro, Honrado and Leal (2004), the KEZKAK Scale by Zupiria Gorostidi et al. (2003), translated and adapted for the Portuguese population by Barroso et al. (2008). A predominantly female sample (78.4%), with a mean age of around 23.32 ( $\pm 3.407$  Sd), in which men ( $M=24.40 \pm 3.282$  Sd) on average, are slightly older than women ( $M=23.02 \pm 3.408$  Sd). The mean stress value was 6.24 ( $\pm 3.522$  Sd). The highest mean values were the "Impotence and uncertainty" factors 17,39 ( $\pm 7,889$  Sd), "Lack of ability" ( $M=16.02 \pm 9.076$  Sd) and "Contact with suffering" ( $M=13.36 \pm 6.819$  Sd). The women showed more stress especially with regard to the factor close relationship with the student ( $p=0.011$ ). Younger, single students, living in urban environments, living with friends/residence, whose clinical teaching took place in Lamego, revealed higher mean ordering values in the stress factors of clinical teaching, suggesting that they are the ones with higher levels of stress. The results emphasize the need for strategies to reduce the level of stress experienced by students during clinical teaching in emergency medicine, in view of its complexity, especially in the initial training of the Licentiate Degree in Nursing.

**Key words:** Nursing students; Clinical teaching in emergency medicine; Stress.

## **INTRODUCTION**

Performing clinical teaching in an emergency service is a significant step in the student's learning process, which requires adapting to a diverse and complex context of healthcare provision that inevitably generates anxiety and stress. However, Abreu (2007) points out that clinical teaching is irreplaceable, given its nature of mobilization and knowledge integration. The same author also highlights that the teaching and learning process seeks to develop the areas expected of a nursing professional, fostering solid theoretical training in articulation with practical concrete situations, in order to develop an integrated, critical and reflexive vision of nursing care in students.

In the teaching and learning process, the pedagogical practices that prevail are guided by cognitive processes, knowledge structures, teaching strategies, namely concerning problem solving, information processing and the transfer of learning in new situations (Barroso, 2009). Hence, students, in clinical teaching learning situations, must be able to respond effectively to the different requests and challenges posed to them, mainly in clinical teaching in emergency medicine, where they are interacting with the entire socio-professional environment and must deal with the complexity of various situations.

Being a nursing student in the emergency service is not always easy because it is a service where complex clients, lacking everything and everyone, come in with a polypathology framework that requires nurses to have several possibilities for solving it, a great challenge (Cunha, 2011). Moreover, and as already previously mentioned, the emergency service is characterized by being a service with a high level of complexity due to its structure, functionality and organization. According to the Ministry of Health, emergency services are "multidisciplinary and multiprofessional services that aim to provide healthcare in all situations within the definitions of emergency and medical emergency" (Order No. 11/2002). In the emergency service, the "unpredictability" factor is predominant, which "is quite pronounced and where the transfer of theoretical knowledge to practice must be ready and effective" (Pereira, 2007, p.64). To corroborate, Serra (2008, p.77) states that "complexity and unpredictability in healthcare situations, sometimes based on urgency, and the professional experience that teachers and professionals have, often show the perspective of clinical practices as an anxiogenic experience and the preview of internships as battlefields."

It is considered that clinical teaching, periods of training in real working situation, is made up of privileged moments of the Nursing student's education. Nevertheless, they are not free of problems and difficulties that can be generators of stress (Serra, 2008).

Stress in clinical teaching is conceived as a relation of imbalance between its demands and personal resources, in which the students perceive that certain requirements exhaust or extrapolate the resources that they deem to have in the face of a situation that they consider as threatening to their balance. Therefore, stress in clinical teaching is the result of the existence of a real or perceived misfit between the demands of the situation experienced and the abilities or desires that the student has in facing these demands (Pacheco, 2008). The literature highlights the problems that occur during clinical teaching, which in some way affect students' learning and provision of healthcare. As an example, it refers to the gap between what is taught in theory and the actual practice of care, potentiating moments of anxiety and stress (Rodrigues & Veiga, 2006; Serra, 2008).

In the context of clinical teaching, students, like nurses, are faced with occupational stress situations. The liability for people, in which wrong decisions can worsen injuries or illness and even lead to the death of the person being cared for, worries students and professionals. In fact, in Nursing, due to the specificity of their tasks and having people as their object of care, it is common for students to realize the complexity and uniqueness of the student-patient/client relationship and to confront the limitations of their work and of their scientific knowledge. This is the main reason why many feel deceived and impotent in this stage of training. Early encounters with clients are usually associated with uncertainties, anxieties, expectations and fears (Rodrigues, 2005).

## **THE STUDY**

When a stress response is triggered in the body, there are changes at the biological level, in the functioning of the vegetative, endocrine and immune nervous systems, resulting in a large number of metabolic variations, modifying the basic biological functions and making the organism more vulnerable to infections (May, 2011). According to the author, the situation is worsened the longer and more intense the exposure to stress is. In addition to biological changes, one must take into account the changes that arise at the psychological level and at the level of observable behavior.

Nursing has been referred to as a risk profession with regard to the high challenges and requirements that nurses face on a daily basis. The domain of its intervention and object, the client and the actual nature of caring, and the inherent conditions of the organizational context are assumed as some peculiarities that make the nursing practice susceptible to the development of high levels of occupational stress (Cunha, 2011).

The complexity of the contexts and clinical situations pertaining to the setting of the emergency service are elements that generate great stress for nursing students. The confrontation with illness, suffering or death at all times requires the supervisor to provide the student, in addition to adequate training strategies, an effective emotional support, insofar as the affective changes that may occur during the clinical teaching of emergency medicine need to be managed and overcome positively, which is crucial for the student's personal and professional development. Treating human lives, with the possibility of error underlying the therapeutic decision to be made,

is a factor of stress that students, according to Cunha (2011), frequently report in clinical teaching and what conditions their decision in the intervention, and increases anxiety and stress levels.

### **RESEARCH QUESTIONS**

The empirical study was oriented to answer the following questions: i) Which socio-demographic variables interfere in the stress of the 4th year nursing students in clinical teaching in emergency medicine? ii) Which academic variables influence the stress of the 4th year nursing students in clinical teaching in emergency medicine? iii) What is the relation of sociodemographic, academic and stress factors in clinical teaching with depression, anxiety and stress?

### **OBJECTIVES OF THE STUDY**

To answer the research questions, the following objectives were outlined: i) To identify the sociodemographic variables that interfere in the stress of 4th year nursing students in clinical teaching in emergency medicine; ii) To identify the academic variables that interfere in the stress of 4th year nursing students in clinical teaching in emergency medicine; iii) To verify the relationship between sociodemographic, academic and stress factors in clinical teaching and depression, anxiety and stress.

### **RESEARCH METHODS**

In order to be able to achieve the aforementioned objectives, a quantitative, cross-sectional, descriptive and correlational study was carried out. The quantitative methodology was used since the data provide objective realities with respect to the variables under study. This type of study "aims to analyze the incidence, distribution and relations between variables that are studied as they exist, in a natural context, without manipulation, being almost always classified according to these three basic objectives: describe, explain or even explore" (Coutinho, 2014, p.277).

It is descriptive because it seeks to discover the incidence and distribution of certain traits or attributes of a given population, without the researcher trying to explain them. Accordingly, the present study can be characterized as such, since the distribution of the trait (variable) in a representative sample of former nursing students of a School of Health in the center of the country (sample) is studied (Coutinho, 2014). It is assumed as a cross-sectional study because the data were collected at a single moment in time in a representative sample of former nursing students, either to describe or to detect possible relations between variables (Coutinho, 2014).

For the collection of data, a self-completion questionnaire was used, consisting of a socio-demographic and academic characterization questionnaire, the Scale of Anxiety, Depression and Stress by Lovibond and Lovibond, adapted by Pais-Ribeiro, Honrado and Leal (2004), the KEZKAK Scale by Zupiria Gorostidi et al. (2003), translated and adapted for the Portuguese population by Barroso et al. (2008). The psychometric studies for the present study concerning the two scales used reveal very good values of Cronbach's alphas. Hence, for the KEZKAK scale the alpha values were classified as good, with minimum and maximum values ranging from 0.970 to 0.971, in which alpha ( $\alpha=0.971$ ) was classified as very good for the whole scale, higher than for the first half where a value of  $\alpha=0.953$  was obtained and  $\alpha=0.945$  for the second one, also classified as very good. For the Anxiety, Depression and Stress Scale (EADS-21), the alpha values were also very good, ranging from 0.918 to 0.927.

For the analysis of the data, we used descriptive statistics and analytical or inferential statistics. All statistical treatment was processed through the SPSS program (Statistical Package for the Social Sciences) version 21.0 (2013) for Windows.

### **RESULTS**

The results obtained allowed the tracing of a sociodemographic and academic profile of the sample of 74 former nursing students, mostly female (78.4%) with a mean age of 23.32 years ( $\pm 3.407$  years). Men, on average ( $M=24.40$  years  $\pm 3.282$  years), are older than women ( $M=23.02$  years  $\pm 3.408$  years). Cunha (2011), in his study, also had a sample of students from the 4th year of the Licentiate Degree in Nursing, mostly female (74.0%) aged between 20 and 45 years old, in which clinical teaching in emergency medicine had already been carried out.

Likewise, Custódio, Pereira and Seco (2009), in their study, found that the majority of their sample was female (81.4%).

Participants without partners (93.2%), those who lived with friends/residence (59.5%) during school time and those living in urban areas (82.4%) are predominant. As for the place where the participants performed clinical teaching in emergency medicine, 47.3% reported that it was in Viseu and 36.5% in Baixo Vouga.

As for data on depression, anxiety and stress, it was found that the mean rates were 3.39 ( $\pm$  3.667 Sd) for depression, with 4.74 ( $\pm$  3.468 Sd) for anxiety and a mean value of stress slightly above 6.0, revealing that the former nursing students went through periods of stress during clinical teaching in emergency medicine. In this context, Serra (2010) concluded in his study that anxiety associated with fears significantly reduces the student's confidence in himself/herself, changing his/her biological rhythm as all this tension increases his/her level of stress, including worrying, decreased hours of sleep and rest, and insomnia. The results obtained in the present study are in agreement with those of Cunha (2011), where it was shown that, at the level of the socio-emotional aspect, nursing students in clinical teaching in emergency medicine showed some emotional inconstancy, especially anxiety (86.00%), nervousness (84.00%) and stress (74.00%). According to the author, these results do not have any significant variation according to the place where the clinical teaching in emergency medicine was carried out. It was also verified, regarding the stress factors of the participants of the present study in clinical practice in emergency medicine, for the total stress, a minimum of 0.00 and a maximum of 172.00, corresponding to a mean of 88.02 ( $\pm$  41.397 Sd), with the highest mean value recorded in the "Impotence and uncertainty" dimension 17.39 ( $\pm$  7.889 Sd), which shows that this was the most relevant stress factor for students at the time of clinical teaching in emergency medicine. In terms of mean, the "Lack of Competence" dimension ( $M=16.02 \pm 9.076$  Sd) and the "Contact with suffering" dimension ( $M=13.36 \pm 6.819$  Sd) came next. The factor that caused the least stress in the former students was "Close relationship with the student" ( $M=2.20 \pm 1.679$  Sd). Some studies confirm that clinical teaching nursing students are confronted with a wide variety of vulnerable situations, experiencing levels of stress and anxiety with greater intensity (Barroso, 2009; Custódio, Pereira & Seco, 2009; Cunha, 2011). This draws negative repercussions on their performance, physical health and emotional well-being, depressive symptoms and stress, associated with the fear of failure, which in many cases results in the feeling of impotence and uncertainty and lack of ability in real-life situations of clinical practice. According to Pocinho and Garcia (2008), occupational stress occurs when people perceive their inability to perform the tasks requested, resulting in suffering, discomfort and a feeling of inability to cope with work situations.

Regarding the first research question, which sought to know which sociodemographic variables interfere in the stress of 4th year nursing students of clinical teaching in emergency medicine, it was verified that women are the ones who show higher means in all stress factors in clinical teaching, highlighting the factor close relationship with the student, where there was a statistically significant difference ( $p=0.011$ ). These results corroborate those found by Custódio, Pereira and Seco (2009), according to which female students express significantly more cognitive-emotional and physical manifestations due to stress, while male students demonstrate significantly more Behavioral stress manifestations. Likewise, Custódio (2010) found that female students showed significantly higher mean levels of perception of stress situations than their male counterparts. It can be inferred that the female sex is more vulnerable to stress during clinical teaching. Barroso (2009) points out that this difference between genders may reflect a greater self-confidence of male students and greater sensitivity on behalf of female students and less self-confidence in their performance. Still from the perspective of the same author, male students can be more realistic and objective whereas female students more perfectionist and subjective.

Another result was the fact that the youngest students were the ones who felt the most stress during clinical teaching, except for the factors impotence and uncertainty, close relationship with the student and work overload, which were more present in older students. Even so, there were no statistically significant differences. These results are not in line with those established by Custódio (2010), inasmuch as the author verified that the students of the 2nd, 3rd and 4th year show a greater perception of situations that induce stress than their 1st-year colleagues.

Regarding the second research question, which sought to verify which academic variables influence the stress of 4th year nursing students of clinical teaching in emergency medicine, the variable that interfered statistically was the place where clinical teaching in emergency medicine took place. It was verified that it was the former students

who had carried out the aforementioned clinical teaching in Lamego who revealed having felt more stress during the same period. The close relationship with the student, getting affected by the relationship with the patient/user and work overload was emphasised. It was also verified that the former students who carried out clinical teaching in emergency medicine in Seia revealed having felt stress during its execution. The participants who reported feeling less stress were the ones that said performed their clinical teaching in Oporto, resulting in statistically significant differences in the factor getting affected by the relationship with the patient/user ( $p=0.025$ ) and work overload ( $p=0.047$ ). Since there are no studies that empirically support these results, it is mentioned that Barroso (2009), in her study, also found that, among the factors that most induce stress in clinical teaching students, it is worth noting the factor getting affected by the relationship with the patient/user and work overload. Nevertheless, the author refers to the progressive learning of the clinical context and the familiarity with the situations of care practices, insecurity decreases, giving rise to a positive development in self-esteem, to which is added the development of coping strategies that allow them to control feelings and deal with situations that may induce stress.

Regarding the third research question, which verified that there is a relationship between sociodemographic variables, academic context, stress factors in clinical teaching and depression, anxiety and stress, it was verified that the relationship with the counsellors and colleagues established a direct relation with anxiety. This suggests that the participants with more impact of the relationship with the counsellors and colleagues reveal more anxiety, being these results in line with those attained by Barroso (2009). These results corroborate those obtained by Rodrigues and Veiga (2006), in a study of clinical teaching nursing students in the hospital context, confirming the existence of anxiety and stress triggers in the supervisory process, interpersonal relationships, adapting to multiprofessional teams, the relationship with counsellors and colleagues, as well as confidence in professional abilities. This leads to the conclusion that these situations, generating anxiety and stress in clinical teaching, may affect the performance of nursing students in healthcare provisions. The same authors concluded that the greater the anxiety and stress felt during clinical teaching, the lower the student's technical skills in providing care to the patient. In this regard, Barroso (2009) refers to the need for a better preparation of the counsellors for the teaching and learning process, because when there is no such preparation, it is translated into a lack of fellowship and support, indifference, passivity and little implication in the learning context of clinical practice. The author points out that the counselling nurses are specified by the students as the most important variable in the success of the training in clinical teaching.

It was also found that getting affected by the patient/user relationship and gender establish an inverse relationship with stress, suggesting that participants who are less aware of being affected by the patient/user relationship, and regardless of gender, reveal more stress.

Taking into account the results obtained, and considering the one recommended by Garrido and Simões (2007), it is important to note that the requirements of the situations experienced in clinical teaching influence the performance of students, as they are faced with new situations, resulting in the development of skills related to their transition from student to nurse. In this context, Abreu (2007) points out that this transition will have to be based on a critical reflection by the student on the work situations experienced. More specifically, on the experience acquired in clinical teaching, aiming to reinforce his/her potential on the environment and to develop the ability to transfer skills acquired from one situation to another. Thus, even from the perspective of Abreu (2007), the lived experiences allow the students to be able to effectively use these skills in different work situations, which will result in a good performance. Otherwise, students may experience stress and consequently see their performance compromised.

## CONCLUSION

It was concluded that, in a sample of 74 former nursing students, the majority is female (78.4%) with a mean age of 23.32 years ( $\pm 3.407$  years), without a partner (93.2%), living with friends/residence (59.5%) during school time and living in urban areas (82.4%). It was found that the main locations where the clinical teaching in emergency medicine was carried out was in Viseu (47.3%) and in Baixo Vouga (36.5%).

The mean values were 3.39 ( $\pm 3.667$  Sd) for depression, 4.74 ( $\pm 3.468$  Sd) for anxiety and a mean value of stress slightly above 6.0, suggesting that the former nursing students went through phases of stress during their clinical teaching in emergency medicine.

Regarding the stress factors of the students involved in the present study in the emergency clinical practice, a higher mean value was found in the dimension "Impotence and uncertainty" ( $M=17.39 \pm 7.889$  Sd), followed by lack of ability ( $M=16.02 \pm 9.076$  Sd) and contact with suffering ( $M=13.36 \pm 6.819$  Sd).

Concerning the sociodemographic variables that interfered with the students' stress, it was found that women showed higher means in all of the stress factors in clinical teaching, highlighting the factor close relationship with the student, where there was a statistically significant difference ( $p=0.011$ ). Younger students felt more stress during clinical teaching, except for the impotence and uncertainty factors, close relationship with the student and work overload. These factors were more present in the older students, but without any statistically significant differences.

With reference to the second research question, the variable that interfered statistically was the place where the clinical teaching in emergency medicine took place. Also, the students who carried out the aforementioned clinical teaching in Lamego were the ones who felt more stress, emphasising as most stressful factor the close relationship with the student, being affected by the relationship with the patient/user and work overload. It was also verified that the students who carried out the clinical teaching in emergency medicine in Seia evidenced to have felt stress during this period of time. The participants who reported feeling less stress were those who performed clinical teaching in emergency medicine in Porto, resulting in statistically significant differences in the factor being affected by the relationship with the patient/user ( $p=0.025$ ) and in work overload ( $p=0.047$ ).

It was found that the relationship with the counsellors and colleagues established a direct relation with anxiety, suggesting that the participants with more impact of the relationship with the counsellors and colleagues reveal more anxiety. It was also noted that being affected in the patient/user relationship and gender establishes an inverse relationship with depression, suggesting that participants with less impact of being affected in the patient/user relationship, and regardless of gender, reveal more depressive symptoms. Finally, it was concluded that being affected by the relationship with the patient/user and gender establish an inverse relationship with stress, indicating that students with a lower perception of being affected by the relationship with the patient/user, and regardless of gender, reveal more stress.

In light of the results obtained and considering a reflection on the theoretical framework, it can be said that, for nurses, the provision of healthcare in an emergency service is characterized mainly by its complexity and specificity. In consequence, students, compared to nursing professionals, have a lower degree of experience and dexterity, which results in greater difficulties, and thus leading to higher levels of stress. Accordingly, it is suggested the creation of spaces of sharing between students and their peers and counsellors/teachers, where they can express what is less well and share experiences. This will serve as a starting point for the nursing student in order to gain skills and autonomy, which implies the strengthening of communication channels, creation of group dynamics giving rise to Team Building activities, that is, through which nursing students in clinical teaching, in partnership with counsellors/teachers, can be proactive. In this sense, an offering of proposals to build a professional accomplishment capable of promoting quality health care.

It is also suggested that support networks be reinforced within the school itself in order to positively reassess the sources of stress of clinical teaching nursing students, so as to fight against the negative impact of stress factors. This may also involve reinforcing learning and clinical simulation training so that they are able to cope with stressful situations in a positive way and are able to cope with clinical teachings with physical and emotional well-being.

In this perspective, a more simulation-based teaching is suggested. This may contribute to an increase in the knowledge and performance of nursing students, because simulated practices allow for controlled environments, helping students to combine knowledge and skills through an interactive construction with the case. It is considered

that, through the simulation training strategy, more skills gains can be achieved, becoming more critical, active and reflexive students. This is an active teaching strategy for training in hospital settings. The implementation of the practice based on scientific evidence on the basis of simulated teaching may allow an improvement in the teaching and learning process of nursing students, while providing an optimization of the quality of healthcare given to patients, considering that students begin to develop their psychomotor skills of decision, dexterity, knowledge, leadership, clinical judgment and attitude toward nursing and being a nurse. It also assumes as relevant the planning and development of strategies for the various clinical teachings, in particular for clinical teaching in emergency medicine, making it possible to continue the teaching and learning process in close articulation with work contexts.

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# Collaboration of the Islamics' School Students in Solving the Jumping Task During the Collaborative Learning in A Mathematics Classroom

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## ABSTRACT

This research aims to describe the collaboration of Islamics' school students in solving the jumping task during the collaborative learning in a mathematics classroom. Collaboration referred to indicators of social ability and emotional development of students that were learn from, care for, and respect one another. The research result indicated that students tended to have attitude of learn from and care of each other with maximal answer truth while care for ability had not yet appeared in students. Students tended to (1) be able to learn from the use of IT-based learning media or visual aids as well as from students' books that had been provided by teachers in solving mathematical problems, (2) able to express their opinions when there were friends who asked about math concept, and (3) able to discuss well between boys and girls.

**Keywords:** Collaboration, islamics' school, mathematics classroom, collaborative learning

## INTRODUCTION

Collaborative classroom is a model for all teachers respecting and supporting all student activities by creating a safe, happy, and exciting atmosphere (Armstrong, 2011). Therefore in this research, what was meant by collaborative mathematics classroom was a model that all math teachers could use to create a learning atmosphere in a fun math class and give students the opportunity to construct their knowledge. Collaborative learning is a learning model referring to communication theory by John Dewey and development theory by Lev Vygotsky (Sato, 2014)

There are four core principles of succeeding a collaborative classroom: 1) social and academic curricula have to be interdependent and related each other, 2) fostering the caring relationship and developing an inclusive and safe environment, 3) classroom learning experiences have to be built around the knowledge developed by students and engage in their actions, and 4) respecting and building the students' intrinsic motivation leading to their engagement and achievement (Classroom, 2015). The four principles were also applied to this research which focused on mathematics learning. Hence, the implementation plan of mathematics learning designed in this research also focused on these four principles and gave every student the opportunity to learn math maximally. During collaborative learning on mathematics learning, students were expected to have good collaboration skills.

Collaboration into several skills, namely (1) demonstrating the ability to work effectively and respectfully with different groups, (2) training fluency and willingness to assist in making compromise needs to accomplish the main goal, and (3) accepting the sharing of responsibilities for collaborative work and the value of individual contributions made by each member of the group (P21, 2016). Future expectation is one day when every school and every classroom provides a safe and supportive environment where children can take the risks needed to grow themselves both socially and academically, and eventually grow into a principled, critical thinker who learn from, care and respect for each other (Anonymous, 2015). Based on the explanation, the collaboration indicators

in this research referred to the indicators of social ability and emotional development of the students that learn from, care for, and respect one another. Students had the learning collaborative skill from IT-based learning media, mathematics tools, student books, and explanations from friends and teachers. Furthermore, students had a sense of care for each other which were being brave to ask friends if there was understandable material, caring to friends by discussing together, and collaborating with friends in solving the jumping problems given by the teacher. Collaboration activities were done when students solved the jumping problem in group discussions.

Jumping task is a suitable task to develop collaborative skill among students (Sato, 2014). Based on Lev Vygotsky's theory, students cannot learn by themselves to develop their academic skills but students develop more if they learn with their friends (Vygotsky, 1980). Jumping task is a set of problems above the students' Zone of Proximal Development (ZPD). This is because students having the low ability or high ability have not been able to solve problems existing in the jumping task, so it needs the collaboration among students in groups. The ZPD is the distance between a student's ability to perform a task under adult guidance and / or with peer collaboration and the student's ability solving the problem independently (Crawford, 1996). According to Vygotsky, learning occurred in this zone.

Student collaboration at Islamic schools in Jember regency, East Java Indonesia had not developed maximally especially collaboration of male students with women students. The collaboration was in the form of mutual learning communication between male students with women students. In addition, students in Jember Regency had not utilized maximally the use of the internet in searching for some mathematical materials that could help them to solve the problems given by the teachers. In everyday life, students used IT for facebook and online games. Furthermore, students also had not been able to have good caring attitude, for example students having good skills (smart) did not want to teach his friends; otherwise, students having low ability did not have the desire to be brave to ask. The use of blackboards at Islamic schools in Jember occupied by teachers and students was also not optimal in helping the smooth learning in the classroom. This resulted student collaboration with blackboard or student collaboration with teachers was also not maximal. Besides, by using a whiteboard maximally, it could improve the learning quality in the math class and able to improve students' learning ability (Balta & Duran, 2015). The use of learning media either interactive projector or general data projector can also improve students' math learning ability (Liu & Cheng, 2015), so it is necessary to collaborate with learning media in the form of interactive projector and general data projector.

Some problems causing students' high order thinking skill of Islamic school were not maximal. It was in accordance with the results of previous research stated that there were 80% of students in Islamic schools around Jember coffee plantations belonging to the Apprentice category, ie students had not been able to have performance ability, especially the utilizing coffee plantations understanding that can support the process of solving math and science problems (Suratno & Kurniati, 2017). Therefore, it was necessary to trace collaboration among students during classroom learning through giving the jumping task. After knowing the collaboration among students in Islamic schools, it could be known the learning model with suitable learning environment used in Islamic schools, especially in Jember, East Java, Indonesia.

## **METHOD**

This research was a descriptive research using qualitative approach. Research aims to describe the collaboration of Islamic school students in solving the jumping task during the collaborative learning in a mathematics classroom. Observations of the students' collaboration were carried out continuously during the collaborative learning. Focuses of the collaborations' observation were how students do learn from, care for, and respect one another. This research was conducted in the Islamic school in Jember regency, East Java, Indonesia. The research subjects were 36 students.

The stages of this research were (1) giving jumping task to each group consisting of 4 students with 2 male and 2 female, (2) observing the collaboration of the four students in one group during doing the jumping task, (3) the analysis of each student's collaboration was based on the observations either written on the observation sheet or video recording during doing the the jumping task, (4) interviewing to some students who were considered observers had not been seen clearly the collaboration process, and (5) determining the collaboration tendency of

all students in finishing the jumping task on mathematics collaborative learning . The observation sheet in this research referred to an open observation sheet and can be seen in Figure 1. The given problem was an essay question, and there were 4 questions relating to the sub-subject of two-dimensional figure. Giving the jumping task was done continuously for four meetings for two-dimensional figure material. The seat position was designed by using cross-linked between male students and female students. It can be seen in Figure 2

### Observations' Sheet

<p><b>Benchmark:</b></p> <p><b>Lesson Objective:</b></p> <p><b>Content Area:</b> _____</p> <p>Students say or do (learn from, care for, and respect one another).....</p>	<p><b>Date of Observation Lesson:</b> _____</p> <p><b>Names of the students:</b> _____</p> <p>_____</p> <p><b>Notes about students:</b> _____</p> <p>_____</p> <p><b>Anticipated problems:</b> _____</p> <p>_____</p>
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Figure 1. Observations' Sheet

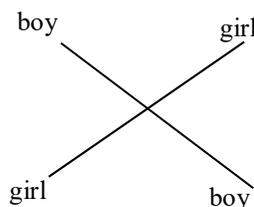


Figure 2. Seat Position

## RESULT AND DISCUSSION

The research test was conducted on two Islamic schools in Jember regency namely MTsN 2 Jember and MTsN Arjasa 1 Jember with the research participants of 36 students. The research participants were divided into 9 groups. Each group consisted of 4 students (2 males and 2 females). The seat position was designed by using cross-linked between male students and female students.

The seats in the classroom were set in U position. It was expected that there were collaborations between students and teachers and students with different groups. Each group was given the opportunity to share with other groups (but it was emphasized not to cheat the answers of other groups). Observation was focused on student collaboration activities with students, teachers, instructional media, student books, and student work sheet during collaborative-based mathematics learning. Collaboration indicators in this research were learn from, care for, and respect one another.

Groups 1, 2, and 3 were able to solve all the problems given on the jumping task correctly. Female students in group 1 were able to work with male and female students; as well as, male students were able to work with female and male students; so that, male and female students in groups 1, 2, and 3 were able to work well despite the U-seat seating position. When completing the question no 1, the students jointly designed a mathematical model by drawing a house design consisting of two-demintional figure of triangular, rectangles, parallelogram, and square. Furthermore, in solving the problem no 2, students groups 1, 2, and 3 were able to utilize Microsoft Excel program to determine the estimated value of the area of two-dimentional figure in the form of a garden

with an approach of number 5 integration. In the problem no 3 and 4, students utilize books in the library and props provided by the teacher correctly in helping them solve the problem about the design of a house completed by a garden in order to make the house look beautiful with minimal expenses. During the process of solving the problem in jumping task, male or female students in groups 1, 2, and 3 were able to collaborate well, for example one female student having high math ability had concern for three friends having low math ability. Furthermore, the other three students were also brave to ask the smart friend when having difficulty in solving the problem.

Groups 4 and 5 had the same tendency in solving problems on jumping tasks. There were 3 questions from 4 questions answered correctly by groups 4 and 5. Students had the ability to draw a house design consisting of two-dimensional figure of triangular, rectangular, parallelogram, and square to solve the problem number 1. Furthermore, students were also able to utilize the book in the library and props provided by the teacher correctly in helping them solve the problem about the design of a house completed by a garden in order to make the house look beautiful with minimal expenses. However, students had not been able to utilize Microsoft Excel program in solving the problem number 2. In addition, female students of groups 4 and 5 had the same tendency that was able to collaborate with male and female students while male students were unable to collaborate with female students although they were in one group. Male students felt awkward in communicating with female friends. However, all students in groups 2 and 3 were brave to ask the teacher if they had difficulty in solving all the problems.

Groups 6 and 7 had similar collaboration tendency among their students. However groups 6 and 7 were able to complete 3 true questions from 4 given questions. Problem that could not be done was the problem no 1 about utilizing the media in the process of solving the problem. Students in groups 6 and 7 were able to utilize Microsoft excel programs, props, and books in the library in solving the problems 2, 3, and 4. The tendency owned by students in groups 6 and 7 was similar to the tendency of student collaboration in groups 4 and 5, ie female students were able to collaborate with men and women students while male students were only able to collaborate with male friends. In addition, all students in groups 5 and 6 were also brave to ask if they had difficulty in solving the problems to the teacher, and had a concern to friends having difficulty.

Students in groups 8 and 9 were only able to do 2 questions from 4 questions given. This was because students had not been able to utilize the props and books provided in solving the problems. In addition, students also had a tendency to communicate only to friends who had same sex and to teachers. The care of students to ask when they experienced difficulty developed well, but the care of helping each other in solving problems in jumping task was not maximal yet.

Based on the results of collaborative analysis of each group, the tendency of male students' collaboration occurred only with male students. It was different from female students who were able to cooperate with male and female students. Male and female students had similar tendency when they collaborated with II-based learning media, props, and student books. Students were able to utilize the media and books to help them solve the problems provided by the teacher. Furthermore, male students did not have a caring attitude towards friends who were unable to solve the problems, but they had the ability to ask a friend in his group if there was something they did not understand. It was different from female students having a caring attitude towards friends having difficulty. They conveyed their opinions related to the knowledge they had to help friends; as well as, some female students were brave to ask if they did not understand the material in the questions.

Referring to the results of each group's collaboration tendency, it could be seen that a group with good collaboration skills would impact on the result of the jumping task. Students were able to solve all problems correctly if all three collaboration indicators were met. It was in accordance with the results of other researches suggesting that collaboration among students can have a positive impact on students when they solve the problems (Zumbach, Reimann, & Koch, 2006). Therefore, learning of mathematics must be done continuously and it had to focus on collaboration among students and utilize the jumping task; so that, students' math skills would increase.

## CONCLUSIONS

The research result indicated that students tended to have attitude of learn from and care of each other with maximal answer truth while care for ability had not yet appeared in students. Students tended to:

1. be able to learn from the use of IT-based learning media or visual aids as well as from students' books that had been provided by teachers in solving mathematical problems,
2. be able to express their opinions when there were friends who asked about math concept,
3. be able to discuss well between boys and girls.

## SUGGESTION

Mathematics learning activities especially in Islamic school is done by focusing on collaboration among students, especially caring for among students, for example students having good ability have to care to other friends whose ability are low by teaching and discussing each other. Furthermore, students having low ability have to be brave to ask friends who have better ability than his ability or to the teacher, so the ability of math increases. Collaborative activities have to be a culture in school learning either in math or other subjects. The quality of learning will increase if students' collaboration and student-teacher collaboration maximally implement. The research results can be used by Islamic schools to determine the learning model and what kind of learning environment is suitable to be used in improving the learning quality.

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# Community Service Learning: An Ethical Proposal for Teacher Education

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### ABSTRACT

Service learning is a pedagogical model for educating students at schools or universities in different dimensions: cognitive, ethical, civic, democratic. This model, very common in the USA, is not well known in Europe.

At Verona University (Mortari, 2017), in Italy, the Center of educational and didactic research proposed the Service Learning model to pre-service teachers education. To avoid using a training model where students simply “apply” academic learning within the class and where schools are considered only as passive locations, students are engaged as service teacher collaborators and educational researchers.

This Community Service Learning project offered pre-service teachers multiple educational directions, not simply theoretical and instrumental learning, and provided them opportunities to: face the complexity of school-life; be the apprentice of in-service teachers; orient teacher education toward an ethical approach; and educate teachers as researchers.

All these directions are core competence requirements as indicated by the European Commission (2013, 2014).

Following this vision, our department chose to pay attention to schools where the complexity of social and educational contexts was growing.

This paper will present this educational path, starting from the theoretical framework nurtured by an ethical and political vision of education, and moving toward its practical and organizational aspects.

**Keywords:** initial teacher education; Community Service Learning; teacher-researcher; ethical competence.

## 1. INTRODUCTION

Pedagogy is a practical wisdom, and it needs to be rooted in a theoretical vision able to nurture its practice and orient its choices. Moreover, pedagogy has a special responsibility toward the community because it deals with the education of people as individuals and as citizens; it deals with the future of the whole society. Pedagogy should thus be framed within an ethical and political theory and rooted in them. Rethinking education as an ethical and political act requires one to imagine and design new educational paths that are able to enforce these two dimensions that are essential for every human being and for every human community.

The necessity to frame educative path within an ethical and political theory is particularly urgent for teacher education; in fact, teacher educators are not only responsible for the education of these adults but also for the children whom the teachers will deal with. There is a double responsibility that requires deeper attention, i.e., a path that is educational not only in its “content” (*what* you teach) but also in its “form” (*how* you teach). Moreover, education should be rooted in reality, in real people’s life; in particular, teachers should be intuitive and pay attention to every child they meet, and they should know how to face the complexities of everyday class life (within specific social contexts: with different social, multicultural, and multilinguistic backgrounds).

The Community Service Learning (CSL) model responds to this deep vision of pedagogy, and in particular, of teacher education. It has been 50 years since the term “service learning” entered the scientific literature (Stanton, Giles, & Cruz, 1999; see the systematic review in Ubbiali, 2017) as a pedagogical model for educating students

at schools or universities in different dimensions: cognitive, ethical, civic, democratic. This model, very common in the USA, is not well known nor has it been adopted in Europe.

At Verona University (Mortari, 2017), the Center of educational and didactic research proposed the Community Service Learning model to pre-service teachers whose academic education requires long periods of scholastic training. This proposal not only educates teachers with a wider vision but also acts “politically,” i.e. paying attention to the common good. In fact, this CSL model answers to the calls from our society and from the schools that must deal with new challenges, very often with few resources to confront them. Moreover, this CSL model has a political vision of the university, engaging it in research that responds to the real needs of the community.

In this paper, are presented in detail the theoretical background and a review of the main themes referred to in community service learning and teacher education, as well as the Verona proposal contained in the Master's Degree in Primary Teacher Education.

## 2. AN ETHICAL APPROACH TO EDUCATIONAL POLICY

According to Aristotle, every being tends toward the good (*Nicomachean Ethics*); human beings look for a good life and for what makes life worth living: the research of the good is the direction orienting our soul to life (Plato, *Republic*, VI, 505e), and it is what allows us to reach wisdom.

Ethics is the discipline that has good as the systematic object of its research. Human beings need ethics as a guide for their tension “aiming at a good life lived with and for others in just institutions” (Ricoeur, 1992, p. 172). Ricoeur himself, to give voice to this necessity, connects ethics to the experience of care, and to avoid a too-generic meaning of the term “aiming” or “wish” (in the original: *souhait*), he suggests substituting “aiming” with the term “care.” As a consequence, he establishes ethics as a discourse about care for oneself, care for the others, and care for institutions (1990). As Ricoeur is a philosopher external to the debate about care, his proposal is interesting because it suggests that the ethics of care could be extended even to the institutional dimension of social life. In this way, care spills over its boundaries into private life and becomes a fundament for public and political life (traditionally founded on the ethics of justice).

In contemporary life, we find the important presence of care in many places: schools, social services, hospitals, voluntary organizations, public organizations, etc. However, social life is also moved by other rationales, often contrary to the ethics of care. In fact, according to a shared sociological analysis of our context, we can affirm we are in a liberistic society, based on competition, where a “good life” is intended as the affirmation of oneself. This individualistic way of living is one of the main risks for a democracy. In fact, if communitarian feelings become weak, democratic culture, i.e., a vision of public life founded on responsibility, solidarity, and engagement in the community, is at risk. These dimensions are strictly connected, and it is very important to consider them in a circular and mutual relationship in order to avoid believing that because these are very recurrent words in our political and medial language, they are also real characteristics of our society. In fact, when the call for responsibility is only empty, rhetorical speech, the excess of solidarity becomes an excess of charity and piety (Bauman, 1999). That which makes the difference are the “structural” responsibilities and solidarity, which become a sort of “grammar” for civic action.

The characteristic of a community is the principle of solidarity (Stein, 2000) that makes society a place where every member is recognized in his/her originality as a subject able to give his/her own contribution to the community project, whose sharing is the basis of the community itself.

### 2.1 Toward a new vision of society and of education

At the hearth of a cultural policy is a culture of education, because without educated minds, there is no possibility of cultivating a society. It is very compelling to rethink educational policy because the institutions devoted to youth education are facing an unprecedented crisis. These institutions, instead of projecting along utopic and atopic lines and imagining a quality of life oriented to the good, enforce the individualistic ethos of the present time. There is an individualistic approach toward knowledge as toward life: a good life is intended as an individualistic affirmation regardless of the others' lives, but a so-intended sense of existence forgets that the essence of the human substance is relational, and every personal development is strictly connected to the others'. The sense of community, of being with the other within a common project involving everybody, must be replaced at the core of the politics, and in particular, of educational policy.

Instead, following the individualistic culture that is the foundation of the liberistic policy, the actual educational practice is poor and minimal, engaged in developing only the skills useful to a society that assesses everything in economic and self-affirmation terms. This model is defined as a “banking model of education” (Marullo & Edwards, 2000, p. 746); competitions and technical skills are the competences emphasized in many educational programs. What is not referred to in this model, for example, the humanities, is considered useless and worthless. Our schools and universities do not cultivate social, ethical, empathic intelligence, thus generating an “illiteracy of civic competences.”

Education is a practice, and it requires a theory to give it form. An effective theory of education should improve the young to “give form” to their life, to make flourish all the existential dimensions of life: that means that education cannot be reduced only to the instructional dimension. Instead, education must cultivate every aspect of life: cognitive, social, emotional, spiritual, ethical, and political.

If education is a practice, we have to design educational paths and experiences able to reach its complex purpose (the flourishing of every human aspect), rooted in reality. According to Dewey (1938), education requires a meaningful way to stay within experience, with a reflective element: an experience aimed at not only learning cognitive or technical skills but also the competences that make a person an engaged citizen (Dewey, 1916). In American literature, there is particular emphasis on the theorization and the design of practices that cultivate the development of every kind of intelligence; for example, many authors talk about “prosocial education” as an educational practice that promotes relational dimensions. Examples of prosocial education are “character education,” “cooperative learning,” “moral development,” “citizenship education,” “service learning,” and “social and emotional learning” (Brown, Corrigan, & D’Alessandro, 2012, p. XIII).

We need to work to realize a new vision of education which provides a meaningful experience, i.e., one able to “give form” to a “good person” and to a “good society.” We need an ethical vision of education (Aristotle, *Nichoamchean Ethics*).

### 3. THE CHALLENGES IN TEACHER TRAINING AND EDUCATION

Within this social scenery and educational vision, teachers have a very important role; caring about their training (pre-service or in-service) is critical for creating “ethical” children and “ethical” citizens, and as a consequence, an “ethical” society.

In multiple official documents (2013, 2014), the European Commission (EC) indicated some core competences required for actual teacher education (pre-service and in-service).

In particular, the EC underlines the importance of these competences (2014, p. 2-3): “sound knowledge frameworks (e.g., about school curricula, education theories, assessment), supported by effective knowledge management strategies; a deep knowledge of how to teach specific subjects, connected with digital competences and students’ learning; classroom teaching/management skills and strategies; interpersonal, reflective and research skills, for cooperative work in schools as professional communities of practice; critical attitudes toward their own professional actions, based on sources of different kinds—students’ outcomes, theory and professional dialogue—to engage in innovation; positive attitudes to continuous professional development, collaboration, diversity and inclusion; [and] the capability of adapting plans and practices to contexts and students’ needs.”

#### 3.1 New challenges, new competences

In theoretical and empirical research (Mortari 2009; 2010; 2017), we can find that what is required is not only academic learning or technical practices (i.e., the traditional university discipline), but also more complex competences that respect the complexity of the teaching and learning process in the contemporary “knowledge society.”

In this paper, we would like to stress the teacher competences deriving from this research:

- *To learn how to face the complexity of real, everyday school life* (Mortari, 2009; Biesta, 2012). The teaching process is one of the most complex human actions; moreover, the school context and the social and familial background of students nowadays is very complex and multifaceted. Very often, schools (and teachers in particular) must deal with numerous challenges related to the different cultures of education and with new educational needs.

- *To be the apprentice of in-service teachers, whose expertise is rich and too often not valorized* (Schneider, 2008). Pedagogy is a practical knowledge, a form of wisdom of educational activity. This wisdom

can be obtained only because of the transmission of expertise from one practitioner to another. There is a richness of experience that in-service teachers have gained in their work life, one that is very often not enhanced or promoted, and even transmitted to novice. University and teacher training programs must promote the transfer of this expertise.

- *To orient teacher education toward an ethical approach* (Mortari, 2017). Education is a very delicate process that deals with the alterity and individuality of a child, and the adult can wound the child's mind and his/her existence; moreover, the entire process of teaching and learning carries a social and political responsibility, since to educate means to build the future society. Teachers should be trained as ethical actors, teaching with care, acting virtuously, and engaging in civic responsibility.
- *To educate teachers as researchers* (Dewey, 1929; Taber, 2007; Mortari, 2009). The complex world of education does not have ready-to-use solutions to everyday challenges because of the situational and contextual dimensions of education itself. An effective teacher should become a researcher, i.e., a practitioner able to analyze his/her own practices and critically reflect on them.

### **3.2 The voice of schools**

In the schools, the complexity of social and educational contexts is growing. Teachers, who are often alone to deal with new challenges concerning with pupils, families and institutions, need practical help, new theories, proposals, and frameworks that can give them answers.

The university is too often separated and distant from the school real life and its research far from the real needs of the community.

## **4. THE COMMUNITY SERVICE LEARNING AT VERONA UNIVERSITY**

According to these social directions, trying to answer these challenges (cultural, political, academic, and educational), and listening to the school's call for help, the Center of educational and didactic research proposed a Community Service Learning path in the academic courses for pre-service teacher education at the University of Verona (Italy).

Community Service Learning is first of all a form of "experiential learning," an educational experience that engages students in real-life problems (Wurdinger & Carlson, 2010). However, CSL does not consider the relationship between university and context in an instrumental way; the "real world" is not only a laboratory useful for making learning meaningful. There is also the possibility of giving the community something useful, a contribution to improving the environment itself.

In the literature, many authors attest that practices of service learning can be organized at every educational level, from kindergarten to university (Furco & Root, 2010; Kielsmeier, 2010; Hart & King, 2007).

At Verona University (Mortari, 2017), the CSL model is proposed to pre-service teachers whose academic education required long periods of scholastic training. To avoid using a training model where students simply "apply" academic learning within the class and where schools are considered only as passive locations without any earning, students is offered the possibility to spend their training time as service teacher collaborators and educational researchers.

The name of our path is "Laboratory LeCoSe"—Learning Community Service. This name sounds like the Italian phrase *le cose*, or "the things," i.e., the important things that must be learned in order to become a "good" teacher and a "good" person.

### **4.1 What is service learning?**

The term service learning was used for the first time in 1946 and entered into the scientific literature in the 1980s (Stanton, Giles, & Cruz, 1999; see the systematic review in Ubbiali, 2017) as a pedagogical model able to educate the students in all their personal dimensions (cognitive, ethical, civic, and democratic) within a school or a university.

#### **4.1.1 A definition**

Service Learning is an educative method that can strengthen both the learning processes and the reflective competences by engaging learners in activities useful to the local community.

A commonly cited definition (Bringle & Hatcher, 1995) argues that:

“service learning [is] a course-based, credit-bearing, educational experience in which students (a) participate in an organized service activity that meet identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility” (p. 112).

The USA Congress has defined SL in the *National and Community Service Trust Act of 1993* (p. 59):

“The term 'service-learning' means a method--

(A) under which students or participants learn and develop through active participation in thoughtfully organized service that

(i) is conducted in and meets the needs of a community;

(ii) is coordinated with an elementary school, secondary school, institution of higher education, or community service program, and with the community; and

(iii) helps foster civic responsibility; and

(B) that

(i) is integrated into and enhances the academic curriculum of the students, or the educational components of the community service program in which the participants are enrolled; and

(ii) provides structured time for the students or participants to reflect on the service experience.”

Under the rubric of SL, a sort of spectrum of service programs (Furco, 1996; Sigmon, 1994), it is possible to find very different programs that combine service and learning. Along this continuum, there are programs that emphasize the service component and the served (volunteer activities and community service) and, at the opposite end, programs that focus on the learning and the provider of the service (internship or on-field experiences). According to Furco and Sigmon, however, only practices where service and learning are in a mutual relationship without the supremacy of one against the other can be defined as real SL.

#### **4.1.2 An equilibrium between different dimensions**

Sigmon (1994) presents SL as a practice in equilibrium between service and learning that is different from other educational methods; in SL there is no preeminence of one of the two dimensions over the other. Furco (1996) underlines that the beneficiaries of the experience are both the recipient (the community partner) and the provider (the student).

Bringle and Hatcher (2009) note that the specificity of SL is a service experience integrated within an educational/academic course. Different from other practice-based or community-based learning experiences, SL is a part of a course aimed at developing civic competences. Also, unlike the community-service programs (usually practiced as an extra-curricular activity), SL is integrated in its contents and methodologies and is considered to be an important part of the curriculum. A so-intended SL not only links the school and the university to the “real world,” but also generates a meaningful learning experience while enhancing the community.

Many authors stress the different dimensions that constitute SL experiences: service (service experience meeting a community need); academics (applying academic knowledge and critical thinking skills); civic responsibility (service experience promoting active citizenship); and reflection (leading to a deeper understanding of course content and civic engagement).

Research suggests that SL also supports the learning of efficient, focused, shared decision-making practices (Buchanan, Baldwin, & Rudisill, 2002; Carrington & Sagers, 2008), and that by serving others, students learn more than in a traditional curriculum, think critically and creatively, appreciate personal and social responsibility, develop empathy, and grow in self-esteem (Conrad & Hedin, 1991).

#### **4.1.3 Different monikers, shared criteria**

“The scope of what potentially counts as service learning has thus resulted in the development of multiple monikers—academic service learning, community-based service learning, field-based community service” (Butin, 2003, p. 1676), i.e., different monikers for different emphasis. Even if a unique definition does not exist, there are some criteria shared by most authors for SL to be legitimate, ethical, and useful. They may be described as the “4 Rs:” respect, reciprocity, relevance, and reflection (Campus Compact, 2002; MJCSL, 2001; Sigmon, 1979).

An SL provider should respect the one being served rather than see him as someone poor who needs charity. The service should benefit both the provider and the beneficiary, and the member of the community should be both

the subject of and the cooperator in the service action. The service should also be relevant to the academic content of the course, and finally, the service should be reflected upon, because SL “does not provide transparent experiences” (Butin, 2003, p. 1677), and this reflection is necessary to transform action into meaningful learning.

#### **4.1.4 The community service learning**

The community service learning programs (such as the “community-based service learning,” Baldwin et al., 2007) stress the dimension of the community as a necessary active partner in every phase of the project. The community must be involved not only at a political and organizational level but also in the design phase, in the initial period of context analysis, during the service action of the student, and in the evaluation of the results of the student’s action.

#### **4.1.5 Service learning and teacher education**

Since the 1990s, SL has gained the attention of teacher educators in the USA; many guides offer examples of teacher education institutions that offer comprehensive programs combining courses and fieldwork in SL (Council of Chief State School Officers, 1995; Erickson & Anderson, 1997; Wade, 1997). Anderson and Erickson (2003) counted more than 300 teacher training programs that integrate SL into the curriculum.

In his synthesis and literature review, Anderson (1988, p. 3) argues that teacher educators cite the following reasons for integrating service learning into their courses:

“(1) to prepare new teachers to use service-learning as a teaching method with their K-12 students; (2) to help socialize teachers in the essential moral and civic obligations of teaching, including teaching with “care,” fostering life-long civic engagement, adapting to the needs of learners with diverse and special needs, and having a commitment to advocate for social justice for children and families; (3) to enhance preservice teachers’ ability to reflect critically on current educational practices and their own teaching; (4) to develop in preservice teachers the dispositions and abilities needed to easily and fully adopt other educational reforms such as authentic assessment, teaching with integrated thematic units, focusing on higher order thinking skills, and making improvements in school schedules and climate; (5) to accelerate the process of learning how to perform a variety of roles needed to meet the needs of students such as counselor, community liaison, advocate, and moral leader; and (6) to develop human service-oriented teachers who can work effectively in schools with integrated services or other social service settings.”

Kirtman (2008) says that there are few researches about service learning and teacher training; the available studies focus on comprehending the challenges of contemporary society and the engagement in community life. If SL is useful for enhancing a transformative vision of the teaching and learning practice, it is also very useful for an inclusive education with special-needs children (Russel, 2007), in multicultural contexts (Baldwin, Buchanan & Rudisill, 2007), in poor areas (Boyle-Baise & Sleeter, 2000), and in building a community of practice involving the university, the school, and the community (Swick, 2001).

Wade (1997, pp. 185-186) affirms that SL is particularly suitable for teacher training, and in fact: (a) it provides student teachers with opportunities to practice reflection so as to engage their pupils to do the same; (b) it fosters a student-centered, caring approach to teaching (as in the service experience, it is beneficiary-centered); (c) it develops a more complex vision of teaching and learning practices, enhances creativity, and searches for local resources to develop educational projects; and (d) it offers pre-service teachers the opportunity to develop autonomy in their teaching.

## **5. LECOSE: SERVICE LEARNING AT VERONA UNIVERSITY**

At the University of Verona, for the Master's Degree in Primary Teacher Education program, the Community Service Learning model was chosen because it speaks to a triple challenge in the contemporary higher-education context:

- the necessity to orient the educational processes of the students, in order to prepare them to meet the complexity of the real school world;
- the distress signal from the school that has to face new educational challenges; and
- the desire to re-think the University role as an actor to be engaged in serving the community.

To face these challenges, it was designed and it has been conducting a laboratory where needs, requests, sources, and competences of every participant interact, benefitting the students, faculty, and school teachers. In this

environment, the students' learning occurs within a service activity due to the reflective mediation of the community of practitioners (school teachers), and the supervision of university (the faculty and the researchers of the Laboratory LeCoSe) who accompany them in this research process that activates a reflective posture toward their service experience.

This project started in the academic year 2015-16 and is currently in its third year.

In summary, the Laboratory LeCoSe project is a Community Service Learning experience where the pre-service teachers are involved in helping the in-service teachers in their everyday educational job, and for the university students, the laboratory is a place to design and improve the basis for their dissertation research.

The SL project at Verona University works on three areas:

- political actions;
- the involvement of school teachers; and
- the involvement of university students.

At a *political level*, the university assumes the project for pre-service, obligatory training in schools; the university signed an agreement with the Office of Education of the Veneto region, and can offer this proposal to the schools.

When schools are in session, the academic team meets the *teachers* and collects their specific needs (or desires) related to the problems or the challenges of their everyday lives at school.

After an analysis of these collected needs, the *students* are involved and paired with the teachers who become their mentors. Together, and with the supervision of academic team, the students perform their service in the schools; they meet and study the context, make a deeper analysis of the teacher's need, design a pedagogical path to provide a solution to that need, and perform research on their actions.

From the point of view of *service*, the students help in-service teachers in their professional lives.

From the point of view of *learning*, the students learn from an "elder" and a more expert teacher, and they learn to become a "practical researcher." In fact, we are convinced that the research competence is fundamental to becoming a professional teacher.

All these dimensions are lived within a *community* context: a community made of pupils, in-service teachers, pre-service teachers, and an academic team.

### **5.1 The phases of the project**

Our project consists of five phases:

1. *Identification of the teacher's need.* Using an open questionnaire, the teachers are asked to identify and describe a need for which they would like to receive help. The identified need is then discussed and shared with the university team so that the problem can be analyzed from different perspectives.
2. *Literature review.* Students look for contribution from the literature about the need they face and the project they must design.
3. *Design of an educational project that answers the identified need.* The project involves the teacher and the student with different functions at different levels, but all activities are coordinated and shared.
4. *Period for class observation and familiarization with the context.* Students pass some days at school to meet children, to become familiar to them and to observe class dynamics.
5. *Service action.* After appropriate preparation and sharing of ideas with the teachers, students work on their project with the teacher.
6. *Realization of a research related to their educational project.* During the period of their class service, the students collect qualitative data which they will process within a methodological framework that they have built together with the academic team. This framework will follow the idea of the educational research (Mortari, 2009) that is useful for teaching practice.
- 7.

### **5.2 Different types of service performed by students**

Since every class is different and has its own characteristics, and every teacher has his/her own approach, every expressed need is different. Consequently, every educational path is different. In order to provide insight into the complex variability of the projects we have undertaken during these first years, we can categorize the projects into two different groups: 1) projects designed by the teacher (during the phase of expressing their needs, some teachers had already identified a strategy for meeting their need, involving a university student); and 2) projects

designed together with the academic team (some teachers asked for help even while identifying an appropriate educational project to meet their need).

Until now, students have been involved in:

- *operational projects*: Students were asked to help their mentor with a specific project during the class lessons (for example: students helped teachers to assist pupils during work group periods).
- *“indirect” service*: Students were asked to perform a critical analysis of the teacher’s practices through an accurate documentation of his/her job or a research focusing on his/her didactic actions (for example, students documented an innovative science laboratory or analyzed the relational dynamics during the class conversations guided by the teacher).
- *design projects*: In order to face very complex situations, teachers asked students and faculty for help in identifying educational strategies (for example, students created a project to improve the well-being of a very conflictual class).

Students were asked to document the teacher’s educational path starting from the idea of “practicality” (Black & Halliwell, 2000, p. 103; Mortari, 2009, p. 120), i.e., what the teacher does and what he/she is thinking while teaching. This documentation, together with the analysis of the need and of the school context, represents the first part of the dissertation.

### **5.3 The service research**

The service experience is also thought of as a research experience, an empirical, pedagogical research (Mortari, 2003; 2007; 2009). In particular, the research that refers to the SL experience can be defined as a “service research” (Mortari, 2003; 2017), i.e., a research that is useful for educators to improve their competences and their capacity to read (and to try to solve) their classes challenges. The research is designed following four steps:

1. *identification of the research question*: identified as starting from the expressed need and the realized project;
2. *identification of the appropriated instruments for data collection*: instruments, typical of the qualitative methods, must be coherent with the question;
3. *data analysis*: following a naturalistic epistemology and a phenomenological philosophy, through a mix of different methods (Mortari, 2007); and
4. *writing of the research report*: the second part of the dissertation.

### **5.4 An example of service learning**

A teacher in a 4<sup>th</sup> grade primary school class wanted to organize collaborative, didactical activities in order to improve both active and collaborative learning with her pupils. The class was so large that she needed the presence of a collaborator, and the service-learning university student was asked to act as one. The pre-service teacher helped the in-service teacher by finding the theoretical instruments to plan a collaborative experience, organizing the activities, helping pupils, and producing thorough documentation of the experience.

At the end of the in-field experience, the student who collected the qualitative data from the class performed research that tried to analyze and evaluate the experience. The teacher was interested in understanding how the communication between the children had changed based on the work groups. The research analysis was done following the “discourse analysis” model elaborated by Mortari (2002).

Another teacher, instead, who was very expert and does not have specific issues with her pupils, was interested in assessing her way of teaching. She elaborated a method, she called “circular discussion”, for primary school children that consists in stopping the lesson whenever a pupil asks for a question, sitting round, and debating about it. Questions were usually rooted in something happening during the lesson, and can be referred to different disciplines. The teacher was convinced that this is an effective method to improve children’s competences. But the teacher was not sure that her intentions were really reached, and she wondered if her way of conducting these discussions was really democratic.

She asked the university student for a service research showing her what children really learned from the “circular discussions” and what kind of leadership she was acting in conducting them. The university student entered the class as a “supportive teacher”, having an intense relationship with children and helping the teacher in her normal activity; when a question was asked and a circular discussion started, the university student turned on her audio recorder and started to collect field notes. The data analysis, conducted following the “discourse analysis” and the “content analysis” (Mortari, 2002; 2007) offered the teacher a clear vision of the teaching and

learning experience in her class. The analysis showed that children increased their interdisciplinary competences, their research competence (the capacity to look for answers without expecting them from teachers), the co-constructive dimension of knowledge, the dialogical skills (that also means interpersonal and civic respect for others' idea).

## 6. CONCLUSIONS

At the beginning of our third year in the laboratory, we can confirm that CSL is a very effective practice that answers the challenges in our contemporary educational context. Students, teachers, principals, and school politicians are enthusiastic about the experience; we collected their opinions unofficially and officially, for example, during dissertations, in seminars, and during a conference we organized in November of 2016.

In summary, the Community Service Learning experience at the University of Verona is a circular practice where service, learning, research, and the creation of the community are brought together. As shown in Figure 1, we can summarize the dimensions of the project as follows:

- a) *service*: the student performs a service as an answer to a real school need;
- b) *learning*: the student learns from his/her expert mentor;
- c) *research*: the student collects and analyses data during the service learning experience;
- d) *learning*: the student learns the research competence; and
- e) *further service*: the school receives the results and the evaluation of the “service research.”

All these dimensions build, step-by-step, a real *community* between the school and the university, providing a political vision of education.

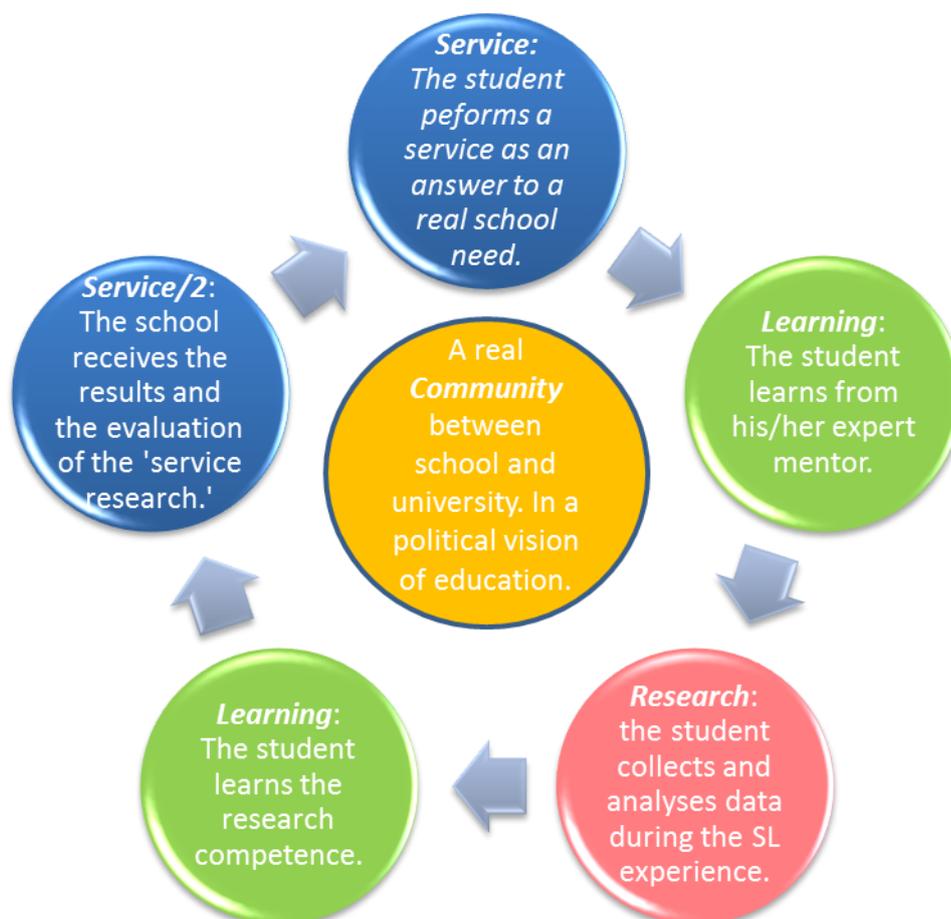


Figure 1: A schematic synthesis of Laboratory LeCoSe.

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# Comparison of The Higher Education Systems in The Visegrad Group of Countries

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## ABSTRACT

The Visegrad group of countries (known as the "V4" countries) is formed by four Central European countries - the Czech Republic, Hungary, Poland and Slovakia. These countries have historically similar political and economic development and also a close cooperation (especially the Czech Republic and Slovakia). Nowadays all these four countries are members of European Union. All these factors (the pre and post-communist situation and EU development) and also the financial crisis in 2008-2009 had an impact and have influence on the situation inside the countries including higher education sector. As higher education institutions (HEIs) across Europe face a threat of critical underfunding and higher dependence on public sources and as we think that the situation might be worse in V4 countries, we decided to compare the situation in these countries. The main studied factors are % of population studied at HEIs, % of GDP spent on education and on the higher education, internal rate of public net financial returns on attending tertiary education or the factors forming the 5th pillar of the Global Competitiveness Index, followed by government subsidies and study fees in V4 countries. For the comparison the multi-criteria evaluation of alternatives methods were used.

## INTRODUCTION

Higher education is nowadays an essential part of a productive economy. The way how it is governed and managed has become a major policy issue. The changes inside this sector cover the restructuring of academic programmes to make them more compatible with the needs of the practice, the higher emphasis on research targets and outputs which are measurable and supported by competitively earned funding, the increase the quality standards or the linkage with the industry or services (Hazelkorn, 2015). If the higher education should be the engine of the economy, it is necessary for governments to invest more money into this sector. The dependence on the public sources seems to be a problem and so the discussion about the private sources and tuition fees is more important than before. A possibility to increase the private sources to help the higher education exist but according to Štefánik and Horvát (2015) a declining trend towards private returns in more recent tertiary education is observable especially in the Czech republic, Poland and Slovakia (out of the central European countries). Within the changes of the HEIs the trends of education sustainable development can be seen also in the central Europe but with the reaching of lower transition stages than other western European countries (Dlouhá t. al. (2017).

European higher education institutions (HEIs) can be academically or professionally oriented and usually are separated according to the main funding sources as public and private ones. Academic higher education is traditionally offered by universities whereas professional higher education is offered by non-university institutions - universities of applied sciences, university colleges, polytechnics, institutes of technology etc. Terminology in higher professional education is based on national concepts and is generally a product of historical tradition and background. The problem is that there is no clear and internationally shared definition for the two types of higher education (Camilleri et al., 2013). In some European countries the distinction of the academic/professional higher education was influenced by the Bologna process that started the reform of higher education in the sense of the separation of the system into two cycles, undergraduate (usually three year study bachelor degree) and graduate (Bologna declaration, 1999). According to these changes more non-university institutions practically oriented started to grow. More about the professional higher education in selected European countries was presented in Kuncova, Mulac (2015).

A lot of problems connected mainly with the underfunding from public sources, uneasy ways of private funding or the demographic decrease can be seen not only in the central Europe. As we see that the situation of the higher education in the Czech Republic is getting worse, we decided to compare it with the closest countries belonging to the so-called Visegrad group (to continue with our previous research - Kuncova, Mulac, 2016). This paper describes the situation in each of the Visegrad group of countries from the higher education point of view. The

main aim is to compare the systems, the differences of the institution types, the expenses on education, subsidies and fees, and also the trends in the factors forming the 5<sup>th</sup> pillar of the Global Competitiveness Index aimed at higher education and training.

## THE STUDY

**The Visegrad Group**, also known as the "Visegrad Four" or simply "V4", is a regional grouping of four Central European countries, including the Czech Republic, Hungary, Poland and Slovakia. V4 was founded in 1991 at a meeting of the presidents of these countries in the Hungarian town of Visegrad. In the then post-communist era, its main objective was to create a democratic environment and lay the foundations for a functioning market economy, including the gradual building of a free trade area. The basic economic objectives of the grouping were in fact fulfilled by the accession of the V4 countries to the European Union in 2004. The importance was therefore moving to strengthening stability in the Central European region and creating conditions for optimal co-operation with all countries. The importance of V4 has increased recently in the context of the migration crisis and introducing mandatory relocation of migrants. The Visegrad Group wishes to contribute towards building the European security architecture based on effective, functionally complementary and mutually reinforcing cooperation and coordination within existing European and transatlantic institutions. In order to preserve and promote cultural cohesion, cooperation within the Visegrad Group will enhance the imparting of values in the field of culture, education, science and exchange of information. (Visegrad Group, 2017)

The states associated to the Visegrad Group have historically, economically and politically passed through stages of co-development and thus raise questions as to how far they have been able to build on earlier cooperation and how their relations evolve in the new conditions of the market economy and EU membership. Especially the higher education systems are changing nowadays so the main aim of this article is to compare the trends in V4 countries. As some other studies consider the Czech Republic and Hungary to be better than Poland and Slovakia (Kuncova, Mulac, 2016; Kosmaczewska, Barczak, 2015) we try to find out if it is valid also in the financing of higher education and in the higher education competitiveness.

Data was taken from the Eurostat (2017) and from the Global Competitiveness Reports (2009-2016). The Global Competitiveness Index is created by these 12 pillars - 1. Institutions, 2. Infrastructure, 3. Macroeconomic stability, 4. Health and Primary Education, 5. Higher education and training, 6. Goods market efficiency, 7. Labour market efficiency, 8. Financial market sophistication, 9. Technological readiness, 10. Market size, 11. Business sophistication, 12. Innovation. The 5<sup>th</sup> pillar aimed at Higher education and training covers 8 parts:

- 5.01 Secondary education enrollment rate
- 5.02 Tertiary education enrollment rate
- 5.03 Quality of the education system
- 5.04 Quality of math and science education
- 5.05 Quality of management schools
- 5.06 Internet access in schools
- 5.07 Local availability of research and training services
- 5.08 Extent of staff training

Each part is measured on the scale 1-7 (the higher the better) and afterwards the ranking of countries is created.

The description of higher education system and the subsidies and fees in each of the V4 countries is below:

### Higher Education in the Czech Republic

Higher education in the Czech Republic is realised at higher education institutions and consists of three cycles: bachelor's, master's and doctoral degree programme. Regarding the system of funding and ownership higher education institutions can be public institutions (legally established), private institutions, existing on the basis of the state approval and state-run institutions (only in the case of military and police academies), legally established under the control of the relevant ministries. In 2017 higher education in the Czech Republic is provided by 26 public higher education institutions, 2 state higher education institutions and 40 private higher education institutions Under the Higher Education Act, they are classified as university type (24 public, 2 state and 3 private) which offer study programmes at all three levels of higher education and non-university type (2 public and 37 private) which offer mainly bachelor's programmes but may also provide Master's programmes. (MSMT, 2017b).

Public and state higher education institutions are established by law and they are funded from the state budget. The main difference between them is the fact that public institutions have the status of a legal entity and they are self-governing organisations with a property passed on them by the state whilst state higher education institutions are governed by the relevant ministries as organisational units of the state. Private higher education institutions could come into existence since 1998 by the 1998 Higher Education Act. The legal entity that establishes a private

education institution is required to have an approval from the Ministry of Education, Youth and Sports. Contrary to the public and state institutions the private ones receive funds from other sources than is the state budget. They can receive a subsidy from the Ministry of Education, Youth and Sports only if they have the status of a public benefit corporation (Eurydice-CR, 2017).

Study programmes are subject to accreditation awarded by the Ministry of Education, Youth and Sports on the basis of the Accreditation Commission standpoint. In April 2016 the amendment to Higher Education Act was approved. New rules for accreditation, including establishment of independent Accreditation Office, and a new system of quality evaluation of higher education institutions were set. In 2017 first accreditation processes started under these new conditions (NAUVS, 2017).

Almost all public higher education institutions with the exception of two are the university type of institutions and both state higher education institutions are universities too. Universities may offer all three types of study programmes and carry out scientific, research, developmental, artistic or other creative activities connected with these. Non-university type of HEIs offer mainly bachelor's degree programmes, only a few of them also master's degree programmes. Their bachelor programmes usually include a period (several weeks – according to the new rules it should be at least 12 weeks) of practical training. They also carry out research, art and other creative activities connected to the programme. All private higher education institutions started as institutions of the non-university type, only three of them became universities lately. (Eurydice-CR, 2017)

The system for financing public universities and non-university type of higher education institutions is the same and also the criteria for evaluation of institutions are common for both segments. The portfolio of the criteria is quite wide, which creates space for some specialization of each institution. The formula of contribution allocation was depended only on quantity of students till 2009 but the demographic decrease and financial situation caused the change of the rules. The new mechanism of performance based funding covers the whole range of activities HEIs could perform. First, the Performance Based Funding was introduced only in certain parts of the budget allocated to Public HEIs and its proportion has been gradually increasing. Second, further expansion of the sector has been capped by limiting the number of new students that would be funded by the state. And third, both measures were linked together – for each HEI the number of students funded by the state would depend on performance indicators attained. The choice of performance indicators is very sensitive as it would significantly affect the behaviour of HEIs and their further development (Koucky, 2012). The Performance Based Funding is based on 10 indicators and their weights. The indicators are divided into four main budget areas. The first area is connected with the performance of the institution – it is based on the number of students in the first year of study, on the financial demandingness of the study programmes (given by the coefficient assigned to each type of study) and for the universities (so in 2017 not for the non-university institutions) also on the research and development activities and the academic staff qualification of the institution (given by the 8 indicators, where for example 30% is connected with the research and development itself followed by the students mobility incoming and outgoing with 20% and employability of graduates with 15% weight). The second budget area is connected with the students support (various scholarships), third area is aimed at the development of the institution and the four area is mainly connected with the international cooperation of the institution. (MSMT, 2017a)

Study fees are related only to admission procedures and need to be paid once per cycle. No tuition fees are paid by 'typical' higher education students who complete their study programme in the regular timeframe. If they exceed a regular length of study by more than one year it is necessary to pay fees (exemptions are made for students on maternity leave). The minimum fee is CZK 9,651/academic year, based on the average cost of a student for the public budget set annually by the Ministry of Education. No maximum is set by law. Also in the situation when students study in second or further degree programmes they have to pay fees (maximum CZK 2,819/academic year). Students of study programmes in a foreign language also have to pay tuition fees which are set by each institution separately and no maximum limit is set by law. (EC, 2016)

Scholarships are granted to students from regions other than the seat of the higher education institution and they are provided in the amount CZK 5,400 per year. Around 47 % of students received this scholarship in 2015/16. Social scholarships are available for students in a difficult economic situation. The amount CZK 24,750 received per year is the same for everyone – but only 0.8 % of students received this support in 2015/16. Family allowances, depending on family economic conditions, may be awarded until the student is 26 years of age as well as the tax benefits for parents provided in the form of tax relief for each student up to 26 years old. The amount is graded according to the birth order – from 2016, CZK 13,404/year for the first child, CZK 17,004 for the second child, and CZK 20,604 for the third and fourth child. In case the child is disabled, the amount is multiplied by two. A child allowance of CZK 700 per month is paid if the family's income is below 2.4 times the subsistence level. (EC, 2016). About 13 % of students receive merit-based scholarships. No public subsidy or market loans are provided

for financing studies in the Czech Republic.

### **Higher education in Hungary**

Higher education in Hungary is provided by higher educational institutions. The establishment and operation of higher education institutions are regulated by Act No. 204 of 2011 (National Higher Education Act). Operating within the legal framework of the National Higher Education Act, Hungarian higher education institutions are recognized state (public) or non-state (church or private) institutions. The list of recognized institutions is indicated in Annex 1 of the National Higher Education Act. Regarding their academic profile, there are universities (egyetem), universities of applied sciences and colleges (főiskola -non-university higher education institutions). The main difference lies in capacities. Universities are higher education institutions authorised to provide at least eight bachelor and six master programmes and offer doctoral programmes and award doctoral degree, provided that at least sixty percent of their teaching and research staff employed directly or on a public service employment basis have a doctoral degree, operates students' academic workshops and is able to provide studies in foreign languages in some of its programmes. Universities are authorised to offer programmes in every educational cycle. University of applied sciences is a tertiary institutions with at least four bachelors programmes and two masters programmes, and at least two dual trainings (if its accreditation includes engineering, IT, agriculture, nature science or business studies), having at least 45% of their teaching and research staff employed directly or on a public service employment basis have a doctoral degree, operates an academic student workshop, and is capable of offering foreign language courses at some of its departments. The large former colleges have recently been transformed into universities of applied sciences. Colleges are tertiary institutions having at least one-third of their teaching and research staff employed directly or on a public service employment basis have a doctoral degree. Colleges are entitled to operate students' academic workshops. No differentiation is made by law, but colleges and universities of applied sciences are usually more active in practical education due to historical reasons. (Eurydice-HU, 2017) Their portfolio mainly offers first cycle programmes and shorter programmes and applied research. By contrast, universities usually offer more theoretically oriented degree courses. (Oktatási Hivatal, 2017)

The funding of HEIs in Hungary can be state state financing and income from other sources. According to the database of the Education Authority there have been 25 state funded universities (including universities of applied sciences), 9 non-state maintained universities, 2 state maintained colleges and 28 non-state funded colleges (out of which 21 are operated by a church) operating in Hungary. (Oktatási Hivatal, 2017)

Higher education institutions apply a credit system based on the European Credit Transfer and Accumulation System. Accordingly, one credit stands for an average of 30 hours of student workload. There are two basic types of financial status for students: state-funded students do not pay fees, and self-financed students do. State-funded places, available for both full- and part-time students, are awarded through a centralised admissions procedure primarily based on the secondary school grades and secondary school leaving examination results. There were 64.7% of students state-funded in 2015/16. Higher education institutions set fees for self-financed students for the different levels and fields of study. Fees range from HUF 230,000 to 4.400,000 in the 1st cycle of study. (EC, 2016)

Students can get two types of grants: need-based and merit based grants. Need-based grants (only for the full-time students) are paid for 10 months in year. For students with one living parent and those under legal guardianship until the age of 18, the grant is for HUF 119,000 per academic year. For multiple disadvantaged students, orphans, students supporting dependents or those from a large family, it is HUF 238,000/academic year. Disadvantaged students can also apply for the Bursa Hungarica scholarship jointly financed by municipalities and higher education institutions with an average value of HUF 25,427. Both fee paying and state subsidised students are eligible. In the autumn semester of the 2015/16 academic year, 6.4 % of students received this scholarship. One-off initial and emergency grants are also available. (EC, 2016)

Merit-based grants are available to full-time state-funded students, and a maximum of 50% can receive this support. The minimum amount is HUF 59,500 per academic year. Another merit based 'Scholarship of the Hungarian Republic' is granted to a maximum 0.8 % of state-funded students with a value of HUF 340,000/academic year. In Hungary 34% of state-funded students received merit-based grant and 20% need-based grant in 2015/16. (EC, 2016)

Two government-subsidised loans are available. The first, with a maximum duration of five years (longer for subjects such as medicine), is for both state-funded and fee-paying students, and has a maximum amount of HUF 50 000/month (HUF 60 000 for certain categories of disadvantaged student) for a period of 10 months in year. 9% of students took this loan in 2015/16. The second loan (Loan 2) can only be spent on fees. 18% of eligible students took this loan in 2015/16. Fee-paying students can take out both loans simultaneously. Loan repayment must start

four months after the end of student status, and by the age of 40, with repayment linked to personal income. No tax benefits for parents or family allowances exist. (EC, 2016)

### **Higher education in Poland**

Since the political transformation after the collapse of the communist regime in 1989, the Polish higher education system has undergone profound changes. Currently, according to the the Law on Higher Education, there are these types of higher education institutions (MSHE, 2017):

- university-type HEI – an institution which carries out academic research and where at least one organisational unit is authorised to award a doctoral degree;
- non-university HEI – an institution which provides first-cycle, second-cycle and/or long-cycle programmes, but is not authorised to award doctoral degrees;
- military HEI – supervised by the minister responsible for national defence;
- state service HEI – supervised by the minister responsible for internal affairs;
- HEI of art studies – supervised by the minister responsible for culture and national heritage;
- medical HEIs – supervised by the minister responsible for health;
- HEI of maritime studies – supervised by the minister responsible for maritime affairs.

In the academic year 2014/15 there were 434 HEIs in total in Poland, including 132 public institutions (nearly 70% of HEIs were non-public). Around 70% of public HEIs are university-type institutions which provide first-, second (or long-) cycle and third-cycle (doctoral) programmes, while the remaining ones are non-university HEIs providing only first- and second (or long-) cycle programmes. (Dobia, Hałas-Dej, 2017)

Education in Poland is funded primarily from public sources. The main part of the subsidy is distributed separately for two groups of public HEIs: university-type HEIs (*uczelnia akademicka*) and non-university HEIs (*uczelnia zawodowa*). Teaching activity of public higher education institutions (HEIs) is financed from State budget subsidies. HEIs receive a subsidy for their statutory tasks set by law, such as tasks related to the education of students enrolled in full-time programmes, full-time doctoral students and research staff; the maintenance of HEIs, including renovation of premises (basic grant), tasks related to non-refundable financial support for students and doctoral students, which can also be used for the renovation of student dormitories and canteens, co-financing and financing of investment projects, tasks regarding the provision of appropriate conditions for full participation of disabled students and doctoral students in the learning process. Moreover, a pro-quality subsidy is set aside within the State budget and allocated in the form of grants to the best organisational units of HEIs for quality-related tasks, including top-ups to salaries and scholarships. The amount of the basic subsidy in a given year depends largely on the amount in the previous year, which is intended to ensure stability in HEIs' funding. This is achieved by applying a so-called transfer rate constant (with HEIs receiving in a given year a fixed percentage of their previous-year subsidy), which was as high as 65% in 2016. The remaining 35% is allocated according to the algorithm which is based on 6 criteria (students, human resources, development of education, research, authorisations, exchanges) where the first two form 35% each in the distribution algorithm. For non-university HEIs the rest 30% depends on the development of education, no research and other criteria is included while for the universities the research forms 10% as well as the development of education. (Eurydice-PL, 2017).

Under the Law on Higher Education, there are full-time and part-time study programmes. Full-time studies at public HEIs are free of charge, apart from fees for courses repeated. Part-time studies (evening, weekend and extramural) at public HEIs and programmes at non-public HEIs are subject to tuition fees at levels set by particular HEIs. Full-time students in public higher education institutions pay only administrative fees, they are charged tuition fees only if repeating a study course. Part-time students pay annual tuition fees of, on average, about PLN 4,700 set by higher education institutions. Each institution may provide exemptions and reductions. All students pay a maximum fee of PLN 150 related to enrolment procedures once per study cycle. Students also pay administrative fees which include the issue of student ID cards, student record books and diplomas. (EC, 2016)

Two types of grant are provided to students in Poland: need based and merit-based grants. Need-based grants are available for all full-time and part-time with a low personal/family income, and for students with disabilities. The income threshold to be eligible for need-based grants for students with low family income is decided by HEIs and is between PLN 668.20 and 1,043.90 per person per month. In 2014, 13.28% of all students received a need-based grant based on their socio-economic situation and 1.64 % of all students received the need-based grants for students with disabilities. The average amount was PLN 4,674.28 per year. Merit-based grants are allocated to the best-performing full-time and part-time students. The average amount of the merit-based grant is PLN 4,332.70 per year. 7.43% of all students received such grants in 2014. The total monthly amount of the need- and merit-based grants may not be more than 90% of the lowest basic pay of an assistant (the lowest academic position at higher education institutions) as regulated by legislation. (EC, 2016)

Loans of PLN 6,000 per year may be taken out in any cycle by students whose personal income is below net PLN 2,500 per month (in 2015). The state guarantees the entire loan for students with family income of PLN 600/month per person and 70% for students with a family income of PLN 1,000/month. Students starting their studies before the age of 25 can apply for a loan which is granted for the period of study or maximum six years. Repayment begins two years after graduation. While receiving the loan and for the following two years interest is paid by the state budget, and later on interest rates are capped. The best-performing 5% of graduates may obtain the cancellation of 20% of their loan. A tax relief of PLN 1,112.04 per child per year (2015) for parents/guardians of students up to 25 years of age available provided income did not exceed a specified level, and if the student did not earn a taxable income (including capital gains) exceeding PLN 3 089/year. There is no relief dedicated only to students. Family allowances are based on low income of parents or disability of a student. (EC, 2016)

### **Higher education in Slovakia**

Higher education in the Slovak Republic (SR) is provided by higher educational institutions that have an exclusive right granted by law to provide and organise higher education (accreditation is assessed by the Accreditation Commission and is by the minister of education based on the Accreditation Commission's statement). Regarding the system of funding and ownership, higher education institutions are divided into public, state owned and private ones. In addition, higher education may be also provided by foreign higher education institutions. In 2016/17 higher education in the Slovak Republic is provided by 20 public higher education institutions, 3 state higher education institutions and 13 private higher education institutions. There are also 5 foreign higher education institutions operating here. (MŠVVŠ SR, 2017)

Public HEI is an autonomous institution that establishes and repeals the law. The state-owned higher education institutions are police, military and healthcare higher education institutions. The private higher education institutions are non-profit-making organisations offering generally useful services or limited liable companies which were founded with the purpose of providing education and research. The State consent for operation as a private higher education institution is granted by the Government of the SR. Foreign higher education institutions provide higher education in the Slovak Republic in compliance with the legislature of their home country based on the authorisation granted by the Ministry of Education, Science, Research and Sport of the Slovak Republic. Rights and obligations of a foreign higher education institution's students are not governed by the Act on higher education but by the legislature of the institution's home country. (Eurydice-SR, 2017)

In agreement with the Higher Education Act the professional higher education institutions provide the bachelor's study programmes only while the public institutions provide also master and doctoral programmes. The professional higher education institutions are oriented particularly on the applied research whilst the universities have the primary orientation at basic research and emphasis is laid on doctoral study programmes. (Eurydice-SR, 2017)

The main sources of funding for public and state higher education institutions are subsidies from the state budget, subject to a special regulation. A public higher education institutions use also other sources to cover expenditure necessary for their activity. The ministry provides subsidies to a public higher education institution for the implementation of accredited study programmes, research, development or artistic activities, the development of higher education institutions and for the social support of students. The revenues of a public higher education institution include a subsidy from the state budget, tuition fees, charges associated with the study, revenues from further education, proceeds of the property and of the intellectual property, revenues from gifts from natural persons and legal entities and proceeds of the business activity and other revenues, if permitted by the law. Private higher education institutions secure financing for their educational, research, development, artistic and other creative activities themselves. The ministry provides private higher education institutions with subsidies for social support of students. The private higher education institutions may be also granted a subsidy for its activity from the state budget but actually they receive only the funds for covering statutory claims of the students. (MŠVVŠ SR, 2017)

Students in the Slovak Republic pay certain fees and tuition in the cases defined by law. A public higher education institution may require candidates for study to pay fees for the material provision for the admission procedure. All students pay registration fees, which range from 10 to 100 Euros per academic year. Also the issue of the diploma following the relating examination, the issue of documents on the study and supply of their copies the issue of documents on the education completed, if required in a foreign language, with the exception of the diploma supplement which is explicitly issued free of charge the issue of copies of documents on completion of a study and on recognition of equivalence of study documents may be associated with fees. The amount of fees is determined by the internal regulation of the public higher education institution and is derived from the real cost incurred to the higher education institution by these services. Full-time students of a public higher education institution that have

not exceeded the standard length of study, as prescribed for a study programme, do not pay tuition fees. Students who simultaneously study two or more study programmes at the same level provided by a public higher education institution in one academic year are obliged to pay tuition fees in the second and the other study programme in the respective academic year. Students who exceed the standard length of a public higher education institution study programme have to pay the annual tuition fees for every extra year of their study to the higher educational institution. Tuition can be a maximum of EUR 1,800 per academic year. Part-time higher education students have to pay annual tuition fees for every year of their study, the maximum amount for undergraduate programs is EUR 2,050 in the first cycle and EUR 3,080 in the second cycle. Tuition and other fees at public higher education institutions cannot exceed 50 % of the average costs of full-time education. Tuition fees and fees connected with the study at a private higher education institution are set by the institutions separately. (EC, 2016)

Students are provided financial support in direct and in indirect forms. There is a legal right for a need-based grant/scholarship subject to specified conditions. The amount of this need-based scholarship varies from EUR 10 to EUR 275 per month. Merit-based motivation scholarships are granted by the higher education institutions for excellent results in studies, research and development, artistic or sporting activity. The amount of the motivation scholarship is set by higher education institutions or faculties, usually it is a sum of 1,000 EUR per academic year for 15% of students in the program. The state subsidy for this purpose is calculated at about EUR 450 per student for 10% of students. Statistical data show that 13.71 % of students receive need-based and 8.07 % merit-based grants in 2015. Publicly subsidised loans provided by the Education Support Fund are available for full and part-time students throughout the regular duration of study programmes. Loans range from EUR 500 per year to 2,500 per year and are taken by about 1 % of students. These are loans with subsidized interest rate and deferred repayment. Indirect support implemented outside the education sector is the support in the form of family allowances for students aged up to 25 of age, if they prepare for a future occupation in a full-time study. The amount of monthly allowance in 2015 is uniformly EUR 23.52 per student, it is paid to parents. Tax benefits for parents exist in the form of a lump sum tax deduction of EUR 21.41 per month. There are no tax benefit for working students. (EC, 2016)

## FINDINGS

The situation in higher education sector in V4 countries can be viewed and compared according to the various aspects and from different points of view: the future management of education (Dobia, Hałas-Dej, 2017), sustainability transition (Dlouhá et al. 2017), academic attractiveness of the country (Kosmaczewska, Barczak, 2015), estimating private returns to education (Štefánek, Horvát, 2015) or seeing the trends in financing the higher education and number of students involved in (Kuncova, Mulac, 2016). In this article we continue with the previous research based on the comparison of countries using statistical data.

Firstly, we analyzed the total number of HEIs per millions of inhabitants or vice versa, thousands number of inhabitants falling on one institution. From this point of view the widest net of institution can be found in Poland where 434 HEIs per 38 million inhabitants means about 11 HEIs per 1 million inhabitants or 87.5 thousands of inhabitants per 1 HEI. Contrary to these results the situation in the Czech Republic and Hungary is different with nearly half number of HEIs per million inhabitants (Table 1). Only in Slovakia the majority of HEIs is public, in other countries private HEIs outweighs. This is probably the reason of the process of transformation where more private HEIs come into being since the communist era – but the evidence of inverse trend is visible especially in Poland (Kwiek, 2014) where still the highest percentage of private institution exist. In the Czech Republic the tendency of the decrease of the number of HEIs also exist but the changes are very slow (MSMT, 2017b). According to the data in Table 1 and according to the previous research (Kuncova, Mulac, 2016) we cannot say that the number of HEIs in the Czech Republic is extremely high (as it is sometimes said by the Czech authorities).

**Table 1:** Comparison of number of HEIs in V4. (Source: Eurostat, 2017; Eurydice, 2017; own calculations)

Country	No. of inhabitants (in millions)	No. of HEIs	% of private HEIs	No. of HEIs per million inhabitants	Thousands of inhabit. per 1 HEI
Czech Republic	10.5	68	58.8	6.476	154.4
Hungary	9.8	64	57.8	6.531	153.1
Poland	38	434	69.6	11.421	87.5
Slovakia	5.4	41	43.9	7.593	131.7

Next part of the comparison was aimed at the number of students in tertiary education as a percentage of population, students' distribution between full time and part time forms of study and at the average student-academic staff ratio (number of students per an academician) – Table 2. The main difference among V4 countries was in the ration of full time and part time students where the Czech Republic has more than 95% of

tertiary students in full time form of study. The reason for this fact might lie in the lower number of study programmes offered for part time study. Poland had the highest percentage of population studied at tertiary education (maybe because of the higher number of HEIs per million inhabitants) and nearly one third of them studied at part time form of study. The Czech Republic had also “beat” the others in number of students per academician (which is more negative than positive) – the situation was worse than in 2014 when the ration was nearly 22 students per academician (Kuncova, Mulac 2016). As the EU average ration was about 15.6 in 2015 (Eurostat, 2017), the situation in the Czech Republic was not optimal (the reason might lie in the higher number of students but also in the low number of academic staff that is influenced also by the low expenditures on higher education).

**Table 2:** Comparison of percentages of students enrolled in tertiary education in V4. (Source: Eurostat 2017; own calculations)

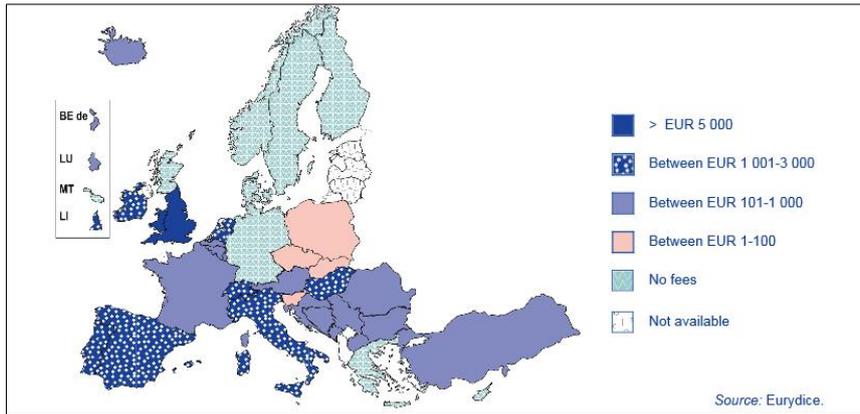
2015	number of students	% of population	% full time	% part time	Avg. number of students per member of academic staff
<b>Czech Republic</b>	395,529	3.75	<b>95.88</b>	4.12	<b>23.97</b>
<b>Hungary</b>	307,729	3.13	70.78	29.22	14.65
<b>Poland</b>	1,665,305	<b>4.39</b>	67.16	<b>32.84</b>	17.10
<b>Slovakia</b>	184,390	3.40	73.04	26.96	14.41

According to the distribution of students into bachelor and master studies the ratio in all V4 countries was nearly the same, a little bit higher number of bachelor students were in Hungary (Table 3). More than 80% of bachelor students studied at public institutions, only in Poland the percentage was around 73% and more than one quarter of students studied at private institutions (as Poland had the highest number of private HEIs – Table 1). As it was mentioned above the Czech republic had only a few percent of students studied at part time form of study – most of them studied at master studies (Table 3) but still the percentage was under 10% (at bachelor study under 2%) while in other countries it was around 20%, in Poland and in bachelor study one quarter of students studied at the part time form of study at the public institutions. The share of the master study student at public HEIs was again the highest in the Czech Republic. The reason lies in the tuition fees paid at the private HEIs and also in the fact that the public HEIs have higher credit and trust than the private ones.

**Table 3:** Comparison of percentages of students enrolled in tertiary education in Bc. or Master type of study in V4 countries. (Source: Eurostat 2017; own calculations)

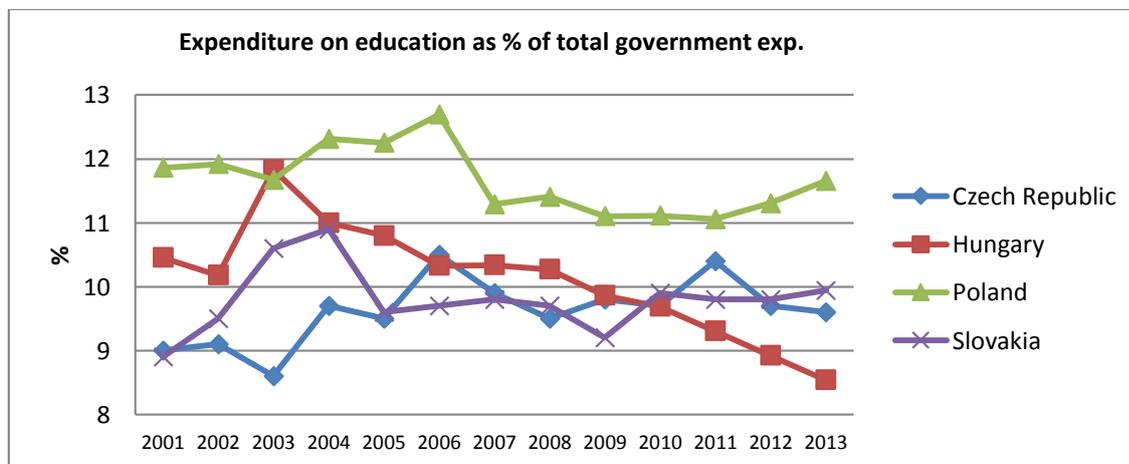
2015	students enrolled in tertiary education							
	% Bc	% Bc public	% Bc private	% Bc part time public	% Master	% Master public	% Master private	% Master part time public
<b>Czech Republic</b>	59.89	85.20	14.80	1.17	33.64	<b>91.14</b>	8.86	9.59
<b>Hungary</b>	<b>69.78</b>	<b>86.96</b>	13.04	<b>25.00</b>	24.08	87.62	12.38	21.11
<b>Poland</b>	66.32	73.04	<b>26.96</b>	12.38	30.91	76.47	<b>23.53</b>	<b>23.76</b>
<b>Slovakia</b>	55.55	84.17	15.83	12.47	<b>37.98</b>	83.13	16.87	17.58

When we compare the fees, the situation was nearly similar in the Czech Republic, Slovakia and Poland while in Hungary the fees were much higher (Figure 1).

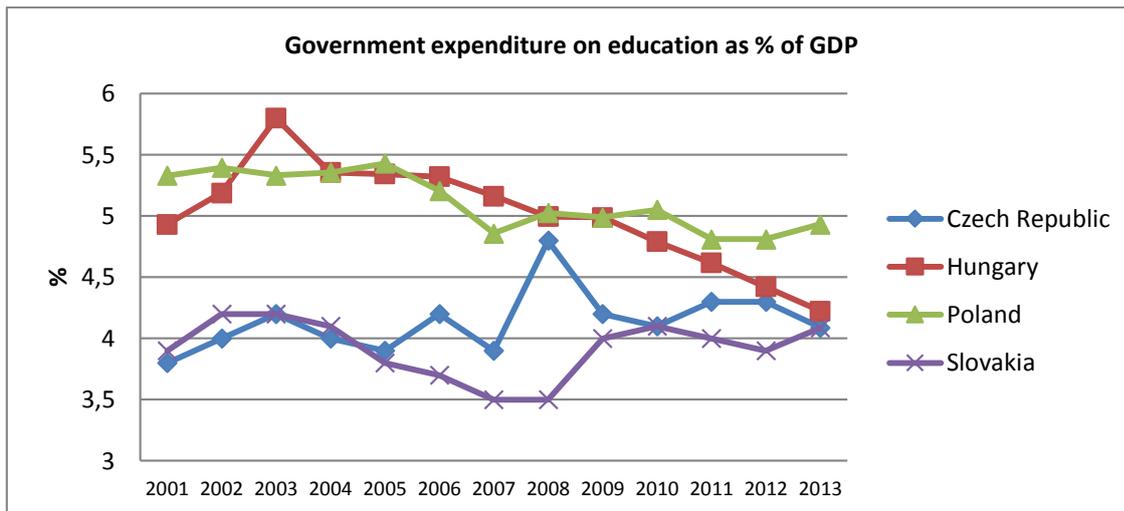


**Figure 1:** Most common fees including tuition and administrative fees in first cycle higher education programmes among full time students in 2016/2017 (Source: Eurydice, 2017)

The situation with the expenditures on education was completely different (Figure 2). Although in the Czech Republic and Slovakia the percentage oscillated around 9-10% (with exception of the year 2003 for the Czech Republic and 2003-4 for Slovakia), Poland had during all years the highest percentage in V4 countries though the decrease since 2007 is evident. The worst situation and mainly the worse trend could be seen in Hungary where the percentage was falling down since 2003. The same trend is visible from the government expenditure on education as the percentage of GDP (Figure 3) where Hungary was the leader in V4 countries in the years 2003-4 and 2006-9 but then it went down to the same level as the Czech Republic and Slovakia. Since 2010 Poland seems to be the best one with about 5% of GDP. But the main problem of the whole V4 is that the EU average in nearly all selected years oscillated around 11% so more than two times higher (Worldbank, 2017). The data show that the changes in expenditures on education are not influenced so much by the economic crisis but more by the policy of every government.

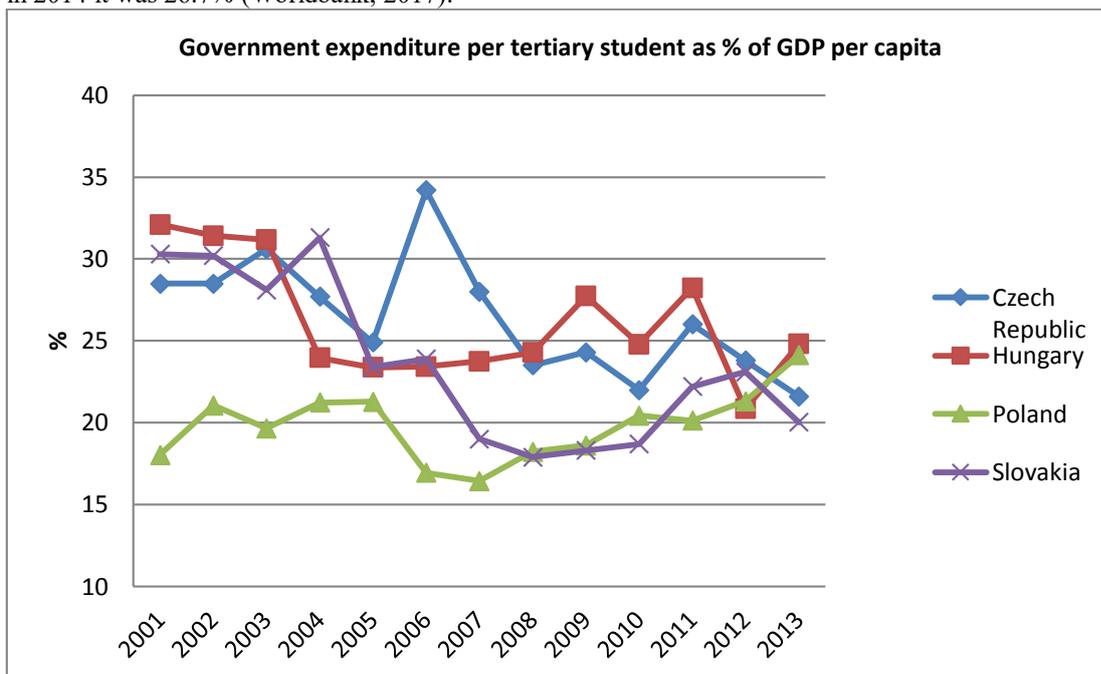


**Figure 2:** Trends of the expenditures on education as % of total government expenditures (Source: Worldbank, 2017)



**Figure 3:** Trends of the government expenditures on education as % of GDP (Source: Worldbank, 2017)

Comparison of the trends in government expenditures per tertiary student as percentage of GDP per capita (Figure 4) showed that all countries tended to the range 20-25% but only Poland seemed to slowly raise the percentage during the selected years. Other countries were more or less falling down with these expenditures. The main reason for this was probably the rising number of students in the tertiary education. The EU average was a little bit higher, in 2014 it was 26.7% (Worldbank, 2017).



**Figure 4:** Trends of the government expenditures per tertiary student as % of GDP per capita (Source: Worldbank, 2017)

Not only the expenditures or costs are important but it is necessary to see the benefits of the education (especially the social ones, on taxes or on unemployment). Based on the OECD (2016) research we see that the highest internal rate of return (in case of public costs) was in Hungary – but the gap between men and women was really big (9%) – Table 4. Only Slovakia was below the OECD average (10% for man, 8% for woman). Concerning the private costs and benefits (Table 5) the internal rates of return were higher in all countries, the highest one was in Poland but again a big differences between men and women existed. In this case all V4 countries were above the OECD average (14% for man, 12% for woman). In this sense tertiary education was very important in a view of benefits and financial returns in all V4 countries

**Table 4:** Public cost and benefits for a woman attaining tertiary education in equivalent USD converted using PPPs for GDP – year 2012 (Source: OECD, 2016)

public costs	total costs		total benefits		net financial returns		internal rate of return	
	man	woman	man	woman	man	woman	man	woman
CZE	22400	22500	157700	105000	135300	82500	16%	12%
HUN	24800	24800	248100	124100	223300	99300	22%	13%
POL	31900	31000	156800	113500	124900	82500	12%	10%
SVK	33200	33200	122300	78500	89100	45300	9%	6%

**Table 5:** Private cost and benefits for a woman attaining tertiary education in equivalent USD converted using PPPs for GDP – year 2012 (Source: OECD, 2016)

private costs	total costs		total benefits		net financial returns		internal rate of return	
	man	woman	man	woman	man	woman	man	woman
CZE	30100	29600	333300	192400	303200	162800	22%	15%
HUN	31400	31500	369700	183200	338300	151700	24%	14%
POL	20900	19100	401400	260500	380500	241400	30%	24%
SVK	21500	21800	287900	171100	266400	149300	23%	16%

The last part of the analysis describes the situation of the V4 countries in 5<sup>th</sup> pillar of the Global Competitiveness Index (Higher education and training). Table 6 shows the ranking of the countries in the period 2011-2015 from 140-148 countries. The Czech Republic and Poland had the best position (which did not improved during years). For Hungary we again see the big falling off. Slovakia was the worst in V4 countries but with nearly the same position. As the 5<sup>th</sup> pillar has 8 parts, we analyzed the situation in the year 2015 in each of these parts (Table 7). Out of the V4 countries the Czech Republic was the best one in 5 parts, Poland in 2 parts, Hungary in one and Slovakia was never the best of the V4. Poland had the best place (22<sup>nd</sup>) in the tertiary education enrollment rate – which was evident from the previous results. The Czech Republic had the best place (26<sup>th</sup>) in the local availability of research and training services. The same (26<sup>th</sup>) place was the best one for Hungary at the secondary education enrollment rate. But the results showed that all V4 countries had (and probably still have) problems with the quality of education system and the quality of management schools. Unfortunately the quality of the education system during the years 2011-2015 was seen (Table 8) as not improving (or maybe increasing but slowly than in other countries).

**Table 6:** Positions of V4 countries in the 5<sup>th</sup> pillar of the GCI (Source: The Global Competitiveness Report 2009-2016)

GCI rank 5th pillar Higher education and training	2011	2012	2013	2014	2015
CZE	24	30	39	35	29
HUN	34	45	44	52	57
POL	26	31	37	34	31
SVK	53	53	58	56	53
<b>Number of countries compared</b>	<b>142</b>	<b>144</b>	<b>148</b>	<b>144</b>	<b>140</b>

**Table 7:** Positions of V4 countries in each part of the GCI 5<sup>th</sup> pillar (Source: The Global Competitiveness Report 2009-2016)

2015	CZE	HUN	POL	SVK
5.01 Secondary education enrollment rate	50	26	45	60
5.02 Tertiary education enrollment rate	32	41	22	50
5.03 Quality of the education system	60	99	73	121
5.04 Quality of math and science education	57	75	51	76
5.05 Quality of management schools	63	73	75	95
5.06 Internet access in schools	29	42	46	32
5.07 Local availability of research and training services	26	81	32	58
5.08 Extent of staff training	39	114	65	82

**Table 8:** Positions of the V4 countries during the years 2011-2015 in the GCI measure “Quality of the education system” (Source: The Global Competitiveness Report 2009-2016)

5.03 Quality of the education system	2011	2012	2013	2014	2015
CZE	34	49	67	77	60
HUN	75	80	93	96	99
POL	62	71	87	79	73
SVK	111	117	130	125	121

## CONCLUSIONS

The main aim of this paper was the comparison of higher education in the V4 countries: the Czech Republic, Hungary, Poland and Slovakia. Each country has its own specific rules and different conditions connected with the tertiary education. The main differences can be summarized by these facts:

- The relative number of HEIs was the highest in Poland as well as the percentage population studied at HEIs, the percentage of students studied part time and the percentage of private HEIs.
- The Czech Republic had the highest % of students at public HEIs and high number of students per 1 academician.
- Most of the HEIs students in Hungary studied at the bachelor level.
- Hungary was the only country in V4 with high study fee.
- Expenditure on education as % of total government expenditures oscillated around 9-11% which was close to the EU average but the government expenditure as the % of GDP was under the 50% of EU average.
- All V4 countries were directed at the similar level of the Government expenditure per tertiary student as % of GDP per capita but only Poland did not decrease it rapidly.
- From the perspective of the Higher education and training as a part of the Global Competitiveness Index all V4 countries came down, mainly in the quality of the education system (compared to other world countries).

To conclude: although Hungary and the Czech Republic are characterized by a higher ratio of students incoming than those outgoing, while in Poland and Slovakia the situation is reversed (Kosmaczewska, Barczak, 2015), Poland seems to be the best one in V4 in some factors related to higher education followed by the Czech Republic. Hungary during few years lost its position and Slovakia was usually the last country in V4 though some changes were made. The analysis showed that in all V4 countries the situation in the education and especially higher education sector was not good compared to EU average. The main reason might lie in the low government expenditures on education and especially at the higher education. This factor influences the quality of the system itself. If no changes happen the V4 countries will deepen the distance from other EU countries.

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# **Comparison of Traditional Instruction Educational Videos and Mixed Methods for Shooting and Passing Skills in Basketball (Kurdistan Region of Iraq)**

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## **ABSTRACT**

The purpose of this study was to compare three different instructional methods (educational videos (EV), traditional coaching (TC) and mixed method (MM)) by means of the skill test scores (AAHPERD shooting and passing tests). Thirty nine (n=39) students (boys) aged  $11.2 \pm 0.6$  selected for this study by random sampling method, enrolled in the basketball summer school held in the Sanhareeb Sport Club Duhok /Kurdistan Iraq. Instruction, practice, and testing for this study were held on six separate and successive weeks. Participants were randomly assigned to one of the three different teaching methods (EV, TC and MM) creating three independent groups of 13 students. The AAHPERD basketball test and the AAHPERD basketball passing tests were used to evaluate the shooting and passing ability. One way Anova and LSD tests were used for comparisons between three method groups. Results showed that the mixed method group ( $12.461 \pm 2.145$ ) surpasses the educational video ( $8.615 \pm 1.325$ ) and the traditional coaching groups ( $10.153 \pm 1.463$ ) in sequence, and the researcher indicates the reason to the effectiveness of the executed program by the coach and the compact between the (educational video) and the (traditional style of the coach) in which the mixture of both methods showed the appearance of the best result in learning the skills of shooting and passing in basketball.

**Keywords:** basketball, motor skills, fundamental skills, education method, coaching techniques

## **INTRODUCTION**

Researchers, coaches and athletes are using different types of technology in order to teach skills and techniques in sports effectively. Moreover to improve athletic performance technology is now accepted as a popular field and play a very important role (Goggin et al, 1997, 280-290).

As an example Carpenter and Greenhill (1955,1958) used the closed-circuit television vs live teaching. No differences were found during this research between two teaching methods. Later work of Clark's logic has been showed affects and differences on learning by using sophisticated technologies like simulators used in medical training (Hague and Srinivasan, 2006, 51-58). On the other hand there are researches argues about the affects of technology on learning and attitudes (Dede, 1996, 2004; Kozma 1991, 1994; Mayer, 2008).

Using videos in education beside the classical teaching methods become an very important part of higher education. Videos used to support the classical education and served as a tool of cornerstone most of the courses. There were researches and meta-analyses showed that the technology can increase the affect of learning (Shmid et.,2014). There are also multiple studies have shown that the videos found very effective on education (Kay, 2012; Allen and Smith, 2012; Lloyd and Robertson, 2012; Rackaway, 2012; Hsin and Cigas, 2013).

Cicciarella (1983), Lynch et al. (2001) reported that the videos have been used during the cognitive instructions of students by watching the drills, that makes teachers, coaches or instructors spend much time with the students that needs more help during the physical education. Huwitz, 1985; Bazillion and Braun, 1998 also reported that

videos help to develop solving problems making decisions and better understanding the concept. Moreover using the video technology also give change to provide information about the athletic development by feedback and used to provide expert modeling (Hazen et al., 1990).

The results of the researches used the video technology in sports indicates that videos used as a part of the training regimen can provide positive interventions. Scott (1998) used the video modeling for adult tennis players for to improve the return rate of the tennis serves. Results suggested that the video technology is a promising for the sports performance researches.

There are other studies also demonstrated improvement on sports performance. Boschker and Bakker (2002) investigated the video technology affect on Wall climbing. The results indicated subjects climbed faster and fluent compared to subjects who did not watched videos about climbing.

SooHoo, Takemoto, and McCullagh (2004) used two techniques for to improve squat performance by using the technology. A video of an expert lifter and a audio tape instructed to the subjects. Results showed that both technology resulted in an improvement in squat technique.

Finally Vernandakis et al (2002) used multimedia technology for to teach skills in volleyball. Vernandakis used computer assisted instruction and classic coaching. Results indicated that there were no significant differences were found between two methods.

Literature surveys showed that there are no studies searched the affects of technology and classical coaching methods for teaching basketball skills. Therefore the the purpose of this study was to compare three different teaching methods educational videos (EV), traditional coaching (TC) and mixed method (MM) during the teaching of two basketball skills (shooting and passing) from subjects aged 10-12 years old with no basketball experience.

## **METHODS**

### ***Sample***

Thirty nine (n=39) students (boys) ( $11.2 \pm 0.6$  years;  $44.4 \pm 4.8$  kg;  $1.51 \pm 6.4$  m) participated in this study by random sampling method, enrolled in the basketball summer school held in the Sanhareeb Sport Club Duhok /Kurdistan Iraq. All participants were healthy and physically active but had no experience in basketball.

### ***Educational programs***

The time of the training unit sections of the three groups related to the section (the general preparation, special preparation and the concluding section of the educational unit) are equal in time and the nature of the general and special exercises, and it was (20) minutes for all sections, and the specific time of the educational and practical section was (45) minutes. The researcher provided the inner hall with laptops, after installing the educational programs of the shooting and passing skills on all devices.

### ***Educational video.***

***The educational part.*** researcher prepared the educational part according to the educational video technique, in which it included the script, sound, images, cartoons and visual parts of the levels and sections of the skill consequently. The video presented one of basketball professional players performing the searching skill. He repeated the performance in different corners. Those shots concentrated on some important details and points like the hand or the shape of the legs stem and the angle of leaning the body and sight besides the position of the feet, and ensuring to use the sound to explain each skill.

***The practical part.*** After that the coach allows the players to try practicing the learnt skill , he doesn't interfere in correcting the mistakes, but he only determines the type of the mistake and asks them to review the educational video and repeat the performance.

### ***The traditional coaching.***

***The educational part.*** The coach explains the educational skill to the players in his own way depending on self-experience and he practices the skill himself or asks a skill full player as a model to practice the skill in front of the learners many times meanwhile the coach explains the parts of the skill.

***The practical part.*** The coach gives the chance to the players to practice the skill meanwhile he notices the performance and gives advices and directions to the players to correct their performance and make it reach the best.

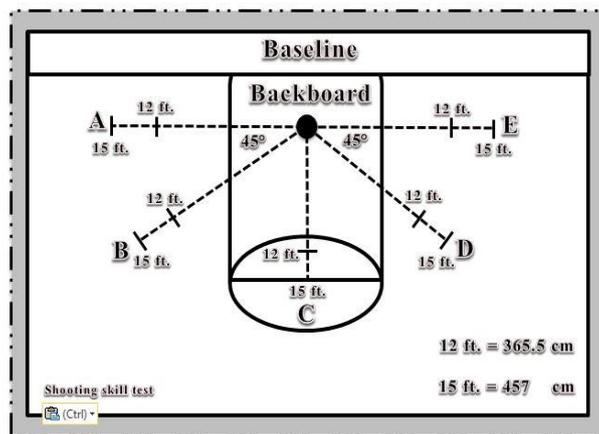
**Mixed method.**

**The educational part.** The researcher prepared the educational part according to the educational video technique, in which it included the script, sound, images, cartoons and visual parts of the levels and sections of the skill consequently. The video presented one of basketball professional players performing the searching skill. He repeated the performance in different corners. Those shots concentrated on some important details and points like the hand or the shape of the legs stem and the angle of leaning the body and sight besides the position of the feet, and ensuring to use the sound to explain each skill, in this part, the coach interferes with his explanation of the skill, besides using a real pattern to practice the skill in front of the players.

**The practical part.** After that the coach allows the players to try practicing the learnt skill, and he interferes in correcting the

**Skill Tests**

**The AAHPERD basketball shooting test.** Strand and Wilson (1993) developed the AAHPERD basketball shooting test fort to evaluate the basketball shooting ability in basketball. It is appropriated for middle school students. One tester was needed for the successful completion of the test. Testing stations were prepared as shown in **Figure 1**. Five markers, from which students had to shoot, were placed on the floor. Students shot from 12- foot marks. Shooting spots A and E were measured from the middle of the backboard; those for B, C and D were measured from the center of the basket. Each shooting spot marker was 2 feet long and 1 inch wide. During the test, the student had basketball in hand, stood behind the shooting spots. On the “ready, go” signal, the student shoots, retrieves the ball, dribbles to another spot and shoots again. The student must attempt at least one shot from each of the five spots and must have at least one foot behind the marker on each shot. Four lay-up shots may be attempted, but not two in succession. The student continues the attempt to score until “stop” is called. All students had three trials of 60 seconds each; the first trial was a practice trial.

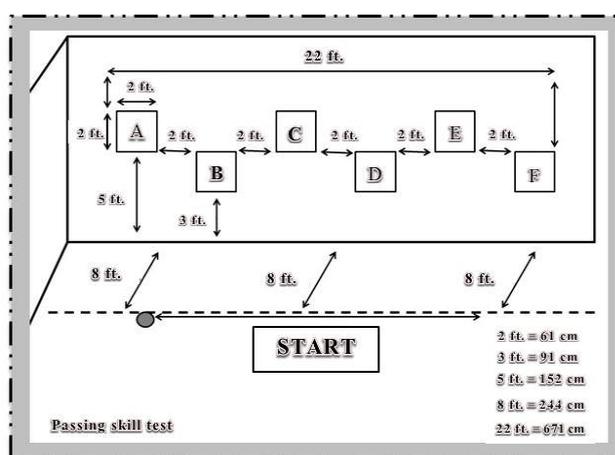


**Figure 1.** Testing stations for shooting

**The AAHPERD basketball passing test.** This test was chosen because it is an appropriate test for assessing basketball passing skills. The test was validated by the American Alliance for Health, Physical Education, Recreation and Dance in 1984, using senior high school students. The test retest approach computed reliability coefficients of .84 to .97 so the test is both valid and reliable. The test also required the participants to pass the ball quickly and basketball (Krause et al., 1999). **Figure 2** show the diagrammatic representation and set up of the test, which required a smooth wall surface of 30 feet.

Each station for the passing test was prepared as shown **Figure 2**. A restraining line 26 feet long was marked out on the floor 8 feet from and parallel to the testing wall. On the testing wall six boxes measuring 2 feet by 2 feet were marked out all 2 feet apart. Moving from the left side of the testing wall, targets A, C and E have their base 5 feet from the floor while B, D and F have their base 3 feet from the floor.

The player stood behind the 8-foot restraining line, holding a basketball and facing the far left wall target (A). The experimenter then played the CD, which emitted a three-beep countdown, and the fourth beep signaled the start of the test. Following the fourth beep, each player performed a chest pass to the first target square (A), recovered the ball while moving to the second target square (B) performed a chest pass to the second target (B). The player then continued this action until they reached the last target (F). While at the last target (F), they threw two chest passes then repeated the sequence by moving to the left passing at targets E, D, C and so on. The only modification to the test was that it continued for just thirty seconds. Only chest passes were allowed.



**Figure 2.** Testing stations for passing

### ***Procedure***

Participants were randomly assigned to one of the three different teaching methods: educational videos (EV), traditional coaching (TC) and mixed method (MM) creating three independent groups of 13 students. All participants had no formal training on learning the skills of shooting and passing in basketball. Prior to group assignments, participants were orientated to the purpose of the study and participant requirements. Following the orientation, informed consent was obtained from each participant. Instruction, practice, and testing for this study were held on six separate and successive weeks. The groups met for 45-minute, 4 times each week in an indoor gymnasium.

***Exploratory experiments.*** We made the exploratory experiments on a sample out of the research sample and where (6) players in order to reach to accurate results before fulfilling the educational programs, as follows:

***The first exploratory experiment.*** The researcher made the first exploratory experiment on Thursday and Saturday (7-9/7/2016) for the physical labels tests. The aim of this experiment was:

- Ensuring the relevance and clarification of the instructions of the research sample tests.
- Ensuring the logical sequence to make the chosen tests in the research.
- Ensuring the capacity and ability of the supportive work team to fulfill the measurements and tests.
- The validity of the devices and tools used in the tests.
- Counting the required time to execute the tests.<sup>3</sup>

The results of the experiment made an obvious image to the researcher and the work team of the nature of the work and its application way.

***The second exploratory experiment.*** The researcher made the second exploratory experiment on Sunday (11/7/2016) to the two educational programs. And the aim of it was:

- Ensuring the validity of both educational programs
- The relevance of the educational unit's time and their divisions for the research sample.

- The validity of both educational programs sections and the response of the sample to them.
- Introducing the mistakes and the expected difficulties during the fulfillment.

The results of the second exploratory experiment were:

- The validity of both educational programs to the research sample.
- The relevance of the educational unit's time and their divisions to the research sample.
- Unifying the repetitions and times to the research sample.
- Avoiding some mistakes and difficulties throughout fulfilling the experiment

**Pre-test of the skills.** The researcher made the pre-test for the skills on Wednesday (13/7/2016) for equal between the three groups and prepared for the program study and show that all groups they are equal in everything.

**The main experiment.** The educational programs were start on the three research groups on Thursday (14/7/2016) till (29/8/2016) in which (4) educational units per week for each group.

**The post-tests.** The post-test of the shooting and passing skills of the three research groups was made on Thursday (1/9/2016) by giving each student two try and for each skill of research skills, the recording the result of the test.

**Scoring**

**The AAHPERD basketball shooting test.** Two points were awarded for each shot made, either a shot from behind the shooting mark or a lay-up. One point was awarded for any unsuccessful shot that hits the rim from above, either initially or after rebounding from the backboard. No points were awarded if a shot was preceded by a ball-handling infraction. If two lay-ups occurred in succession, the second got no points. Only four lay-ups were attempted; any lay-up in excess of four scored as zero. Failure to attempt shots from all designated shooting spots voided a trial. Voided trials had to be repeated. The test score was obtained by totaling the two trials **Figure 1.**

**The AAHPERD basketball passing test.** The test score was obtained by totaling all the points scored over the duration of the (30) thirty-second test.

- Two points (2) were awarded for each chest pass that hit the target or on the target lines.
- One point (1) was awarded for every pass that hit between the targets.
- No points (0) were awarded if a player's foot was on or over the restraining line, or if a pass other than a chest pass was used.

**Statistical Analysis**

Scoring data were collected and compared between the educational videos (EV), traditional coaching (TC) and mixed method (MM). pre and post tests were compared by using one way Anova and LSD tests ( $P < 0.05$ ). Throughout the text, data for all participants were averaged and presented as means and standard deviations.

**RESULTS**

Table 1 shows that there are insignificant differences among the three research groups in the skills labels tests for being the values of the false rates more than (0.05) which indicates the equivalence of the three research groups in those variables.

**Table 1.** The summary of the contrast analysis results among the three research groups in the skills labels tests by the research sample in the pre-test.

Variables	Groups	Mean $\pm$ SD	F	P
Shooting	EV	5.384 $\pm$ 1.609	0.334	0.718
	TC	5.000 $\pm$ 1.080		
	MM	5.000 $\pm$ 1.414		
Passing	EV	16.538 $\pm$ 1.391	0.103	0.902
	TC	16.230 $\pm$ 1.832		
	MM	16.307 $\pm$ 2.097		

\*Significantly higher ( $P < 0.05$ )

Table 2 indicates that there are significant differences between the pre and the post-test of the three research groups (the educational video, the traditional coaching, mixed method) in the shooting skill in which the amid accounts (Mean) reached in sequence (5.384 , 8.615), (5.000 , 10.153), (5.000 , 12.461) and the standard deviations (STD.) reached in sequence (1.609 , 1.325), (1.080 , 1.463), (1.414 , 2.145) and the counted (T) reached in sequence (7.584 , 14.090 , 11.366 ) and the false rate in sequence (0.000 , 0.000 , 0.000 ) it shows significant differences for being the values of false rate possibility smaller than (0.05) these degrees indicates improvement in the learners' level and getting benefit of the three training programs.

**Table 2.** The paired-sample T test the results of pre and post-test of the shooting skill in basketball.

Variables	Groups	Pre-test	Post-test	T	P
		Mean + Std.	Mean + Std.		
Shooting	EV	5.384 + 1.609	8.615 + 1.325	7.584	< 0.001*
	TI	5.000 + 1.080	10.153 + 1.463	11.090	< 0.001*
	MI	5.000 + 1.414	12.461 + 2.145	11.366	< 0.001*

\*Significantly higher ( $P < 0.05$ )

Table 3 above indicates that there are significant differences between the pre and the post-test of the three research groups (the educational video, the traditional coaching, mixed method) in the passing skill in which the amid accounts (Mean) reached in sequence (16.538 , 30.230) , (16.230 , 34230) , (16.307 , 36.230) and the standard deviations reached in sequence (1.391 , 3.218), (1.832 , 2.127), (2.097 , 1.832) and the counted (T) reached in sequence (15.435 , 23.439 , 25.019) and the false rate in sequence (0.000, 0.000, 0.000) it shows significant differences for being the values of false rate possibility smaller than (0.05) these post-test degrees indicates improvement in the learners' level and getting benefit of the three training programs.

**Table 3.** The paired-sample T test the results of pre and post-test of the passing skill in basketball

Variables	Groups	ts ep̄rp	ts rpprp	T	P
		Mean + Std.	Mean + Std.		
Passing	EV	16.538 + 1.391	30.230 + 3.218	15.435	< 0.001*
	TI	16.230 + 1.832	34.230 + 2.127	23.439	< 0.001*
	MI	16.307 + 2.097	36.230 + 1.832	25.019	< 0.001*

\*Significantly higher ( $P < 0.05$ )

Table 4 indicates that there are significant differences among the three research groups in the post-test (the educational video, the traditional coaching and the mixed method) in the shooting and passing skills in the post-test in which all the counted values of (F) reached in sequence (17.195, 19.952) and the false rate in sequence (0.000, 0.000) it shows significant differences for being the values of false rate possibility smaller than (0.05).

**Table 4.** The One Way Anova results of the contrast analysis in the post-tests among the three research groups in variables of the Shooting and Passing skills

Variables	Groups	Mean $\pm$ SD	F	P
Shooting	EV	8.615 $\pm$ 1.325	17.195	> 0.001*
	TI	10.153 $\pm$ 1.463		
	MI	12.461 $\pm$ 2.145		
Passing	EV	30.230 $\pm$ 3.218	19.952	> 0.001*
	TI	34.230 $\pm$ 2.127		
	MI	36.230 $\pm$ 1.832		

\*Significantly higher (P < 0.05)

Table 5 indicates the comparison of the averages of the shooting skill test results in basketball, the results showed the following:

- There was a significant difference in the Mean between the first experimental group and the second one, in which the difference was (1.538) degree by the false rate (0.026).
- There was a significant difference in the Mean between the first experimental group and the third one, in which the difference was (3.846) degree by the false rate (0.000).
- There was a significant difference in the Mean between the second experimental group and the third one, in which the difference was (2.307) degree by the false rate (0.001).

**Table 5.** The difference of the Mean and the false rate in the test (L.S.D) of shooting skill in basketball

groups	Mean Difference	Sig.	significance
EV - TC 8.615 – 10.153	1.538	0.026*	Moral for the second group Coach style
EV - MM 8.615 – 12.461	3.846	0.000*	Moral for the third group compact (video + coach)
TC - MM 10.153 – 12.461	2.307	0.001*	Moral for the third group compact (video + coach)

\*Significantly higher (P < 0.05)

Table 6 indicates the comparison of the averages of the passing skill test results in basketball, the results showed the following:

- There was a significant difference in the Mean between the first experimental group and the second one, in which the difference was (4.000) degree by the false rate (0.000).
- There was a significant difference in the Mean between the first experimental group and the third one, in which the difference was (6.000) degree by the false rate (0.000).
- There was a significant difference in the Mean between the second experimental group and the third one, in which the difference was (2.000) degree by the false rate (0.046) for the second experimental group.

**Table 6.** The difference of the Mean and the false rate in the test (L.S.D) of passing skill in basketball

groups	Mean Difference	Sig.	significance
EV - TI 30.230 – 34.230	4.000	0.000*	Moral for the second group Coach style
EV - MI 30.230 – 36.230	6.000	0.000*	Moral for the third group compact (video + coach)
TI - MI 34.230 – 36.230	2.000	0.046*	Moral for the third group compact (video + coach)

\*Significantly higher (P < 0.05)

## DISCUSSION

By noticing the Tables 3 and 4, it shows that the third group surpasses the first and the second one in sequence, and the researcher indicates the reason to the effectiveness of the executed program by the coach and the compact between the (educational video) and the (traditional coaching) in which the mixture of both methods showed the appearance of the best result in learning the skills of shooting and passing in basketball.

The players got benefit of the video programs for containing techniques besides the static and kinetic images and video films working on explaining the kinetic skill in details, on addition to the coach's style which contained a detailed explanation of the kinetic skill performed by a model in several angles and styles, which mixed with the educational video in explaining and showing the best ways to learn the kinetic skills reaching the best performance. In which the video program executed by the researcher appealed the scientific principles of learning according to the abilities and preferences of the players by dividing the kinetic skills into small parts according to its logical sequence and work on comprehending the movement and understanding it correctly then performing it.

Muhammad & Hanan (2003), indicates that dividing the educational situation according to an educational video leads to increase the chances of performance and decrease the wrong reactions which leads finally to the correct performance and the positive and effective participation of the learnt skill. Hoffester (1995) mentions that the learners remember (20%) of what they hear and (30%) of what they watch and (50%) from what they hear and watch and thus increase the proportion of the ticket when the learner, the greater use of dialogue in learning faster.

The researcher adds the positiveness of the executed video which created a good educational environment by using all the senses of the learner and motivating him towards learning and helping him to think orderly to perform the skill which led him to comprehend the way of the correct movement, Wings (2000) agrees that using the video technique in the educational institutions including the athletic ones, aims to prepare an educational environment throughout which learning operation is effectively fulfilled.

By noticing the Tables 3 and 4, it shows that the second group surpasses the first and the second one in sequence, and the researcher indicates the reason to the effectiveness of the executed program by the coach which contained a detailed and complete explanation of the skill through the movement and the primer situation of standing position and determining the angles in this situation and the best way to catch the ball and the movement position from the beginning till the final part, and this means that the coach explained the skill from the primary, main and final situation of both skills personally and then using the pattern and later the players

performed the skill with correcting their mistakes by the coach. Hardyl (1995) noticing the pattern show by seeing gives the learner a future view to perform it and how it should be.

In conclusion, the subjects can learn the skills with those three methods selected for teaching. However mixed method indicates better results compared to video education and traditional coaching alone. On the other hand traditional coaching indicates better results compared to educational videos. The results of this study may give ideas to coaches and physical education teachers to chose the right teaching method in order to teach skills in a better way.

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# Comparison of Turkish and Foreign Students' Metaphors Regarding the Concept of "Examination"

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## ABSTRACT

Examination, held to measure people's knowledge about any subject, is very important because it affects the future of individuals. This situation results in perceiving the examinations from a different perspective. It is thought that this research is important in terms of revealing people's feelings aroused by the concept of examination. This study was carried out to find out whether there is a difference between the Turkish and foreign students' metaphors regarding the concept of examination. For this reason, sample group of the study consists of a total of 200 students, 100 Turkish and 100 foreign students, studying in TRNC universities. The research data was obtained as a result of putting appropriate phrases into the places left blank in the sentence of "Exam is like/similar to .....; because.....". Since this research is a qualitative study, analysis of the relevant data has been performed using content analysis, percentages and frequency parameter, and also the participants' metaphors regarding the concept of examination have been analyzed by categorization.

**Keywords:** Examination, Metaphor, Student, Foreign Nationals, Turkish.

## INTRODUCTION

In the Turkish education system, the concept of examination, which is a part of the lives of students, has importance as an indispensable part of their lives, starting with primary education and continuing with secondary school, high school, university, graduate and doctorate. Exams that take place effectively at all stages of life-long education are often considered as a difficult and anxious concept for many students (Boyacioglu & Kucuk, 2011). Various studies have tried to elucidate this situation (Tekbas, 2019; Guler & Cakır, 2013). The aim of examination is to determine the extent to which the objectives determined by the education program and practitioners are achieved. In other words, it is a basic tool used to determine the relationship between goals and achievements (Topbas & Toy, 2013, 288). The written and multiple-choice examinations are generally used as an evaluation tool in Turkey and the TRNC, whereas different auditing approaches and methods are used in different countries. In both countries, the examinations are mostly used for the purposes of evaluation, selection of the sufficient, elimination etc. In primary, secondary, high schools and colleges, two exams are usually administered in each semester. In other words, at least 4 exams (plus quizzes) are applied within each academic year (two semesters). These are called midterm and final exams. Apart from these, there are also student selection examinations in the transition to the upper level which will take place between the grades. In recent years, there has been two main examinations in Turkey: 1) Transition from Primary to Secondary Education Examination-TEOG in transition from secondary education to high school, and 2) Transition to Higher Education Examination-YGS and Undergraduate Placement Examination-LYS in transition from high school to university.

In many countries, there are certain selection and elimination examinations in the transition to higher education, as student qualifications/sufficiency are searched for at a certain standards in entry to a university. For example;

large-scale central university entrance examinations are applied in Japan, South Korea, China, etc. (Kalaycioglu 2015, 181).

In addition, various countries including USA, European countries, Asian countries such as China, Russia, Japan, Israel etc., apply different examinations such as high school graduation examination, central university entrance examination, university entrance examination and aptitude (special talent) examinations, for the university entry process (Gunay & Gur, 2009, 2-5). This situation indicates that even though there are different educational systems in all developed, developing or undeveloped countries in the World, the examination phenomena has a very important place in all those countries (Balci, 2009; Erginer, 2007).

The question of how the students who intensely confront examinations associate the concept of "examination" with a "metaphor" should be considered as a matter to be emphasized and pay attention. It can be predicted that the perceptions, thoughts and feelings of the students, who spend a significant part of their lives in exams, on the concept of examination can be better evaluated by means of metaphors.

The word "metaphor" is derived from the Greek word, *metapherein* (meta: beyond, upper, pherein: carry) meaning "moving from one place to another" (Karairmak & Guloglu, 2012, 122). The current dictionary of the Turkish Language Association defines this word with the concept of "metaphor". Again in the same dictionary, the word metaphor is defined as follows; "1. The word that is used in a different meaning other than the real one as a result of a relation or an analogy. 2. The use of a word or concept in a way other than its general acceptance, metaphor." (<http://www.tdk.gov.tr>). According to Lakoff and Johnson (2005) who have very important studies in the field of metaphor, the metaphor is to perceive and experience a phenomenon / case according to another phenomenon / case. The metaphor, a major perception tool, involves the transfer of information from a known area to a new / unknown area (Guveli & Ipek et al., 2011, 140).

In the study, college-level students are given a written opinion form, as the data collection tool of the study, including the sentence of (Exam is similar / like ....; because .....), then asked to associate the examination with a metaphor and explain why they associate it in this way. Thus, the student firstly defined the elements in his/her mind related to the concept of "examination" by depending on his/her emotions, thoughts and experiences, and then tried to explain why he/she thinks in that way. Thus, it has been tried to obtain the metaphors that both Turkish and foreign students studying in a university have been matched with the concept of examination.

### **Aim of the Study**

The study aims to find out whether there is a difference between the metaphors of Turkish and foreign students regarding the concept of examination. For this purpose, answers for the following questions were searched:

1. What are the metaphors of the undergraduate students (Turkish-foreign) studying in the TRNC regarding the concept of "examination"?
2. What conceptual categories do these metaphors bring to the stage?
3. What are the similarities and differences between the Turkish and foreign students' metaphors regarding the concept of examination?

### **METHOD**

The study used the phenomenology design as one of the qualitative research strategies to reveal the "individual's experiences, perceptions and implications related to a phenomenon" (Yildirim and Simsek, 2013, 84). This design focuses on "a phenomena that we are aware of but do not have an in-depth and detailed understanding"(Yildirim and Simsek, 2013, 78). The "content analysis "approach is used in the analysis of qualitative data, and the data obtained at the end of the data collection process are summarized and interpreted according to the pre-determined themes (Yildirim and Simsek, 2013, 259).

### **Study Group**

The students studying at TRNC universities constitute the universe of this study, and 100 Turkish and 100 foreign students studying in these universities (200 students in total) also constitute the sample of this study. The sampling groups were selected randomly among the students in science and social sciences. The Turkish

students in the study are the Turkish citizens who study in different departments of the universities as follows; (Turkish Language Teaching, Special Education Teaching, Pre-School Teaching, Child Development, Social Services, International Relations, Political Science, Public Administration, Business Administration, Banking and Finance, Dentistry). The foreign students in the study participated from different departments of the universities as follows; (Dentistry, Medical fields, Graphic Design, Nursing, Civil Engineer, Mechanical Engineer, Computer Engineer, Banking and Accounting, Banking and Finance, Computer Informatics, Aeronautical Engineering, Marketing Management, Architecture, Health Sciences, Pharmacy, English Language and Literature, Law, Psychology, International Relations, Environmental Education, Translation and Interpreting), and they are also from different countries predominantly in Asia and Africa as follows; (Syria, Palestine, Lebanon, Iraq, Jordan, Qatar, Oman, Iran, Thailand, Turkmenistan) and (Egypt, Morocco, Sudan, Nigeria, Zimbabwe, Ghana, Rwanda, Kenya, Somalia, South Africa).

### Collection of Data

An open-ended written opinion form was used as a data collection tool in the study. The measuring tool used for data collection was created by means of an extensive field literature review, and an expert opinion about the tool was received, then the final version of the tool was designed in the direction of these opinions. In order to collect data, the students were asked to fill the blanks with appropriate phrases in the sentence of "Exam is similar/like.....; because ..... ". In this way, the relevant metaphor and reasons for choosing that metaphor were obtained (Yildirim and Simsek, 2013, 242).

### Analysis and Interpretation of Data

Since this research is a qualitative study, analysis of the data has been performed through content analysis, percentages and frequencies. In addition, the participants' metaphors related to the concept of examination were analyzed by separating them into conceptual categories. In order to ensure reliability in this study, the written opinion forms, justifications and conceptual categories were presented to a specialist in Educational Sciences. After the metaphors and categories were matched, these data were compared with the matches made by the researcher. In order to determine the reliability of this comparison, the formula of "Reliability = Consensus / Consensus + Dispenses" (Miles and Huberman, 1994) was used, and as a result, the relevant Reliability values were calculated as follows; Reliability =  $87/87 + 6 = 0.93$  for Turkish students; Reliability =  $82/82 + 7 = 0.92$  for foreign students. These results were found to be sufficient in terms of the reliability of our study.

## RESULTS AND INTERPRETATIONS

In this section, the results obtained from the form including the sentence of "Exam is similar/like.....; because ....." were examined under separate headings. The results were examined in two separate main tables. The categories of metaphors, student numbers and percentages were specified in the Table-1, and the categories, student numbers and percentages of the metaphors set forth by the Turkish and foreign students were specified in the Table-2.

Table 1. Conceptual categories, number of students (f) and percentages (%) of the metaphors revealed by Turkish and foreign students regarding the concept of "examination"

Conceptual categories (Turkish students)	f	%	Conceptual categories (Foreign students)	f	%
Education and examination system	27	29.03	Exam Related Feelings	26	29.21
Exam Related Feelings	24	25.80	Measuring and Evaluating Action	24	26.96
Life and experience	16	17.20	Education and examination system	11	12.35
Measuring and Evaluating Action	9	9.67	Negative criticism	9	10.11
Targeting and Achieving Results	7	7.52	Life and experience	9	10.11
Belief/Religion-based Concepts	5	5.37	Targeting and Achieving Results	6	6.74
Negative criticism	5	5.37	Belief/Religion-based Concepts	4	4.49
TOTAL	93	99.96~100	TOTAL	89	99.97~100

According to the table given above, the metaphors revealed by Turkish students most frequently concentrated under the following categories with the specified concentration ratios; "Education and Examination System" (%29.03), "Exam Related Feelings" (%25.80), "Life and Experience" (%17.20), "Measuring and Evaluating Action" (%9.67), "Targeting and Achieving Results" (%7.52), "Belief/Religion-based Concepts" (%5.37) and

"Negative Criticism" (%5.37). On the other hand, the metaphors revealed by foreign students most frequently concentrated under the following categories with the specified concentration ratios; "Exam Related Feelings" (%29.21), "Measuring and Evaluating Action" (%26.96), "Education and Examination System" (%12.35), "Negative Criticism" (%10.11), "Life and Experience" (%10.11), "Targeting and Achieving Results" (%6.74), and "Belief/Religion-based Concepts" (%4.49). As can be understood from these data, most of the metaphors produced by the foreign students (it is the second for Turkish students) are under the category of "Exam Related Feelings". This situation indicates that the examination phenomenon means stress, anxiety, fear, distress and excitement for many of the students from different parts of the world (from Turkey, TRNC, Asia, Africa in our study) with different education systems. It can be reached that besides the category of "Exam Related Feelings", there is a closeness in percentage between the categories of "Targeting and Achieving Results" and "Belief/Religion-based Concepts". The categories in which Turkish and foreign students differ significantly are as follows: "Measuring and Evaluating Action", "Education and Examination System" and "Life and Experience". That is, 26.96% of the foreign students associated the concept of examination with the category of "Measuring and Evaluating Action", whereas only 9.67% of the Turkish students related it to that category. A difference of 17.29% was observed among these student groups for the category in question. Moreover, %29.03 of the Turkish students associated the concept of examination with the category of "Education and Examination System", whereas only %12.35 of the foreign students related it to that category. On the other hand, %17.20 of the Turkish students associated the concept of examination with the category of "Life and Experience", whereas only %10.11 of the foreign students associated it with that category.

Table 2. Conceptual categories, student numbers (f) and percentages (%) of the metaphors revealed by Turkish and foreign students regarding the concept of "Exam"

Category	Metaphor within the scope of the category (Turkish students)	Metaphor within the scope of the category (Foreign students)
a. Measuring and Evaluating Action	An information measuring instrument, Evaluation, Law, Control, Meter, Proof of our learning, Measurement, Filter, Intelligence test	A mirror, Calculator, Evaluating yourself(2), Final stage, Interrogation, Jig-saw puzzle, Judgment, Knowledge test, Learning a game, Learning to cook different meal, Measurement, Meter, Opportunity, Right balance, Scales, Shopping, Test, Test of knowledge, Test of the level of learning, Test what we've learnt, Testing myself, Testing students ability, Using non-calibrated scale
b. Belief/Religion-based Concepts	Judgment Day(2), Grave Question (Endless question), Nightmare, As-Sirāt (hair-narrow bridge)	Angel of death, Devil, Hell(2)
c. Negative criticism	Relentless disease, Eysan in Ezel, Magnet, Death, Fatal disease	Executed, Executed-boring module, Funeral, Nightmare and jail, Pain in the neck, Torture, Very hard, Walking in high heeled shoes, Writing Chinese that I won't know/love
d. Life and experience	Barbed wire, Seasonal work, Life (3), A Puzzle part of our life, Challenges of life, Breath, Physiological need, Thief, Everything in our life, Life tree, Walking a long way, Obstacle to be overcome, Door, Occupation	A busy life, Fun party, Judgment day, Life line, Life(2), My life, Death, Fun or hell
e. Targeting and Achieving Results	Going the same place in different ways, Reaching the summit of the mountain, Power, Crop, Ladder, Field, Field crop	A meal that I can enjoy, A Wall that is so high you can't climb, Borderline of future, Egg, Route to go, Rugby match
f. Exam Related Feelings	A fireball, Reaping machine, Chinese torture, Tension-restlessness (2), A fearful dream, Anxiety and / or stress (7), Anxiety-stress-fear-excitement, Horror film, Fear and stress, Death, Mental disorder-anxiety, War, Labyrinth, Stress machine, Disease (2), Mental affliction	A sea or sky, Anticipation and dread, Anxiety, Burning sun, Crying, Dark room without any kind of light, Disease, Enemy, Football match, Horror movie, Hurricane, Nightmare(2), Injection, It's fear and horror, Panic attack, Panicking, Rush hour, Storm cloud, Stress, Stress & anxiety, Suffering, Terrible, To judgment, To watching my cat being killed, War
g. Education and examination system	Horse racing (2), Pressure tool, Pressure, Loading information on a computer, A Race, An empty item, Empty paper, Trial board, Putting a Tile on wall, Labor theft, Donkey, Memorizing system, Memorizing, Hippodrome, Uphill and downhill road, Turtle running after rabbit, Pessimism, Running marathon, Running, Robot students, Sports, Execution of an innocent person, Forgetting, Competition program, Talent and intelligence work	Boring thing, Broken tool, Trial, Collaboration & game, Difficulty, Disaster or calamity, Experience, Future generation, Happiness, Slavery, Torture

It is thought that important deductions and analyzes can be provided through the metaphors given in the above table. For example; the fact that Turkish students' metaphors about the concept of examination concentrated on the category of "Education and Examination System" and "Exam Related Feelings" rather than the category of "Measuring and Evaluating Action" is thought to be because of their negative perceptions on the education and examination system in Turkey and TRNC. The fact that only 9.67 of the 93 students related the exam to the category of "Measuring and Evaluating Action" leads us to consider that the evaluation dimension of Turkish education system has created a sense of serious inadequacy in the students' perceptions towards the exam. Accordingly, it is observed that the Turkish students mentioned at most about the education and examination system (and related issues) in metaphorical categories. The Turkish students who associate the exam with the measurement-evaluation usually have created positive and objective metaphors. For example; the following metaphors mentioned by them are positive content metaphors: "Meter: If the meter measures the length of something, then the exam also measures our own knowledge and competence in the same way." "Control: Measures how much information is received. The exam shows how knowledgeable and inadequate we are in our lives. It helps us to complete our deficiencies."

On the other hand, the foreign students' metaphors about the exam, contrary to those of the Turkish students, are determined to concentrate on the category of "Measuring and Evaluating Action" rather than the category of "Education and Examination System". It is interesting to find that similar to Turkish students, foreign students had positive and objective approach related to measurement and evaluation. According to the foreign students, the exam the benefits of enabling them to make self-assessment, measure and test their own knowledge and abilities, and to determine their own deficiencies. For example; "A mirror: An exam is like a mirror for me; because it is a reflection of everything one would have learned during the lectures will be reflected in the exam true reflection of oneself", "Opportunity: You get the chance to see how much you gained knowledge from studying and put more effort if you see your knowledge is not enough. Exams are always a chance." We see that only one of the foreign students touches upon the negative aspect of the examination: "Using non-calibrated scale: Because a lot of students sometimes turn to cheat, and others may have special problems."

In the *Belief / Religion-based Concepts* category, we see that two groups have close frequency with each other. When the metaphors in this category are reviewed; we see that Turkish students used religious metaphors by making connection with the first meaning of each religious concept. Some metaphor examples used by Turkish students are as follows: "Judgment Day: Questions will be asked in the Judgment Day, then the right things will be separated from the wrong ones. You will pay the price of what you did wrong... ", "As-Sirāt (hair-narrow bridge): Those who can pass the exams have a good profession and live a life like in the heaven, but those who do not pass the exam fall from the bridge and live a life like in the hell." The religious metaphors used by foreign students are weakly connected in the first meaning of the words. For example; "Devil: Exams was the last thing that I didn't want to hear from because I am a person who would want to finish studying all the units that we would have done in the class for me to be motivated to write anything, otherwise without me being not prepared I will be confused and not sure of what I am going to write. I'm really afraid from exam." Here, the exam with the features that the student does not want to hear anything about it, is afraid of it, has a mind confusion for it, evokes the evil in our minds. However, there is no apparent direct relationship as in the concepts of Judgment Day and As-Sirāt (hair-narrow bridge).

The negative elements in the *Negative Criticism* category directly or indirectly associated the exam with a bad concept. In this association, we can state that the metaphors of foreign students are mostly harder, stronger and more specific than those of the Turkish students. We can assert that the metaphor of "fatal disease" and "magnet" mentioned by the Turkish students are particularly interesting. We can also point out that the metaphors of "death and relentless disease" also directly focused on the negative side of the concept of examination. Among the foreign students' metaphors including "Executed, Nightmare and jail, Torture/ Pain in the neck, Walking in high heeled shoes, Writing Chinese that I won't know-love", the first three can be judged to be more rigid and

the other three can be evaluated as authentic, and it can be stated that the examination is directly regarded as negative.

The “*Life and Experience*” category of the Turkish students is ranked as the third following the categories of “Education and Examination System” and “Exam Related Feelings”. This also demonstrates that for the Turkish students, the examination is a crucial concept that embodies indispensable, complex, good and bad elements like life: The metaphors including “Barbed wire, Challenges of life, Breath, Physiological need, The uncertainties in life, Thief, Everything in our life, The need of life” show us the importance given to the concept of examination. For example; the metaphors including the followings indicate that the concept of examination also includes experiences, difficulties and hardships like life: "A barbed wire: As you get closer to it, you suffer, and as you touch it, you burn. Life sometimes resembles to a cruel teacher, first makes an exam and then teaches. ... The exam, like a barbed wire, teaches us to protect, to be protected and to stand strong and stable against what is experienced. " and "Everything in our lives: whatever we do, actually we pass through an exam or an interview. Even when we born, we go through thousands of difficulties, examinations..." We can see that the metaphors of the foreign students related to the life are 7.09% less than those of the Turkish student, and they do not associate the exam with life as much as the Turks. However, we can also see in the related associations that the point on which foreigners emphasize in the life-exam matchup includes experiences, difficulties and troubles. This means that both groups regard the examination as a concept that includes ups and downs, difficulties, experiences and troubles like life. However, we can stated that the Turkish students have a stronger interest in life than the foreign students.

When we examined the “*Exam Related Feelings*” category, we can see that the examination is an element of stress, distress, anxiety and excitement for both groups. In the table of foreign students, the exam related feelings category placed on the top, while it placed in the second rank with a little difference in the table of Turkish students. When both metaphors and reasons were examined, from the students’ metaphors and comments, we can easily understand that both Turkish and foreign students have an intense stress, anxiety, fear and excitement before, during and after the exams, that this situation reaches to the extent of affecting their success and concentration, and may cause disturbance, insomnia and even the psychological disorders.

In the “*Education and Examination System*” category, we can see that the Turkish students expressed more metaphors than the foreign students. From the metaphors and reasons of the Turkish students, we can easily understand that they have important complaints and problems about the education system. These complaints and problems relate primarily to the fact that the evaluation and elimination which will affect their educational life (for example; university entrance exam, transition to high school-TEOG exam, midterm and final exams etc.), are only dependent on the 1-2 hour examinations. Also, another important point that has been emphasized is the fact that Turkish students are being competed in an exam marathon throughout their lives almost in an atmosphere of a competition. As a matter of fact, some of the students associated the concept of examination with the metaphors such as race horse, race, marathon, and hippodrome. For example: "Horse race: All people are in a meaningless race. This also determines the system. Everybody enters exams without being asked the question of ‘what is your interest/ability’. Not everyone is the same ... Then why is the examination system same for everyone? This race will never end, and all humanity will be condemned to fail." In addition, another criticism towards the general education system is related to the way the system encourages students to memorize. For example; "Memorizing: Is the memorization by forcing ourselves of the information that most of the time we do not use and will forget later." Besides these, the students made many more criticisms about the system: "Turtle running after rabbit: People's brain structures are different. Therefore, not all people's brains work in the same way, but they try to make sure that all people think in the same way through the examination system. It's really impossible. It's as ridiculous as to make a turtle run as fast as a rabbit." There is a criticism in this metaphor for the fact that it is wrong for students to evaluate their intelligence according to a single shape/mold without regarding to their intelligence. Another example is as follows: "Donkey: The test is part of a system that enslaves people, puts them into a continuous race, and creates a single type of human being. I wish everyone can get hands-on training without examination according to the profession desired. This system puts too much burden on people." In this example, it is mentioned that the Turkish education system unnecessarily loads too much information on students and that students cannot get the correct education in the fields suitable for their

abilities. Depending on these, some students also considered the examinations to be unnecessary, ridiculous, and pointed out that different measurement tools should be used to assess students. According to the results obtained, although there is a high level of anxiety and stress among the foreign students, we can see that they did not make intense criticism about the system. This situation is seen as a striking and interesting result. When we look at the metaphors and reasons given by the foreign students, we see that their comments and problems are more about the exam itself. For example; "Disaster or calamity: It's not a fair to evaluated students by exam. Because maybe this student was sick the day before the exam and he can't study well. In my opinion we can replace it by activities." "Future generation: A good way to test a students' understanding of a certain subject when it's done consistently. But on the other hand cheating has become something a lot of student rely on which takes away the whole benefit of the exam. So a solution must be found. Other ways the generation will fall off. Only good test and education can make our future."

## **CONCLUSION AND DISCUSSION**

Table 2 shows what the metaphors of the undergraduate students (Turkish-foreign) in the TRNC are associated with the concept of "examination". These metaphors are also involved in the aim of the study. According to this, "Education and Examination System" (29.03%) was observed as the most intensified category among the Turkish students and "Exam Related Feelings" (29.21%) was observed as the most intensified category among the foreign students. When we look at the conceptual categories brought by the metaphors, we can see that these are collected under 7 different categories: Education and Examination System, Exam Related Feelings, Life and Experience, Measuring and Evaluating Action, Targeting and Achieving Results, Belief/Religion-based Concepts, Negative Criticism. 29.21% of the foreign students and 25.80% of the Turkish students has emphasized on the emotional stress, anxiety, distress and excitement about the concept of examination. This results in that the examination arouses "negative" feelings for the students participating in the study. Karasahinoglu (2015), similar to this study, found that the students described the concept of examination as an anxiety with measurement and evaluation. However, Karasahinoglu (2015), unlike this study, has come up with several different categories. For example; Feedback, competition, threat and entertainment are some of these categories.

When we examine the criticisms of Turkish students about the education system, we can easily see that they focus on the negative aspects of the examination. Paris, Lawton, Turner and Roth (1991) also stated that the students negatively considered the education system and especially the examination as insignificant/unimportant. We see that there is no obvious problem with regard to the system in foreign students. We can also see that both groups have more pessimistic and negative concepts than the other categories in the category of worse concepts and elements. We also observed that Turkish and foreign students made more positive associations in the categories of "Measuring and Evaluating Action" and "Targeting and Achieving Results". Taking into account of the whole study and examining all the metaphors of Turkish students, the examination appears in our minds as a concept measuring the information given in a distorted education system, being a source of anxiety-stress, including difficulties, troubles and requirements similar to life, and helping to achieve certain goals. When we look at all the metaphors of foreign students, the examination appears in our minds as a concept measuring knowledge and abilities of the students as well as being a source of anxiety and stress.

## **RECOMMENDATIONS**

- Due to the high rates of examination anxiety of foreign and Turkish students, quality improvement studies should be carried out for the exams in the respective education systems,
- Students should be assisted by psychological counselors in order to avoid anxiety and fear,
- Education policies should be revised considering the fact that Turkish students emphasize on the existence of a problem with examinations especially in the education system.

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# Computer-Based Activity's Development for Probability Education in High School

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## ABSTRACT

In the Third millennium, it is important to equip learners with the tools they need to deal with uncertain everyday situations independently and with confidence. This case study presents and analyses a sequence of episodes that documents the mathematical thinking of one student's group about two random phenomena. The design activities, implemented in problem solving conditions, use games as a means for investigating and studying aspects of sensible reality. The methodological approach favours the experiential-symbolic-reconstructive model and uses the computer as a pedagogical tool through programming practice, with the aim of helping the students in the construction of the meaning and interpretation of probability.

## INTRODUCTION

The formal development of probability learning is closely related to a series of paradoxes that show the disparity between intuition and conceptual development in this field. For example, many students think that the events "Get 5 and 6" and "Get two times 6" in the launch of two dice are equally likely to occur (Batanero, et al., 2005). Many people's spontaneous judgments on probabilistic results are partial and sometimes erroneous; incorrect assessments of some random situations are often expressed as preconceived opinions and superstitions (Fischbein, & Gazit, 1984). Learning about probability is essential to help prepare students for life; everyday life is permeated by random phenomena (Beltrami, 1999; Chernoff, 2008, Fandiño Pinilla, 2010). For this reason several school curricula include probability from the first and second level of education (e.g., Australian Curriculum, Assessment and Reporting Authority [ACARA] 2010; MECD 2015; Indicazioni Nazionali 2012, Ministerio de Educación Pública [MEP] 2012; Ministry of Education [ME] 2007).

According to Hawkins (1990) the calculus of probability cannot be reduced to the teaching of conceptual frameworks but must foster in students the development of thought processes, which lead to correct intuitions. The need to develop appropriate probabilistic intuitions is a basic component of the teaching of probability (Feller, 1968). Accordingly, a teaching program that intends to develop intuitions and promote informed knowledge of probabilistic facts should provide students with active experiences of stochastic situations (Frassia, 2016). Therefore misconceptions cannot be modified only through formal and rigorous definitions, but should be overcome through a gradual process of simulation experiences in which the learner is directly involved. As far back as in the last century Bruno De Finetti (1957) had stated that: 'Learners should experience the consistent flow of general ideas from detailed problems, and from particular observations to general theories, the continuous transition from the concrete to the abstract and from the abstract to the concrete, ideas that are based on the intuition of a single magical reality, in which all conceptual resources serve the practical issues and all the practical problems contribute to conceptual development, this and that in turn, means and end, overcoming any form of antagonism'.

In Italian secondary schools teaching practice, unfortunately, the calculus of probability has often been overlooked. This generalized ignorance of even the most elementary notions determines the spread of wrong convictions and/or misconceptions, which border on superstition (Fischbein, & Gaziz, 1984; Ang, & Shahrill, 2014; Erdem, & Gürbüz, 2016). Nowadays computers can act as mediators between the concrete and the abstract thanks to the relationship between Mathematics and computer technology: the principle at the basis of the latter is part of the former, while the rapport is also extrinsic because the latter has highlighted and extended the former's application and theoretical potential. As a result the computer -within a suitable methodological framework- can become an indispensable and continuous impulse for the teaching and learning of Mathematics; moreover, the use of computer technology through the practice of programming represents a highly educational mental training (Kuzler, 2000; Lye, & Koh, 2014), while at the same time sensible reality problems can effectively be solved or simulated. The practice of programming represents both a constructive and cognitive activity in so far as it allows the students to acquire abilities, strategies and techniques for solving problems through the notions of variable, procedure, repetition and re-occurrence that are also common to other school

disciplines (Liao, & Bright, 1991). To sum up, programming represents relevant experience that leads students to the full acquisition of mathematical meaning, and contents are no longer just abstract notions difficult to grasp (Bell, 2013).

### **THEORETICAL FRAMEWORK**

The theory of Probability was initially used in gambling alone, and it began to be used in various scientific areas only in the second half of the last century. However, despite its importance, in many countries the concept of probability has only recently been included in the Mathematics curriculum and only became a field of research only in the twentieth century (Gürbüş, 2010; Amodio, & Depueto, 2014).

Fischbein (1975), Steinbring (1991) and Pratt (2005) have stressed the importance of the calculus of probability for student education. In recent years, the reasons for including probability in the school curricula have been highlighted several times (Gal, 2005; Franklin, et al., 2005; Jones, 2005; Batanero, & Diaz, 2009), emphasizing also the need for a connection between theoretical and experimental activities. Introducing probabilistic reasoning into everyday classroom practice requires the integration of theoretical and experimental activities.

The experimental activity is essential because it trains the students to formulate precise questions, to register reflections, and reach a common synthesis; the theoretical activity complements the experimental as it trains the students to 'order' ideas so they can evaluate events rationally and correctly interpret real world phenomena (Frassia, 2014, 2015). Furthermore, it is that reciprocal dynamics of theoretically computed probabilities and observed relative frequencies that may best contribute to the development of efficient probabilistic intuition (Fischbein, & Gazit, 1984; Bonawitz, et al. 2014). The combination of games and simulation could be a successful strategy for the development of probabilistic thinking. Game-situations offer good opportunities for learning (Speiser, & Walter, 1998; Vidakovic, et al., 1998). At the same time simulations allow to develop students' mental models in relation to complex situations or problem solving strategies. Games and simulations represent real 'experiential exercises' because they constitute a real opportunity for students to interact with knowledge. Gaming experiences and simulations offer excellent learning opportunities for all students, even from a motivational point of view (Ke, 2014). A simulation can be used as a pseudo-concrete model for different real situations, in this case offering the chance of working without mathematical formalisms. The simulation acts as a mediator between reality and the mathematical model; it is an educational tool, which serves two purposes: it helps students improve probabilistic intuitions and the teacher in the various steps of modelling (Beanery, et al., 2005). The use of the computer for the simulation of even simple situations and random processes is of great help because it allows the repetition of the phenomenon an increasing number of times, which is not always feasible. It also enables students to build models, to gain experience with random phenomena and predict the behaviour of the same, something hardly possible without fast random generators. Ultimately, in probability teaching and learning the computer is a support tool for creating simulations and for generating data. Along these lines, studies carried out by Pratt (2000) show that probabilistic reasoning can be explained as part of a broader perspective that encompasses different types of resources for learning situations. For example, the use of programming environments aimed to the teaching and learning of mathematics gives learners the opportunity to build and/or process a different type of interaction that entails the writing of a resolving algorithm and the resulting implementation in language (Aydin, 2005). Compared to real or experiential simulation, virtual or symbolic simulation implies two or more variables, which means that the student is cognitively engaged in more interconnected tasks at the same time (Cosmides, & Tooby, 1996). Virtual or symbolic simulation can also be performed with 'closed software': in this case, students would remain external to the development of the phenomenon and would thus be unable to follow the process of construction of meaning.

Probability teaching and learning can be fully achieved through strategic choices such as cooperation and constructivist activities (Barab, et al., 1999).

### **METHODS**

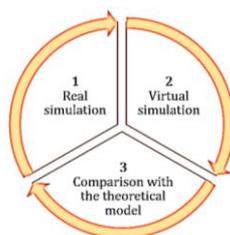
The calculus of probability is actually one of the most stimulating branches of mathematics, also because of its many applications (Gigerenzer, et al., 1989; Greer, & Mukhopadhyay, 2005), and includes three different approaches: classic, frequentist and subjective (Chernoff, 2008). The classic approach to probability has long been dominant in Italian secondary schools. The majority of students find this approach based on combinatorial calculus quite hard especially because of the calculations involved in solving the formulae. The difficulties in the classic approach have so far represented a real obstacle to classroom teaching and learning of the topic, not only in Italy but also in other countries (Batanero, et al., 2005). However, in recent years the growing interest for statistical methods and the use of information technology have contributed to the study of probability as a limit of stabilized frequency (Biehler, 1991). The modelling point of view was adopted in the last years, linking probability teaching with the statistical thinking. The introduction of efficient computers in secondary education allows us to simulate models resulting from statistical observations and to introduce students to the large field of statistical inference. The advantage to using simulations is that we can overcome much of the difficulty

encountered when using the formal rules. Therefore, the use of computers as pedagogical tools - through programming - necessarily implies re-thinking about how students learn but especially about how we teach. This means identifying and experimenting with didactical strategies so that students can have meaningful experiences in class. The authors have based the design activity on the present case study, which involved two classes of a higher secondary school, operating in synergy with researchers in Didactics of the Department of Mathematics and Informatics of the University of Calabria (Italy). The computer-based activity inherent the concept of independence between events adopts a frequentist approach and includes the simulation, real and then virtual, of two random phenomena relating to the drawing of two cards from a pack of poker cards. This way, students have the real chance to experience learning environments based on the experiential-symbolic-reconstructive combination. The specific objective is to offer opportunities for exploration, application and evaluation of different aspects relating to the drawing of two cards from a pack of poker cards. Comparison on different tasks is an opportunity for reflection on both the data obtained from different angles, and on the identification of new connections (Cosmides, & Tooby 1996). The intellectual involvement of the students through (real and virtual) simulations adds concreteness and enhances learning because it enables the comparison and analysis of observed data against the expected results (Lee, et al., 2010). The research study involved 44 students, attending class IV (Year 12) from the “Liceo Scientifico - E. Fermi”, Cosenza (Italy). The sample of students already had some prior knowledge of the programming environment MatCos, because used the software during the lessons. The sample of students had already studied the first concepts relating to the calculus of probability in the traditional way with the same teacher, who did not use any didactic software. This paper reports and observes in particular the evolution of a group student on the topic of some random phenomena by analysing their conversations.

### A COMPUTER-BASED ACTIVITY

Some probabilistic ideas are closely connected to the field of Statistics. An example of a modelling framework for statistical thought), which describes the complex thought process involved in solving real-world problems, was developed by Willd and Pfannukuch (1999).

On this basis, the model of computer-based activity is circular and follows the pattern in Figure 1:



**Figure 1:** Design activities cycle.

The pattern in Figure 1 facilitates the study of random phenomena because it allows to compare the results with those dictated by the theory; the student judges that the empirical results are close to the theoretical ones the more the greater the number of trials made. The transition from the experience in the construction of the meaning takes place after the actual simulation through the implementation of simple algorithms, implemented in the programming environment MatCos. The use of a programming environment like MatCos adds value because it helps the students to reinforce their skills in handling mathematical language (Costabile, & Serpe, 2012, 2013). The virtual simulation through the programming is a constructive activity and cognitive as it allows the student to acquire skills, strategies and techniques to solve problems using the concepts of variable, procedure, repetition and recursion, which are also, transversal concepts to other school subjects. The design teaching setting based on game allows students to exercise their critical thinking skills, problem solving, creativity and collaboration.

### REAL SIMULATION

The teacher divides the class into group of 3-4 students and distributes a pack of poker cards to them. Secondly, the teacher delivers the first problematic situation.

*Two extractions with replacement are performed from a pack of poker cards. The player wins if she or he extracts at least one hearts. What is the probability for the player to win?*

As a result of the stimulus provided by the teacher, students begin to formulate some hypotheses. Common judgment goes as follows:

*“In a pack of poker cards, there are 13 hearts on a total of 52 cards. If we extract a single card the probability of obtaining a heart is  $13/52 = 1/4!$ ”*

There follows the discussion of the group of students taken into consideration:

Anna: We can think of two extractions with replacement as two draws from two different packs of cards, that is, we take two packs of poker cards P1 and P2, and we draw a card from P1 and P2!

Simone: Clever!

Paolo: Then I have two equal chances...

Anna: Yes, you mean that the chances to extract one hearts from each of the two packs (which are identical) are the same!

Paolo: But we want to establish the probability of the event 'at least one hearts', how shall we do that?

Simone: In my opinion, the probability is 1/4 ... the hearts are always 13 of 52 in both extractions, are they not?

Paolo: Yes, maybe you're right ...

Anna: I'm not convinced of what you are saying!

After the discussion, the students, prompted by the teacher, begin to simulate the proposed situation. At the same time, the teacher guides them through a careful analysis of the text, pointing out the meaning of words, and invites them to register the results on a chart, in order to remember them later. After 30 repeated tests, the groups compare the results obtained. At this point a discrepancy of results will become evident; and here is where the teacher initiates a guided discussion, after which the need to repeat a large number of tests emerges to obtain significant results. An answer to this need is provided by the use of computers, used to simulate random events.

## VIRTUAL SIMULATION

The next step involves the computer simulation of the proposed situation with MatCos. This phase has a strong educational value because students have a real opportunity to use and show what they learnt in the first phase. Also at this stage the writing of the algorithm gives rise to a constructive debate on the analysis of the event. The problem is here 'dismembered' and each part is a crucial step of the solving algorithm.

Here's a transcription of dialogue between the teacher and the student group:

Luisa: Let's think of when the event occurs of which we want to calculate the probability!

Anna: Well, you're absolutely right!

Teacher: 'At least one' does not mean exactly one, but 'greater than or equal to one'. Then, the player wins if he or she gets one hearts from P1 and one non-hearts from P2, or if he or she draws one non-hearts from P1 and one hearts from P2, or if they draw one hearts from P1 and one hearts from P2!

Paolo: That's right, so we need two whole variables ranging from 1 to 52 including the extremes, to memorise the results obtained from the extraction of two cards from two packs!

Luisa: But how can we say if it is hearts or not?

Paolo: We can think of a correspondence between natural numbers from 1 to 13 with hearts and those from 14 to 52 with a different suit from hearts!

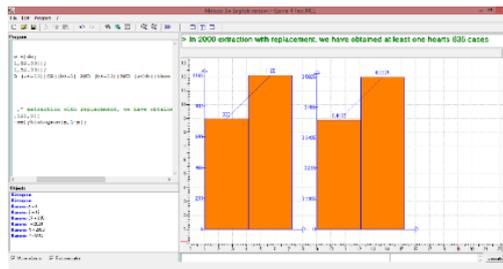
Anna: Perfect! Now everything is easier, by entering the two variables into a cycle and the control with 'if' with the appropriate increase in the counter of favourable cases, we have done it!

At the end of the discussion, the simulation concerning the proposed issue will follow, and the subsequent coding in the MatCos programming environment. Constructing the algorithm is an important and delicate phase because the students have to design the 'finite sequence of steps' that enables the computer to get to the solution. The steps of the algorithm of the two simulated extractions with replacement from a pack of poker cards are the following:

1. Assigning the number of simulations;
2. Initializing a counter to record the number of successes;
3. Cycle for the simulations:
  - a. Assignment of two variables (to which the result of the extraction for each card is assigned);
  - b. Control action to verify the drawing of at least one hearts and appropriate increase of the counter.
4. Calculation of relative frequency;
5. Printing of the relative frequency;
6. Representation of results obtained on a histogram.

The implementation of the algorithm in programming environment MatCos is as follows:

```
n=readnumber; cf=0;
for(i from 1 to n)do;
  a=int(random(1,52.99)); b=int(random(1,52.99));
  if(((a>=1) and (a<=13))or((b>=1) and (b<=13)))then do;
    cf=cf+1;
  end;
end
p=cf/n;
print("in ", n, " extraction with replacement, we have obtained at least one hearts ", cf, "
cases"); histogram(cf,n-cf); histogram(p,1-p);
```



**Figure 2:** Output first problematic situation with  $n = 2000$

The output of the virtual simulation yields results, which differ from the predictions, which confirmed a victory with a percentage of 25%; this offers the chance to analyse the meaning of the probability assigned to the event.

Luisa: Simone, I think your solution is far from the value of the probability!

Anna: Ehm...yes! Let's think a little...

In a pack of poker cards there are four suites; if we draw a card we have 4 different possibilities...either hearts, spades, diamonds, or clubs.

If we put the card back in the pack and we draw another we have again 4 different possibilities.

So with two extractions with replacement there are 4 times 4, that is 16, possible cases.

Simone: And how many favourable cases?

Paolo: Clubs-clubs, clubs-spades, hearts-diamonds, hearts-clubs, spades-hearts, diamonds-hearts, clubs-hearts!

Luisa: 7! So 7 out of 16!

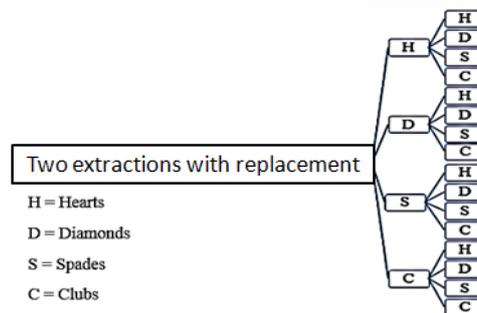
### COMPARISON WITH THE THEORETICAL MODEL

Finally, students must use algebra to solve the proposed game, and compare the results with the numerical values of the relative frequencies obtained in the virtual simulation. At this point, the teacher intervenes; the event of which we want to calculate the probability is as follows:

$E = \text{“Extraction of at least one hearts in two extractions with replacement”}$

The event is realized if in one of the two extractions you get one hearts or if you get one hearts in both.

In order to summarize the situation, it seems appropriate to make use of the tree diagram (Figure 3):



**Figure 3:** Tree diagram relating to the extraction with replacement of two poker cards.

The possible cases are in total 16, the favourable cases 7, and then the probability of  $E$  is:

$$p\left(\frac{7}{16}\right) = 0,4375$$

As all branches are equally probable. The students should find that the theoretical results agree with the numerical value of the relative frequencies obtained in output.

### NEW PROPOSAL

At this point, the teacher proposes to the students the same problematic situation with some variations:

*Two extractions without replacement from a pack of poker cards are done. The player wins if at least one hearts is extracted. What is the probability for the player to win?*

A small variation of the problematic situation becomes an opportunity for a new exploration: students, confident from previous experience, make some predictions about the probability of the player to win; influenced, too, by the results obtained previously almost all settle on a probability of 43%, because as some of them say:

*“The fact that we do not replace the first card extracted does not change the final result”.*

The teacher for her part continues to maintain a neutral position so as not to affect the predictions expressed by the various groups, that this time proceed immediately to designing the algorithm of the new situation, so it can be implemented on the computer. During the drafting of the algorithm, substantial differences with the previous algorithm begin to emerge:

- Anna: This time we cannot expect to extract two cards from two different packs of cards. The first time we draw a card and the situation is very similar to the previous case, but in the second extraction, we find ourselves a pack of cards with one less card, 51 cards. Also, we do not know if there are 12 or 13 hearts, it depends on what we extracted earlier!
- Simone: Then we have to modify the algorithm ...
- Paolo: Sure, but I think it is enough to establish the condition that the two variables are different!

After the discussion, the students agree that it is enough just to add in the control action the instruction ‘*a different from b*’ to the previous algorithm, where *a* and *b* are the variables associated with the two cards extracted. Below is the program output.

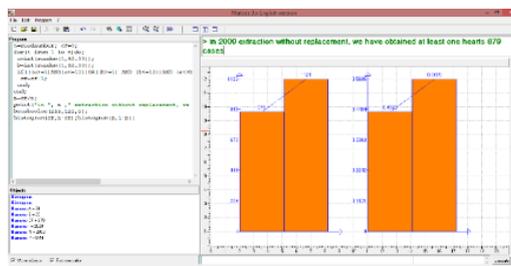


Figure 4: Output second problematic situation with  $n = 2000$ .

At this point, the groups are able to operate a comparative analysis of the results obtained experimentally with the aid of the computer with the theoretical results, obtained also with a tree diagram. Indicated with:

$F =$  “Extraction of at least one hearts in two extractions without replacement”

and H, D, S, C extraction of one hearts, diamonds, spades and clubs, respectively, we have:

$$p(F) = p(HH) + p(HD) + p(HS) + p(HC) + p(DH) + p(DS) + p(DC) + p(SH) + p(SD) + p(SC) + p(CH) + p(CD) + p(CS) \approx 0,4245 < 0,43$$

At this point, the teacher highlights what has already emerged during the discussion of the various groups: in the first problematic situation proposed the second extraction is not affected by the previous extraction as it occurs in the same situation. The second problematic situation is different, though. As a result of the first extraction, the pack of cards has now one less card. Also, the extraction of the second card is influenced by the earlier extraction. The fact that at first the students do not see a difference between the two situations highlights the usual resistance to accept that the probability of the occurrence of an event depends not only on the event itself, but also on the environment in which it occurs. Afterwards, the teacher introduces the definition of independent events and more examples and suggestions for exercises complete the experience.

## DISCUSSION

From the students’ conversations it is apparent that they had no difficulty in determining the probability relative to elementary events, as shown also by Simone’s initial observation. However, in different steps of the conversations the authors noticed some very interesting elements which were analysed according to the design objectives. For example, in the conversation Anna says: “We can think of two extractions with replacement as two draws from two different packs of cards, that is, we take two packs of poker cards P1 and P2, and we draw a card from P1 and P2!”. She shows logical and abstraction skills by correctly interpreting the problem posed by the first problematic situation: she associates the two events “Extraction with replacement of two cards from a pack of poker cards” and “Simultaneous extraction of two cards, each from a pack of 52 poker cards”. At the same time, in the first conversation we register Simone’s consideration as an ‘incorrect intuition’ because it associates the compound event of the first problematic situation to the elementary event relative to a single extraction. Regarding this, it is important to notice also Anna and Paolo’s doubts, which they express but that remain unmotivated. Furthermore, in the first conversation Luisa listens carefully to her peers’ observations but she doesn’t take part actively. After the real simulation, Luisa’s attitude changes: she indeed participates in the discussion pointing to the importance of considering the cases which verify the event whose probability we want to calculate. After this, the teacher’s intervention on the meaning of “at least one” as part of the game instructions is essential. Another interesting element was registered during the writing of the algorithm for first problematic situation, finalised to the virtual simulation. Paolo’s intuitions about the choice of casual variables to be assigned to the two cards to draw, are in fact fundamental for structuring the algorithm. Finally, the output obtained in the virtual simulations offers the chance to reflect and reach the correct solution of first problematic situation. Regarding second problematic situation the students - influenced by the experience so far- start from the idea that the value of the probability required is not different from the previous value. However, their initial conviction begins to waver when they have to think up the algorithm for the virtual simulation of second problematic situation; Anna in fact says: “This time we cannot expect to extract two cards from two different

packs of cards. The first time we draw a card and the situation is very similar to the previous case, but in the second extraction we find a pack of cards with one less card, 51 cards. Also, we do not know if there are 12 or 13 hearts, it depends on what we extracted earlier! ”. Anna’s comment is noted by her peers, who now understand the importance of modifying the conditions in the control instruction of the previous algorithm so as to be able to carry out the virtual simulation.

## CONCLUSIONS

To conclude, the model of computer-based activity favours the interpretation, description and representation of the observed phenomena, strengthening the process of construction of concepts. The choice to present some random phenomena through the practice of programming stems from the need to propose methods which are alternative to traditional teaching. In the majority of cases, traditional methods deal with the calculus of probability as a series of properties and results to be applied in often limited contexts, and therefore inadequate for a real understanding of its meaning. Through the analysis of the students’ conversations, we can consistently observe and monitor how their thinking evolves and how they re-organise their interpretations during the activity. The model of computer-based activity plays an essential role because it helps the students to develop good *problem solving* skills; in particular, simulation aids the understanding of the concept of probability of an event, assigning to it a ‘degree of reliability’ in the prediction of random phenomena. The realisation of simple programming codes stimulates learners’ analytical skills, while at the same time it trains them to use the formal language of programming. Finally, the model proposed exploits the potential of computers to reinforce the main probability concepts from the semantic point of view, and to add to the traditional theoretical background the algorithmic and constructive aspects of Mathematics.

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# Computing Teachers in Basic Schools and Their Role in Education Today

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## ABSTRACT

The methods of teaching in basic schools have been changing in the emerging knowledge society, as it is indicated by the utilization of and approach towards modern and communication technologies. One of the major changes concerns the teaching and learning of information and communication technologies, and the related training of future computing teachers. At the same time, however, the question arises concerning further training of the teaching staff who teach the subject but did not pass respective undergraduate training. Therefore, it is imperative that these teachers complete their education in courses or as part of further education of teachers. The role of computing teachers extends, among other things, to developing educational materials, creating websites, and understanding the field of computer networks.

## INTRODUCTION

During the 20<sup>th</sup> and 21<sup>st</sup> century, there was a very rapid development of technical and technological means. These technologies became a source of stimuli and were also applied in the field of education. What were the technological means permeating the field of education, what expectations were associated with the introducing of technological means and what was the reality in school environments, what results were reached or, alternatively, how many visions remained unfulfilled (e.g. Cuban 1986; Maddux, Johnson 2003; Mehlinger, Powers 2003)? To educate with new objectives, to educate differently, to educate dynamically, to develop key competences of pupils in a new environment using information and communication technologies is a challenge for teachers today.

## 1 DEVELOPMENT OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE SECTOR OF EDUCATION

Education in the Czech Republic has changed considerably over the last 15 years. It is precisely the development of digital technologies and their entering the life in schools that is one of the key causes of many changes. While at the turn of the 21<sup>st</sup> century it was rather an exception for a school to have an access to the internet, currently the vast majority of schools are connected to the internet, they are equipped with computers, the agenda of schools is largely or entirely processed in an electronic form. The number of computers in schools has been continuously increasing, the equipping of schools with interactive whiteboards and other digital technology has improved (e.g. MEYS, 2014; Neumajer, 2015). The equipping of schools must always be seen in a broader context, as it cannot be a purely technological process, but also the pedagogical process.

Computer supported learning is constantly developing and changing, because it reflects the development of technologies. The field of information and communication technologies underwent significant changes in the 1990s, which resulted in the rapid expansion of the internet and one of its services - the developing and using of websites that have become a part of school presentations and the life at schools. The concept of computer supported learning was implemented in the Czech Republic with the support of the MEYS in the framework of the INDOŠ project. One of the main reasons for this project is the dynamic development of one of the newer concepts, which is e-learning. E-learning is an educational process in which the information and communication technologies that work with data in their electronic form are used. Methods of application of ICT means depend on educational objectives and content, the character of educational environments, the needs and capabilities of all actors of the educational process (Zounek 2006).

## 2 MODERN TECHNOLOGIES USED BY TEACHERS IN PREPARATION FOR THEIR LESSONS

Modern technologies help teachers to prepare for their lessons. If teachers choose to create their lesson plans and materials in the electronic form, they have access to various computer programs, for example text and graphics

editors, programs for processing photos and videos or programs for creating animations that can be used to develop a wide variety of teaching materials, and not only text documents (or hypertext documents with links to other resources), but also for example a variety of presentations, image documents (photos, scanned materials), interactive models or multimedia learning materials combining text, video, and audio resources. ICT also enable teachers to distribute teaching materials to pupils by means of CDs, websites or other on-line teaching contents. In addition to general programs, teachers can use specialized computer programs, for example for the creation of tests or mind maps (Balanskat, Blamire, Kefala 2006).

### **3 UNDERGRADUATE TRAINING FOR COMPUTING TEACHERS**

The concept of the subjects focusing on utilization of information and communication technologies by pupils and the overall developments concerning integration of information and communication technologies into the education process in basic schools gave rise to the need to train computing teachers who would be able to teach the aforementioned subjects and also have mastered the basics of administration of school computer networks, effective work with multimedia and graphics, the methods and forms of education supported or managed by information and communication technologies, and hence be able, among others, to also serve as ICT coordinators. At the same time, there is a certain “necessity” that the present teachers who studied at the faculties of education without obtaining any training in information and communication technologies should complete their education in the field through self-learning or in courses of further education of teachers (Polakovič, Dubovská, 2016).

The basic framework of the skills and knowledge that teachers of informatics or informatics-oriented subjects should master so that they could ensure education that would meet the requirements of the current curriculum documents (e.g. framework educational programmes, etc.). However, the questions arise whether that is the case or whether future computing teachers are instructed on all the study areas and obtain necessary competences for their future teaching practice during their undergraduate education, and most of all whether the present computing teachers who graduated at the time when no coherent concept of the teaching and learning of these subjects existed are able to teach the relatively newly defined teaching content.

### **4 COMPUTING TEACHER AS AN EXPERT**

The studied issues can be detected in the area of informatics related educational activities in basic schools and also alongside the further development of relevant digital competences of children and young people. The challenging area is the content of informatics and educational activities, which is seen as a range of topics that reflect the current status and recent trends (Android, IOS features to Gmail), and the fields of information and communication technologies, including the current requirements for the development of pupils’ digital competencies. Another problematic area is the progress in the structuring of the approach toward the development of pupils’ digital competencies. Competencies are seen as concretization of relevant key competencies or as components of digital literacy of basic school pupils. Questionable is also the complex of respective competencies of the teachers who participate in implementing compulsory informatics subjects. And the last area is the integration of development of digital skills into the educational activities realized within the school environment and life (Štípek, Rambousek, Vaňková, 2015).

The teacher is a key element in shaping the final form of the curriculum that is implemented during informatics lessons in basic schools. A number of factors are introduced to the curriculum designing process intentionally as well as accidentally. These factors then influence and regulate the process. In particular, it is necessary to consider the *Framework Educational Programme* (hereinafter referred to as FEP) and the *School Education Programme* (hereinafter referred to as SEP) and, in addition, also the local physical conditions and internal factors on the side of the teacher - in particular the time the teacher has at his or her disposal to prepare for teaching and his or her didactic skills. The teaching content is formed with respect to the expected competencies of pupils that are linked to the level of technological and social development. It reflects the challenges and life situations that pupils need to be prepared for. These are also subject to continuous changes and the teaching content must reflect them, otherwise education would have no effect. This fact was also noted by O. Neumajer (2016), who states that “*It is obvious that amendments are necessary because the current wording of the educational area of Information and Communication Technologies in the FEP for basic education has not changed since its origin in 2004.*”

The outlined facts are sufficient enough to clearly suggest that many of them operate as variables in the context of the resulting form of instruction, which leads to the *differences in the concept of the informatics teaching content in basic schools*. This brings us to the essence of the studied problem. The aim is to use the research base for determining the factors with influence on the shaping of the teaching content and to identify the thematic units of the teaching content that are taught at schools. The research will also seek to find out how teachers evaluate individual thematic units from different perspectives (topicality, usefulness, performance requirements for implementation, etc.).

Theoretical research methods (e.g. analysis, comparison, and synthesis) will be used in the studying of the given issues. On the empirical plane, methods typical for pedagogical research will be applied, when the main goal will be to determine the form of the teaching content which is implemented in the informatics tuition at basic schools. We will determine the current level of education by means of an interview and a questionnaire. The results will be evaluated by statistical methods.

In the modern form of training of future teachers, this is related mainly to relevant competencies based on contemporary trends in education. By competencies, we understand a combination of knowledge and skills with the ability to use them in a specific situation in practice.

The training aimed primarily at preparing future teachers of information and communication technologies corresponds to the structure and content of the implemented teaching-learning process. Demands placed on computing teachers are cumulative and the teachers are expected to meet them at basic schools based on network services that have been developing rapidly and so it is necessary that the teachers respond to such changes. Mastering such activities requires knowledge of several mutually interconnected areas.

1. The first area is the operation of computer software and hardware. Computing teachers are acquainted in detail with how to build and configure a computer from individual components. Teachers are able to set up or repair all the attributes required for correct operation of a computer. They can connect any peripheral devices and install them to the operating system. They are able to configure and manage operating systems. The extent of their knowledge and skills is higher. Teachers are able to create advanced projects and presentations designed to support teaching.

2. The second area to be mastered by computing teachers is the knowledge and skills necessary for creating Web-based presentations. This study field also includes scripting languages. Computing teachers are able to create advanced website presentations. (Osif, 2003)

3. The third area is the operation of computer networks at the level of an administrator. Computing teachers are acquainted with the configuring of network operating systems of various manufacturers. Teachers are able to install and configure these operating systems under the conditions of basic schools with respect to the INDOŠ project. (Horák, 2001)

4. The fourth area of the knowledge and skills of computing teachers is the creating of graphical 2D and 3D still images, both in the vector and raster form.

5. The fifth area is the creating of animations and video sequences, including the presentation of resulting projects.

6. The sixth area is the knowledge concerning utilization of a computer as a teaching and learning tool. By this we understand creation of various pedagogical and didactic presentations to support the educational process.

## **5 STRATEGIES OF DIGITAL EDUCATION IN THE CZECH REPUBLIC**

In line with the priorities of the Strategy of Educational Policy of the Czech Republic until 2020, the Digital Education Strategy focuses on creating the right conditions and setting up the processes that will lead to the objectives, methods and forms of education corresponding to the current state of knowledge, to the requirements of social life and the labour market, affected by the development of digital technologies and the information society in general. The mission of the Digital Education Strategy is to initiate changes both in the area of methods and forms of education and in the area of educational objectives. A whole range of changes will be required and it cannot be expected that all of them will have been implemented until 2020. The developments in the area of digital technologies and, in this connection, also the development of the teaching content or scientific knowledge in the field of pedagogy are very dynamic and cannot be reliably predicted. Therefore, it is individuals who are in the centre of attention of the Digital Education Strategy and who have to become versatile personalities with support from schools and other education actors outside schools, prepared for the life and employment at the time the characteristics of which are unknown to us to a large extent. That is why the Digital

Education Strategy cannot be considered to be a strategic document in the long run. It must be regularly evaluated and updated. The Digital Education Strategy formulates three priority objectives that the first interventions will be directed at:

- to open education to new methods and forms of teaching by means of digital technologies,
- to improve competencies of pupils in the area of working with information and digital technologies,
- to develop informatics thinking of pupils.

These objectives cannot be achieved without consistent support provided to teachers. Teachers will bear the main weight of the planned transformation. They must be won for the planned changes, provided a wide and varied offer of trainings and sufficient methodological materials. Their activities in introducing creative approaches to education and innovations to teaching must be acknowledged and appreciated accordingly. Alongside, it will be necessary to ensure that digital infrastructures are built in schools and the access to digital teaching and learning resources both at school and outside of it is free of discrimination. It will also be necessary to support modernization and innovation processes both in education and the management of schools and the educational system in general, and concurrently to develop ways of monitoring and evaluation of the efficiency of these processes. All the aforementioned elements of the strategy will have to be significantly supported by activities that will enable to understand the processes of integration of digital technologies into the education of the general public (MEYS, 2014).

## CONCLUSIONS

The changing life of the whole society is also reflected in schools where utilization of information and communication technologies in the pedagogical process brings along changes requiring computing teachers to be trained so that they would be able to be administrators of computer networks and to use education programs. They are also able to advise other teachers, ICT users, on any issues arising in this field and concurrently guide their pupils through the world of information and communication technologies.

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# Concept of Educational Values in the Prism of Pupils From Roma Families

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## ABSTRACT

The issue of the education of Roma pupils is gaining importance of late, especially with regard to their professional development, future employability, and their successful inclusion in society. The socialization of this group is influenced by important determinants specific to the social and cultural environment of Roma families, as well as by their living in areas affected by social exclusion and a number of negatively impactful, even pathological, social phenomena. In the context of the reproduction theory of society and the subsequent theory of social and cultural reproduction as it applies to the field of education, children from Roma families are at risk for early departure from the education system. One of the key factors determining the pupils' decision in this area is the perception of the value of education. How much importance Roma pupils place on the education in their lives influences their educational aspirations as well as the potential for upward learning and social mobility.

## INTRODUCTION

Central European countries are not confronted with cultural and ethnic diversity as much as the countries of Western Europe (Hladík, 2016). The Roma minority is one of a number of ethnic and national minorities living within the territory of the Czech Republic. Their differences from the majority population are largely cultural, specific to their emic subcultural history, lifestyle and folkways, mentality and cultural traditions. The story of this minority is long, characterised by persistent experience of social exclusion, the existential experience of poverty, a paucity of opportunities compared to that of the majority population, constant cross-cultural misunderstanding, and even a culturally-enshrined desire to find and establish a home-place and achieve the recognition and validation enjoyed by so many other minorities in the Czech Republic.

In the scope of socio-pedagogical practice with the Roma minority, we often encounter the problem of very low professional and educational confidence. Children from families of lower socioeconomic status, including many Romani families, naturally follow as adults the same life path modelled by their parents and, understandably, adopt their parents' opinions that the pursuit of higher education and a professional career is for non-Roma and, therefore, inappropriate for Romani to pursue. Nonetheless, there is a growing awareness among the Roma minority of the need for higher education to cultivate professional success and a prosperous future, as well as a growing interest in other forms of education of adults. Unfortunately, the prospect of re-entry into an educational system and getting a vocational certificate or, additionally, passing the graduation exam (*maturita*) is at best an uncomfortable one for Romani people and, thus, they are dependent on retraining courses organized by labour offices or other forms of further education arranged by various non-profit organizations. Numerous research studies indicate that educational deficiency is one of the main factors contributing to the social and economic exclusion of Romani people. Experts agree that school system is, in the long term, one of the most effective tools for alleviating the impact of marginalization of Romani people and creating opportunities for meaningful and inclusive social interaction with the greater Czech society. Systematic steps supporting school success and educational opportunities for Romani children are typically associated with high expectations and an immense investment of financial and human resources. Increasing the upcoming generation's educational level is a precondition for change, the intended result of which is upward mobility and enhanced lifestyle potential (Navrátil, 2003). However, achieving an advanced level of education is subject to important factors arising from individual approaches, family environments, social circumstances, subjective interest, as well as such ethical considerations as employers' requirements, supply, the relative value and availability of various forms of education, financial possibilities, and others. It is true that in some cultures (Romani, for example), the number of children who attend high schools or universities is substantially smaller in comparison with children from the majority culture (GAC, 2007). These kinds of statistics lead to a speculation as to whether the presence of this phenomenon is caused primarily by lower intellectual abilities and talent among the subculture in question, or by reduced cultural capital available to this subgroup, its individuals, families and children. Educational cultural capital not homogenous, as it differentiates itself in accordance with a panoply of variables. Educational disproportions are clarified in the context of several sociological and socio-cultural theories, which define mechanisms and determinants of educational opportunities and paths. In light of such theories, we can identify strong transgenerational reproduction of economic and social status in members of Romani minority. A great deal of research shows that most Czech Romani people replicate the social status of their parents and thus occupy the lowest floors of the Czech social structure, inevitably conferring permanent economic deprivation

(compare Mareš, 2003; Sirovátka, 2003, 2006; Šimíková, 2003). In spite of that, some from this group nonetheless manage to overcome these systemic barriers by escaping the mechanisms of social predestination, demonstrating as a result increasing educational achievement and subsequent social mobility.

The precondition for social success and a prosperous lifestyle is one's level of education. Thus, the question of education of Romani pupils becomes not only a pedagogic problem, but also an issue of geo- and socio-political, cross-cultural, and historical importance. Many books agree; one of the main factors in the educational deficiencies of Romani pupils is the different sociocultural environment from which they come from and which influences them in the process of socialization (compare Gulová, 2010, GAC, 2007). Factors of a rather subjective nature intervene in the student's decision to pursue or discontinue further education - motivation disposition, attitudes, aspirations and others. However, even these subjective factors are determined by affiliation with a particular social class. While all classes place emphasis on education, among the lower strata, the portion of those who prioritize education highly tends to decrease. According to Brüggemann (2012, p. 50), the shared supposition is that marginalization in education of the Romani is associated with low level of aspiration and with the perception that higher education is undesirable to the Roma minority and, because of the fear of loss of cultural identity, it needs to be rejected. In this case, the culture is the crucial factor causing the low educational aspirations of Romani pupils, especially the girls who prefer traditional Romani values. Nevertheless, according to research conducted by the UNDP/World Bank/EC Regional Roma Survey (Brüggemann, 2012, p. 50) the differences are proven, but the experts did not conclude that the level of aspiration would be associated with cultural or ethnic origin.

Much research shows that most of the Czech Romani people end up having the same social status as their parents. As Šotolová (2000, p. 39) states, conclusion of compulsory education means the end of education for many Romani people in general. Those who decide to continue their education at high school often attend vocational school, but many of them opt to terminate their studies entirely after only a few months. This decision typically has a negative impact on the former student's employability; people with only an elementary education are rarely qualified for anything more than low-paying positions in unskilled labour, severely limiting their financial prospects and condemning many of them to long-term unemployment.

Educational paths and educational chances of Romani pupils in marginalized Romani localities were studied by GAC 2009 researchers. The study illustrated the presumption of differences between the educational paths of Romani and other children, respectively, who attended schools in marginalized localities in the territory of the Czech Republic. The results of the analysis proved the hypothesis that Romani children are less successful academically than other pupils. Still, there is evidence of positive results for some Romani students, which is as a minority of these did continue their studies at higher education institutions after high school. Such students prove that a Romani heritage does not necessarily condemn one to no more than an elementary education, and they should be highlighted as role models, not only to the Romani specifically, but to all Czech students generally.

## **EDUCATION AS A VALUE**

Values lie at the core of many scientific disciplines and fields of study. In the area of pedagogy, especially the youth values systems, education as a social value in itself, as well as the intrinsic value of the goals and contents of formal education defined in the educational programs, are important to youth development (Průcha, Walterová, Mareš, 2008). The influence of the value system of an individual in the course of their upbringing and education is extremely important. Within the value system, the educational value is crucial. Individual's attitude towards education in environments which privilege educational value is different from environments with low preference. Analogically, the value specifics of an individual are reflected in each educational activity (Sak, 2000). The degree of significance an individual attributes to the value of education shapes their educational process and is reflected in their attitude towards school, academic success, and even in the quality and intensity of home preparation for classes. If this value is not included in the hierarchy of family values common to a certain culture, and an individual does not attribute to it at least some value, it is harder to influence the individual in the social-educative process at school. The absence or deprioritization of this value in the individual's value system is negatively reflected in both their educational and professional paths. The values with which a child begins the process of education -- essentially, the values gained prior to participation in formal schooling-- have a major influence on his or her understanding of the role of education in society (Katrňák, 2003). Cultural variation also contributes to differences in the perceived value of education, in the meanings attributed to education, and education's relative position in the ranking of value preferences of their participants. This does not have to mean that pupils from cultural background other than the Czech majority population do not attribute any meaning or value to education. Rather, it means that, sometimes, adherents of different cultures assign importance to different values, taking into consideration such varied aspects of life as strong self-identification with their ethnicity, devotion to their family or values supporting collective living.

Research results that address the concept of education within the Romani culture specifically are somewhat ambivalent. On one hand, the Roma appear not to perceive education as a prominent value; on the other, Roma ethnics, axiologically, perceive education quite differently from the majority society, and the placement of education as a value is usually lower. However, this is not to say that Roma do not consider education to be of no value at all, simply that it holds a lesser relative value than it does in the surrounding culture (Kaleja, 2013).

The field of values, value orientations and preferences is a frequent topic of discussion in social scientific literature. However, these are rarely the primary focus of the research in which they appear (Prudký, 2009) mainly because experts still face the complex issue of establishing a firm grasp of this elusive topic and discovering solid methods for measuring values. Approaches to measuring values so far work with or are inspired by the models by Hofstede (1980), Rokeach (2000), Inglehart (1990), Schwartz (1992), and, within the Czech and Slovak research context, models by Sak (2000, 2004) and Vonkomer. In spite of the fact that there is a wide range of extant studies so far, researchers still seek new schemes, models and inspirations in order to approach measurement and codification of values (Prudký, 2009).

This research project is narrowly focused on the value of education and its goal is to specify the importance of the value of education and its rank among value preferences of the pupils from different cultural backgrounds, though this group's perception of the role of the value of education may differ from that of the majority population. Thus, we build upon the aforementioned models and approaches. With respect to particular targeting, we intend to investigate the value of education for children from Romani families in more detail and from multiple points of view, and thereby to combine already-verified research tools and to further supplement these with a separate research strategy. We prefer using exploratory, rating and projective methods. However, in order to have a more in-depth look into the issue and to comprehend how pupils and their parents understand the value of education, the research will be enriched with other methods, such as in-depth interviews with both pupils and their parents, in the framework of a quantitative approach.

## METHODS

The main aim of this project is to find out how much importance the pupils from the Roma environment place on educational value, as well as to analyse areas that influence the individual construction of the educational value within a particular target group and interpret these in a descriptive way. The focus is on the following areas:

- ✓ the state of education (educational aspirations, the relative placement of educational value within the overall values system)
- ✓ the area of motivation and the reasons for education
- ✓ the area of educational support
- ✓ the area of importance, conception and understanding of education
- ✓ the area of determinants regarding the conception of education

### Description of the 1<sup>st</sup> wave of the research, "Education as a value"

In the first quantitative wave of the research, the focus was on the relative placement of education among value preferences of the Roma pupils, on their educational aspirations and their reasons for education. We performed a questionnaire survey in selected localities of the Zlín and Olomouc region in the Czech Republic (with respect to the high diversification of the Roma ethnicity, we focused on intentionally selected localities and processed the data for each locality separately). Given the specific research sample and recommendations made by experts, we decided to create a questionnaire of our own design.

The research was carried out among selected group of the youth and was subject to clear, predefined criteria:

#### A) The research sample of the Roma pupils:

- selected locality of the Zlín and Olomouc region
- pupils from 6<sup>th</sup> to 9<sup>th</sup> year of primary school
- self-identification with the Roma ethnicity

#### B) Research-comparative sample from the majority population

- selected locality of the Zlín region
- pupils from 6<sup>th</sup> to 9<sup>th</sup> year of primary school

The research was conducted at elementary schools found in the following localities: Přerov, Holešov, Otrokovice, Vsetín and Nedašov.

Selected research questions from the 1<sup>st</sup> phase of the research:

*What is the hierarchical position held by education in the value system of pupils from the Roma background?*

*What are the educational aspirations achieved by the Roma pupils?*

## FINDINGS

The table presents a comparison of the results concerning the position held by the value of education in the overall value preferences of the investigated groups of pupils. They were instructed to rank presented values according to their importance in life and assign a rank to an individual value, in order from 1 to 15, with 1 being the most important and 15 being the least important.

Value	ROMA	NON-ROMA	Order of Values/ROMA	NON-ROMA
Health	3.06	3.41	1	1
Satisfied family and children	3.69	5.54	2	3
Love	5.04	5.07	3	2
Sufficient financial situation	7.24	8.15	4	8
Truth	7.46	8.55	5	9
Friendship	8.00	6.46	6	4
Freedom	8.24	7.70	7	7
Life partner	8.53	7.15	8	5
Education	8.56	7.44	9	6
God (faith)	8.57	9.79	10	12
Interesting job	8.96	9.15	11	11
Peaceful life	9.48	9.09	12	10
Environment	9.94	10.46	13	14
Personality development	10.24	9.97	14	13
Helpfulness	11.70	10.57	15	15

Figure 1: Comparison of Value Preferences

The research shows that, in comparison with the pupils from the majority population, the Roma pupils assign education a lower position in the hierarchy of values; however, they do not place it last. As far as complex comparison of value preferences are concerned, we find that the values systems of the Roma pupils and non-Roma pupils are similar. The Roma pupils prefer values such as *Health*, *Love*, *Satisfied family and Children*. Conversely, they sideline such values as *Peaceful life*, *Interesting job*, *God (faith)*, *Personality development*, *Environment*, and *Helpfulness*.

Another field on which we concentrated during the research was a comparison of educational aspirations of all samples of pupils.

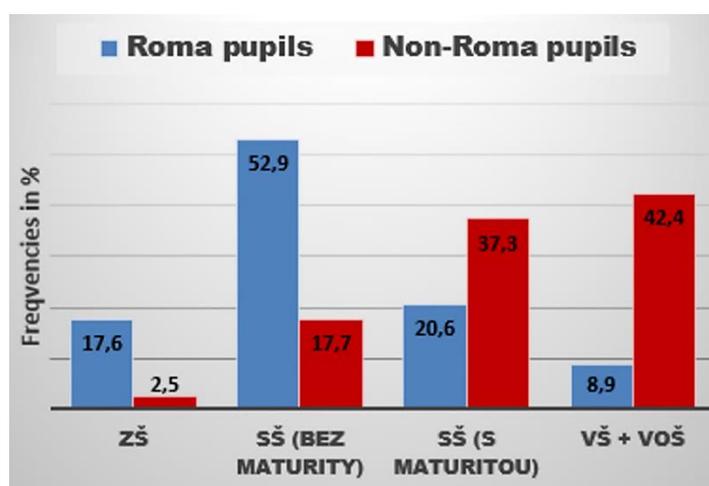


Figure 2: Educational Aspiration Graph

As we can derive from the graph, we get consistently different results from the two groups when enquiring about educational aspirations. While, among pupils from the majority population, aspirations to achieve secondary (37%) or higher education (41%) predominate, the Roma pupils are more reluctant in their aspirations; most would be satisfied with completing secondary education with a vocational certificate. 21% of the Roma respondents want to complete the graduation exam (*maturita*), and only 9% aspire to higher education.

## DISCUSSION

The results confirmed that Romani pupils include educational value among their value preferences; nevertheless, they rank it lower than do pupils from the majority population. Thus, we can validate Romani students' awareness of the significance of education to their future professional opportunities. This is supported by the fact that almost 75% of Roma pupils have set for themselves the goal of completing secondary education, even though it is apparent that the Roma prefer vocational training. However, whether they will complete their studies at the secondary education institution remains in question because, as Šotolová (2000) states, the end of mandatory education, for many Romani people, still signifies the end of their educational process overall. In this respect, we need to concentrate on support for such pupils during their studies, on improving the educational results of Roma pupils, on eliminating Roma students' premature withdrawal from the secondary education system, on increasing the number of those who successfully complete their secondary school studies, and, possibly, on motivating them towards further studies at higher educational institutions.

The goal of this contribution was to outline individual steps and intermediate results of the research project tracing the concept of value of education among pupils coming from Romani families. Based on the primary data, it is apparent that education as a value holds a different position in the value systems of Roma pupils than it does in that of the majority population, and that educational aspirations of these pupils are different. Subsequently, we can confirm that socio-cultural influences in the process of construction of the individual's value system, as well as the value of education itself, are important, from the view of members of the Roma minority. In the future steps of our research, we will focus on these determining influences in detail and we will try to apprehend the reasons for education motivating these selected groups of pupils, analyse their opinions and attitudes towards education and describe the concept of education from the pupils' and their parents' point of view.

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## Content Analysis of the Articles Covering the Subject of Student Academic Achievement and Organization

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### ABSTRACT

The purpose of this study was to analyze the content of 245 articles published in various journals and indexed in Scopus database between 2014 and 2017. These articles were examined and screened on the basis of keywords of organizing, academic achievement, student and education. As a result of the screening, 30 articles were reached. In the content analysis research, articles were reviewed in terms of the years they were published in, journals where they were published, number of authors, countries and regions, disciplines, data collection method and number of keywords. The data were subsequently analyzed by the content analysis method. According to the findings, it has been found that most studies were carried out in the United States. Most of the articles included in the study were published in 2016. As a result of the research, it has been ascertained that the qualitative researches are in a majority in the educational researches in recent years whereas the number of those who use the mixed research method is very low.

**Keywords:** Organization, academic achievement, student, education, content analysis

### INTRODUCTION

At the present day, knowledge influences every aspect of human life swiftly and without any limitation. Thus, individuals cannot remain indifferent to educational institutions and educational programs with this emerging interaction. Educational institutions have certain missions. These involve educating individuals with learning abilities who think, attach meaning to what they think and keep up with the age they live in. The learning process which begins with the birth of the individual gains pace with the developments taking place within the process. In conclusion, keeping up with the change and development is directly proportional to the education one gets. The students can develop their skills during the narration of the teacher within the understanding of education-teaching which is in line with the requirements of the time. In this kind of education, it is aimed to make the student use the knowledge rather than memorize it, generate new knowledge and briefly to make him think (Özden, 2005).

One of the basic elements of the education system is the teacher. The success desired to be achieved in the education system is linked with the qualities of teachers and other educational staff who will be influential in the system. No education model is capable of generating services exceeding the quality of the staff to run the model (Gülsün & Atalar, 2014).

Technologies in modern education serve as a practical tool in the implementation of education systems which have more pedagogical features than the conventional ones. These technologies direct the education process in achieving the educational activities and qualities at the desired level. Also, they enable each student to opt for individual tendency paths which take into account their cognitive skills, motivations, tendencies and other personal qualities (Zakirova & Koletvinova, 2014).

Education involves structuring of educational organizations to fulfil aims in line with the national education policies of a country, taking precautions to train a workforce in the quantity and quality to meet the aims and carrying out relevant tasks effectively.

The precondition for the organizations to be productive and successful is to be established and run as based on organizational principles. Thus, organizations established and run as per these principles can be more successful in terms of harmony and competition against other systems and fulfil the organizational objectives as planned.

An organization's using the available human resources, time, materials and accurately and productively in order to attain its objectives is called management (Tortop & vd., 2016) Management is using the individuals in charge of running of organizations as well as the predetermined aims of the operation of the organization in a proper way.

This research aims to determine the tendencies of studies made between 2014 and 2017 on the subject matter of “organizing”, “academic success”, “student” and “education” by means of data screening in Scopus, the database most commonly used for this purpose.

### **The Objective and Significance of the Research**

The aim of this research is to clarify the present situation and shed light on future studies by analysing the articles on “organizing, academic success, student and education” entered in Scopus database between 2014 and 2017 in terms of the research subject, research methodology and suggestions.

In line with the designated purpose, answers were sought to the following research questions;

1. In which journals were the articles published?
2. What is the distribution of articles in terms of number of keywords, number of authors and data collection methods?
3. What is the distribution of articles in terms of year of publication, countries they were written in and disciplines?

### **METHODOLOGY**

#### **Research Model**

Within the research, 30 studies related to “organizing, academic success, student, school and education” which have been made available in the Scopus database have been analysed and these studies have been assessed by means of content analysis. Content analysis is a research method used to classify, organize and compare texts to draw conclusions (Cohen, Manion and Morrison, 2007). Krippendorff (2013) argues that content analysis is equally valuable and valid in emphasizing a text and also identifying its scope.

#### **Data Collection and Analysis**

The classification form formed by the researchers was used as the data collection tool in this research and it includes sections for the year of publication, data collection methodology, number of authors, number of keywords, number of references and journals the articles were published in.

In selecting the keywords, the opinion of an educational administration and supervision expert has been taken and screening has been carried out accordingly. Initially the abstracts of the articles have been examined following the Scopus screening results obtained by using keywords and subsequently the full text have been reached within the Scopus database. Articles the full texts of which could not have been reached have been excluded from the research group.

The data have been analysed through content analysis methods, that is, in terms of percentage and frequency. The goal of descriptive analysis is to present to the reader the findings obtained in an arranged and interpreted way (Yıldırım & Şimşek, 2011).

#### **Study Group**

In the research, 245 articles made available on Scopus database between 2014 and 2017 have been screened for “organizing, academic success, student and education” and 39 articles have been selected through sampling method. Scopus has been preferred as it has the largest database in the world. It is the world's largest abstract and citation database of peer-reviewed research literature and contains scientific journals, books and conference reports ([www.elsevier.com](http://www.elsevier.com)). Furthermore, it is the only database updated daily and not just weekly (Scopus, 2017).

### **FINDINGS**

#### **1.1. Distribution of Articles by Year of Publication**

Consequent to the screening of the keywords “organizing”, “academic success”, “student” and “education” in Scopus database, 30 articles published between 2014 and 2017 were reached. The distribution of these articles is given in Table 1. The examination of Table 1 reveals that 5 articles pertained to the year 2014, this figure doubled and the articles amounted to 10 in 2015 and the number of articles rose to 16 in 2016, indicating that 2016 has been the year with the biggest number of articles. In 2017, however, only two articles were written and the figures reveal that 2017 has been the year with a limited number of studies.

**Table 1. Distribution of Articles by Year of Publication**

<b>Year of Publication</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
2014	5	16,67
2015	10	33,33
2016	13	43,33
2017	2	6,67
<b>Total</b>	<b>30</b>	<b>100,00</b>

**1.2. Distribution of Articles by the Journals They Were Published In**

The distribution of articles by the journals they were published in is given in Table 2. According to the findings obtained, 6, 5, 4, 2 and 2 articles were published respectively in Journal of Education Administration, BMC Medical Education, Journal of School Health, Journal of Educational Administration and History and Journal for Multicultural Education whereas 1 article was published in each of the remaining sources. It is also seen that the majority of studies were contained in journals of health sciences.

**Table 2. Distribution of Articles by the Journals They Were Published In**

<b>Name of Journal</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
Journal of Educational Administration	6	20
BMC Medical Education	5	16,7
Journal of School Health	4	13,33
Journal of Educational Administration and History	2	6,67
Journal for Multicultural Education	2	6,67
Administration and Gender in Eretz Israel	1	3,33
Advances in Health Sciences Education	1	3,33
Community College Journal of Research and Practice	1	3,33
Educational Research for Policy and Practice	1	3,33
International Journal of Disability, Development and Education	1	3,33
International Journal of Educational Management	1	3,33
International Journal of Educational Development	1	3,33
International Journal of Inclusive Education	1	3,33
Nurse Education in Practice	1	3,33
Nurse Education Today	1	3,33
Social Science Journal	1	3,33
<b>Total</b>	<b>30</b>	<b>100,00</b>

### 1.3. Distribution of Articles by Number of Authors

**Table 3. Distribution of Articles by Number of Authors**

Number of Authors	Number (n)	Percentage (%)
One author	6	20
Two authors	6	20
Three authors	6	20
Four authors	6	20
Five authors	5	16,67
Eight authors	1	3,33
<b>Total</b>	<b>30</b>	<b>100,00</b>

The distribution of articles under the research by the number of authors is given in Table 3. The examination of Table 3 leads to the conclusion that the percentage of articles under the research which are written by one, two, three and four authors was 20% for each. It has also been found out that 16,67% of the articles was written by five and 3,33% was written by eight authors.

### 1.4. Distribution of Articles by the Countries/Regions They Were Written In

The distribution of studies by countries/regions is given in Table 4. It has been found out that 13, 6 and 2 articles were written respectively in the USA, Australia and France whereas 1 article was written in each of the remaining countries. In the light of the findings obtained, the USA has been the country where the majority of the studies, that is, 13 studies were made and it can be concluded that the researchers in the USA attach importance to the issues of organizing in education and academic achievement.

**Table 4. Distribution of Articles by the Countries/Regions They Were Written In**

Country	n	%
America	13	43,33
Australia	6	20
France	2	6,7
Africa	1	3,33
Cambodia	1	3,33
Canada	1	3,33
Denmark	1	3,33
Greece	1	3,33
Israel	1	3,33
New Zealand	1	3,33
Saudi Arabia	1	3,33
Spain	1	3,33
<b>Total</b>	<b>30</b>	<b>100</b>

### 1.5. Distribution of Articles by Disciplines

The distribution of articles by disciplines is given in Table 5. It has been found out that 18 of the articles (60%) were written in the discipline of social sciences and 12 of them (40%) were written in the discipline of health sciences. In the light of the findings obtained, it is seen that the majority of the studies were made in the discipline of social sciences.

Disciplines	Number(n)	Percentage (%)
Social sciences	18	60
Health sciences	12	40
<b>Total</b>	<b>30</b>	<b>100,00</b>

## 1.6. Distribution of Articles by the Research Types Used

**Distribution of Articles by the Research Types Used**

Research methodology	Number (n)	Percentage (%)
Quantitative	16	53,34
Qualitative	13	43,33
Mixed	1	3,33
Total	30	100,00

The examination of Table 6 reveals that of the articles about whose methodology we could obtain information, 16 were written through quantitative method, 13 were written through qualitative method and 1 of them was written through mixed research method. Based on these conclusions, it is seen that in 53,34%, 43,33% and 3,33% of the studies, the quantitative, the qualitative and the mixed research methods were employed respectively. It can be concluded that the researchers prefer the quantitative method over the qualitative one and the mixed research method is used less in studies.

## 1.7. Distribution of Articles by the Number of Keywords Used

**Distribution of Articles by the Number of Keywords Used**

Number of keywords	Number (n)	Percentage (%)
3 and below	1	3,3
Between 4 and 5	1	36,7
Between 6 and 10	18	60
Total	30	100,00

The distribution of articles by the number of keywords used is given in Table 7. As per Table 7; in 3,33%, 36,7% and 60% of the articles under the research, 3 and less, between 4 and 5 and between 6 and 10 keywords have been used respectively.

## DISCUSSION AND CONCLUSION

In the screening made by using the keywords of “Organizing”, “academic achievement”, “students” and “education”, it has been found out that relevant studies were mostly made in 2016. While the percentage of studies pertaining to 2014 was 16,67%, it has been ascertained that the studies doubled and amounted to 33,33% in 2015.

When the findings are analysed, it is seen that the Journal of Education Administration ranks first and it is followed by BMC Medical Education. Journal of Education Administration is focused on educational administration studies since the day it was established. Also, it is the first peer- reviewed journal in the field of education leadership and administration ([www.emeraldgroupublishing.com](http://www.emeraldgroupublishing.com)).

When the distribution of studies which are the subject matter of the research are analysed by the countries/regions, it has been found out that USA is the country where the majority of the studies were made with 13 studies and it was followed by Australia and France with 6 and 2 studies respectively. According to Ortaş (2002), the USA takes the lead in the scientific research ranking. Cherrstrom et al (2017) have discovered as a result of their 10-year (2006-2015) content analysis on adult education that the country with the biggest number of publications is the USA.

In terms of disciplines however, studies on social sciences rank first with a percentage of 60% and it is followed by health studies with a percentage of 40%.

When the research approaches of the publications were examined, it has been concluded that the studies were mostly made through the quantitative method yet qualitative researches were also widespread. However, studies made through the mixed method were less preferential. Sözbilir et al (2012) also obtained

similar results in the content analysis they conducted in a similar manner and put forth that the qualitative and mixed methods were the most preferred methods after the quantitative method. In another similar study, Selçuk et al (2014), concluded that the quantitative method was the most widely used method consequent to the content analysis they conducted. In their study conducted by analysing the tendencies of the researches published in the Education and Science journal, they found out that the qualitative, mixed and literature review methods were the most preferred methods after the quantitative method.

When the research methods of the studies were analysed in terms of disciplines, however, it has been discovered that the qualitative method was preferred more in studies on social sciences whereas the quantitative method was preferred more in the field of health sciences. Since the mixed method was not preferred much, it is believed that conducting researches through the mixed method could make valuable contributions to science.

When the articles published as from 2014 are analysed, it can be said by judging on the developments over such studies that organizing and the academic achievement of students will become an integral part of future studies and the range of application will further expand.

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# Contribution of Virtual Microscopic Simulation (Vms) to Unveil Students' Conceptual Development and Misconceptions of Physics Concepts of Heat Transfer

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## ABSTRACT

The aim of this research was to investigate the contribution of Virtual Microscopic Simulation (VMS) to unveil students' misconceptions the physics concepts (Heat Transfer). Our simulation was produced using the software Macromedia flash. This research evaluates the progress of concept by students (20-22 years old) after one lesson (90 minutes) in three step scenarios: Predict of a problem, Experience using only VMS, Reflect from the difference between prediction and what happens in the experience. The results VMS related to heat transfer was evaluated through a pre-, post-, and retention test. The tests scores were analysed using both qualitative and quantitative methods. The findings suggested that the VMS helps students to achieve better conceptual understanding and enables students to retain their understandings to unveil students' misconception.

**Keywords:** Virtual Microscopic Simulation (VMS), Students' Misconceptions, Learning; Physics, Heat Transfer.

## INTRODUCTION

Physics concepts, in nature, consist of both microscopic and macroscopic properties (Gould & Tobochnik, 2010). Macroscopic properties could be observed and measured easily. Hence, macroscopic properties generally well understood. In reverse, microscopic properties could not be understood very well (i.e. misunderstanding or misconceptions). A remarkable example of microscopic physics is heat transfer topic. We use the topic in everywhere in daily life events, for example; the process of cooking water, convection occurs in heated water long into water vapour. In the sense of particulate nature of matter; water particles which are very difficult to observe by naked eyes, especially motions and interaction of particles, for this reason simulation to visualize is needed. Visualization of the movement of the water particles also enhances learners to more easily understand and to more meaningful conceptual development (Gould & Tobochnik, 2010).

In the literature, there have also been lots of studies (e.g. She 2003; 2004b) showing that the use of virtual simulation can remediate learners' misconceptions and can provide in depth and sound understanding. Other obvious examples in science concepts as follows; Finkelstein, et al. (2005) showed that the use of virtual media

can help learners in building-related conception of velocity and acceleration in the motion of projectiles; Atasoy & Akdeniz (2007) showed that the use of computer simulations in learning Newton's laws of motion can help reduce misconceptions that occur in learners; Trundle & Bell (2010) showed that simulation to draw scientific moon shapes or in their conceptions of the causes of moon phases. Miklopoulos and Natsis (2011), the three treatments were equally effective in facilitating desired conceptual change the use of simulation media on climate change materials to facilitate construction of the transformation in the conception in the minds of learners; Olympiou, Zacharia, & de Jong (2013) showed that the use of media simulation of light and colour dispersion is effective in helping students to construct its conception so that the ability to understand can be improved; Srisawasdi & Kroothkean (2014) showed that the use of virtual simulation media on the concept of light waves could improve understanding of the concept of waves and the process of conceptual change students towards scientific conception.

As aforementioned, the studies indicated that simulation has commonly been used to achieve sound understanding. However; many of them (e.g. Atasoy & Akdeniz, 2007; Spyrtou et al. 2009; Maheshwari, 2011; Nguyen et al., 2012; Alsultanny et al., 2014; Akkoyun & Careddu, 2015) do not provide visualization of the microscopic feature of the physics concepts. Therefore, students confronted many misconceptions though after different levels of schooling. This is because the materials physics are microscopic so that learners difficult to absorb all the material well enough.

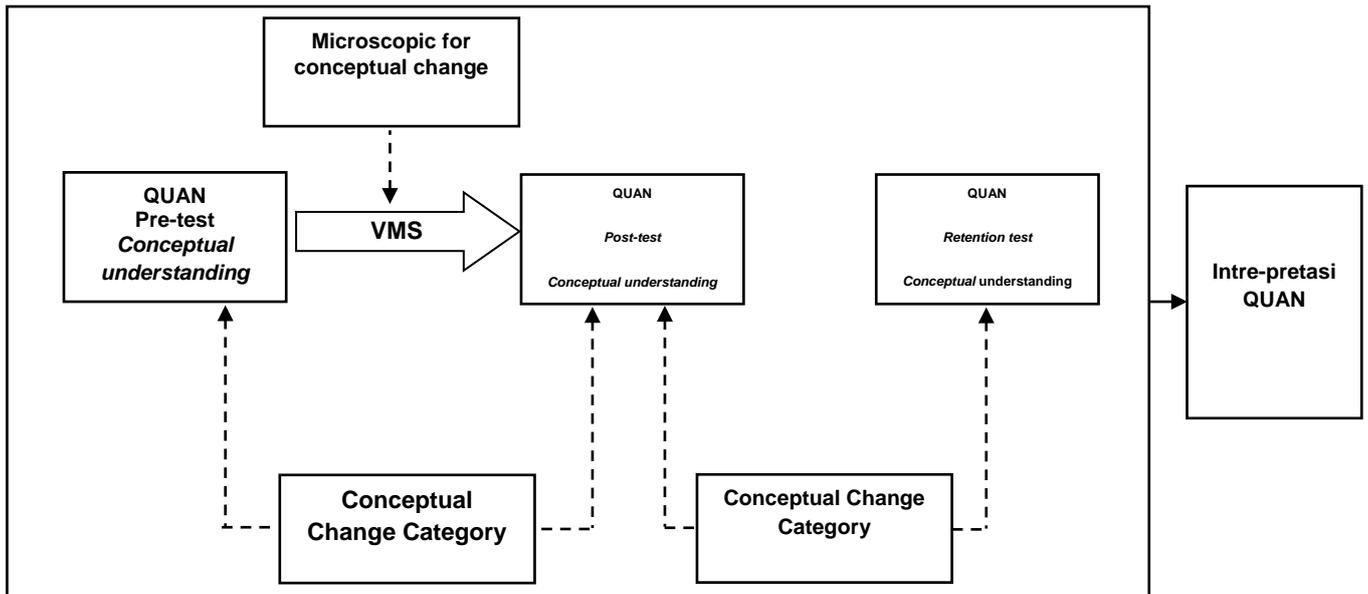
Computer simulations used for learning purposes generally involve a model of a phenomenon system with which the learner interacts. In such perspective, learners build their own knowledge by conducting experiments and by observing the effects of the experiments. Physics simulation experiments overcome the drawbacks of traditional physics teaching and promote reforming the methods of physics classroom teaching under the new curriculum ideas (Li, 2009). Computer simulations have become progressively more dynamic and higher interactive over the last three decades and along with their multi-representation nature have gained a position along the tools of high educational value. Their affirmative impact to students' science learning has been confirmed through numerous studies in the literature.

Information and Communication Technology (ICT) challenges students to learn physics. Physics on a particular concept needs computer aided instruction to explain the concepts of physics which are microscopic. Various computer applications have been developed and used in teaching physics, such as spreadsheets (Dory, 1988), laboratory-based computer (Thornton & Sokoloff, 1990), multimedia (Crosby & Iding, 1997; Wilson & Redish, 1992), simulation (Andaloro, Bellomonte & Sperandeo-Mineo, 1997), environment exploration (Teodoro, 1993) and an intelligent tutor (Jimoyiannis & Komis, 2001). In addition, the results are often used to guide the design of software for the education and development of evaluation tools. Students know that the basic concepts of physics learned will be useful in developing various products (project) based on the concept (Wibowo, & Suhandi, 2013).

The use of computer simulation applications have developed new research area in physics education, in general, to change the frame in which the teaching of physics elusive and implemented. Among the various applications of computer simulations are of special importance in learning Physics. Simulation aims to increase the potential of teachers in learning and to facilitate learners actively involved. Computer simulations have wide a range of opportunities for concept modelling and process. Simulation also provides a bridge between the knowledge of students before and after learning of physics and to help learners develop the scientific understanding through active reformulation and to decrease misconceptions or to provide conceptual change. The development of a variety of media visualization of physical phenomena that are very abstract and microscopic until today have been used for the sake of learning physics, among others; Newton's laws of motion simulation by Savinainen & Scotr (2002), Atasoy & Akdeniz (2007), Macabebe et al. (2010), Saglam-Arslan & Devecioglu (2010), simulation of Optical by Djanett et al. (2013), & Kaewkhong et al. (2010), simulation of thermal expansion by She (2003), simulation of heat transfer by She (2004b), simulation electricity and magnetism by Dega et al. (2013), simulation of climate change by Miklopoulos and Natsis (2011), Trundle and Bell (2010). The aim of this study was to investigate the contribution of Virtual Microscopic Simulation (VMS) to unveil students' misconceptions the physics concepts (Heat Transfer).

## **THE STUDY**

The aim of the present study is to explore the effects of simulation (VMS) on students' conceptual understandings and conceptual change. To achieve the aim, the mixed-method research through a mixture qualitative of quantitative in a research study was utilized (Creswell, 2008). In this regard, same test was implemented as pre-, post-, and retention with in one group experimental design, as exposed in Figure 1.



**Figure 1.** Representative schema of the research design

The study was conducted on 50 students, whose age ranging from 20 to 22. Before the treatment, the pre-test was applied to determine students' prior understanding about heat transfer (conduction, convection, and radiation). The treatment was utilized using Virtual Microscopic Simulation (VMS) in the experimental group. After the treatment; the same test was administered as post-test to all students. Lastly, the same test was administered as retention test for retention of students' understandings.

## FINDINGS

### Learning materials

The treatment (i.e. VMS) consists of three parts concept, namely conduction, convection and radiation. Simulation is used to build understanding of heat transfer concept. This media is created using Macromedia Flash 8 main software and design drawings using the Corel Draw.



**Figure 2.** Main menu display of VMS

Figure 3 is a picture of conduction of the metal when heated. When the metal is heated to other end of the metal will feel the heat, but we know what kind of heat propagation. This simulation seeks to explain how explanation there is. Besides, the most important part of the simulation is to explain microscopic constituent particles of metal when heated. VMS conduction section there is two parts is material conductivity A and conductivity material B.

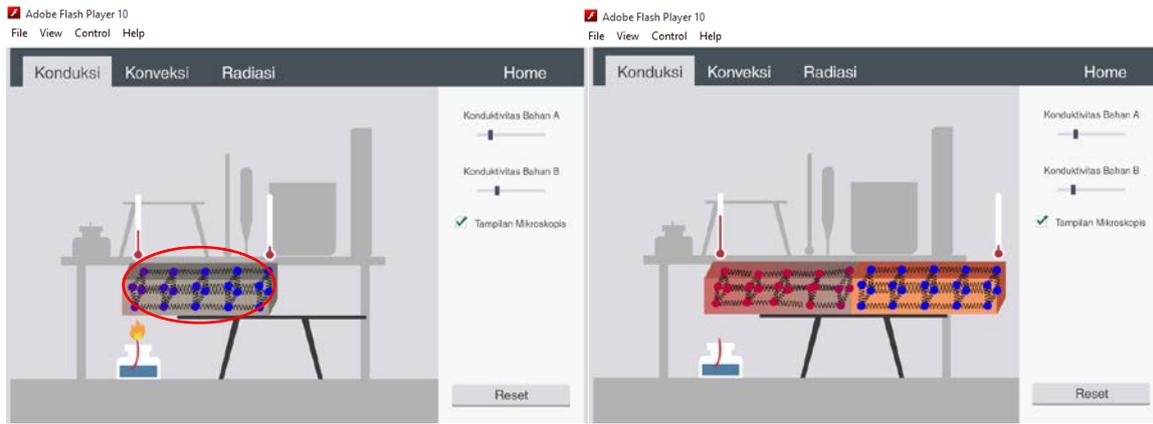


Figure 3. VMS conduction: microscopic of the material is heated

Figure 4 and 5 are pictures of VMS media convection; these simulations explain how the movement of water particles is heated. Water heating is carried out in three different places, namely in the mountains with a pressure of 38.6 kPa, around the beach with a pressure of 101.4 kPa and at a pressure of 476.2 kPa. The movement of water particles in the simulation in detail and show the most important part of this simulation is to explain the movement of microscopic water particles when heated.

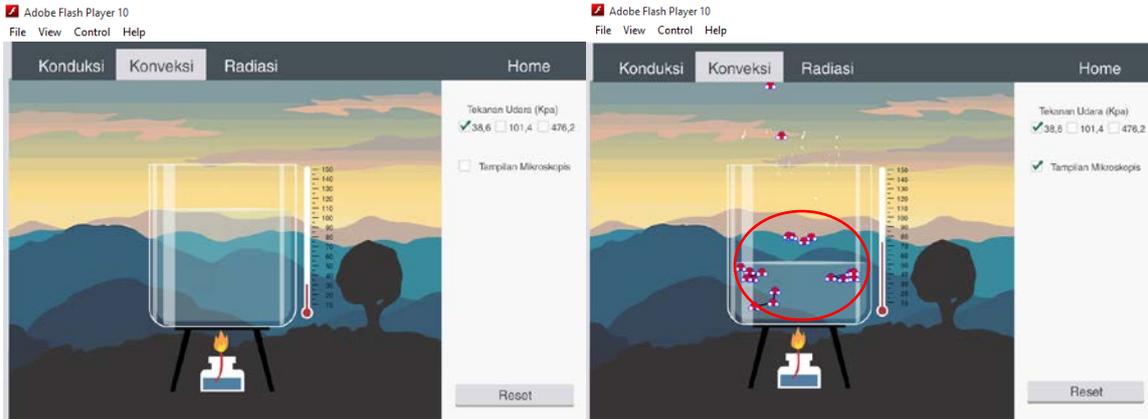
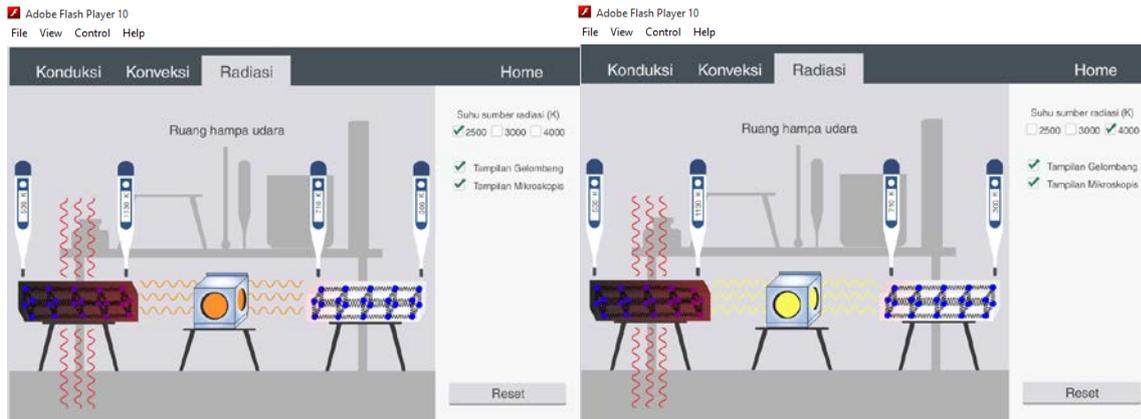


Figure 4. VMS convection: microscopic of heat the water in the mountains (38,6 Kpa)



Figure 5. VMS convection: microscopic of heat the water at the beach and (101,4 Kpa) and (476,2 Kpa)

Figure 6 is a radiation image VMS media, these simulations explain how radiation with electromagnetic waves do. This simulation shows wave source toward premises exposed to intense radiation difference of temperature, 2500 K, 3000 K and 4000 K. The constituent particles move in this simulation the show with detail as well as the most important part of this is to explain the microscopic simulations.



**Figure 6.** VMS radiation: microscopic of the material is heated to a temperature of 2500 K and 4000 K

Learning strategy use VMs for learning the physics-oriented conception of the material conversion of heat transfer with the following characteristics: (1) display the physical processes of heat transfer in microscopic and macroscopic and as closely as possible with the actual process; (2) accommodate the student misconceptions in the material of heat transfer; (3) includes a simulation of the phenomenon of conduction, convection, and radiation; (4) using a constructivism understands that covers the process of assimilation and accommodation; and (5) give the expansion of the learning experience (extension), in order to strengthen the construction of conceptions on students.

### Data Analysis

The classification of categories set five by She and Liao (2010) in Table 2 were used to analyses the data obtained from the heat transfer concept. The scoring of the text was achieved by the evaluation of the data in the first tiers, second tiers and three tiers.

The students' written responses to open-ended question items were analysed quantitatively. The analyses showed students' understanding (pre-, post-, and retention-test) and changing their understandings from pre-, post- and retention test. As analysis procedure, we used three-stages in early outlined, firstly, the researchers began with repeatedly read the students' written responses (pre-, post-, and retention-test). After that step was the advance of a common conceptual understanding rubric that useful to all items and then item specific rubrics consistent with key concepts of heat transfer. The qualitative data collected from students' responses to the items were quantitative into a numerical score based on the item-specific rubrics. This numerical score represented the students' level of conceptual understanding about heat transfer. In order to use statistical analysis for students' conceptual understanding scores, the normal distributions of data were not met for their scores. As a result, nonparametric statistics of Wilcoxon Signed Rank Test used to check significantly difference for their conceptual understanding scores on the pre-, post-, and retention tests. Next, the quantitative content analysis including five categories (given in the Table 2) based modification from She and Liao (2010).

**Table 2.** Quantitative analysis categories

Category	Representation
Progress (PG)	coverage the student's conceptions improved
Maintain-Correct (MC)	degree to which the student's conceptions be maintained correctly
Maintain-Partial Correct (MPC)	degree to which the student's conceptions be maintained as partially correct
Maintain-Incorrect (MIC)	degree to which the student's conceptions be maintained as partially incorrect
Regression (RG)	degree to which the student's conceptions regressed

However, analysis representation of the change of students' conceptual understanding as elicited in students' written responses. The number of conceptual change was described by respective percentages for PG, MC, MPC, MIC, and RG from pre-test to post-test and from post-test to retention test.

### Analysis of conceptual understanding score

To explore the effectiveness of the virtual microscopic simulation (VMS) on the students' conceptual development of heat transfer, statistical analysis was performed and given in the Table 3. The results indicated that there was a statistically significant difference with overall pre-, post-, and retention-test scores of conceptual understanding on heat transfer. The results of Post hoc analysis with Wilcoxon signed rank test indicated that the students through a great progression of their conceptual understanding of heat transfer considering from pre-test to post-test and the post-test score was significantly better than the pre-test, show  $Z: -4.33, P(\text{post} > \text{pre}) < 0.012$ .

Besides, a great progression of their conceptual understanding was established on a discrepancy between pre-test and retention-test scores, and the retention-test score was significantly better than the pre-test, show  $Z : -4.33$ ,  $P(\text{post}>\text{pre}) < 0.012$ . Though, they too ended a slight reduce of conceptual understanding scores from post-test to retention test and its difference was also significantly, show  $Z : -2.27$ ,  $P(\text{post}>\text{pre}) < 0.023$ .

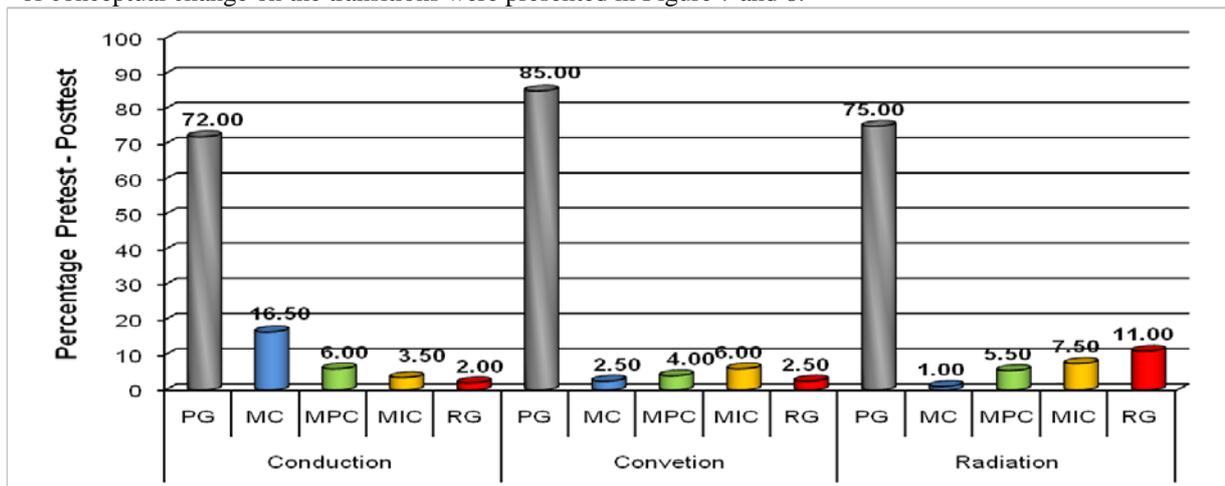
**Table 3.** Statistical results of Wilcoxon sign rank test of conceptual understanding

Types of Tests		SD	Mean (max. = 20)	Mean Rank	Post hoc comparison
Protest	(a)	3.02	8.15	1.38	(b) > (a)*
Post-test	(b)	2.84	17.25	2.58	(b) > (c)*
Retention test	(c)	2.95	11.65	2.18	(c) > (a)*

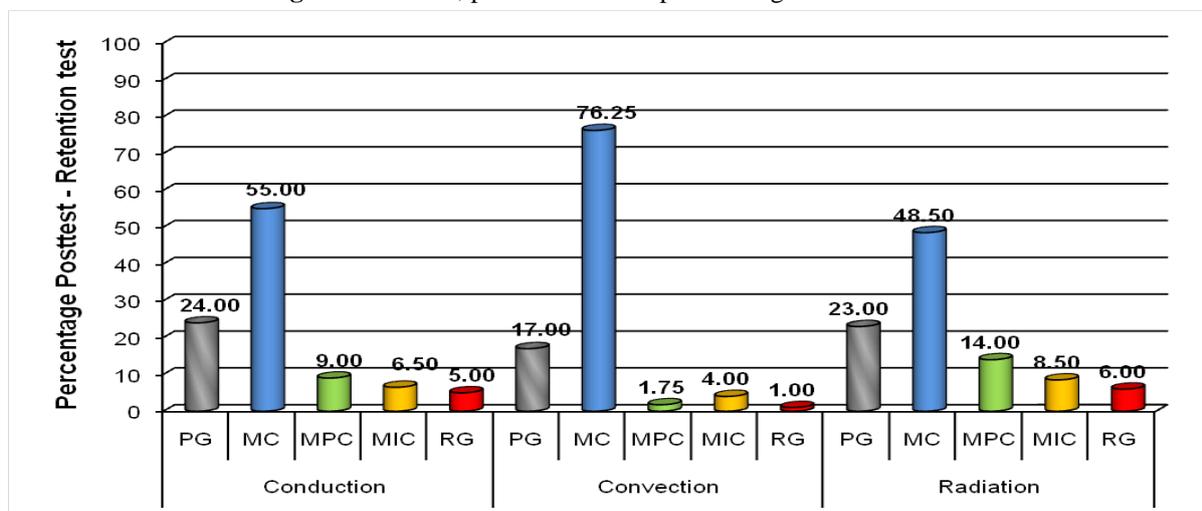
In summary, Table 3 indicated that there was a statistically significant difference among overall pre-, post-, and retention-test scores of conceptual understanding on heat transfer. The result indicated that the students' conceptual understanding showed significant improvement after simulating by the VMS (as of 8.15 to 17.25), other than they ended a slight reduce as of post-test to retention test (as of 17.25 to 11.65). Post hoc analysis with Wilcoxon signed rank test conducted with adjustment applied and the results indicated that the students blot a great progression of their conceptual understanding of heat transfer from pre-test to post-test and the post test score was significant.

#### Analysis of conceptual change category

The effectiveness of VMS on the students' conceptual development on heat transfer was also investigated in this study. Five categories (PG, MC, MPC, MIC, and RG) were used to interpret a transitional change of students' conceptual understanding from pre-test to post-test and post-test to retention test. The percentages of the quantity of conceptual change on the transitions were presented in Figure 7 and 8.



**Figure 7.** Pre-test, post-test of conceptual change on heat transfer



**Figure 8.** Post-test-retention test of conceptual change on heat transfer

Figure 7 to pre-test post-test of conceptual change on heat transfer, the percentage of the Progress (PG) category

was higher than any other category. The conceptual change on conduction concept percentages was for Progress (PG) 72.00, for Maintain-Correct (MC) 16.50, for Maintain-Partial Correct (MPC) 6.00, for Maintain-Incorrect (MIC) 3.50, for Retrogression (RG) 2.00 respectively. The conceptual change on convection concept percentages was for PG 85.00, for MC 2.50, for MPC 4.00, for MIC 6.00, for RG 2.50 respectively. The conceptual change on radiation concept percentages was for PG 75.00, for MC 1.00, for MPC 5.50, for MIC 7.50, for RG 11.00 respectively. This result indicated that there was an understanding development of the students after learning to use the VMS.

Figure 8 displayed the percentages of the quantity of post-test retention test of conceptual change on heat transfer. The conceptual change on conduction concept percentages was for PG 24.00, for MC 55.00, for MPC 9.00, for MIC 6.50, for RG 5.00 respectively. The conceptual change on convection concept percentages was for PG 17.00, for MC 76.25, for MPC 1.75, for MIC 4.00, for RG 1.00 respectively. The conceptual change on radiation concept percentages was for PG 23.00, for MC 48.50, for MPC 14.00, for MIC 8.50, for RG 6.00 respectively. This result indicated that there was consistency of student understanding after learning to use the VMS.

## CONCLUSIONS

This research informed the impact of innovative teaching method called Virtual Microscopic Simulation (VMS) for the development of students' 'conceptual understanding' of heat transfer by showing the cognitive process of conceptual change (misconception). The result showed the increasing of students' conceptual understanding scores from pre-test, post-test, and retention test to statistically significant effect across three concepts of heat transfer. This indicated that the teaching method effectively helped student construct a more scientific view of heat transfer. The result is consistent with the research findings that students performed better achievements with learning from computer simulation (e. g. Savinainen and Scotr, 2002; Atasoy and Akdeniz, 2007; Spyrtou et al., 2009; Macabebe et al., 2010; Saglam-Arslan & Devecioglu, 2010; Kaewkhong et al., 2010; She, 2003; She, 2004b; M Trundle & Bell, 2010; iklopoulos & Natsis, 2011; Dega et al., 2013; Djanett et al., 2013). The results showed that the percentage of the progress (PG) category was higher than another category.

In addition, students' conceptual change in this research was a deep process of reconstructing students' alternative conceptions into scientific conception, called radical conceptual change, and the process of conceptual change could be encouraged by the promoting with VMS.

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# **Co-Operative Education Guidelines: Architecture Degree Program, Phranakhon Rajabhat University**

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## **ABSTRACT**

This research on the Co-operative Education Guidelines: Architecture Degree Program of the Faculty of Industrial Technology, Phranakhon Rajabhat University has an objective to study the guidelines of the curriculum development, a co-operative program based on (1) the organizing of a participatory learning process to achieve the standard knowledge, and (2) the professional skills practicing from real experience through multilateral cooperation between educational institutions, establishments and the Council of Architects of Thailand. The researcher has surveyed the need from “establishment samples” which employ the architect graduates in 2014-2015. The data from 22 of 25 samples or 88% shows that: the graduates’ performance assessment in term of knowledge and ability was at the highest level, that was 81.7% average; the result from the need analysis of characteristics and qualities of desired performance graduates in term of 6 areas of learning result, shows the establishments’ priorities as follows: (1) working skills, (2) self-concept, (3) cognitive skills, (4) cognitive performance, (5) moral, ethics and professional ethics, (6) numerical analysis skills, communication and use of technology.

The Co-operative Education Program using Tyler's developed curriculum includes (1) the curriculum design, (2) the content frameworks, the participatory learning processes, (3) the professional skills training, and (4) the learners’ learning outcomes. After that the draft curriculum was raised. Then five experts were selected for consensus based on 5 criteria. If the consensus meets the criteria, it can be assumed that the projected issue is indeed occurring.

Moreover, the Thin Sandwich developed curriculum is a co-operative program that switches students to continuous learning throughout the course, a module system bringing related content courses together, a link of knowledge from the classroom to work, a project-based 20 problems, and then requested the 4<sup>th</sup> year students to choose cooperative education 6 (not less than 540 credits) before entering the job position of an architect practitioner at the establishment for at least 4 months.

At this stage, advisors are available to assess the students’ competency in the job by shadowing. The proportion of the evaluation is from 80% and 20%. Finally, in the final semester, students prepare their Thesis proposal in Architecture 8 (24-0) before graduation.

## **INTRODUCTION**

The Co-operative Education is a system that offers instruction in schools, in contrast to the work of students in a systematic way by cooperation between establishments and educational institutions. Cooperative education is an educational system that combines learning with practice. Focusing on the student work in the workplace, switching to theoretical classroom lessons before graduation and enter into their career is to promote the quality of graduates and to meet the quality of the establishment.

It consists of two major concepts: 1) the recognition of the career importance career development and entry into graduate work systems. (2) The development of the quality of graduates according to the professional standards meeting the needs of the labor market according to the "learning by doing" principle. Architectural Revised Edition 2013 Phranakhon Rajabhat University is a 5-year undergraduate degree program that has been accredited by the Council of Architects.

The purpose is to produce a professional architect by adhering to the principles of developing the knowledge and standards of professional skills and starting the first course. In the year 2004, the curriculum was revised twice in the year 2006 and BE 2556. The curriculum was organized according to the National Higher Education Curriculum Framework, 2009 to the present.

In the year 2018, the "Architecture Curriculum" will need to be updated. This is in accordance with the announcement of the Commission for Higher Education, “The Guidelines for the Implementation of the National Higher Education Curriculum Framework, 2009”. The Board of Directors has agreed to develop the curriculum

in co-operative education. Focusing on integrating the learning with professional work in architecture and preparing students to have the potential to enter professional practice in quality to create the desirable characteristics of graduates to meet the needs of graduate users and in accordance with the Council of Architects' Committee on Architectural Standards in Architectural Regulations, Council of Architects, on -the certification of a bachelor's degree and a certificate in the field of Architectural Controls, 2002.

The research on "Co-operative Education Guidelines: Architecture Degree Program, Phranakhon Rajabhat University" was designed to develop curriculum to integrate learning with continuous learning throughout the curriculum, based on the "learning from doing" principle, Experiential learning, Authentic learning, and Project-based Instruction. This must be in accordance with the establishment's context. It resulted in the development of graduate quality according to academic standards, and profession needs of the country labor market.

## **THE STUDY**

### **Research objective**

The objective of this research aims to guide the Co-operative Education and development of Bachelor of Architecture, Phranakhon Rajabhat University to integrate learning with continuous learning throughout the course.

### **Research scope**

Guidelines for Co-operative Education Guidelines: Architecture Degree Program, Phranakhon Rajabhat University is to develop the curriculum in accordance with the Bachelor Degree Standard Requirement notification, the Ministry of Education, 2015, and the Framework for National Higher Education Qualifications 2009 (Thailand Quality Framework, TQF), and the Regulation of the Council of Architects (Thailand)

### **Sample population**

1. The population is the total of 364 establishments in the Bangkok metropolitan area and the metropolitan area registered as juristic members of the Council of Architects.
2. The sample are from establishments in the Bangkok Metropolitan and Vicinity and are registered members of the Council of Architects' Juristic Personnel and 25 graduates in the academic year 2014-2015.

### **Research implementation**

#### Phase 1: Basic Information and Research

1. Study documents related to curriculum and curriculum development with content analysis.
2. Conduct a performance evaluation questionnaire / questionnaire for desirable traits and competencies.
3. Take the survey to 5 experts for an index of content validity. Then improve the question, according to expert opinion.
4. Send the survey to the sample establishments to answer the questionnaire.
5. Use the data obtained from the questionnaire to analyze the mean, percentage and standard deviation to find the results of the performance evaluation of the graduates and the results of the evaluation of the characteristics of graduates and the desirable performance of the establishments.

#### Phase 2: Curriculum Development

Using of Tyler's curriculum development model with Futures Research:

1. Set up a group of experienced and knowledgeable specialists in each area to develop 6 curriculums, including 2 course lecturers, one curriculum expert and one teaching expert, one cooperative education expert, frame expert. 1 National Higher Education Quality Award, one of the Council of Architects.
2. Identify the issues that will be collected in Tyler's curriculum: 1) The purpose of the course, 2) The learning process, 3) The experience, 4) The assessment of the learner.
3. Bring all four issues to a semi-structured interview in the form of open-ended and non-directed questions. (Non-directive Open Ended) and collect data from the interview using Cumulative Summarization Technique.
4. Bring the data from the interviews to analyze and synthesize to form a closed-end questionnaire to collect data from the experts in the second round and analyze trends towards the central and distribution.
5. Perform data analysis. To find a consensus based on a criterion using a 5-level median with a median of more than 3.5, the range between quartile 3 and quartile 1 is less than 1.5, and the difference between median and normality does not exceed 1.0. If the consensus meets the criteria, it will conclude that the projected issue will definitely occur.
6. Focus Group with 11 lecturers and instructors, to comment on the curriculum development.
7. Bring the information obtained to develop the curriculum. To comply with the Notification of the Ministry of Education Regarding Criteria for Bachelor Degree Programs, 2015, Framework for National Higher Education Qualifications 2009, and the Council of Architects.

8. Organize the draft curriculum. There are representatives from the establishment as a total of 8 users and then commented to analyze the content. To improve the course completely.
9. Prepare summary and report of research results.

## FINDINGS

Results of the sample survey shows that the graduates in 2014-2015 from 22 establishments out of 25, representing 88 percent.

1. The average performance of the graduates is good. The mean score of 78.67% was very good. The average score of 81.7 percent was classified as

- 1) Fifty-two got 80% (Very good)
- 2) Thirty-two got 32% (Good) and
- 3) Less than sixty-five got 16%

which corresponds to a survey of 61% of establishments that indicated their willingness to work in the office.

**Table 1:** Performance Appraisal of Graduate Graduates in Academic Year 2014-2015.

Items	Year 2016 (%)
Work Achievement	74.3
Knowledge and Ability	81.7
Responsibility	78.8
Personality	79.9
The desire for students to work in office	61

2. The Result of the desirable characteristics of Graduates from the entrepreneurs shows that the needs and characteristics according to the course achievement goals are as follows:

- 1) Skills
  - 2) Attitude
  - 3) Knowledge
  - 4) Moral and professional ethics
  - 5) Numerical Analysis Skills
  - 6) Communication and use of technology
- (Details as shown in Table 2.)

**Table 2:** Desirable characteristics and competencies of Graduate Entrepreneurs Candidates Completed in Academic Year 2014-2015.

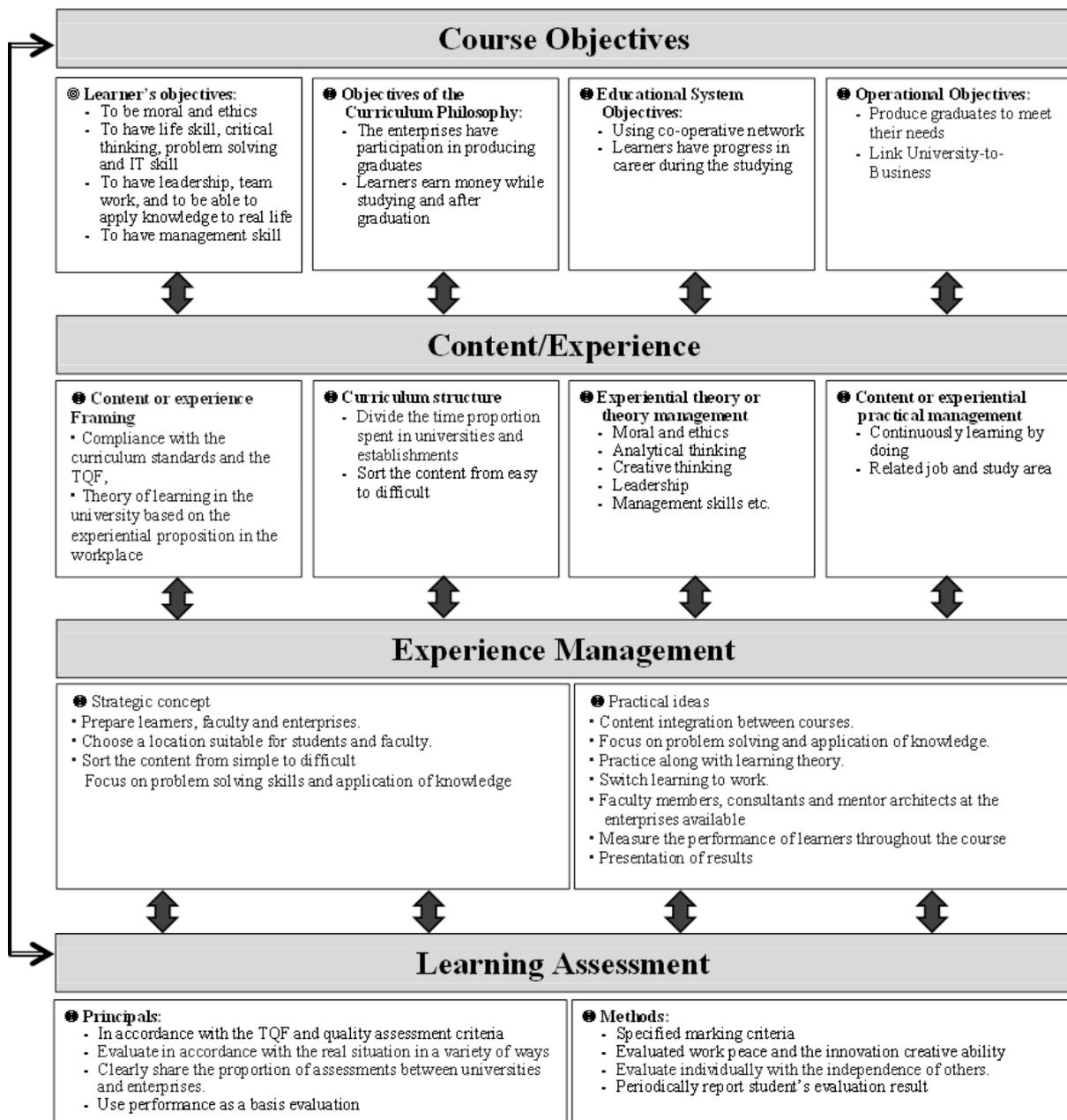
Priority	Features	The graduates' desired characteristic
1 <sup>st</sup>	Skill	The ability to practice professionally. The creativity of architecture applying, such as building techniques. The modeling. The quality presentation and presentation skills.
2 <sup>nd</sup>	Self-Concept	The good attitude to work. The responsible for duty. The interactions. The coordinate communication with colleagues. The self-development in all aspects.
3 <sup>rd</sup>	Cognitive Skills	The assigned tasks priority. The correct assigned task communication. The way to think of a systematic solution.
4 <sup>th</sup>	Knowledge	Principles and theories in the field of architecture. Architecture growing.
5 <sup>th</sup>	Moral, and professional ethics	Being honest, disciplined, punctual and self-responsible.
6 <sup>th</sup>	Numerical Analysis, Communication and Technology Skills	The critical and appropriate use of information technology.

## Principles and Concepts of Co-operative Education in the Bachelor of Architecture Program, at Phranakhon Rajabhat University

Co-operative Education for Integrating Learning with Curriculum Work has some important elements in Tyler's format: (details as shown in chart 1).

1. The aim of the cooperative education program is to focus on integrating learning and working, which is aimed at the learner. Purpose of Philosophy Educational Management System Purpose and Purpose of Implementation.
2. The content and experience needed to provide the learners with the curriculum structure, the framing of the content and experience, the content management and the theoretical or experience, and the content management and practical experience.
3. Forms and methods of organizing learning experiences include strategic concepts, and practical ideas.
4. Evaluation of learners' learning includes principles and evaluation methods.

Chart 1: Principles and concepts of co-operative education in the Bachelor of Architecture program.



**Co-operative Education Model for Integrating Learning with the Work of the Bachelor of Architecture Program Architecture Phranakhon Rajabhat University.**

The format of the instructional plan is "Thin Sandwich" by switching to continuing education throughout the course. Organize module learning (Module) by bringing together related content courses. There is a linking of knowledge from the classroom to the work by doing the course. Project-based Learning includes 20 propositions.

The fourth year students choose to study co-operative education 6 (not less than 540) to work in the position: architects practice at the establishment for at least 4 months, there is an advisor to monitor the competency of the students. Job Shadowing divided the proportion of teachers by 80% and 20%. Then, in the final semester, students must prepare a Thesis in Architecture 8 (24-0) before graduation. (See chart 2).

**Chart 2:** The instructional plan is "Thin Sandwich" Course.

Year/ Academic year	Semester 1			Semester 2		Semester 3 (Summer)	
Year 1	Pre-course	Office	Basic and Architectural Profession foundation courses		Basic courses + Architectural Profession Courses		Volunteer
		ACT	Basic design		Architectural Design 1	PBL -1	
				Building Construction 1	PBL -2		
Year 2	General Education+ Architectural Profession			General Education+ Architectural Profession		Volunteer (The Association of Siamese Architects under the Royal Patronage, ASA)	
	Architectural Design 2		PBL -3 PBL -4	Architectural Design 3			PBL -6 PBL -7
	Building Construction 2		PBL -5	Building Construction 3		PBL -8	WBL (MOU)
Year 3	Architectural Profession			Architectural Profession		WBL & Practicum	
	Architectural Design 4		PBL -9 PBL -10	Architectural Design 5			PBL -12 PBL -13
	Building Construction 4		PBL -11	Building Construction 5		PBL -14	Thin sandwich
Year 4	Architectural Profession			Architectural Profession		WBL	
	Architectural Design 6		PBL -15 PBL -16	Architectural Design 7			PBL -18
	Building Construction 6		PBL -17	Building Construction 7		PBL -19	Plan A Internship
	Plan A	Plan B		Community base learning	Thin sandwich	Plan B Cooperative Education	
Year 5	Architectural Profession			Architectural Profession		Graduation Architect License Examination	
	Plan A	Architectural Design 8	PBL -20		Architectural Thesis		
	Plan B	Cooperative Education					

**DISCUSSIONS**

Based on the research results the researcher has found that it is in line with the harmonious mix of classroom work experience and classroom learning (Kramer, M. and Usher, A., 2011: 1), Academic and Professional under the working environment that is part of the curriculum (Franz, J., 2007).

There is an opportunity for students to apply and integrate the theoretical knowledge gained from their learning and practical experience in real-world workplaces (Martin, A. and Hughes, H., 2009: 8. However, the researchers also have the expectation. Interoperability between universities Establishment and Council of Architects To prepare standards for students to enter the cooperative education process.

The roles and responsibilities of co-operative advisors and cooperative education personnel are defined, including networking with a ready-to-go cooperative education facility. This will be beneficial and will result in the development of graduate quality in accordance with professional standards according to the curriculum objectives.

**CONCLUSIONS**

Research Results, Co-Curricular Guidelines for the Architecture Program Phranakhon Rajabhat University factors that influence the co-operative development of the curriculum are as follows.

- 1) Develop students' knowledge and skills to suit professional practice.
- 2) Preparing the readiness of schools and enterprises. Especially the availability of students. Advisors and Architects.
- 3) Establish standards and management systems for cooperative education within enterprises.
- 4) Creating academic and professional networks to support cooperative education.

There is an integrated guide to co-operative education in the curriculum. There should be a restructuring of teaching and learning as a project based learning approach for cooperative students to "learn from doing" by delegation. "Architectural Design" is a real project in the establishment with a mentor and a nanny caretaker.

By the results of the implementation of the project: students can apply to the thesis layout course and the course of theses in architecture. In addition, they have enhanced their professional knowledge. In the CPD and academic institutions it should be counted as the academic or research task of the teacher to determine the academic position.

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# Corporate Social Responsibility Managers and Their Decision Making

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## ABSTRACT

Corporate social responsibility managers define and oversee the objectives related to sustainable production, environmental protection, the wellbeing of employees and positive impact on local communities and society as well. Their decisions influence how enterprise and their stakeholders can benefit in a socially responsible way. This article is trying to draw attention that CSR evaluation and reporting enable to sustain the CSR decision making process. It is based also on the empirical findings from the preliminary survey carried out among Slovak companies focusing on managers and their relation to make CSR decisions.

**Keywords:** corporate social responsibility, management, decision making, reporting

## INTRODUCTION

Corporate social responsibility (CSR) is a “topic, which has already become an inseparable part of modern management theory and praxis” (Remišová, 1999). Corporate social responsible enterprises are highly motivated and keen to make sure that their productions, business, processes, and products are sustainable, ethical and environmentally friendly. „The changes in economy, new technology, innovation as well as other factors such as globalization and sustainability influence the whole society” (Lorincová, Hitka, Balážová, 2016). Enterprises are not isolated economic entities, but they influence and they are influenced by a broader group of stakeholders (community, society). Growing pressure to increase enterprise’s performance both now and in the future demands managers with the ability to define performance goals develop a relevant CSR project (its scope, schedules, budget, etc.) and manage it. They ought to be able to detect and analyse emerging issues, prioritize complex initiatives and make decisions to impress enterprise’ CSR strategy, maximise its profitability and increase the positive impact to an enterprise’s surrounding. The CSR expert Alberto A. Pinillos says, that the CSR manager’s responsibility is “to identify ahead of time the social and environmental risks or opportunities that may not be relevant in the near term, but will be so in the medium to long term — and then place them in front of the appropriate organizational decision makers.” This requires the ability to work either independently either collaboratively with top managers on the strategic level and department leaders on the tactical and operational level of management.

The significant question that scholars and professionals have been trying to answer is not “Why enterprise (should) implement CSR? “but “How does enterprise engage in CSR? “ Consecutively there is a discussion, that what is more important: to hire a high skill CSR manager or to educate all managers of the enterprise in the field of CSR? Evidently to find the right answer we should distinguish between the short run, when enterprises still have a lack of these professionals and long run, when we need to get CSR to the enterprise’s culture. When we analysed the current labour market the demand for CSR managers is growing as more and more stakeholders are becoming aware about issues concerning climate change, sustainability, human rights and the impact of the enterprises to their surroundings. These altruistic endeavours provide not only positive image for the enterprise, but also bring

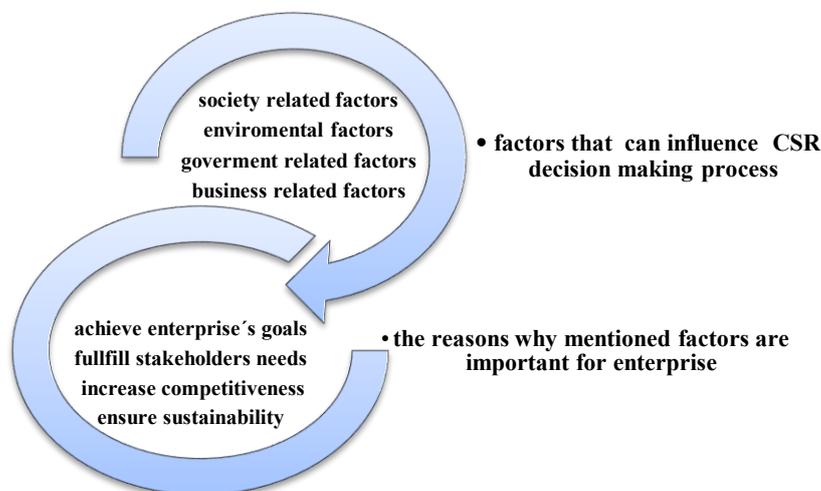
benefits for business in the long-run. Currently these are, the more required CSR manager's knowledge and skills in Slovak enterprises:

- to create and implement corporate social responsibility strategy on the whole level of management,
- to communicate and educate corporate social responsibility on top level, middle level and of course on the first level of management,
- to set up CSR goals and objectives, because the primary purpose of a business is to maximize profits for its owners or stakeholders while maintaining corporate social responsibility.
- to create and develop CSR activities encompassing community, workplace, environment and marketplace topics,
- to establish partnership programmes and CSR network to engage stakeholders and develop relationships with them, etc.

The above mentioned skills are only sprigs what are expected actually from CSR managers. Our point of view is that today's CSR managers should educate all managers of the enterprise to make their decisions in a corporate social responsible way. This is a reason why our pilot survey was focused to identify what are the main factors which can affect CSR's managerial decisions. The authors of this article assume that by understanding these factors managers can be encouraged to act more responsibly. Our pilot survey is just the first step to be done to obtain all immediately available information about the relevant issue. The primary objective was to identify both CSR and decision making aspects and collect information from real business conditions.

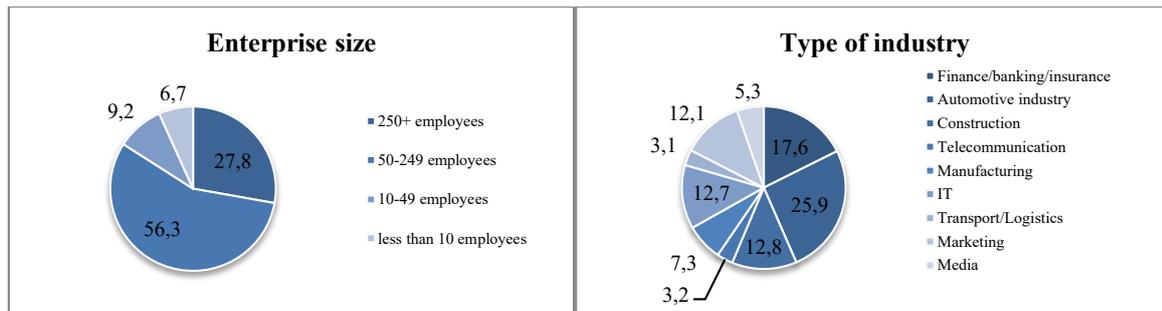
### SURVEY AND FINDINGS

We know, that wide range of stakeholders making their everyday economic decisions. Managers also face decisions, but sometimes make unsustainable choices. What can their decision making process towards CSR improve to make it more effectively? Our preliminary survey is reflecting opinions of 89 managers (12 CEO, 26 CSR practitioners and other managers on the middle level) from Slovakia and Romania. The survey was undertaken from September 2016 to May 2017 using a semi-structured questionnaire and interviews. Our questions issued from basic definitions of CSR and decision making (Fig. 1). Authors understanding of CSR is closely linked to definitions such as "Social responsibility is the obligation of decision makers to take actions which protect and improve the welfare of society along with their own interests" (Davis, 1975) and "Corporate social responsibility encompasses the economic, legal, ethical, and discretionary (philanthropic) expectations that society has of organizations at a given point in time" Carrol (1991). Drucker (1967) says that "whatever a manager does, he does through decision-making" and Trewatha & Newport (1982) argued that "decision-making involves the selection of a course of action from among two or more possible alternatives in order to arrive at a solution for a given problem".



**Fig. 1.** Basic logical relation what can influence manager's CSR decisions

Firstly, we introduce some basic characteristic of the overall sample of respondents and in the following paragraph analyse some responses that were given.



**Fig. 2.** Basic characteristic of overall sample of respondents

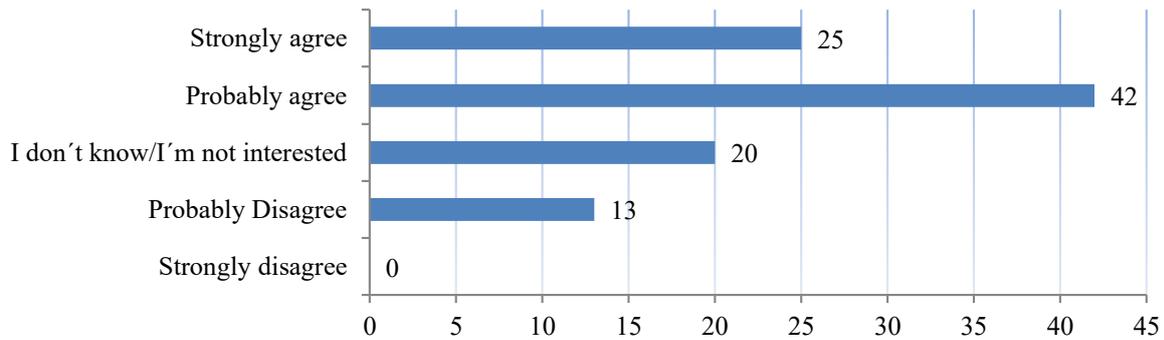
Management science declares that decision making is a cognitive process and one of the most critical processes in every enterprise. Corporate social responsible decisions making brings the opportunity for creating shared value and smart partnering. To make it effective, the information should be gathered thoroughly because all social and environmental decisions must be realized in the context of their economic consequences. And this is the question which factors influence CSR related decision making to allow managers to be simultaneously socially and environmentally responsible and also economically viable.

**Table 1:** The level of importance of related factors influence good CSR related decision making

Factors influence CSR decision making process	Mean value	Rank	Internal/External info
Data about customer CSR satisfaction	4,89	1.	external
Enterprise's CSR performance indicators	4,87	2.	internal
Reporting CSR activities of the enterprise	4,75	3.	internal/external
Education in field of CSR	4,06	4.	internal/external
Knowledge of industry standards	4,00	5.	external
Information about welfare of the local community	3,99	6.	external
Data about employees 'satisfaction and work conditions	3,99	7.	internal
Understanding of link between performance and CSR	3,74	8.	internal/external
Benchmark CSR performance	3,56	9.	internal/external
Public relation of the enterprise	1,56	10	internal/external
Marketing activities and advertising	1,05	11	internal/external

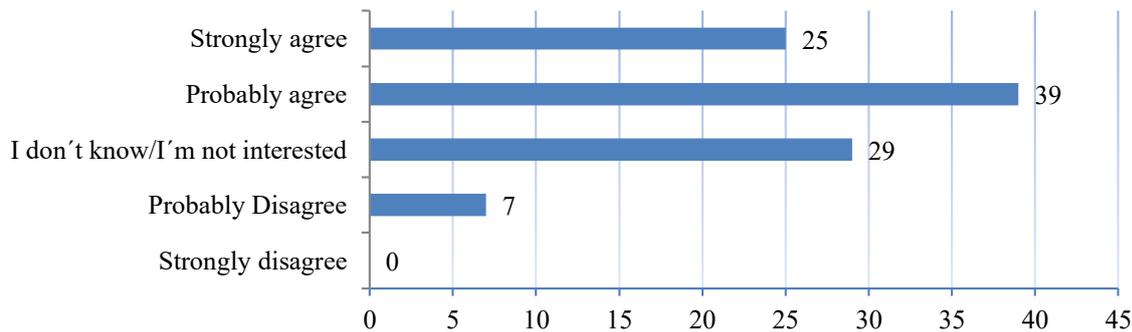
Note: Answer on the 5 point scale with 1= strongly disagree, and 5= strongly agree

Key findings of this preliminary survey (with part 2. interview) are that managers mainly emphasize the role of understanding measurement of customer CSR satisfaction, CSR performance indicators and CSR reporting to bring the enterprise in line as well as developing CSR reports that provides clear direction also in manager's decision making processes. Clarifying enterprise's current portfolio of the CSR initiatives and achieved benefits helps to make other better decisions. On the other hand strong influence of advertising to CSR decision making process hides potentially dangerous if it proves a gap between the enterprise's statements and actions. CSR in all concerned enterprise permeates almost every decision taken by managers. All top issues belong to the economically-bound issues, where "financial literacy belongs to the most important competencies" (Kozubíková, 2016) As you can see marketing activities and advertising aspect are ranked as the least important issues influencing good CSR related decision making.



**Fig.3.** Survey results: Do you think that EU Directive on non-financial reporting has a positive impact the quality of CSR decision making?

Reported data in Fig. 3 shows that 67% (42+25) of managers agree, that EU Directive on non-financial reporting has a positive impact the quality of CSR decision making. It shows that managers think that there is a strong interest to get qualitative data for decision making.

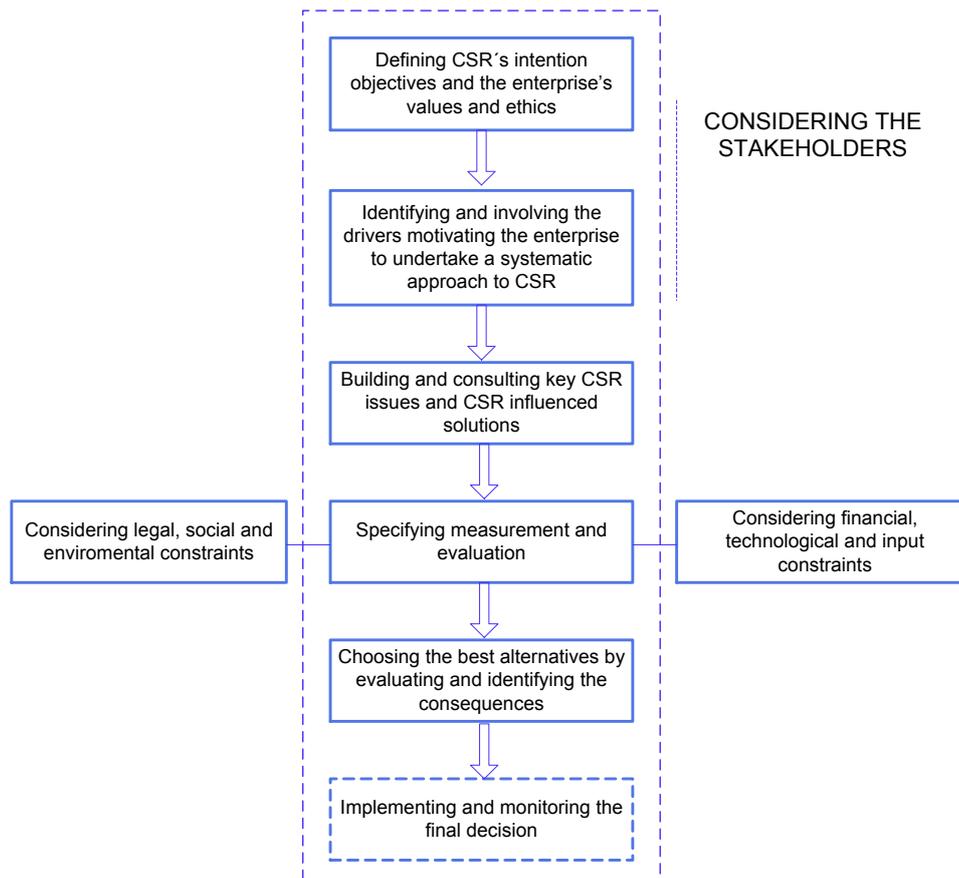


**Fig.4.** Survey results: Do you think that there is a positive relationship between CSR and corporate financial performance?

To underlay results in Fig. 4 even some empirical studies detect curvilinear (U- shaped) relationship between corporate social responsibility and corporate financial performance, but more common are those with positive relationships (e.g. Rodgers et al. 2013, Erhemjamts et al. 2013, Margolis, Elfenbein and Walsh 2007)

## DISCUSSION

As corporate social responsibility is a dynamic concept evolving along social norms, it must be included in decision making processes through all the enterprise. “The decision makers would be helped by having available a general well-researched list of factors for some of their complex decisions in order to have greater assurance that their decisions are comprehensive and right. To do that, they must have wide exposure and be familiar with the full spectrum of human values and environmental opportunities.” (Saaty, TL, Begicevic, N., 2010)



**Fig. 5.** CSR's managerial decision- making process

It means that not only CSR manager's decisions making processes are influenced by external and internal factors, but all CSR related strategic and operative decisions and activities implemented in the enterprise. Different stakeholders with varied typologies and power affect choices when managers are prioritizing CSR requests. Fig. 5 is showing our suggested CSR's managerial decision- making process. As time and resources are limited, managers should concentrate to areas where business notably interacts with society. Then by understanding issues both from a business and a societal side the creations of mutual value are easier. Long-term relationships with right partners (stakeholders) bring a greater opportunity to apply win-win strategy and achieve substantial benefits. Managers who want to make right CSR decisions need to have a long-term mind-set backed up by measurable commitments and actions. To choose the best alternatives managers can use the balance sheets. All these activities must consider the stakeholders. Unfortunately, managers often forgot that "economic policy has an essential impact on the process of managerial decision making" (Malichová at al., 2016) even on daily routine work. Examples of bad decisions are e.g. that "controversial environmental donation policy led to the devastation of large areas of arable land, a worsening of food availability and unprecedented market distortions among other things" (Klieštiková, Križanová, A., Čorejová, T., Král, P., Špuchl'áková E., 2017). Certainly managers should try to balance any cost of decision with any benefits, it means to focus on where extra expenditure is necessary in order to make a decision in a social responsible way, against the savings and /or benefits that accrue from these same approach. "The purpose of these is an effective use of potential resources and their rational investment, an effective sourcing from surrounding economic area and their usage and to eliminate business risks "(Chodasová, Tekulová 2016). This background is important e.g. in decision –making process related to:

- impact on costs of adding a new product or service feature in a social responsible way,
- reducing the enterprise's carbon footprint or other negative environmental impact,
- return of investment in green technologies or other social or environmentally indicated research,
- good relationships with suppliers, who treat their staff fairly,

- reducing outgoings by cutting down enterprises' consumption of valuable resources,
- impact for better recruitment process by attracting the best candidates,
- interaction with actual employees, securing staff safety and satisfaction,
- cooperation and impact on local communities,
- minimization of energy consumption,
- establishing charity partnership programmes,
- etc.

## CONCLUSION

The enterprise's interactions and interdependencies with society are many and complex. However, long term commitments of corporate social responsible approach bring significant business opportunities. The tests for all managers are whether they can make decisions which meet the challenges and impact that lie ahead for the enterprise in a socially responsible way. It is important for enterprise to strengthen the business by contributing to society simultaneously. We believe that CSR related and influenced the decision process will become a part of routine business interactions and practiced everywhere to create value for both business and society at the same time. It's helping also creatively address key business issues and strengthen business.

## ACKNOWLEDGEMENT

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## **Cosmetic Products And Our Health**

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### **ABSTRACT**

Throughout human history, the pursuit of beauty has become an indispensable part of society. Among these pursuits are various cosmetic products with herbal and chemical content. Cosmetics comes out as an indispensable product of modern society; because it completes our life, makes us feel good, even directs our life and has various effects. Cosmetics are spreading to a wide range of shaving products, which are part of men's everyday life, from women's makeup products, soaps to toothpastes, colones to perfumes, skin care products to shampoos. These products, usually used without regard to the chemical substances in their content and targetting mostly women, negatively affect our health when used unconsciously. The most important one of these effects is 'toxicity'.

In this sense, the most striking materials (heavy metals, hair dyes, hair lighteners, powders, nanotechnology products, parabens) are emphasized. In this study, the health effects of certain chemical substances in cosmetics products, which should be legal regulations such as drugs, were discussed with current researches and aimed to increase the awareness of the society (especially women) on cosmetics products.

In order to avoid these substances, which negatively affect our health, it is firstly necessary to raise awareness and consciousness of both health professionals and consumers of cosmetic products. For this reason, it is recommended that health professionals integrate cosmetic products and health effects into vocational training programs, raise awareness of legal regulations and sanctions on consumers concerns.

**Key words:** Cosmetics, Toxicity, Health Problems, Awareness

### **INTRODUCTION**

Cosmetics are all kinds of products, which are used to change the appearance, smell, clean, protect ; including hand soap, deodorant, sun cream and lotions, lipstick, nail polish, makeup material applied to the human body. Used by people to look healthy, attractive and beautiful, these products have become an indispensable part of our life. Helping to have a beautiful, well-groomed and healthy body, cosmetics allow people to feel good about themselves physically and emotionally by raising their level of confidence.

Since beauty and well-being usually make women come to mind, the cosmetic sector has taken this mass as a target. But as the time progresses, the interest of the male group in the cosmetic products has also increased. Increasing the importance of external appearance in the working life, the increasing number of beauty salons and increasing variety of products in the cosmetics market have also increased the consumption of cosmetic products. In addition to looking beautiful and attractive, they have also sought new products to reduce signs of aging. In line with these demands, cosmetic products that reduce lines and wrinkles, prevent coloring, and increase the soft appearance of the skin have started to develop rapidly (Choi,CM.,Berson DS. Cosmeceutical, 2006). However, the content of these products has been supplemented by many and various chemical substances that help heal wounds and assist metabolic processes. It is emphasized that the application of chemical

substances to the skin involves more risks than swallowing. Since the only help that consumers can find out about what kind of a product they are using are the contents, they distinguish harmful substances by looking at them here. As a result of a research on cosmetic use, it has been found that consumer information is under the effect of product label; for example, a product that is claimed to be natural by more than half consumers believes is thought to have natural ingredients (Lewis, 2004). But listing up all the contents is not always doable. According to another research result, 99.7% of the total 7497 care products examined in our country contain at least one chemical substance which has not been researched until now ( The Other Side Of Cosmetic Products, 2012).

### **Danger Related to Cosmetic Products**

One of the dangerous substances in cosmetic products is phthalate (2-ethylhexyl). During pregnancy; anomalies can occur in the fetal reproductive system when encountering phthalate or its monoester metabolites, which are components of many cosmetic products such as nail polish, lotion, soap, cleansers, hair care products and room spray. (Durmaz, Özmert, 2010, Koniecki, Wang, Moody, Zhu, 2011). Products containing this substance can cause infertility, cancer and organ dysfunction. It is also emphasized that the amount of phthalate exposure increases in line with the variety of cosmetic products, and that this affects human health (Russ, 2009). In Europe and America, the use of phthalate, which is found to cause health problems (especially in the reproductive system) is restricted and its use in children's products is prohibited (Koniecki D, Wang R, Moody RP, Zhu J. 2011). A study in South Korea revealed that phthalate was found in 102 products when examining cosmetics in four different categories (hair, care product, deodorant, perfume and nail polish) ( Koo, Lee, 2004). All this data gives us the conclusion that the use of cosmetic products, especially those used by pregnant women, should be controlled. It is also necessary for health professionals to include the health effects of cosmetic products on pre-pregnancy care services.

Chemical substances are used blindly. Consumers need to know the safety dose of the chemical substance they use for their body and to make a consumption in this direction. The fact that in America, where every woman uses an average of 2 kilograms of cosmetic products annually, cosmetics also cause cancer, allergic reactions and birth defects in addition to containing 800 grams of toxic substance; validates the news above. ( The Other Side Of Cosmetic Products, 2010). A report released in September 2002 and supporting the findings of this research was as follows: *The high price of beauty: a study conducted by the US National Institute for Occupational Safety and Health revealed that 800 noxious chemical substances were present in cosmetics. A study of 2,983 chemicals used in cosmetics revealed that 884 of them caused toxic tumors, 218 caused reproductive disability, 314 caused mutation and 376 caused skin and eye related diseases.*

### **Hair Dye**

It has been found that general leukemia risk increases by 50% with the use of hair dye, and by 150% if the exposure time exceeds 16 years. Women who dyed their hair 1-4 times a year have a 70% greater risk of ovarian cancer compared to non-dyed women, whereas for women who dyed 5 times a year or more this risk is above 100%. Some studies have shown that there is a link between hair dye use and non-hodgkin lymphoma (50% more risk).

### **Chemical Events During Hair Color Change**

The hair-color changing preparations oxidize the melanin pigment that gives the hair its color and thereby change it. The change of the color is based on complex chemical reactions. By bringing the color changing agent and the oxidation material together, the agent and the acid by which the hydrogen peroxide preparation is stabilized get neutralized. Now oxygen can be separated. Since the alkaline hair contained in the coloring agent dissolves with strong acids, the oxidizing agent may be effective on hair. The active oxygen, which binds and oxidizes pigments, is separated. In the meantime, some of the hair dye is reduced or chemically changed so that they lose their color. So the color of the hair changes. Alkaline residues must be neutralized and purified from the hair by a final treatment with 33 acid-reacted preparations (Strengthening Vocational Education and Training System Project, Beauty and Hair Care Services, Hair Care Cosmetics, 2007).

### **Paraben**

Paraben is included in many products. Because of its antimicrobial properties, it is used in almost all cosmetic products, food products and drugs. These materials, which are very common in use, are cheap and have low toxicity levels. According to European Cosmetic Direction, the amount of parabens which cosmetics should

contain is determined as 0.4% for single ester and 0.8% for ester mixtures. The paraben group consists of methyl paraben, ethylparaben, propylparaben, isopropylparaben, butylparaben, benzylparaben. Daily use of parabens in cosmetic products is estimated to be 17.76 g in adults and 378 mg in newborns (Int J Toxicol, 2008).

The 1994 risk assessment of the European Commission Food Scientific Committee (SCF, 1994): This risk assessment of the committee in 1994 concluded that methyl, propyl and butyl-parabens showed that there was no genotoxicity in in-vitro and in-vivo mutagenicity tests, and that butyl-paraben did not cause cancer in rats. Reproductive toxicity and teratogenicity studies in rats with 10% ethyl paraben diet did not have a negative effect on reproductive performance. However, it has been reported that even though it is not proven definitively, it leads to some anomalies on the fetus and therefore it is necessary to renew teratogenicity studies. It has been reported in elimination studies that methyl, ethyl and propyl-parabens are well absorbed by the body in metabolism, metabolized by the hydrolysis of ester bonds in very high amounts (approx. 99%), and excreted by urine. Especially in some specific studies with propyl and butylparaben, it has been reported that cytokinesis has increased in the anterior region (there is no such anatomic structure in humans) prior to the mastoids in which the rats store their nutrients. In the light of this assessment, the scientific committee identified a temporary daily intake limit (ADI) of 10 mg/kg for methyl, ethyl, propyl parabens and their sodium salts. The reasons for being temporary are the above-mentioned possible effects on the fetus and the need for further studies clarifying cell proliferation in anterior segment of rats' stomach (EC The Scientific Committee for Food (SCF), Reports of the Scientific Committee for Food, Opinion on p-hydroxybenzoic acid alkyl esters and their sodium salts expressed on 1994).

### **Powders**

They are powdered solid materials used only as a preservatives, and have no therapeutic interest. As carriers, the effects are very weak; they can not provide adsorption and hence penetration, thereby only antimycotic, antibacterial, antipruritic drugs can be added for their superficial protective effect. The main effects are increasing evaporation surface, thus accelerating the evaporation (particularly evaporation of sweat) and reducing moisture. They also reduce the friction and give a slight slippery with the help of simple rotation motion, and they can also provide a protective effect by creating a new layer. Due to these properties, they are used especially to prevent the development of irritation, intertrigo, fungus etc. at points of curling. Since their power is not enough to vaporize such liquid and forms a layer like sloughy pat or mud which is very suitable for bacteria and candida to replicate, they are not used in watery and pale lesions. In addition, inorganic powder particles such as "talc" may also cause foreign body reaction. Even though they can be applied 2-3 times a day, previous wastes should be cleaned. The application is in the form of spreading or buffering to the skin.

The powders can be divided into inorganic and organic (maize, wheat starch) subgroups, but organics are not used commonly as they are quickly deteriorated. In addition to titanium dioxide, bentonite and kalamine; the most commonly used inorganics are talc and zinc oxide. (Aydemir, 1997).

### **Skin Care Products**

The most commonly contact dermatitis occurs due to the use of cosmetics and skin care products. Contact dermatitis results of an inflammatory reaction that either destroys the deep barrier function of these products or causes epidermal damage or immunological events that are related to skin sensitization. 5-10% of side effects due to cosmetic applications are contact dermatitis. It manifests in clinically similar situations. In the applied skin area, subjective symptoms such as itching and burning, as well as erythema, edema and vesicle formation, desquamation, followed by watering and crusting. Scratch formation and erosion may occur in severe conditions. The cosmetics that lead to these reactions are: skin care products (28%), hair care products (24%), facial cosmetics (11%), nail care products (8%), perfumes and fragrances (7%) and sunscreen creams (3%). The most common dermatologic chemical agents found in the contents of these cosmetics are; lanolin, glycerylthioglycolate (content of perm solutions), propylene glycol, toluenesulfonamide (nail polish) and paraaminobenzoic acid (sun barrier cream). The recovery of contact dermatitis depends on the removal of the responsible allergen. In cases where the allergen can not be detected, the responsible substance may be found by performing a patch test. This condition is usually corrected with the use of topical corticosteroids (Adams, Maibach, 1985).

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# Creating a Collective Alzheimer Awareness in Basic Design Education Through Costumes Designed with the Theme ‘Missing Years’

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## ABSTRACT

In the present study, the concept of “memory loss due to Alzheimer” was scrutinized as a design problem in architecture department basic design course, for young individuals to recognize the increasing prevalence of the Alzheimer's disease worldwide and in Turkey and to raise social awareness in the society. Initially, the students discussed how memory loss can be presented as a design. Later, using two and three-dimensional presentation techniques, they turned their designs into material products. In basic design education in architecture, “learning by doing” method was used. The problems presented in Basic Design course are supported not only by the discipline of architecture but by different disciplines as well. In creating the problem presented here, fashion design discipline, which is similar to architectural construction techniques, was utilized. Both disciplines are based on human scale. Furthermore, “Fashion design” was chosen since it is an interesting and intriguing, easily accessible design discipline that people from all walks of life could relate to. The building and production approaches of both disciplines that determine the main construct of design using a concept, are also similar. Construction and production techniques are determined by material/detail solutions. Thus, the students of architecture were asked to design an “Alzheimer’s Awareness Costume with the theme of Missing Years” and to present the costume in a fashion show to arouse interest. The “Awareness Fashion Show/Exhibition,” organized in collaboration with Eskişehir Alzheimer's Association was presented to all at a predetermined venue in Eskişehir urban center.

**Keywords:** Basic design education, Fashion and Architecture, Alzheimer’s Awareness, Spatial/Temporal Disengagement, Items of Forgotten Memory.

## INTRODUCTION

Today, universities focus on their students’ emotional and intellectual development as well as their vocational education. University education no longer tackles with only acquisition of material knowledge, but also focuses on current social problems. Thus, the most prevalent disease of the future, “Alzheimer’s disease” was addressed as a social problem in the present study. The world population is gradually getting older and the average life expectancy is getting longer. The World Health Organization calculated the rate of population over 65 years to the total population as 10% today and predicted the same rate as 16% in 2050 (Arslantaş et al., 2009). According to Turkish Statistical Institute figures, while the rate of the population over 65 to total population was 7.5% in 2012, it was expected that this rate will be 10.2% by 2023, 20.8% by 2050 and 27.7% by 2075 (Ozturk, 2017). Based on this data, universities and all educational institutions are responsible to devise pertinent projects to attract social attention to Alzheimer’s disease and increase collective awareness on the issue.

In design disciplines such as architecture, interior design, industrial design, fashion design, etc., when design is considered as an act of problem solving, the “Basic Design” course provides abstract and conceptual thinking which is the most basic tool of the act of design. Basic design course makes it possible to analyze a given problem, to conceptually deconstruct the same, to reach an abstract plane from the tangible, to produce ideas, and then to return to tangible (Erdogdu, 2016). Especially during the “Basic Design” training in the freshmen year of architecture education, the cognitive formation of the abstract, the development of creativity, critical thinking and perceptual awareness, three-dimensional thinking, are among the most important development of skills. The basic design course studio possesses the most significant contextual weight in time and effect at the beginning of architectural education. The design logic commences to form in this course. In the design studio, it is important to discuss the predesigned products rather than the instruction of design. L. Bruce Archer defined design as systematic research, the knowledge of manmade objects and systems or the determination of the view, composition, structure,

objectives, values and the meaning of the abovementioned objects (Archer, cited by Bayazit, 2004). The designers work with an imagined future reality; the designer describes and creates the non-existent (Jones, cited by Yürekli, 2004). The most important characteristic of the act of design is the need to think about the future and to identify future problems. The designer should learn to strengthen and utilize intuitions and common sense, and thus could 'speculate about the future' (Yürekli, 2004). Recently, the schools of architecture were criticized that they instructed the “basic design courses” in stereotypes, reducing the course into instruction of the form, without improving creative skills. In today's rapidly changing environment, it was argued that there is a need for a curriculum, which constructs a mental structure that can produce flexible, dynamic, and novel probable situations and an inquisition process (Yurtseven, 2011).

In the present study, which continues the abovementioned debate, the utilization of interdisciplinary work in the basic design course was studied. The transformation of the knowledge in different disciplines and theoretical heuristic approaches also affect the final products. Students who discover relational approach to architecture through various disciplines would present their unique designs with their unique presentation methods and would transfer rich cognitive images to the final product in the design process (Avcı, 2011).

In the present study, the discipline of fashion design was selected as an instrument in transferring the memory loss caused by Alzheimer's disease to the design. The main objective of the study was to draw attention to Alzheimer's disease, which is the greatest health and social problem of today and the future, and to contribute to future studies by creating a social awareness on the issue. The fashion design discipline was selected since it has become an important discipline that people from all walks of life could relate to and it is an interesting, intriguing, and an easily accessible design discipline.

The main topic of the present study was the “memory loss caused by Alzheimer's”, and the content was examined theoretically and the problem of “Alzheimer's Awareness Costume Design with the theme of Missing Years” was developed empirically. It was expected that the uncertainty of the problem and the necessity of defining it in detail by the designer, rather than providing a final definition of the design problem, would promote abstract concepts such as intuition, common sense, emotional intelligence, flexibility and creativity. The resulting product, “Alzheimer's Awareness Costume Design with the theme of Missing Years”, was presented in a fashion show, arousing interest.

## **THE STUDY**

Eskişehir Osmangazi University (ESOGÜ) Architecture Department renamed the freshmen “Basic Design” course as “Introduction to Design I and II” studio with a change in the curriculum in 2012. Within the scope of the studio, several basic design problems are discussed throughout the academic year. These design problems are often introduced in a vague structure without sharp limits to improve mental creativity and abstraction skills. The design approach is learned by practicing and experimenting in the studio. Students are asked to produce three-dimensional models using hands-on “learning by doing” method and explain their designs. The overall aim was to develop the “critical thinking and producing approach” of the freshmen architecture students based on their designs. Instead of theoretical instruction, the construction of nurturing concepts in architecture using different disciplines (art, sociology, philosophy, medicine, natural sciences, etc.) and developing a discussion-ideas through these concepts was the basic approach in the Design Studio.

In architecture education, the words studio and workshop are occasionally used synonymously. Hence, it is essential to make a distinction between these two terms, since there are fundamental differences in terms of their implementations. In workshop spaces, student work is revised by instructors and the final products are shaped according to the direction provided by the coordinator. In a hierarchical, canonical structure, a study for a product with a predetermined outcome is the subject matter. Nevertheless, the studio environment is different from such structure with respect to its focus on development rather than the correction of the final product. Accordingly, the work in the studio is criticized and most of the studies are carried out in groups. The student work is expected to be developed according to the criticisms and interpretations of the studio instructors who teach the course together. The hierarchy between students and teaching staff is perceived less and the design process is more important than

the final product (Lang, 1998). Therefore, Introduction to Design course in Eskişehir Osmangazi University (ESOGÜ) Architecture Department is taken into consideration from the viewpoint of a studio.

Once the relevant literature is reviewed, it is possible to observe that two major paradigms play an important role in the development of architectural design education. One of these paradigms is Ecole des Beaux-Arts, which first applied the studio system. In Dewey's early period study at the beginning of the 19th century at Ecole des Beaux-Arts regarding the basic design system in architectural education, it was observed that students discussed the problem in a collaborative manner with their instructors, shared an intensive process and simultaneously experienced the means to design (Tschimmel, 2010). This paradigm was criticized for its formal and stylistic approach to design, which repeats the precedents in the history, for its two-dimensional and symmetric composition approach, and elitist and aristocratic attitude (Uluoglu, 1990). The second paradigm of architectural design education is the Bauhaus school. It is possible to assert that the ultimate difference of the Bauhaus from the Beaux Arts model is to free the student from any kind of conditioning and bring his creativity, imagination, individual expression possibilities to the forefront.

In addition, Itten, the founder of the Basic Design education in Bauhaus, aimed that the student could question the previously acquired patterns of thought, could consider the problems before deciding and could experience these within a personal integrity (Arıdağ & Leo, 2012, citing Lerner).

Similar to the education method defined in Dewey's book, "Freedom and Culture", the design studio should have a structure that does not solely provide information to students, but makes them accustomed to finding the paths to problem solving and provides students the habit of thinking for this purpose (Dewey, 1987). Concurrently, Dewey points out learning by doing as an important way to establish causal relationships between objects, concepts, in his books "Experience and Education" (Dewey, 2007). According to Dewey, it is important to grasp relationships in the design studio and construct similar relationship in other circumstances and other time periods, to interpret or decipher other situations (Özkar, 2009). In this sense, Dewey's method, which allows the student to freely discover oneself and allows him/her to learn by doing, was adopted as the instructional methodology in the Introduction to Design course in Eskişehir Osmangazi University (ESOGÜ) Architecture Department.

Architecture and fashion design, which are both design activities regarding humankind, exhibit similarities in terms of tectonic and structural strategies. Architecture and fashion have common concepts regarding design theories. Design is referred as a problem-solving process by individuals. Gully asserts that, even in fashion design, problems regarding clothing is related to the resolute aesthetics proposed by the designer. Such solution should have a connection with the human body in terms of design style, color, fabrication, proportion and pattern (Chnwendu, 2014). Both architects and fashion designers tend to use similar techniques such as the use of geometry to create form where they both begin the process with a skeletal structure then add other elements to support it, occasionally these elements could be draped or even suspended. Even though there are connections between architecture and fashion as pointed out above, there are some modifications in scale, materials, sizes, shapes and proportions as well.

One of the main methods of improving educational process in the Architectural Schools is systematic and gradual development of skills to create tectonically embodied space. In Eskişehir Osmangazi University, Architecture Department the complex three-phase model for acquisition of the tectonic skills is employed. At every phase, the tectonic skills are improved progressively. In the first phase (initial year), the reveal of tectonic characteristics in nonarchitectural objects is treated as an experimental stage that sums up the analysis of the nature of materials. In the second phase (intermediate year), the cognition of tectonic systems in architecture and their types are approached as the analytical stage for studying the evolution of tectonics. In the third phase (third and fourth years), tectonic systems are interpreted as the final stage which develop skills in tectonic treatment of a form in terms of architectural composition and architectural design. At this phase, the design aims to secure coherent educational system and interdisciplinary connection via the tectonic subject. The aim is to encourage students to avoid mannerism and incapacity related to the form and instead to accentuate simple visual characteristics of architecture and to comprehend truthful possibilities in creating tectonically embodied space.

In the first-year Introduction to Design course, the concept of tectonics was analyzed in the light of etymology via its comparison with terms such as *techne*, *technique*, and *technology*. The main idea of the studio’s methodology commences with Aristotle’s concept of *techne*. According to Aristotle, everything in the world is a matter that gained form, and the essence of any matter is its potential to become and do something. The matter performs its essence as a form. Aristotle, and thenceforward Heidegger, mention the four causes in the formation of *techne*. These causes are, *hyle* (the material cause), *eidos* (the formal cause), *telos* (the ultimate cause) and *logos* (the effective cause). According to this idea, *techne* is “knowing by doing, doing by knowing” (Ergül, 2015). During the studio work, this conceptual substructure was utilized as the “knowing by doing, doing by knowing” technique. It was previously suggested that technology is a mode of revealing the essence of the materials. As presented in Diagram 1, organized knowledge for production technics could be formulated in order to transform raw material into useful instruments, which reveal the means they were made in contrast to natural objects.

In this study, the students were primarily requested to choose and develop a past memory item to explain the memory deficits caused by Alzheimer’s as design decisions. As seen in Table 1, the designs were taken into consideration as matters that belong to the past, namely, Daily objects, culture and art objects, famous artists, forgotten technological images, and forgotten items of romantic sentiments. Starting with such conception, the nature of the materials was analyzed, assembly techniques were developed and a holistic body structure was created in order to design costumes with three-dimensional multipartite materials. In the creation of the whole, materials’ tectonic function independent of the body was discussed during the course. According to Gottfried Semper, assembly is a contemporary fragmentation experience and it allows a discourse that eliminates the metaphysical content of the duality between construction and representation. Assembly presents its tectonic form in its disconnectedness (*dis-joint*) (Özkan & Akçakoca, 1997). The experience of assembly constitutes an important mental process in the formation of the tectonic construct by the students. According to Louis Kahn design should as well transform the nature of the present matter via technical means (“by technique”) and enlarge its environment (Güvenç, 1997). The three-dimensional and piecemeal techniques of materials enable the act of making that allows the creation of tectonic construct. Therefore, various joint and assembly techniques (knitting, sewing, stapling, etc.) were developed and the surface properties of materials were altered via the employment of these techniques.

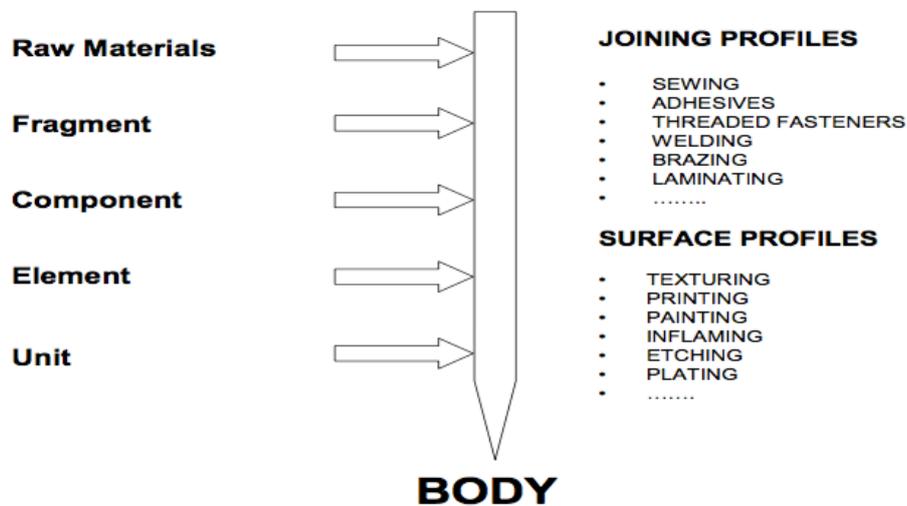


Diagram 1: Methodologies of creating tectonics and making Technologies

## FINDINGS

Within the scope of basic design studies in Eskişehir Osmangazi University Architecture Department, this study intended not only to inform students on Alzheimer’s, but also to explore significant consequences of the disease, such as “spatial/temporal loss,” through transforming the items of forgotten memories (audio tapes, black and

white photos etc.) into costumes and a costume exhibition. In this framework, the designs were analyzed and were presented in 5 distinct groups in Table 1. These distinct groups constitute of items deleted from past memories (newspaper headlines, typewriters, pay phones and twig brooms), collectors of cultural and everyday life (audio tapes, 33 rpm records, black and white film strips etc.), childhood games in the past (abacus, pog game chips, Tetris, the Friendly Ghost etc.), past images (good-bad memories, memory boxes, spinning toy etc.) and romantic memory items (love letters, photo albums, archives, seals, etc.).

As presented in Diagram 1, raw materials (such as paper, cardboard, linear elements as wires, etc.) were transformed into three-dimensional objects from their two-dimensionality via geometric organizations and various making methods (knitting, stitching, etc.). Costume designs with structures that acquire stability via establishing a relationship with the body through partial contact were created. The designs that were outcomes of group work were presented initially to the jury members by one individual from the group, and then were developed and finalized, and finally presented to the inhabitants of the city to improve awareness of Alzheimer's. Emotional moments were experienced at the fashion show, to which Alzheimer's patients and their relatives joined, and the costumes were observed with enthusiasm. This study is considered as an important experience for students to experience design practice through a different discipline, in addition, it is as well a significant experience in terms of researching on an important social problem and developing a design thinking through examining its complications, and presenting the design interactively to receive its implications.

Table 1: Abstract representation of the items/images of the forgotten memories through costume design.

DESIGNS	ITEMS/IMAGES OF FORGOTTEN MEMORY	MAKING METHODS
	1. Newspaper headlines	Knitting 2-dimensional newspaper papers after transforming them into 3-dimensional strips
	2. Classic typewriter	Combining circular section cardboard typewriter keys with metal structure
	3. Pay phone	Creating surface texture with electric cable knitting method and metal pulley
	4. Twig broom	Creating surface texture via knitting of bushes and attaching them by metal clamps
	5. Audio tapes	Creating texture via knitting audio tapes
	6. 33 rpm records	Combining the circular elements produced as 33 rpm records within different geometric organizations
	7. Audio tapes and veils	Providing an irregular fabric through the tight pattern of audio tapes that pass through the scattered gaps of the veil membrane
	8. Black and white film strips	Obtaining a volumetric textile material in flexible geometric forms by passing thin wires through the top and bottom holes of the film strips
	9. Abacus	Creating a wearable costume with the curvature construction of metal bars and wooden beads, referring to abacus, the counting element of our childhood
	10. Casper the Friendly Ghost	Fixing the image of the cartoon character Casper (the Friendly Ghost) into the transparent triangular prisms and clothing the body via a metal construction
	11. Pog game chips	Creating a surface of geometric organizations through the 2-dimensional pop game chips image pieces
	12. Tetris	Fixing colored Tetris blocks to a metal construction with different geometric organizations
	13. Spinning toy	Creating a spinning toy by knitting a linen thread around the body that constitutes a formwork for the spinneret through the use of kraft paper and the combination of three-dimensional geometric patterns
	14. Photo albums	Creating geometric patterns that originate from the habit to keep all our photos in albums and frames in the past
	15. Erasable photo storages	Making old printed photos portable via mobile storage
	16. Good and bad memories	Geometric abstraction of good and bad memories as black and white memory elements
	17. Archive and seal	Creating a three-dimensional surface texture from the two-dimensional kraft paper to represent the old archival images
	18. Türkan Şoray, old Turkish movie actress	Türkan Şoray's image, one of the strong images of Turkish cinema, is transformed into a three-dimensional textile element through the combination with two dimensional kraft paper and geometric forms
	19. Autograph love letters	Transforming the old autographed love letters on paper into three-dimensional representation to constitute a surface texture
	20. Empty photo frame	An object of photographic images in the past, the photo frame, is constructed as a structure



Figure 1 and 2. Exhibit of Alzheimer Awareness Costumes at the fashion show.

Figure 1 and 2 presents the dramatic representations of the costumes selected from the musical archives of the past. One of the most important advantages of the conducted study was the evidence that university students are interested in community problems and that they could show determination in addressing these problems. The comments received from the students indicated that they heard of the “Alzheimer’s disease” until then, yet they did not have substantial information on the subject, and would be willing to work on social projects in the forthcoming processes.

## CONCLUSIONS

One of the most important constituents of architectural education is ‘knowing by doing/doing by knowing’. Design problems, which are as well enriched by interdisciplinary studies as much as the autonomous realm of architecture, are particularly transformed into end products by means of discussion. It can be asserted that two well-known branches of design, fashion and architecture, are substantially integrated with each other. Both disciplines employ the ‘concept’ approach to regulate design, while their manufacturing approaches also run in parallel. Their fabrication techniques are established on the search of the relationship between material and detail. Thus, each material in design a process has the potential of adding new layers or changing the meaning of the design product. This study addresses the student Works as the final product of the Introduction to Design course and emphasizes the significance of these outcomes to demonstrate the effectiveness of the employed course methodology. Consequently, this study aims to create a collective awareness regarding Alzheimer’s through costume designs of architecture students on the theme ‘Missing Years’. A fashion parade and exhibition was performed in collaboration with Eskişehir Alzheimer Union, under the name “Awareness Parade/Exhibition” in the city center for Eskişehir’s inhabitants.

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# Culture in Education: Fairy-Tale Therapy and Other Forms of Art Therapy

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## ABSTRACT

The present article presents an important role of culture, especially the spiritual one, in education as well as the ways of applying it through different forms of art therapy, in particular fairy-tale therapy, which is currently very attractive and popular. Workshops for pre- and lower-primary school children as well as research studies conducted by the author show that culture is most effectively and permanently acquired through personal experience. Taking an active part in sessions, based on art therapy, has a great impact on children's intuitive-emotional sphere. The most attractive and engaging form of classes is a mixed one – a workshop combining different forms of art, cultural tradition. It has a positive influence on the psychomotor development of the child (stimulation of sensory channels, memory, perception; emotional, social, linguistic development). In the era of the domination of practical knowledge and consumerism it is of particular importance to introduce spiritual culture (art, customs, beliefs) to the educational process, which can be achieved by means of art therapy. Such action passes cultural, linguistic and social models in a parallel and multidimensional way. It equips young recipients with key skills and competences, indispensable for a successful coping with life situations, independently of the chosen specialization.

## INTRODUCTION

Culture, being defined in many ways, can be broadly viewed as all human products and encompasses both the **material and the spiritual sphere**. In education it is crucial to maintain the proportions between these two domains. **Material culture** is a collection of practical skills, technical products and - in broader terms - can be equated with (especially) exact science. **Spiritual culture** incorporates beliefs, tradition, but also all forms of art. Nowadays the tendency towards the domination of science can be observed, in the sense of knowledge and practical skills, over communing with art and tradition. Science corresponds with the intellectual sphere, while art with the intuitive-emotional one. This broad division is graphically presented by the diagram below.

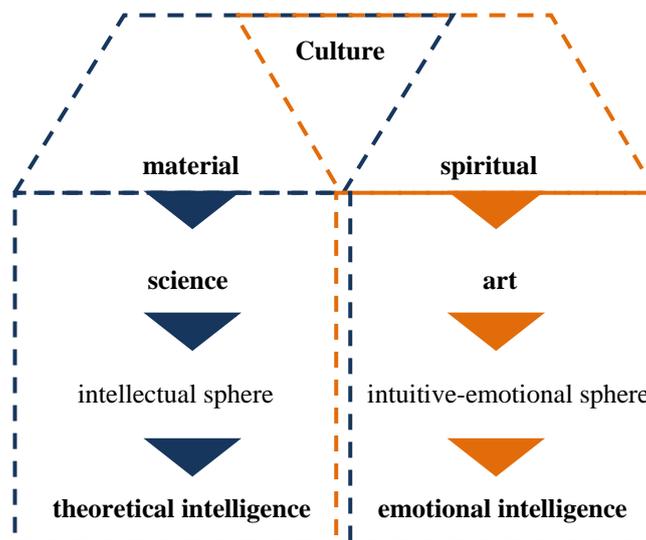


Fig. 1. The division of culture into the material and the spiritual one, the localization of the two domains in psychological human spheres, and its relation to theoretical and emotional intelligence.

Both science and art constitute culture, which is based on human creation. According to Górnio-Naglik (2007: 20), "Analysing science and art as two types of creation is tantamount to classifying them under the same genre, and so perceiving their similarities rather than differences. The possibility of noticing the similarities

between science and art is not limited to the fact that both branches sprang up on the foundation of creative action – they are creation. The diagram presented above, depicting the division into material and spiritual culture, may be vague, but a few aspects enable this classification.

First of all, **the role of imagination** is essential in the two spheres presented. Górnik-Naglik (2007: 20-21) emphasizes that “imagination in science is different than the one encountered in art. In art, its role is to lead to the creation of a complete production - an artwork. This type of imagination is closely related to sensation. There is, however, a difference in sensory experiences which accompany the contemplation of art and communing with science, because the sensations are formed on a different existential ground.” The author explains that in a piece of art imagination leads to the creation of a new object, a thing which expresses the mystery/the unknown, while in a scientific work imagination is to rationalize what seemed to be a mystery before. This relation can be transferred to the diagram presenting the division of culture.

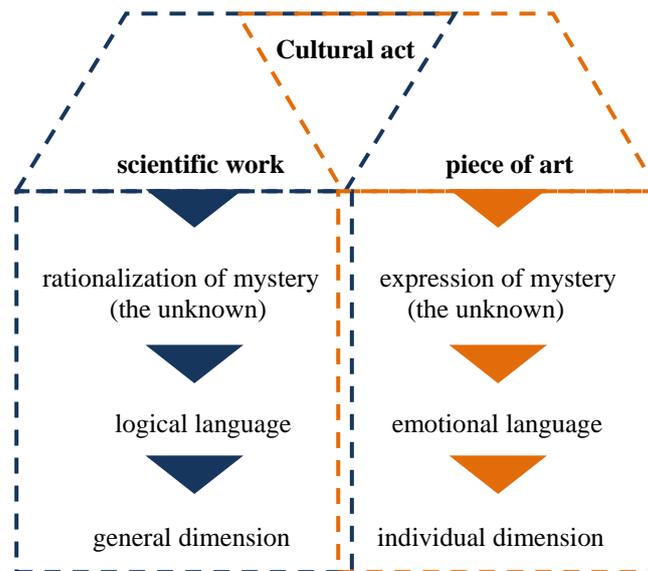


Fig. 2. The division of human artifacts into pieces of art and scientific work, the language related and the dimension of functioning in a person’s life.

Another factor, which diversifies the two spheres, has been taken into account in the diagram, namely **the mean of expression of the cultural act – the language**. Art is linked to **emotional language**, which stems from the fact that the creator acts in the heat of emotions. A piece of art evokes in the recipients particular feelings. Science can also involve emotions. The subject of research or its findings can trigger positive as well as negative feelings, sometimes very strong ones, but the results of the creative act “have to be justified in logical terms and translated into a language devoid of emotions” (Górnik-Naglik, 2007: 23). Since the early levels of education children should learn two basic forms of communication - logical and emotional, and how to use them in a given situation, context.

The next differentiating factor, which is connected with the previous ones – imagination and language, is **the level of functioning** of a piece of art and scientific work. Scientific work should be a universal medium enabling the understanding of (an unambiguous) theory by the general public, while an artwork is meant for individual perception and allows for multiple interpretations. The creation of scientific work gives the author a utilitarian fulfilment. The creator of art can get to know and express him-/herself (self-aggrandizement/self-expression).

The three aspects indicated explain why science has been classified under the intellectual human sphere, while art under the intuitive-emotional one. A parallel stimulation of both domains is indispensable. In this day and age specialization is important. Nevertheless, at the lower levels of education a person should be provided with the opportunity to get to know both areas in order to allow him to properly choose in the future. What is more, the intensification of the contact with art in the process of education can be expressed in many forms, among others in art therapy: music therapy, dance movement therapy, visual art therapy, as well as a very popular and

effective fairy-tale therapy. The intensification shapes the intuitive-emotional sphere of children (imagination, feeling). Communing with spiritual art has a positive influence on the development of emotional intelligence, conditioning life success independently of the chosen specialization.

**Synthesis and symmetry** are crucial in culture. They should be preserved (between the spiritual and material spheres) since the earliest levels of education due to the highest capacity and plasticity of the brain in childhood. As pointed out by Daniel Goleman, it is mainly the experiences in childhood that “shape” the human brain (Goleman, 2007).

Nowadays, when there is more focus placed on practical knowledge and skills, students lack the conditions for self-knowledge, the development of intuition as well as the expression of emotions and their verification, which shapes self-consciousness and self-control. Art is a plane which stimulates imagination and favours the emotional development. Daniel Goleman claims that “naturally, the development of each of the skills included in the **emotional intelligence** is determined by everything that happens in the period encompassing several childhood years. This period is the time when children can be helped to develop good emotional habits. If that opportunity is wasted, it is very difficult to fix it later.” A balanced stimulation of the child is thus an investment for its future success. “Therefore, it is the responsibility of educational institutions not only to educate, but also to bring up. Kindergarten groups or the groups of first graders are the first, next to family, social groups in which children are included” (Bełtkiewicz, 2014).

Art therapy is an attractive, interesting form of stimulation which is easy to apply in kindergartens, schools and institutions. Skorny distinguishes the following forms of **art therapy**:

- **music therapy**;
- **choreotherapy**;
- **bibliotherapy**;
- **psychodrama**; and
- **graphotherapy** (Szulc 1994, following: Skorny, 1990).

**Music therapy**, which consists in having contact with music, can have a passive form – the perception, listening to music or songs, as well as an active form – playing musical instruments, singing (group or individual activity). Górniok-Naglik (2007: 126-127) notices that „a constant communing with music of a child, especially with singing, since the first days of life is a chance for teaching him/her to love music” and that “every communing with music is a school of imagination. Szulc (2011: 117-118) indicates that “four categories: the awareness of feelings, mobilization, belonging and meaning are based on the premise that there is a relations between music and identity. Analysing the four parameters of identity, namely personal space, social space, the space of place and time and transpersonal space, we can spot the strong relation taking place between music, identity and health”. Music therapy has a significant, long-term impact on the development of an individual as well as the current state and the quality of life.

**Choreotherapy** means influencing through dance. It can have the following forms: individual, ballroom, team. Its selection depends on the capabilities of the participants and the aim of the classes. Górniok-Naglik (2007: 129) observes that “children react to sounds and rhythm instinctively, but this reaction has to be developed since the early months of life.” The continuation of the stimulation is also indispensable in kindergarten and school, in particular in the form of a play. The author points out that “when the child dances, accompanying itself with clapping or singing, double sensory sensations support the formation and reinforcement of permanent kinaesthetic-auditory conceptions”.

**Bibliotherapy** is influencing on the recipient by means of a particular text/literary work, which is appropriately chosen for a given age, capabilities, life situation, aim of the class. A very popular and attractive form of bibliotherapy is **fairy-tale therapy**.

“It is based on applying specifically developed or selected texts presenting the problem similar to the experiences of the child. Such texts can be used simultaneously in all the above-mentioned child’s immediate living environments, and when this is not possible – in a compensatory way in the dominant environment” (Bełtkiewicz, 2017).

Molicka indicated three basic functions of therapeutic stories:

- **psycho-educational**,
- **psycho-therapeutic**,
- **relaxation** (Molicka, 2011).

“Particularly important elements in the process of story-telling/reading are attractiveness and availability of this

genre for children, as well as the accompanying aspect of building bonds with the person, with the significant others” (Bautsz-Sontag, 2013: 20). The aims of fairy-tale therapy, among others, are: the reinforcement of proper

patterns of behaviour (presented by the main characters), the development of problem-solving thinking, redefinition of the ‘self’, boosting one’s self-esteem, linguistic development (stimulation of narration, enrichment of lexicon) (Bełtkiewicz, 2017).

“Patterns included in therapeutic stories may be related to **culture, social relationships, or language**. Of course, these domains form an inseparable triad; however, depending on the listener’s individual circumstances, therapeutic stories should be selected so as to display a specific type of a pattern” (Bełtkiewicz, 2017). Ostasz (2000) states that “it is commonly known that patterns are most effectively instilled during childhood. The most powerful child’s play is the one which contains certain patterns or role models. During play, such patterns become instilled without opposition and with pleasure, since, for a child, playing is both a necessity and a pleasure. At the same time, the following rule of development is respected: that which develops interiorizes and assimilates that with which it comes in contact”

**Psychodrama** is based on acting out, staging of a given topic, often using puppets/dolls. It is performed spontaneously, through improvisation or following a play script. Its goals are, inter alia, to: simulate the recognition and expression of emotions, increase empathy, prepare for a social dialogue, project potential situations (usually problematic ones) and their solutions (Bełtkiewicz, 2017).

**Graphotherapy** is about performing actions which accompany drawing and painting (with a brush or fingers). The main aims of this form of action are: stimulation of the visual analysis and synthesis, training of the eye-hand coordination, manual dexterity and visual perception, the feeling of agency/causing by the realization of one’s own idea, preparation to a multi-level work.

All the above listed forms of art therapy engage not only imagination, which was mentioned before, but also the senses. Appropriately planned multisensory classes can generate all kinds of stimuli, sensitizing children to their reception. Using different forms of art therapy simultaneously shapes also many skills and competences.

## THE STUDY

The study conducted concentrated on the use of different forms of art therapy during workshops (additional classes) in educational and cultural institutions. Pre- and lower-primary school children (aged 3-6/7, 6/7-10) took part in the research, in groups of 15-20.

Zbigniew Skorny lists three main functions of art therapy:

- **recreational;**
- **educational;** and
- **corrective** (Szulc 1994, following: Skorny, 1990).

The leading function during the classes conducted was the **educational function**. The sessions were tailored to fulfil this function.

Different forms of art therapy concentrated on one, leading theme. The main message was passed at the beginning through fairy-tale therapy. The therapeutic story was presented in an engaging, interesting way, forming a bond. The subsequent forms of art therapy were of an individual, group or mixed character.

### **I model of workshops** (for preschool children, aged 3-6/7)

#### **Workshop „Ogród dobrych słów”** (‘The garden of good words’)

- 1) bibliotherapy - fairy-tale therapy: the author’s therapeutic story (‘The garden of good words’ about positive emotions and words presented by kamishibai),
- 2) graphotherapy: painting - decorating paper butterflies - individual cards with children’s names (self-presentation) and a big, collective poster (cooperation),
- 3) choreotherapy: ‘dance of butterflies’ - dancing to calm music,
- 4) music therapy: listening to relaxing music with the sounds of nature.



Fig. 3. Hand-made children's name cards used for self-presentation and adaptation.

## II model of workshops (for lower-primary school children, aged 6/7-10 )

### Workshop „Wielki atut” (‘The great asset’):

- 1) bibliotherapy - fairy-tale therapy: the author's therapeutic story 'The great asset' about acceptance presented by a multisensory book,
- 2) graphotherapy: painting/cutting - creating puppets - favourite (similar to children's traits) animals from the ZOO,
- 3) music therapy: singing a song about ZOO with ethnic instruments,
- 4) psychodrama: using created puppets, acting out the roles,
- 5) choreotherapy: 'dance of animals' - dancing and imitating animal movements,
- 6) music therapy: listening to relaxing music with the sounds of nature.



Fig. 4. Hand-made puppets for children's self-aggrandizement used in psychodrama. The composition of classes assumed the following order of activities:

- 1) maximal concentration on the therapeutic story (imagination, emotions),
- 2) intensive creative activity (graphomotor, musical and/or psychodrama),
- 3) physical relaxation (physical activity, dancing),
- 4) psychological relaxation (relaxation listening to music).

When projecting the scenario, children's developmental capabilities and the aim of the classes were taken into consideration. The topic of the meeting and the level of difficulty of the tasks were appropriately adjusted to their age. Receptive (perception, communing with the child) and creative (creation/production) tasks were combined in a balanced way.

The plan of the classes took individual and team tasks for granted in order to meet the needs of the individual within the scope of self-aggrandizement, experiencing art, as well as to enable cooperation and socialization through creating artworks in a group.

## FINDINGS

The action research, with a cyclical organization of classes with a given group, indicated:

- greater concentration of children during the reception and the creation of a piece of art,
- greater freedom in operating the means of expression (forms of fine arts, music, movement, acting),
- development of imagination (children were able to create the projection of the future fate of the protagonist of the therapeutic story, realize an original visualization),
- development of empathy, self-awareness and emotional self-control,
- shaping of identity (local, national) through getting to know cultural works connected with the place of residence, background/descent (myths, legends, symbols).

The interviews/conversations with children after classes demonstrated that their **state of being** was very good, quoting: *"I felt comfortable"* (PL.: *"czułem się swobodnie"*), *"I could benefit from the forms which I didn't know before"* (PL.: *"mogłem skorzystać z form, których dotąd nie znałem"*), *"attractive art materials were available, which allowed latitude in creation"* (PL.: *"dostępne były atrakcyjne materiały plastyczne dające dowolność tworzenia"*), *the tale presented was nice and smart, and the good behaviour shown in it is worth-imitating"* (PL.: *"prezentowana bajka była ładna i mądra, a dobre zachowanie w niej pokazane warto naśladować"*), *"it was nice to create something pretty"* (PL.: *"miło było stworzyć coś ładnego"*), *"I could express what I really feel and what I cannot always talk about"* (PL.: *"mogłem wyrazić, co naprawdę czuję, a o czym nie zawsze mogę i chcę mówić"*). It can be concluded that the level of satisfaction of the participants was high as a result of the lack of artistic limitations, appropriately adapted material to children's age and needs.

Few statements with a negative tinge were: *"the classes lasted too short"* (PL.: *"zajęcia trwały za krótko"*), *"such workshops are organized too rarely"* (PL.: *"takie warsztaty są organizowane zbyt rzadko"*), *"it's a pity that we cannot repeat such classes at home"* (PL.: *"szkoda, że w domu nie możemy powtórzyć takich zajęć"*).

The statements are indicative of a great satisfaction with the classes as well as of art-deficiency at home and at school, in the educational process.

Górski (1986: 27) points out that "the child's needs, especially the psychosocial ones, are exceptionally strong", their partial fulfilment, as the studies conducted show, can be realized by contact with art, both individual and in a group.

The key conclusions are:

- beneficial impact of art-therapy classes on children's psychomotor development,
- the need to include such classes in the educational programme as a balance for theoretical lessons consisting only in assimilating knowledge and acquiring practical skills, the intensification of the creation and the reception of art by children (a bond with the teacher and peers),
- the need to include art in households in the process of upbringing in a natural way: a free creation of art reflecting emotions, visualizing experiences, a spontaneous interpretation of the pieces of art encountered (a bond with parents, siblings and other family members).

## CONCLUSIONS

A natural human need is a balanced academic and artistic development, especially in the childhood period when the capacity and plasticity of the brain are the greatest and the experiences gained have an influence on future choices, the standard and the quality of life. Górniok-Naglik (2007: 33) states that "The advancing synthesis of art with other fields of science is a peculiar reflection of natural mechanisms of the functioning of the human brain, it calls for the necessity of treating its output equally with the scientific achievements both in everyday life

and education". The observed tendency, being stronger and stronger, to eliminate art from education "prevents the development of individual sensitivity and the ability of the student to intuitively sense and perceive the world". Childhood, in education the pre- and lower-primary period, allow for the shaping of skills and competences whose lack or a delayed acquisition often has a negative influence on the life success of the individual. In this period the need for the discovery of the world is particularly strong, but also for self-aggrandizement/self-expression, sense of identity, forming bonds (in the family and school environments), which is evident in the urge for understanding and acceptance. All these needs can be met by art included in the process of education and upbringing. As Goleman (2007: 69) points out, "that is the problem: theoretical intelligence, which is manifested in good grades at school, does not practically prepare to cope with adversity – or to use the opportunities which life's vicissitudes present us." Art strengthens internally, because it enables the highest form of cognition: the discovery of the 'self'.

Concentration on art as well as sensitizing to it since the youngest age will allow the future generation to resist the tendency towards the growing consumerism, pressure on a swift and spectacular success and the pressure of being well-educated and modernly utilitarian, which without emotional self-control and intuition is difficult to achieve at present for many young people and even children.

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## **Curriculum Model for Improving Quality of Life for Remote Indigenous Community (Research On Baduy Tribe Of Banten Province, Indonesia)**

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### **ABSTRACT**

The Indonesian population consists of ethnic and cultural diversity, including tribes in the Remote Indigenous Community (KAT) category. KAT is synonymous with conditions of backwardness, backwardness, and poverty. They have the desire and the potential to learn and progress. This study aims to determine the curriculum model in Remote Indigenous Communities, especially the Baduy tribe in improving the quality of life and their welfare. The research used qualitative method against Baduy Luar and Baduy Dalam. Data were analyzed by descriptive approach. The results show that: 1) the purpose of the curriculum is to change the behavior to increase the added value of the potential they have in the aspects of agriculture, crafts, environment, and customs and culture. 2) Curriculum materials include: increasing value added on agricultural products, intensification of rice crops and crops, inculcating honest attitude in entrepreneurship, improving the quality of craft, arranging the environment and increasing human resources as a cultural tourism area, improving healthy and clean life, Marketing of the resulting product. 3) Learning method is done through Peer Tutor; 4) Assessment focuses on behavior change aspects that are real and beneficial to life.

**Keywords:** Baduy tribe, remote customary community, remote indigenous community curriculum model.

### **INTRODUCTION**

The Republic of Indonesia has a population of about 258 million consisting of 1,128 tribes and spread over 17,508 islands. The number of these tribes, there are several tribes identified as isolated and remote tribes. They live in communities that tend to be closed and very obedient to run culture and local wisdom that is hereditary for generations. These isolated and remote populations are usually called Remote Indigenous Communities (KAT). The reality of this Remote Indigenous Communities lives not only in Indonesia or in Asia, but many are scattered almost in various countries.

Indigenous communities as part of Indonesian society are isolated community groups, both physically, geographically and socially (Adimihardja, 2007). Usually this community occupies a remote and difficult to reach area. Their social order generally rests on a very limited and homogeneous kinship. His daily life is still based on the traditional interactions of the biological nature of blood and the bonds of the marriage ropes. These communities are categorized as isolated Indigenous Communities, both externally (outside parties are difficult to provide access to basic social services) and internally (difficult access to basic social services) (Abdullah, 2004). This means that KAT is a group of people who still have limited access to basic social services (including education) because the adat community is closed or geographically difficult to reach.

Remote Indigenous Communities (KAT) is synonymous with backwardness, backwardness, and poverty. In general, the KAT lives in simplicity and poverty (Sihabudin, 2012). In the preamble of the Constitution of 1945, it was emphasized that development in Indonesia one of them aims to educate the life of the nation and realize the common prosperity for all citizens. The KAT community is an Indonesian citizen who has the same right to enjoy the results of development. Therefore, the government is obliged to improve the quality of life and welfare of the Remote Indigenous Community community.

The Remote Indigenous Community life is almost unaffected by the changing times, including advances in information and communication technologies. They live in various corners of the country. One of the KAT is still strong to maintain life with the culture and local wisdom of his ancestors is the tribe Baduy. Baduy tribe is interesting to be studied, because this tribe is located in the island of Java, which is in the Village District Leuwidamar Kanekes Lebak district of Banten province. Geographically relatively not far from the capital city of Jakarta as the capital of the state of Indonesia.

Baduy community is one ethnic that still holds tradition and tend to be closed. Baduy tribe consists of two namely Bady Luar and Baduy Dalam. According Sihabudin (2012) Outer Baduy is relatively willing to accept innovation and modernization from the outside while the Inner Baduy can not receive things that smell of technology and modernization. Despite this social and economic life, the Baduy Luar community is not much different from the Inner Baduy, which is far from prosperous.

Increasing the key welfare is to improve the quality of human resources, through education. Therefore, in accordance with the government's program, it seeks to guarantee all citizens, including Remote Indigenous Communities to obtain good educational services. However, education in KAT differs from the education done to the general public. Remote Indigenous Communities strongly uphold the customs and traditions of their ancestors. They are very careful and selective in accepting various forms of change that come from outside, including the process of education.

Anwas (2009) results in Baduy indicate that children aged 7 s.d. 15 years even generally Baduy tribe people have not followed formal education. Though their learning motivation is generally high, but the custom which still prohibits it as a form of concern to preserve the teachings of his ancestors. Education is taught by traditional leaders and their parents. Formal schools that are even close to their village are unable to change their perceptions of formal schools.

Baduy tribe actually do not reject to education from outside (Anwas, 2009). What is important is the approach that should be appropriate and appropriate to their local culture and wisdom. This is in line with the opinion of Rogers and Shoemaker (1971), Lippitt (1969), Sumardjo (2008), that the program changes planned (in this case education) is very important notice: the need, value system and culture, and involve them widely with the Handled holistically. Conversely, if education does not pay attention to these aspects, then there will be social and cultural resistance of the community.

Baduy people have a desire to learn, although limited by their custom (Anwas, 2009). On the other hand many potentials can be developed. Results of research Sihabudin et al. (2008), Baduy tribe has the potential of nature that can be developed, for example: aspects of agriculture, craft, forestry, culture, and also tourism. Therefore education and curriculum for advancement and welfare of Baduy society need to be specially designed and different from the general public.

The current reality is that there is no model of education / curriculum that suits their potential, needs, and culture. The problem is how is the curriculum model for Remote Indigenous Communities, in improving their quality of life

and well-being? Curriculum model is interesting to study, as an effort to improve the welfare of indigenous communities in remote communities either in Indonesia or in any country.

The process of education both in formal and non formal education, curriculum is required. This curriculum serves as a reference in implementing the education. In the National Education System Act of 2003 it was emphasized that the curriculum is a set of plans and arrangements concerning objectives, content and instructional materials and ways used as guidelines for the implementation of learning activities to achieve certain educational goals.

Referring to the definition of the curriculum, the curriculum has several important elements, namely objectives, content / lesson materials, and how or methods of implementation and penilainnya. According to Palupi (2016) the objectives in the curriculum are competencies that must be possessed by the students after receiving the learning, the content and the materials are the learning materials that must be conveyed by the teacher to the students so that they have the competence as set on the goal. The method used is a learning process used to deliver learning materials to students, the arrangement is an attempt to ensure the achievement of learning objectives through monitoring, measurement and control which are the functions of the assessment of learning. Therefore, in curriculum development, including the formal education curriculum needs to develop the curriculum elements.

This study aims to examine the curriculum model of improving the quality of life for Remote Indigenous Communities Baduy Tribe. This curriculum model focuses more on: 1) objectives that meet the needs and potentials, 2) necessary educational materials, 3) ways / methods of implementing education, and 4) assessment in measuring the success of the education. The curriculum model was developed to improve the quality of life, and prosperity that is in line with the potential, needs, and culture of Baduy people.

## **RESEARCH METHODS**

This research uses qualitative approach. The research location is Remote Indigenous Community / Community (KAT) Baduy tribe, covering Baduy Luar and Baduy Dalam. Baduy tribe is located in Kanekes Village, Leuwidamar District, Lebak regency of Banten province. The number of villages in Baduy reaches 55 Baduy Luar villages and three villages of Baduy Dalam namely Cikeusik, Cibeo, and Cikartawana (Kanekes Village Office 2008).

Data collection is done through several methods, namely: literature study, observation (observation), indepth interview, and Focus Group Discussion (FGD). Literature studies are carried out in the review of the various writings, especially from relevant previous research results as well as the concepts / theories on curriculum development, and Education on Remote Indigenous Communities. Observation stage, conducted at research location, Remote Indigenous Community of Baduy tribe. This assessment is conducted primarily to obtain data related to the research objectives, for example: geographical conditions, natural conditions, social life of everyday society, culture and local wisdom, and other aspects. At this stage will also be done photo / video documentation in strengthening research data. This stage is also used as a preparation to determine prospective informants and respondents in conducting field interviews.

In-depth interview stage, conducted to informants from various backgrounds. In this stage the informant is persuasively asked to provide information relevant to the research objectives. The informants were mainly indigenous leaders: Jaro, Puun, to the village and Kanekes apparatus, baduy community figures, children and youth of Baduy tribe, parents of school-age children, farmers, traders, Baduy tribesmen, people around the Baduy tribe, And educational leaders around the Baduy tribe, and other parties.

The next stage is Focus Group Discussion (FGD). At this stage meetings and discussions with various stakeholders, including some experts in limited numbers. This stage is also done to perform data validation (via tri data angulation) with data source obtained through previous interview result. Data analysis is done through three stages:

data reduction, data presentation, and conclusion. Data reduction is the process of selecting, centralizing and simplifying data from the field. Data reduction includes sharpening, suppression, and selection of unnecessary data. Furthermore, the conclusion is based on the analysis of the data.

## **RESULTS AND DISCUSSION**

Baduy tribe is one of the Remote Indigenous Communities in Indonesia. This tribe occupies the territory of Kanekes Village, Leuwidamar District, Lebak regency of Banten province. Baduy tribe is very strong to maintain customs and traditions, including in preserving nature and environment. They have consistently maintained nature conservation and natural spatial planning. The total area of Baduy has generally been divided into three zones ie residential zone, cultivated land zone or agricultural business area, and forest protection zone (forest deposit). The residential zone is where they live, consisting of several villages. The arable land zone is where they grow crops. Protection forest zone is an area in the hills that never worked. The area is considered sacred, no one dared to cut down the tree or open the land. This area is used as a means of water storage, erosion guard, and also as a place of pilgrimage of adat leaders.

This conservation order of nature they keep consistently and hereditary. Baduy tribal areas, although the region consists of hills, avoided from landslides. According to the people's confession, they never lack water even in long dry seasons. Clean water comes from protected forest zone flowing into various tributaries up to Ciujung River that flows into Rongkang city up to the north coast of Java Sea. This means that the culture and local wisdom of Baduy tribe in the conservation of land can be enjoyed not only by Baduy residents but Baduy outsiders to Rongkang city and part of North Serang to the north of Java Sea.

The main livelihoods of the Baduy tribe rely on agricultural products. They generally work on hilly fields by planting rice (huma), Banana, Ginger, and tubers such as cassava, Tales, Hui, and other types. They also plant fruit crops such as sugar palm trees, Durian trees, Jackfruit, Pete, Jengkol, Asem Kranci and others. Forest Baduy area especially forests of protection (forest titipan), produces forest honey. In the handicraft aspect, the Baduy tribe has been from generation to generation making a bag (Koja, unique bag of Baduy tribe). They are also the usual range of kitchenware, such as: Centong, Lumping Wood, Haseupan, and other types.

The culture and livelihood of the Baduy people have not brought their society prosperous, especially from the economic aspect. In general, the Baduy tribe is still classified as the poor. According to Suyono (2009), poverty alleviation, the key is to build the mind set, change the behavior to leave unfavorable habits changed into positive behavior.

If you consider the habits of the tribe Baduy, their agricultural products in addition to their own consumption, also partially sold to the tribe outside Baduy. They generally sell these produce in raw and unprocessed form. They sell Bananas, Ginger, tuber tubers, and unprocessed raw fruits. Likewise the craft that they have, need innovation and improvement of ualitas according to the demands of consumers. Excess of agricultural products of the Baduy tribe, they are taboo using chemical fertilizers. They plant a variety of plants using organic fertilizer. Public awareness, especially in urban consumption of agricultural products using organic fertilizer is higher. Therefore, the result of the earth produced by the Baduy tribe becomes a potential commodity and attracts the public interest of that class.

The results of in-depth interviews with several parties and observations of researchers, that to improve the quality of life, especially on the earth products owned by the Baduy, is needed is to create added value to the produce they have produced. For example, produced bananas, can be processed into banana chips. For this we need increased knowledge and skills of the Baduy tribe to process raw banana into banana chips, or various other food preparations. They can sell bananas in the form of chips or other types of processed foods at a price much higher than selling raw bananas. Other commodities, such as Cassava, Tales, Hui, and other tuber types can be processed into various types of delicious, nutritious, and high economic value.

Baduy tribe actually have the ability in processing the crops. They already have the skills to process Palm Sugar. They also have been able to make health drinks from Ginger material produced from the garden, then mixed with Palm Sugar. This drink is good enough for health, especially nutritious to warm the body. Kelemahanya is in the packaging. They packed with dried banana leaves, making them less attractive and less durable. If processed drinks Ginger and Palm Sugar is packaged well and interesting, of course, will be sold at a higher price and can last longer. Forest area of Baduy especially forest protection (forest titipan) many inhabited by Wasp. Baduy people are accustomed to take Honey from the forest Wasps, then packed in bottles to be sold to people outside the Baduy tribe. Hornet honey is a honey that is very good quality, because it is produced from the multi-flower found in the trees in the forest. But Honey produced by the Baduy tribe is not sold in the market, because it is well known that the honey is not original. They are light with sugar water. This is a constraint, a mental attitude that needs to be nurtured.

In the handicraft aspect, the Baduy tribe has been from generation to generation making various kitchen tools, such as: Centong, Lumpung Wood, Haseupan, and other types. Such household appliances are usually used only for their household use and are not traded. Though the tool is very unique and interesting so it can be used as souvenirs (handy craft) typical of the Baduy tribe.

Another type of handicraft is Making Bags (they call it Koja). This bag is very distinctive made from woven in various forms of traditional Bags. They have also made innovations to make this Koja to place bottles, mobile phones, and other requests. The disadvantage is, the innovation of the bag models tend to be static. If developed more dynamically according to the needs of the community, then these crafts can be an interesting and very distinctive souvenirs.

The people of Baduy tribe have been accustomed to doing business transactions with Baduy outsiders. Not a few of those who bring the produce and crafts are sold to big cities around the province of Banten, West Java, even to the capital city of Jakarta. Based on the observation of some outside Baduy community figures who often witnessed the sale transaction of Baduy crops, generally the sale is valued with relatively cheap value. Baduy tribe is often less understood with the market price of the products sold. Thus they tend to be disadvantaged in the sale and purchase transactions. The ability of competitiveness and marketing of Baduy is very low. Yet the results of the earth or craft that they produce has a superior potential. Therefore efforts to improve the welfare of the Baduy tribe, in addition to providing added value in crop processing and handicraft production, also improve the ability in the marketing aspect.

The habit of maintaining custom and culture has made many residents come from various regions even abroad to conduct tours and studies. This potential becomes a big capital for Baduy tribe to be developed as a better cultural tourism area. But the number of visitors who come, less optimized by the Baduy tribe to improve their welfare. Agricultural commodities that can be sold to migrants are still relatively low because they sell the produce in raw form. The result of handicrafts and some quality of crop processing are also still relatively low. Ironically, it is precisely the people outside the Baduy tribe who get a profit with the presence of tourists and foreign tourists. They provide a variety of purposes, including restaurants and lodging. This potential should be enjoyed by the Baduy tribe in improving the quality of life and welfare.

Based on the potential and needs of the Baduy tribe, efforts to improve the quality of life of Baduy tribe is by changing old habits with better behavior, through the education process. Education on Remote Indigenous Communities (KAT) is different from ordinary people. According Sihabudin (2012) educational mission is directed at community empowerment. This empowerment of its mission is to increase the dignity and value of KAT, improve the quality of life, strengthen the institutions within the social network, develop living and livelihood systems applicable to KAT, and enhance community participation and social responsibility in the process of empowerment of Remote Indigenous Communities.

Empowerment should be based on the needs, potential, and culture of local communities (Anwas, 2013). Education / curriculum on the Baduy tribe should be tailored to the needs, potential, and culture it has. In this community, curriculum development is based on their local needs. Needs in this case are needs that felt (felt needs) by them and converted into real needs (Asngari, 2007).

If considering the needs, potential, and culture of the Baduy people above, then the formulation of curriculum objectives in improving the quality of life especially from the economic aspect is to increase the added value of existing commodities, both agricultural products, handicrafts, environment, and customs and culture. Similarly, improvements in the ability of basic health and environmental hygiene need to get attention for improving their quality of life.

Curriculum materials are directed at improving knowledge, attitudes and skills that serve to improve the quality of life in accordance with its potential and needs. In detail the curriculum substance is directed as follows.

- A. Increasing the added value of the agricultural produce they produce through a variety of healthy and quality food processing. Types of knowledge and skills needed include: 1) Banana processing into various types of food, such as chips, fried bananas, bread, and other types; 2) Processing of Cassava, Tapes, Hui, and other types of tubers can be processed into various types of foods that are delicious, nutritious, and have high economic value; 3) Making and simultaneously packing health drinks from Ginger and Palm Sugar are interesting and good quality.
- B. Intensification of Paddy and Palawija plants on dry land. The paddy field (huma) done by the community can be optimized with other crops after harvest rice is harvested.
- C. Processing, packaging, and marketing Honey. The honey produced by the Baduy tribe is highly qualified because it is produced by the wild Hornet which consumes various types of flowers. The problem is honesty in processing and packing Honey. Baduy tribe needs to be instilled mental attitude and honesty not to mix honey with anything, so the quality is maintained and consumers believe to buy the honey.
- D. Processing and packaging of Palm Sugar. The quality of Palm Sugar produced by Baduy is very good. Needed added value in processing and packaging so that the product can be more interesting, durable and quality.
- E. Improving the quality of typical Baduy handicrafts, especially the production and innovation skills that suit the demands of consumers.
- F. Structuring the environment and improving human resources Baduy tribe to become a cultural tourism area. Environment and culture need to be styled more attractively according to their culture and local wisdom. It is also necessary to improve the attitude and skill in providing services to the tourists who come with remain their customs and culture. Language skills, especially Indonesian and English, need to be mastered by them.
- G. Increasing daily habits in healthy and clean living, nutritious food processing, and maintaining environmental cleanliness, especially in mothers.
- H. Knowledge, attitude and skills in marketing for all products produced. They also need to be given the ability in processing, packaging and marketing various products produced.  
Learning method on Baduy tribe can not be done formally.  
Baduy tribe refused formal form of education, for fear of undermining their customs and culture. They are also very careful and selective in accepting various forms of change that come from outside the community. Anwas (2009) study results, actually Baduy tribe does not reject to education from outside. What is important is the approach that should be appropriate and appropriate to their local culture and wisdom. This is confirmed by Rogers and Shoemaker (1971), Lippitt (1969), Sumardjo (2008), that the program of change of plans (in this case education) is very important to pay attention to: needs, values and culture, and involving them as widely as possible Holistically. Conversely, if education does not pay attention to these aspects, then there will be social and cultural resistance of the community. Therefore the proper learning method for Baduy tribe through Tutor Sebaya done gradually and continuously.

To train and form tutors, the Baduy tribe included the customary mebaga and Jaro (the leader of the Baduy tribe) to Midwife Eros Rosita and her husband Pak Asep. Midwife Eros Rosita has long served to help the birth of the tribe

Baduy. Already many Baduy tribe who gave birth successfully ditolong field Eros. Thanks to the persistence of Midwife Eros, the Baduy have successfully formed Family Planning Conceptor (KB) not less than 1,700 people. Both people are familiar with interaction with the Baduy tribe. Baduy people believe in him. Therefore the method of education in this Baduy society can be through both figures, especially to form Tutor Sebaya in every village of Baduy tribe. Through this Tutor Sebaya, education messages are delivered in stages and continuously. The learning process emphasizes more on aspects of practice and mentoring.

Assessment of the success of the curriculum, focused on real behavior change aspects in their daily lives. This behavior leads to abandoning old bad habits leading to better behavior. The process of education, needs to be gradual and sustainable, dialogic especially with adat leaders, and with principles not in conflict with their customs and cultures.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusion**

Curriculum development in improving the quality of life of Baduy tribe is formulated according to their potential, needs and culture. The objectives of the curriculum are to change the behavior to increase the added value of their potentials in the aspects of agriculture, crafts, environment, and customs and culture.

Curriculum materials include: increasing the added value of the agricultural produce they produce through various processing and packaging of healthy and quality agricultural produce; Intensification of Paddy and Palawija crops on dry land; Instilling mental attitude and honesty in entrepreneurship, improving the quality of unique Baduy handicraft, environmental arrangement and increasing Baduy human resource to become a cultural tourism area, increasing daily habit in healthy and clean life, and knowledge, attitude and skills in marketing for all Products produced.

The method of learning on the Baduy can be done through Tutor Sebaya done gradually and continuously. The learning process emphasizes more on aspects of practice and mentoring. Assessment of the success of the curriculum focuses on aspects of behavior change that are real and beneficial to their daily lives.

### **Suggestion**

Improving the quality of life of the alienated tribes such as Baduy tribe is urgently needed. Participation mainly from the government is necessary. Similarly, the need for participation of various parties, especially companies through corporate social responsibility (CSR) program. To get a more operational curriculum model in improving the quality of life of Baduy tribe, more detailed research is needed by involving various related parties

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## Curves and Surfaces: Method and Creativity in Design Process

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### ABSTRACT

The paper deals with a didactic experience through courses that are part of the first year of studies for the Schools of Architecture and Design of the Politecnico di Milano. One of the themes of these courses concerns geometric problems, in order to introduce students to 3D space. The peculiarity of the didactic method used is, first of all, to induce the student to observe the real object by identifying its geometric characteristics (symmetries, proportions, contours, and surfaces enveloping it). Subsequently, the goal is to teach how to translate the observed form into mathematical language and finally draw it on the computer.

The virtual reconstruction of the architectural form of the official symbol for EXPO2015 in Milan (Italy) is presented as an example of application of the method using dynamic surfaces.

The basic mathematical background for application in Computer Graphics is 3D parametric analytical geometry and matrix calculus, along with a basic approach to the SCILAB® library.

The most characteristic aspect of this teaching method is the sense of success achieved by students who can quickly manipulate and control complex lines and shapes by improving familiarity with geometry and stimulating creativity.

### INTRODUCTION

Mathematics is usually considered a noble and abstract discipline, very close to philosophy. However, in applied sciences, such as physics, biology, chemistry, engineering, mathematics is recognized as a pillar for the simulation of natural phenomena. Even as regards geometry, essential tool for the work of Architects and Designers, it is generally seen as means of classifying curves and surfaces and describing their characteristics. Rarely mathematics is considered as an aesthetic and creative intellectual activity. This is the aspect of mathematics that is highlighted in this paper.

On the other hand new technologies, heavily computer based, like 3D printers, renew the designer figure, by imposing an effort on common design between designers, architects, mathematicians and engineers. This fusion of artistic, scientific and technological cultures brings with it a creative project based on a revised geometric sensitivity. In fact, the designer responds to this renewed cultural baggage by creating objects of geometrically innovative shape or, otherwise, using classical geometric forms in an innovative way (see Pottmann, 2007, for a very interesting formalization of this idea). The tendency is to design in a way apparently disordered, but in reality linked to geometric harmony.

In this direction the didactic experience, here presented, within the Schools of Architecture and Design is developed.

The first goal of this proposal is to learn, with the eye of the artist, to grasp, among the aesthetic aspects, in nature, in art, in buildings and in artifacts, the geometric component, which brings with it harmony, symmetry, dynamism and consequent beauty (see for example, Marchetti, 2012).

A second goal is to learn how to design, at any scale, by giving priority to harmony that is determined through geometric characteristics.

Another objective is to find the right tool. The painter has his brush, the writer the pen. What expressive tools does the mathematician want to give to the designer? Obviously a mathematical tool that offers the ability to express and manipulate, taking into account all the geometric features, even complex forms, in a simple way. An expressive and creative mathematical tool, as well as rigorous, is 3D analytical geometry (Caliò, 2016). Here, lines, surfaces, classical

and more generic shapes can be represented not only with pencil, ruler and compass, but also with a few equations. This vision requires a sensibility that is certainly different from that of a painter or writer, but still can be defined as artistic. Another example of mathematical tool is the matrix calculus (Caliò, 2016). Thanks to this instrument we are able not only to virtually represent, deform and move objects in space, but also to create, define and construct them (Caliò, 1997).

Now the subsequent steps of the didactic method are described.

- The student observes the form of a real or ideal "object" (some images of architectural buildings or Design objects are presented) from an aesthetic point of view and comes to this consideration: each object designed, understood as a structure that defines a space, is delimited by surfaces.
- The student understands that, from the figurative point of view, besides the other factors - static, material, functional, social and so on - the object is characterized by the configuration of its surfaces.
- The student points out the peculiarities and the geometric nature of the surfaces.
- The student, using a suitable software provided with rigorous instructions, virtually represents the surface reconstructed or imagined.

In order to give a significant example of how the didactic experience develops, the attention is focused on particularly interesting surfaces, called dynamic surfaces: their epistemological nature is identified and the mathematical language is able to interpret their dynamism.

The dynamic surfaces are special surfaces obtained by continuous transformation of a planar or skew curve or by deformation of a given surface (Caliò, 2000, Marchetti, 2002, Caliò, 2012).

A curve that is subjected to a transformation is generatrix, a curve leading the transformation is directrix. A continuous transformation is rotation, translation or combination of them.

A surface acquires its physiognomy through the definition of the generatrix curve and through the law of movement.

The rotation surfaces (or revolution surfaces) are generated by a generatrix line rotating around an axis. Many examples of them are found in Design (for example the table lamp *Taccia* by *Castiglioni* and the *Bombo* tables by *Giovanoni*). More contemporary rotations can lead to very famous and strange surfaces : *Moebius* strip or *Klein* bottle (Caliò, 1997).

The translational surfaces are generated by the movement of a generatrix along a directrix and assume qualitatively different aspects, because they are strongly influenced by both curves (generatrix and directrix). The translation of generatrix curves along rectilinear lines creates indefinite cylinders of different nature (for example the roof of the *Theatre* in Lyon designed by *Nouvel*), whereas curved lines generate saddles and twisted tubes (for example the roof of the *Royal Theatre* in Torino designed by *Bertone*).

The combination of the two movements (rotation and translation) gives rise to forms that Architecture appreciates and adopts with enthusiasm (*Wright* in *Guggenheim Museum* is an example): helicoids of every type (dependent on generatrix, from the rotation axis and the directrix of translation).

Deformation of the simplest surfaces (plane and sphere) generates surfaces that acquire a remarkable significance from aesthetic point of view (*Isosaki Tower at City Life* in Milano gives example of architecture whose reading key can be the controlled deformation of plans).

This transform-oriented vision of reality is the principal subject here presented on which the didactic method is illustrated.

This idea has proven to be successful thanks to the fact that not only the searched target can be easily and pleasantly reached but also it can be somehow overridden. In fact it is intrinsic to this approach the capability of generating new unpredictable shapes whose aesthetic and validity can be verified a posteriori. It is a fantasy stimulating approach.

In the next Sections of the paper the generative process of the shape is described and an example of this procedure is illustrated . Final remarks will concern the skills of students acquired through this methodology.

## GENERATIVE PROCESS:

What it is meant by 3D parametric geometry?

The 3D parametric analytical geometry is understood as the evolution of 3D analytical geometry, which in turn constitutes the evolution of the synthetic geometry language, superimposing the algebraic language to the geometric language. Precisely:

- given a Cartesian orthogonal reference system, a point P can be represented in 3D space through Cartesian coordinates;
- there is correspondence of point P as well as with an algebraic 3-component vector, as well as with a geometric vector, starting from the origin of the Cartesian system and terminating into the point P;
- a curve is expressed by means of an algebraic vector depending on a single parameter and it is geometrically described by the set of the terminating points of the geometric vector corresponding to the different values of the parameter;
- a surface is expressed by means of an algebraic vector depending on two parameters and is geometrically described by a set of generating curves related to each other through some given law;
- an affine geometric transformation (i.e. translation, rotation, reflection, scaling, ...) is obtained from the application of an appropriate matrix to a vector and by imposing a translation to the result. It is possible to compose some transformations. Each linear transformation is described by a generic matrix equation:

$$A\mathbf{v} + \mathbf{b} = \mathbf{w} \quad (1)$$

where  $A$  is the transformation matrix,  $\mathbf{b}$  the translation vector,  $\mathbf{v}$  the current vector that must be transformed and  $\mathbf{w}$  the transformed vector.

What it is meant by the generative process of a surface?

It is meant firstly the interpretation and secondly the representation of the genesis of surface shape.

Using the dynamic surface definition and the mathematical tools introduced, we can get to describe the generative process. Precisely:

- the shape is analyzed;
- a geometrical genesis (i. e. generation law) of the shape is determined;
- a basis curve is selected (generatrix curve) and parametrically expressed;
- an action is applied to the curve by means of an algebraic parametric transformation (one parameter is introduced in the matrix of transformation). Successive elementary transformations are composed if needed;
- the parametric equation (two parameters) of the surface is determined;
- finally the surface is graphically obtained.

## LABORATORY EXPERIENCE: THE TREE OF LIFE

The didactic experience here presented is integrated by laboratory activities. The main purpose of the laboratory is to graphically implement and visualize the theoretical results obtained at the lessons. The open source software SCILAB® (<http://www.scilab.org/>) is used. The SCILAB® software allows very easy manipulations of one- and two- parameter equations and an immediate application of matrix calculus. Moreover it gives dynamic rendering of the image during the generation of forms. It can be used as an introductory tool to more professional and complex products.

The following example illustrates the laboratory activities.

The architecture object chosen is the symbol of EXPO 2015 (EXPO 2015, 2015): The Tree of Life [Figure 1]. This item is proposed for different reasons. Firstly it is, surely, attractive because it is a very recent work, a symbol of a popular event of very successful. Moreover its form, which gives us a concrete example of dynamism, is closely related to its meaning. The base, roots of the tree, and the terminal part, the tree's branches, take on the look of regular plot formed by basic elements that are close to the leaf and to the drop of water. The base and the top connect to each other in a vortex movement that seems to describe not the shape of the tree, but its growing, slow and regular. The surface of the object is realized by means of lines and voids that, for our benefit, highlight the forms to be grasped and reproduced.



**Figure 1:** The *Tree of Life*

Below the principal steps related to the virtual reconstruction in the 3D Cartesian space  $Oxyz$  of the *Tree of Life* are described.

The first step of the algorithm is to generate the top and the basis of the tree.

In particular:

i) The projection on the horizontal plane of a singular arc forming the top and the basis of the tree is assumed as lemniscate arc (Caliò, 2000).

$$\Gamma_0 : \begin{cases} x = A(a,t) = -a + a \cos(t) \sqrt{\cos(2t)} \\ y = B(b,t) = b \sin(t) \sqrt{\cos(2t)} \\ z = 0 \end{cases} \quad t \in \left[-\frac{\pi}{4}, -\frac{\pi}{40}\right] \cup \left[\frac{\pi}{40}, \frac{\pi}{4}\right] \quad (2)$$

where the variation of the parameter  $t$  identifies the portion of the arc, and the coefficients  $a$  and  $b$  are related to the shape of the real curve.

The (2) in vectorial form is  $\mathbf{v} = [A(a,t) \ B(b,t) \ 0]^T$ .

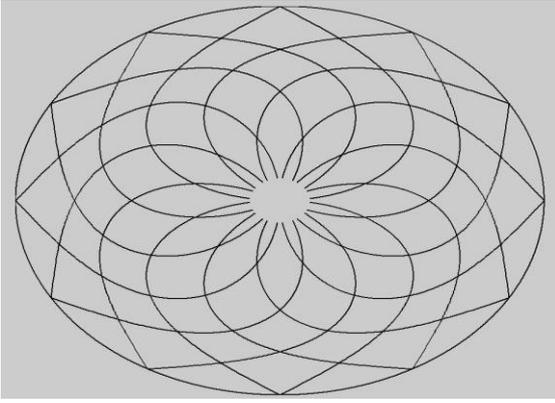
ii) The complete basic plane form with 12 arcs is achieved by 11 rotations of  $\Gamma_0$  around  $z$ -axis with angle of rotation  $\alpha = \pi/6$ . Applying to vector  $\mathbf{v}$  a suitable matrix of rotation according to (1) it follows:

$$\Gamma_1 : \begin{cases} x = C(a,b,c,t) = c(\cos(k\alpha)A(a,t) - \sin(k\alpha)B(b,t)) \\ y = D(a,b,c,t) = d(\sin(k\alpha)A(a,t) + \cos(k\alpha)B(b,t)) \\ z = 0 \end{cases}, \quad \text{with } k = 0,1,\dots,11 \quad (3)$$

This basic form is inscribed in an ellipse with semi-axes  $c$  and  $d$ , suitable to the desired form.

The surface delimited by the ellipse can be considered formed by continuous rotations of  $\Gamma_0$  around  $z$ -axis, but only 12 of them are selected in  $\Gamma_1$ .

Thanks to this transformation, it is evident the relation between the basic forms and the decoration of the Campidoglio pavement (in Roma), one of the symbols of the Italian Renaissance [Figure 2].



**Figure 2:** Virtual image of Campidoglio pavement

iii) The top and the basis in 3D are obtained as projection of  $\Gamma_1$  on a revolution logarithmic surface of equation:

$$S : \begin{cases} x = v \cos(u) \\ y = v \sin(u), v > 0, 0 \leq u < 2\pi \\ z = \log v \end{cases} \text{ that can be parameterized as } S : \begin{cases} x = u \\ y = v \\ z = \log(u^2 + v^2) \end{cases}, u \in R, v \in R.$$

Consequently projecting suitably  $\Gamma_1$  on  $S$ :

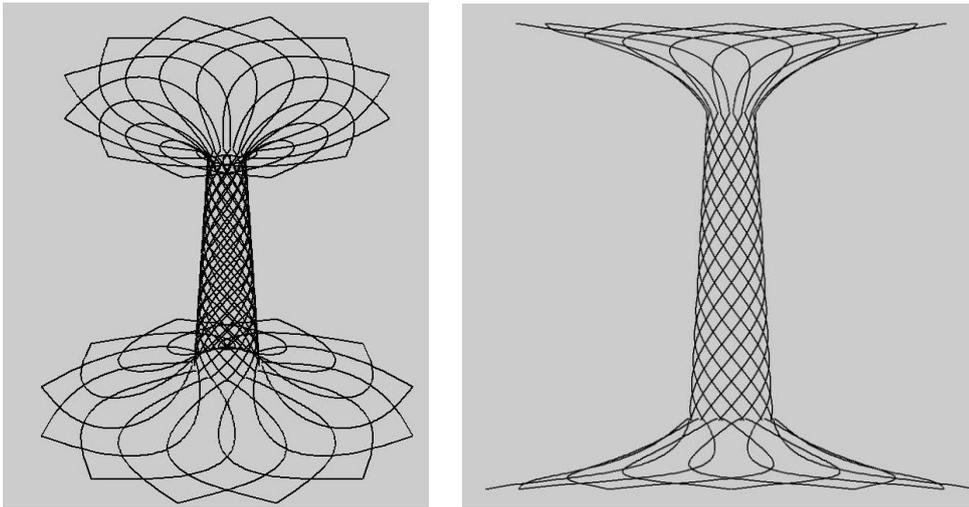
$$\Gamma_2 : \begin{cases} x = C(a, b, c, t) \\ y = D(a, b, d, t) \\ z = h \pm \ln((C(a, b, c, t))^2 + (D(a, b, d, t))^2) \end{cases} \quad (4)$$

In (4) the values of  $h$  and the choice  $\pm$  are related to construction the top or basis.

- 2) The trunk of the tree is obtained by the projection, on a trunk of cone, of two sets of twelve Archimedean spirals, symmetric with respect to a center. That is:

$$\Gamma_3 : \begin{cases} x = (k_1 t + k_2)(\cos(k\alpha) \cos(t) \mp \sin(k\alpha) \sin(t)) \\ y = (k_1 t + k_2)(\sin(k\alpha) \cos(t) \pm \cos(k\alpha) \sin(t)), k = 0, 1, \dots, 11 \\ z = k_3 t + k_4 \end{cases}$$

The values of  $k_1, k_2, k_3, k_4$  are chosen according to the shape of the trunk. In [Figure 3] the whole tree is represented in two perspectives.



**Figure 3:** Virtual reconstruction of the *Tree of Life*

### FINAL REMARKS

The didactic method in teaching the geometric component of mathematics in Architecture and Design Schools exemplified in this work leads to interesting results, suitable to the audience to which it is addressed.

Firstly, it educates the student to thoroughly observe the object, to be described or to be designed, with an aesthetic eye, focusing on the geometric aspects of the surfaces that characterize the object.

Secondly, the student incorporates the possibility of creating complex forms with the modern and agile mathematical language of the parametric 3D geometry. As a result, students are sensitized to the potential of mathematical language itself, which will be an indispensable cultural basis for those who are oriented to virtual design.

Finally by the virtual reconstruction of the object, the student understands that he has in his hand a tool that allows to manipulate the object, for example to correct its dimensions and shape.

This latter consideration allows the student to grasp the aspect of less obvious and unusual mathematics: the creativity. In other words, following the particular path proposed in this paper, the knowledge and study of the genesis of the surface stimulates the designer to develop creative abilities, which allow him to go further the possibility to observe, understand and then communicate the already realized projects.

This method seeks to consolidate the deep and ancient bond between art and science, contributing to the collapse of the separation between scientific culture that it observes and it studies and the humanistic culture that it thinks and creates.

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## Denying Giftedness As A Social Strategy of Gifted Pupils

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### ABSTRACT

The article presents the results of a research survey, which was realized on a sample of gifted pupils (n = 208) from the Czech Republic, from the level of education ISCED2 (lower secondary), from classical schools and schools specialized in education of gifted pupils. The survey was conducted using the Social Coping Questionnaire, which includes factor called Denying Giftedness. The analysis focuses on this factor separately based on the previous exploratory factor analysis. The results show, that a third of gifted pupils declare certain tendencies to deny their giftedness. More than 80 % of the research sample attributes giftedness to other people and does not speak about their own giftedness publicly. The results do not differ significantly in terms of type of school or in the group of pupils with special educational needs. However, they differ in terms of gender where girls tend to deny their giftedness more than boys in all questionnaire items. Furthermore, it appears that with the growing school age, there is a growing percentage of pupils who do not tell people about their giftedness.

### THEORETICAL BACKGROUND

The most commonly used definition of gifted is that provided by the U. S. Office of Education, which states: Gifted and talented children are those identified by professionally qualified persons who, by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs in order to realize their contribution to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas or in combination: General intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual or performing arts and psychomotor ability. (Marland, 1972, as cited in Gardynik & McDonald, 2005)

According to Porter (1999), these definitions of giftedness may become more specific in relation to their perspectives. These encompass, for example, liberal and conservative views (difference in quantity estimate of gifted people in population), one- and multi-dimensional (given by the number of criteria to identify gifted pupils), the definition of potential and the actual performance. Our view on giftedness is based on multi-dimensional liberal definitions and is focused on intellectual ability. In our view, a gifted pupil is a pupil who successfully passed complex diagnostics of intellectual talents at the pedagogical-psychological counselling centre.

In school environment, gifted pupils tend to demonstrate typical features. As far as cognitive features are concerned (Davis, Rimm & Sielge, 2011), let us mention, for example, intense curiosity, abstract thinking, ability to transfer knowledge, creativity, generating original ideas, excellent memory, interest in philosophical topics. As for social-emotional features described by T. L. Cross (2011), these are represented by asynchronous personality development (conflict between one's level of intelligence and aspects such as motoric, verbal and socio-emotional development), perfectionism, emotional sensibility, multipotenciality, intensity and profundity of experience. Because of these features, gifted pupils might feel very different from other children in class and might exclude themselves from (Coleman & Cross, 1988).

Social exclusion can be supported negatively by labelling of gifted pupils. The term of labelling tends to be defined in the scope of so-called labelling theory (Hudak, Kihn, 2001), which is concerned with labelling individuals by description of his or her abilities, skills and characteristics. After being labelled as such (“gifted”), the approach of one’s social environment as well as his or her own towards himself or herself, which leads to stigmatization. Labelling in relation to giftedness is mentioned by a lot of authors, for example Matthews and Foster (2005), Renzulli (2004), Freeman (1998), Heward (2013) and Clark (2013).

Research focused on giftedness, reflecting the above mentioned information and trying to prove it empirically, are realized not only in school environment, but also in family and peer environments, and they rely on quantitative research methods predominantly. If we focus on research from school environment (for example Gates, 2010; Renzulli, 2004; Moulton et al, 1998), the results point out to negative outcomes of labelling. These negative aspects are, for example, stereotypical evaluation of a gifted pupil’s personality, a gifted pupil’s fear of academic failure, pressure and higher expectations from teachers and parents which is not in accordance with his or her level of giftedness, social exclusion from class.

However, a human, as a social being, needs to belong among others and share his or her emotions and experiences with friends (Coleman & Cross, 1988). Researches on value preferences of children (Bocan, 2011) show that children from the age of 10 to 12 in the Czech Republic consider following things to be most important: 1. To have friends, 2. To be healthy, 3. To have a happy family. That is why it is logical that pupils might put all their effort to become fully-fledged part of the class. In the case of gifted people, this might mean that they will deny their giftedness, or chose other social strategy in order to fit in the class. Other research (Šramová & Hamranová, 2015), which used Portrait Value Questionnaire, showed that conformity, benevolence and success is currently going up in adolescents’ hierarchy of values. However, these are values which might be mutually conflicting (i.e. to be conforming and to experience success at the same time). The gifted pupils created a number of strategies in order to cope with consequences of labelling. We can refer to one of the most cited typologies of giftedness by Betts and Neihart (1988) which defined types of the gifted ones by using three criteria: expressions of behaviour, emotions and needs. As the authors themselves say, this approach enables us to understand the gifted ones in using social strategies used by them in order to make cognitive, emotional and social growth easier. From this theory, we select following types of gifted children and following social coping strategies:

Type 1: the successful gifted one. He or she is a conforming individual. He or she is submissive. On the outside, he or she does not seem to have any serious problems, achieves excellent study results. Teachers usually have no struggles with identification. 90% of pupils identified for school programmes focused on gifted pupils belong to this type. In the emotional sphere, this type of characteristic for the feeling of boredom, dependence and positive self-conception. In the behaviour sphere, it is perfectionism and high performance rate.

Type 2: the provoking gifted one. In this case, the authors emphasize creativity and the resulting problems in interpersonal relationships. The emotional sphere: feeling of boredom, frustration and low self-assessment. The behaviour sphere: correcting the teacher, asking questions about rules. Needs: the need to be with others, to learn social diplomacy and to gain self-esteem.

Type 3: the concealed gifted one. Most of the unidentified gifted children belong to this type. According to the authors, there are more girls than boys belonging to this type. The emotional sphere: insecurity, feelings of stress and pressure, embarrassment and feelings of guilt. The behaviour sphere: they hide their talent, refuse changes. Needs: the need to have a free choice (in both activities and friendships), the need to realize conflicts and emotions.

Type 4: the ignored gifted one. These gifted children did not meet with support and understanding of the others. That is why they often realize their interests and potentials outside of school. The emotional sphere: irritability, anger, depression. The behaviour sphere: unstable behaviour, tendency to keep tasks unfinished and engaging in activities outside of school. Needs: the need of individual approach and intensive support, the need for new opportunities.

Type 5: the independent gifted one. This type is characteristic for frequent expression of giftedness and ability to work effectively at school. He or she is respected by both children in class and adult authorities. The emotional sphere: confidence, self-acceptance and enthusiasm. The behaviour sphere: has solid social skills, works independently and is able to set his or her own goals.

Another analysis of social coping strategies was carried out by Swiatek (2002), using The Social Coping Questionnaire. The version of a questionnaire that we applied, the fields we covered were Denying giftedness, Social interaction, Humor, Conformity and Peer acceptance. In our research, we decided to map the usage of Denying giftedness strategy and find coherence between using this strategy and the school type, year of school

(age), gender and the information whether the pupil shows other special education needs (in the area of learning disabilities, behaviour problems, long-term diseases or their combinations) except for giftedness.

### THE STUDY

The research is based on five-factor version of The Social Coping Questionnaire (Swiatek, 2002). Various versions of this questionnaire were tested in the past (Swiatek, 2002; Swiatek, Cross, 2011; Cross, Swiatek, 2009); however, the results were not satisfactory due to their inconsistency, both in terms of construct validity and reliability (Rudasill, Foust, & Callahan, 2007). Our goal is to test this questionnaire in Czech environment and to analyze and to compare gained results in the field of Denying giftedness.

208 ISCED2 pupils (in the Czech educational system, it means 6th to 9th year of elementary school) were included in the research. In terms of gender, there were 75 girls (36%) and 133 boys (64%) in the age from 10 to 16 years. The average age in the research sample is 13 years. The research sample is evenly spread in school years: 6th year is represented by 58 pupils (28 %), 7th year by 58 pupils (28 %), 8th year by 45 pupils (22 %) and 9th year by 47 pupils (22 %). 161 pupils (77 %) go to the type of schools oriented on education of gifted pupils (8-year grammar school, lyceum or elementary school oriented on education of gifted pupils) and 47 pupils (23 %) go to ordinary elementary school. Such a disproportion is usual in the Czech education system. Even though, there have been efforts to apply inclusive approaches, the education of diagnosed gifted pupils is realized as segregated in specialized schools. 50 pupils (24%) from the sample stated that they have one or more certificates on special educational needs to which we include learning disorders, behavior disorders, long-term illnesses, other disorders and their combinations.

Given the fact that we have only available selection of respondents, we treat work with the results only on the explorative descriptive level and they cannot be considered general. However, they indicate relationships which can be interesting for a comparison with other similarly oriented researches in the given field.

### FINDINGS

The results of analysis are divided into three basic sections. Firstly, we will present exploratory factor analysis of eight questionnaire items falling under the factor of Denying Giftedness in the scope of The Social Coping Questionnaire, and also their overall reliability in the conception of Cronbach's alpha. Further, we present descriptive results for all items. In the conclusion, we focus on a comparison of results within the scope of selected groups of respondents.

The questionnaire was not applied in the Czech environment yet, which was why we were worried that its application together with the translation to different language will slightly change its factor structure. We investigated it with the usage of exploratory factor analysis (extraction method: Principal Component Analysis; KMO = 0,847; stat. signif. Bartlett's test of sphericity; MSA of all items  $\geq$  0,807). Its results are shown in the table below.

**Table 1:** Component matrix of Denying giftedness

Items	Factor loadings
I28. I don't think that I am gifted.	0.812
I29. People think I am gifted, but they are mistaken.	0.753
I30. I am not gifted, I am just lucky in school.	0.729
I31. As I get older and academic work gets more difficult, people will stop seeing me as gifted.	0.708
I33. There are many people who are more gifted than I am.	0.667
I32. Most of the success I experience are due to luck.	0.666
I35. I don't tell people that I am gifted.	0.508
I34. I try not to be too successful at the things I do.	0.307

Note: Total variance explained = 43 %; Cronbach's alpha = 0,801.

Even though the questionnaire was applied in the new context and it had to be translated for such purposes, the selected factor seems to be relatively consistent and reliable from the view of construction validity in spite of the fact that in the scope of realization of exploratory factor analysis, it was possible to arrive at multi-factor solution.

The table above shows that there are 8 questionnaire items which were presented in full text. At the same time let us mention that the respondents could answer them by the scale of four levels (I strongly agree, I agree, I do not agree, I strongly disagree). For reasons of clarity, we focus only on the percentage of positive answers in the

scope of the analysis (i.e. I agree and I strongly agree). The following table sums up the descriptive results of the analysis.

**Table 2:** Descriptive analysis of individual items (affirmative answers)

Items	n	%
I34. I try not to be too successful at the things I do.	12	6%
I30. I am not gifted, I am just lucky in school.	39	19%
I32. Most of the success I experience are due to luck.	40	19%
I29. People think I am gifted, but they are mistaken.	57	27%
I28. I don't think that I am gifted.	68	33%
I31. As I get older and academic work gets more difficult, people will stop seeing me as gifted.	90	43%
I33. There are many people who are more gifted than I am.	168	81%
I35. I don't tell people that I am gifted.	174	84%

It is interesting that one third of the pupils shows tendencies to deny their giftedness in the half of all questionnaire items. They do not think they are gifted, they assume that people will stop labelling them as such at the higher and thus more demanding level of education, they identify other gifted people around them and they don't tell people that they are gifted themselves, even though in all these cases are pupils who were diagnosed and in most cases, they are enrolled to specialized education institutions. They show their giftedness by belonging to specialized education institutions, but at the same time they try to deny it and grant it to others, as if they tried to apologize for or play down their affiliation to the group of gifted pupils. Social position of these children is rather complicated because they need to cope with their difference strategically.

In the last part of the analysis, we present a comparison of results in selected groups. In comparison of the two types of education institutions, (traditional and specialized), there are no substantively significant differences found. More remarkable difference is only in the case of item number 31, which a higher percentage of pupils from specialized institutions agrees with. Another comparison focuses on the differences in the answers of the pupils who state that they have one or more special learning needs certified (learning disorders, behaviour disorders, long-term illness, and other or their combinations). In this case too are minimal differences from the factual perspective. Comparisons in which there are no significant differences are summed up in the table number 3.

**Table 3:** The results of comparisons in terms of education institution types and special learning needs of pupils

Items	Traditional education institution		Specialized education institution		Pupils without special learning needs		Pupils with special learning needs	
	n	%	n	%	n	%	n	%
I28	54	34%	14	30%	50	32%	18	36%
I29	44	27%	13	28%	42	27%	15	30%
I30	31	19%	8	17%	28	18%	11	22%
I31	65	40%	25	53%	66	42%	24	48%
I32	31	19%	9	19%	27	17%	13	26%
I33	133	83%	35	74%	129	82%	39	78%
I34	8	5%	4	9%	9	6%	3	6%
I35	135	84%	39	83%	131	83%	43	86%

As far as the results in terms of a school year (and, at the same time, age) are concerned, the results do not show that these variables remarkably determined pupils' answers in most of the items; that is why we do not present these in detail. Only number 35 shows (not presented in the tables) that the higher year of school (and age), the more likely pupils tend to keep quiet about their giftedness. In the 6th year, 78% of pupils do not inform other people about their giftedness, in the 7th year it is 83%, in the 8th it is 87% and in the 9th it is 89%.

In connection to gender of pupils, there are more remarkable differences. In case of all items, there is higher tendency to deny giftedness in the girls than in the boys (details in the Table 4). Our findings correspond to those of Swiatek (2002), who also mentions that the girls demonstrate higher tendency to hide their giftedness than the boys. Her findings are also supported by Kerr (2000) with reference to traditionally differentiated approach in bringing up girls who are expected to be passive, adaptable and moderate.

**Table 4:** The comparison of the results in relation to pupils' gender

Items	Girls		Boys	
	n	%	n	%
I28. I don't think that I am gifted.	30	40%	38	29%
I29. People think I am gifted, but they are mistaken.	27	36%	30	23%
I30. I am not gifted, I am just lucky in school.	19	25%	20	15%
I31. As I get older and academic work gets more difficult, people will stop seeing me as gifted.	37	49%	53	40%
I32. Most of the success I experience are due to luck.	18	24%	22	17%
I33. There are many people who are more gifted than I am.	66	88%	102	77%
I34. I try not to be too successful at the things I do.	6	8%	6	5%
I35. I don't tell people that I am gifted.	67	89%	107	80%

## CONCLUSIONS

In the scope of this study, our goal was mainly to test The Social Coping Questionnaire, more concretely its dimension of Denying Giftedness, in the Czech context. It turned out that this dimension is relatively stable in Czech version too, which we based on results of exploratory factor analysis (there was no use in application of confirmation level of this analysis on the data we gathered). We also dealt with description and comparison of the results in this field. We found out that gifted pupils tend to have strong tendencies to deny their giftedness, which is more spread among the girls than the boys. In the case of hiding one's giftedness (I35), this strategy is more likely to be used with higher year of school. The denial of giftedness is explained in the context of labelling theory, according to which, there is a tendency to label gifted pupils, which can cause in their exclusion by their classmates and lead to stigmatization which is what these individuals try to naturally avoid, even though they are usually put in classes with other gifted individuals.

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# **Design Framework of Constructivist Web-Based Learning Environments to Enhance Problem Solving on C Programming Language for Secondary School**

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## **ABSTRACT**

This research study aimed to designing framework of Constructivist web-based learning environments to enhance Problem Solving on C Programming Language for Secondary School. The target group consisted of 3 expert reviewers for content, web-based learning and learning environment designing. Research methodology is developmental research; developmental research consisted of 3 processes: (1) designing process, (2) developing process, and (3) Evaluate the efficiency of the design framework. Research methods are document analysis. The procedures were as following steps: (1) to examine and analyze the principles and theories, (2) to synthesize theoretical framework as following that Contextual base, Psychological base, Technologies base, Problem Solving for programming base and Pedagogies base Model learning environments, (3) to synthesize designing framework. The result revealed that: 1) to synthesize theoretical design framework of 5 components as following that Contextual base, Psychological base, Technologies and media base, Problem Solving, Pedagogies base Model learning environments. 2) To synthesize theoretical design framework of Constructivist web-based learning environments to enhance Problem Solving of 7 components as following that. (1) Problem base (2) Resource (3) Collaboration (4) Problem Solving Center (5) Related Case (6) Scaffolding (7) Coaching. The efficiency of the Constructivist web-based learning environments to enhance Problem Solving are shown in following: learning content, web-based learning and learning environment designing.

## **INTRODUCTION**

21st Century is the time when people around the world face change and develop quickly. Education is an important tool in the development of human and social resources. That is, education will develop people to have the features that society needs. To be a factor in social development )WANGSRIKON , 2014(. Therefore, education must play a role in line with the changing world society that is entering the 21st century, with the necessary learning and innovation skills. Is a Problem Solving. Programming is a complex and complex science and is essential for enhancing students' 21st century skills and problem-solving skills )PHOLASA, 2016(. And the key theoretical principles that will help to encourage students to learn such skills are: Constructivism. Theory and characteristics of the media are used in the design, teaching, use of media, and the way of learning with the essential elements of the theory. Constructivist Combined with the principle of Problem Solving. web-based media enabled us to design instructions that responded to learners' requirements at all places and time )SAMAT,2015(. For this reason, we have adopted theoretical problem solving to support programming, and to enhance the problem solving needed for 21st century learners to improve their problem solving skills in computer programming. Thus, this research was aimed at designing framework of Constructivist web-based learning environments to enhance Problem Solving from analysis of theoretical framework and learning environment. In order to obtain the basis for constructing the appropriate and efficient learning environment for the learners.

## **METHODOLOGY**

This study was aimed to synthesize theoretical framework and design of Constructivist web-based learning environment to enhance problem solving. Research methodology is developmental research consisted of 3 process; (1)Designing process and (2)Developing process research methods are document analysis, (3)Evaluate the efficiency of the design framework The procedures were as following : (1)To examine and analyze the principles and theories. (2)To synthesize theoretical framework. (3)To synthesize designing framework. (4)To evaluate the efficiency of the learning environments.

Target Group in the design and development process consisted of 3 expert reviewers. (1) Experts in content validity. (2) Experts in web-based media. (3) Experts in learning environment design.

The instruments in this study as following details : (1)The document examination and analysis recoding form to synthesize a theoretical framework. (2)The recoding form for synthesis of the design framework to learning

environment to enhance problem solving. (3)The evaluation form for synthesize theoretical framework and designing of Constructivist web-based learning environments to enhance Problem Solving.

The researchers collected the data as follows: (1)Synthesis of theoretical framework and Components of the learning environment. The data were collected by analyzing principles, theories, related research of the constructivism theory, cognitive theory, media and technology theory, pedagogy and contextual study, (2) Synthesis of Designing framework of the learning environment: The above synthesized theoretical framework was taken into this process. The underlined theories base such, Contextual base, Psychological base, Technologies and media base, Problem Solving for programing base, and Pedagogies base Model learning environments. (3) Designing and develop of the learning environment based on foundation of creating designing framework was adopted. (4)Evaluate of the learning environment by experts. The analytical description, summarization and interpretation were used to analyze data

## RESEARCH RESULTS

The designing and development of the learning environment that promote student’s problem solving are follows:

### A. SYNTHESIS OF THEORETICAL FRAMEWORK

The results show that the theoretical framework as following that (1) Contextual base are follows: basic education curriculum core in Thailand, Content of course. (2) Psychological base are follows : Constructivist, cognitive, social constructivist theory and cognitive theory, Information processing theory.(3) Technologies and media base are follows: Web-based learning, The system of media. (4) Problem Solving for programing base are follows: (1) Problem-Solving Phase, Analysis and Specification. (2) Implementation Phase, Concretresolution, Test. (3) Maintenance Phase, Use, Maintain. (5) Pedagogies base Model learning environments are follows: OLEs Model, CLEs Model, Situated learning, Cognitive apprenticeship. From the synthesis of principles and theories. Theoretical frameworks can be synthesized as follows in figure 1.

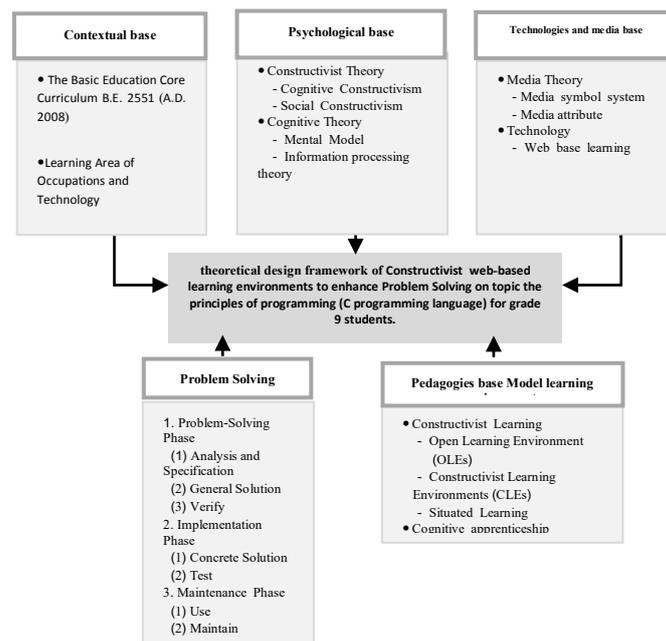


Figure.1 : Theoretical framework of the learning environment for enhance creative problem solving.

### B. SYNTHESIS OF DESINING FRANEWORK

According to this study, the findings of synthesis of the theoretical framework which was used as foundation in synthesizing the designing framework of the learning environments to enhance Problem Solving which include following details;

Activating cognitive Structure, Problem Solving.It is illustrated the relationship between the underlined theories and the component as follows: cognitive constructivism, situated learning (Brown, Collins, and Duguid,1989), Problem Solving (Dale et al., 2007). Designing of the component of which is called Problem situation. It focuses on authentic design, contextualize problem. This help to activate cognitive structure of the students.

Supporting cognitive equilibrium. It is illustrated the relationship between the underlined theories and the component as follows: cognitive theories, Information processing theory (Klausmeier, 1985), Mental model theory, OLEs (Hannafin, 1999). Designing of the component of which is called (1) Resources. It focuses on how the students process the information effectively. This can help the students understand easily. (2) Related case, this component used CLEs model (Jonassen, 1999). It focuses on Understanding each problem stimulates the experience of the problem and create a conceptual model of the problem in the case of a less experienced student.

Enhancing knowledge construction and Problem Solving. It is illustrated the relationship between the underlined theories and the component as follows: Problem Solving (Dale et al., 2007). Designing of the component of which is called (1). Problem Solving Center, the learners showed problem solving ability of Problem-Solving Phase that analysis and specification. Implementation Phase, the learner can create solution and test solution. Maintenance Phase ;Use ; Maintain. (2) Collaboration, this component used social constructivism (Vygotsky, 1962) that help the learner collaboration within a group of participants and shared decision making.

Supporting enhancement for construction knowledge. It is illustrated the relationship between the underlined theories and the component as follows respectively ; Social constructivist (Vygotsky, 1962), focuses on the Zone of proximal development to support the student as scaffolding . CLEs model (Jonassen, 2004), the component as follows: (1) Scaffolding include Metacognitive Scaffolding, Strategic Scaffolding, Conceptual Scaffolding and Procedural Scaffolding. (2) Coaching, relies on theory Cognitive apprenticeship focus to monitor, analyze, and regulate the learners' development of important skills (Jonassen, 1999; Charuni Samat & Sumalee Chaijaroen, 2009). The relationship between the underlined theories and component are shown in Figure 2.

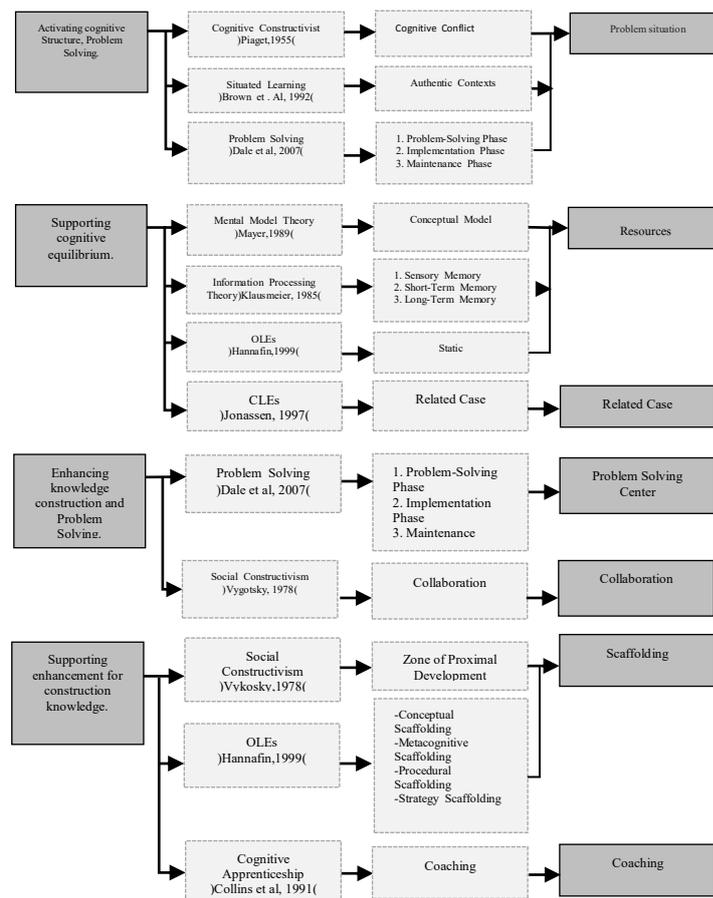


Figure2 : Designing framework of learning environment to enhance problem solving.

### C. EVALUATE THE EFFICIENCY OF THE LEARNING ENVIRONMENTS

The results of the expert assessment on learning content, theoretical framework, and design framework, a way to check the quality of the specialists Content Design and Constructivist web-based learning environment Design to learn from the evaluate form. The learning environment is designed according to the principles of the theory

as a basis for the design. Overall fitness and help promote the creation of knowledge-based theory constructivist Whistler undertakings augmented reality is a new technology that promotes analytical thinking as well. The results of the expert synthesis design were shown in table 1.

No.	Lists of preconception towards the Constructivist web-based learning environments	results of the expert (Percentage)
<b>Learning Content</b>		
1.	Appropriate learning content	78
<b>Synthesis of theoretical framework</b>		
1	Contextual base.	79
2	Psychological base.	77
3	Technologies and media base.	82
4	Problem Solving.	78
5	Pedagogies base Model learning environments	80
Total		78
<b>Web-based learning environments components</b>		
6	Problem base	79
7	Resource	78
8	Collaboration	80
9	Problem Solving Center	79
10	Related Case	78
11	Scaffolding	79
12	Coaching	79
Total		79.2
Total of the 3 assessments.		78.9

**Table 1:** The results of the expert Synthesis design learning environment. Evaluation, synthesis, design learning environment.

According to Table 1, the results of the assessment of the experts on the learning content, Synthesis of theoretical framework and the Constructivist web-based learning environment Design, as follows :

Learning Content : It was found that the content was appropriate for the learners. Accounted for 78 percent.

Synthesis of theoretical framework : Based on the study of related research theories. Synthesizes 5 fundamental theories: Contextual base, Psychological base, Technologies and media base, Problem Solving, Pedagogies base Model learning environments. Found that theoretical basis from the synthesis. It is appropriate to design a web-based learning environment that promotes student problem solving. Accounted for 78 percent.

Web-based learning environments components : To synthesize theoretical design framework of Constructivist web-based learning environments to enhance Problem Solving of 7 components as following that. (1) Problem base, (2) Resource, (3) Collaboration, (4) Problem Solving Center, (5) Related Case, (6) Scaffolding, (7) Coaching. Each components is derived from the application of theoretical principles that are appropriate. And it is necessary to help the learner to be able to solve the problem. Which is 79.2 percent.

The results of the expert Synthesis design learning environment. Evaluation, synthesis, design learning environment, found that the synthesized; Consistent design principles along constructivist that promotes problem solving was 78.9 percent.

## CONCLUSIONS AND CONCLUSION

The study of the design framework of Constructivist web-based learning environments to enhance Problem Solving on C Programming Language for Secondary School. The 7 important components i.e., (1) Problem base (2) Resource (3) Collaboration (4) Problem Solving Center (5) Related Case (6) Scaffolding (7) Coaching.

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# **Designing Framework of Constructivist Web-Based Learning Environment to Enhance the Creative Thinking for College Student**

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## **ABSTRACT**

The purpose of this research was to synthesize theoretical framework and designing framework of constructivist web-based learning environment to enhance Creative thinking for college students. Documentary research was employ in this study. The procedures were as following: 1) to examine and analyze the principles theories review relevant research.2) to explore the relevant context concerning 3) to synthesize theoretical framework and designing framework of constructivist web-based learning environment to enhance Creative thinking. Using the framework of Creative thinking as following:1)Fluency2)Flexibility 3)Originality 4) Elaboration. The result revealed that: 1) Theoretical framework comprise of 5 components as following: (1) Psychological base (2) Pedagogical (3) Context base (4) Technology base (5) Creativity base. 2) Constructivist web-based learning environment to enhance Creative thinking comprise of 5 step as following: 1) Activating cognitive Structure and promoting Creative thinking 2) Supporting for adjusting into equilibrium 3) Supporting and enlarge for constructing knowledge 4)Fostering the creativity 5) Support and assisting the knowledge and construct of 6 components as following: 1) Problem base 2) Learning Resource 3) Collaboration 4) Creativity Center 5) Scaffolding and 6) Coaching

## **INTRODUCTION**

training that makes students learn and develop their knowledge from learning in a classroom from their teachers. Students must learn a lot of information, plus the information changes all the time because the knowledge of information technology changes all the time; changes into the economic society of knowledge and technology as well as epistemology with the quote that knowledge is not stable, it changes all the time. Therefore, how to know is to create knowledge. Learning management must be changed rapidly that can respond to knowledge-based economic society with the characteristics of an all-the-time knowledge seeker and a creator of new knowledge to use in living, and the theory that is used to design and compatible with the aforementioned characteristics is the constructivist theory emphasizing creating students' knowledge via information interaction from various sources through the cognitive process and social interaction that makes comprehension to enhance learning and emphasize students to start doing it by their own thought processes connecting the old knowledge to the new one and expanding the intellectual structure. Teachers can help students improve the intellectual structure by managing learning environment that enhances the students' knowledge creation process combined with the principle, theory and characteristic of compatible technology media (Chaijaroen, S. , 2008).

In addition to the constructivist theory, another key principle enhancing students to be able to learn effectively is the creative principle consisting of 4 elements: 1) skillful thought, 2) creative thought, 3) flexible thought and 4) careful thought [3]. Learning management by the web-based learning environment is to lay the floor to support knowledge creation with efficiency and expand students' ideas; thereby, it is proper to self-learning and compatible with learning process. The web-based learning environment is to design learning management between media and methods that significantly emphasizes students. The constructivist theory is used as the basic in designing with media characteristic and symbolic system of media that support students' knowledge creation consisting of the problem situation, assistant base, learning source, coaching, learning exchange and promoting

center of creative thinking. Students can control what to learn themselves, plus it supports students to learn with awareness, have the opportunity to start doing something themselves and can connect to many information sources; that is to say, it is convenient to search for information as well as students and teachers can interact to each other via the web-base system.

### **THE PURPOSE THE STUDY**

To synthesize the theoretical framework and the framework in designing the environmental model of constructivist web-based learning enhancing creative thinking.

### **RESEARCH DESIGN**

Document analysis and survey research were employed in this study.

### **TARGET GROUP**

The target groups of this study consisted of two experts to assess the designing framework of the constructivist web-based learning environment model to enhance Creative thinking for college students.

### **RESEARCH INSTRUMENT**

The instrument in this study consisted of 4 instruments as following:

- 1) Record of synthesizing the theoretical framework is a record used to create the theoretical framework, used to record, examine and analyze the document, the principle, theory and related research of web-based learning environment as well as how to apply the record of synthesizing the theoretical framework to the basic in designing web-based learning environment developed under the constructivist idea.
- 2) Record of synthesizing the framework in designing the learning environmental model that enhances creative thinking.
- 3) Evaluation form for an expert of evaluating the framework of designing the learning environmental model that enhances creative thinking.

### **DATA COLLECTING AND ANALYSIS**

- 1) Literature review is to study and analyze the principle, theory and related research of designing the web-based learning environmental model under the constructivist idea enhancing creative thinking for bachelor's students by studying the principle and theory of related learning theory that consists of the intellectual theory that is the theory that evaluating information and the related theory of creating knowledge under the constructivist idea as well as the characteristic and symbolic system of multi-media to apply as the learning basic and record in the record of documentary examination.
- 2) The researchers study the context condition of students' creative thinking and the context of learning management to study the basic of students' previous creative thinking and considers the aforementioned result to be the basic in designing the web-based learning environment under the constructivist idea enhancing creative thinking for bachelor's students.
- 3) The researchers synthesize the theoretical framework of web-based learning environmental model with reviewing the idea, principle, theory, research and literature related to the theoretical framework and the framework in designing and element of web-based learning environmental model under the constructivist idea enhancing creative thinking for bachelor's students to make the result from studying and analyzing the constructivist theory, creative thinking and research related to the web-based learning environment under the constructivist idea as well as studying the context condition about students' creative thinking as the basic in synthesizing the theoretical framework in designing and element of web-based learning environmental model under the constructivist idea enhancing creative thinking for bachelor's students. Summarization, Interpretation and analytical description were used to analyze the data.
- 4) The researchers synthesize the designing framework counting on the basic from the theoretical framework with underlining the process of creativity.
- 5) The researchers synthesize the element of web-based learning environmental model under the constructivist idea enhancing creative thinking for bachelor's students counting on the basic from the theoretical framework with underlining the process of creativity.
- 6) The researchers offer the framework in designing and element of web-based learning environmental model

under the constructivist idea enhancing creative thinking for bachelor's students to an expert to examine the compatibility between the framework in designing and element of web-based learning environmental model enhancing creative thinking and the principle and theory used as the basic as well as the designing framework to criticize and evaluate and make a proposal for improvement and amendment.

## RESEARCH RESULTS

1. According to the result of synthesis framework of constructivist web-based learning environment model to enhance the creative thinking for college students, the researcher studied the principles, theories, and related studies about creative thinking for college students as well as designed the web-based learning environment including (1) principles of designing web-based learning environment, (2) Constructivism theory, (3) Multiple Intelligence theory (Klausmeier, H. J. 1985), 4) creative thinking<sup>[3]</sup>. Then, the researcher synthesized the theoretical framework of the constructivist web-based learning to enhance the creative thinking. The synthesized theoretical framework is showed in the Figure 1 below.

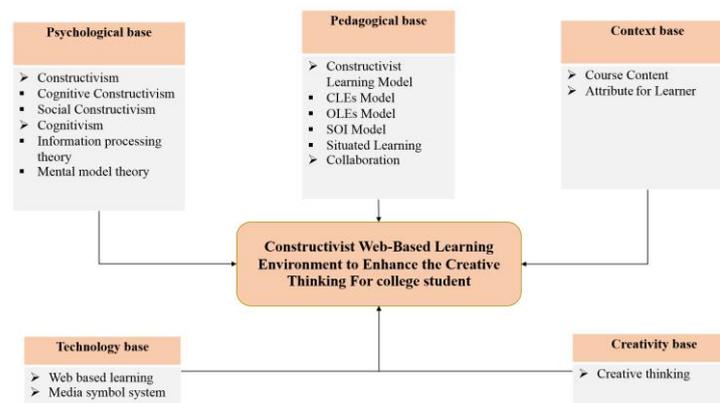


Figure 1 Theoretical Framework of Constructivist Web-based Learning to Enhance Creative Thinking

2. According to the theoretical framework of constructivist web-based learning to enhance creative thinking for college students in Figure 1, the researcher the framework of constructivist web-based learning to enhance creative thinking as follows:

2.1 Activating cognitive Structure and promoting Creative thinking , which are:

1) Problem Base Due to the Piaget's cognitive constructivism theory, the learners are activated by the situational problems leading to the conflict of cognitive process or intellectual disequilibrium. These theories were transformed into practice as problem situation in order to induce the learner into discovery learning process.

2) Learning task to enhance creative thinking or questioning to activate learners to use creative thinking. As for 4 abilities of creative thinking (Guilford, J.P., 1967) as follow: Fluency, Flexibility, Originality, Elaboration were transformed into practices as learning task in order to promote Creative Thinking. This may help activating cognitive structure and Creative Thinking of the college student.

2.2 Supporting for adjusting into equilibrium, when the learners are encountering with the situational problems or the learning task to enhance the creative thinking, they need to employ the resource. The resource stores the information to solve the problem by using SOI Model<sup>[6]</sup>. The principle of SOI Model includes 3 processes of Constructivist learning process. In SOI Model, S means selecting, O means organizing, and I mean integrating respectively. Cognitive process encourages learners to construct the cognitive knowledge due to the Constructivist theory, which based on how to activate the cognitive process of learners while learning with adding picture captions for the information processing theory. The information processing theory focuses on thinking process, staging of evaluating information, and retrieving to use long-term memory effectively. By using bold and italic alphabet in web-based learning environment, learners are interested and able to process the information effectively. These theories were transformed into practice as learning resources in order to provide information for the learners to construct the knowledge. This may help learner Creative Thinking

2.3 Supporting and enlarge for constructing knowledge. In terms of collaboration, learners are supported to exchange their experiences in order to expand their own vision. Moreover, learners are supported by the teachers or the experts to show their opinion about themselves to the others. While constructing the knowledge, it was important to learners to change and defend the misunderstanding, which could be occurred while learning,

including expanding the concept (Klausmeier, H. J. 1985).

2.4 Fostering the creativity, learners to have creative thinking by (Guilford, J.P., 1967) including 1) fluency, 2) flexibility, 3) originality, and 4) elaboration.

2.5 Supporting and assisting the knowledge construct based on the framework, the theory was applied to the principle to practice in scaffolding. According to the Social Constructivism theory by Vygotsky, if the learners go beyond the Zone of Proximal Development, they are not able to learn. Therefore, they need to be scaffolding in order to support the learners to solve the problem while learning in case they cannot complete the mission by themselves. The researcher adapts the principle of Open Learning Environment (OLEs) which developed by (Hannafin, M. J., 1999). to scaffold the learners. The principle of Open Learning Environment (OLEs) includes: (1) Conceptual Scaffolding Base is to help learners to design and guide learners what information is related to the problems. In other words, knowledge classification is the main concept to solve the problem, as it was designed to illustrate the link between the titles and information, and then summarizing the main idea into the concept map.

(2) Procedural Scaffolding Base is to recommend learners to use the resources and the instruments in the system. In this designing, the researcher describes the elements of the instruments in the web-based learning environment by coaching which based on Situated Cognition and Situated. From the principles which based on the Constructivist theory, the role of teachers was changed from transferring the knowledge to “coaching” or assisting the learners.

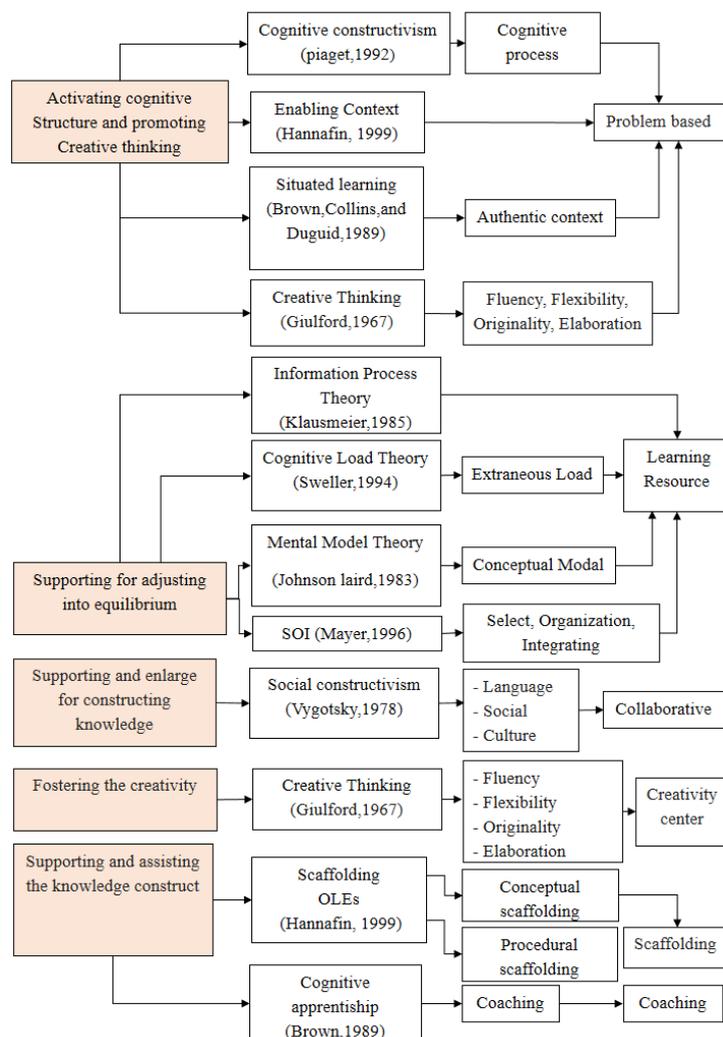


Figure 2 Designing Framework of Constructivist Web-based Learning Environment to Enhance Creative Thinking

From the synthesis of the conceptual framework. Based on a theoretical framework, important element. 1) Problem base 2) Learning resource 3) Collaborative 4) Creativity Center 5) Scaffolding and 6) Coaching

Table 1 element describe the element of the Constructivist Learning Environment model

<b>Element describe the element</b>	<b>describe the designing element of the Constructivist Learning Environment model</b>
Problem base	Problem base was designed framework to activate cognitive structure into disequilibrium by using enabling contexts: Externally Induced (Hannafin,1999) as open problem situation in order to induce the learners into discovery learning process. And 4 abilities of Creative Thinking (Guilford,1967): Fluency, Flexibility Originality, Elaboration were used to design learning task for promoting Creative Thinking.
Learning Resources	Resources was designed to support for adjusting cognitive disequilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), SOI model (Mayer, 1996) Mental model theory (), Schema theory, and Cognitive load theory. (sweller,1994), media attribution, symbol system of multimedia, These theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively.
Collaboration	Social Collaboration Center was designed to support for enlarging cognitive structure and promoting Creative Thinking.Social constructivism (Vygotsky,1962 was used to design the Social Collaboration Center. It may help support the learners for sharing experiences, multiple perspectives, and adjust misconception.
Creative Thinking	Creative Thinking Center was designed to foster Creative Thinking. Guilford (1967). 4 abilities of Creative thinking theory: Fluency, Flexibility Originality, Elaboration were used to design the Creative Thinking Center. It may help the learners to foster creative thinking.
Scaffolding	Scaffolding center was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin,1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding Center. It may help the learners to guide and support learning efforts in their knowledge construction process.
Coaching	Coaching Center was designed to support for providing hints and helps when needed, monitor learners' performance and help learners reflect on their performance. Cognitive apprenticeship (Collins, Brown and Newman,1989) used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

## CONCLUSION

Due to the result of synthesis framework of constructivist web-based learning environment to enhance the creative thinking for college students, there were 5 process which are 1) Activating cognitive structure and promoting Creative thinking, 2) Supporting for adjusting into equilibrium, 3) Supporting and enlarge for constructing knowledge, 4) Fostering the creativity and 5) Supporting and assisting the knowledge construct. The main theories which were adapted to use in this study include Constructivist theory including Cognitive Constructivist and Social Constructivist, and Intellectualism theory including information processing with creative thinking framework shown in Figure 1 and Figure 2. In this study, the researcher focuses on reviewing and analyzing the theories and the related contexts, and then synthesized the theoretical framework which is the main concept to reach the objectives in designing the framework. Moreover, knowledge construction and creative thinking which are consistent to the principles and theories were able to be supported by researching documents. The results of this study are consistent with Jarunee Samat and Sumalee Chaijaroen (2009) Design and development Constructivist Web-Based Learning Environment the Creative Thinking. With the analysis of all related theories and synthesized framework, the theory led to practice, which links to the principles and theory into the basic of designing and the elements of web-based learning environment to enhance creative thinking for college students. This study aims to synthesize the theoretical framework, which is the first factor that is significant to design the process and develop Constructivist web-based learning to enhance creative

thinking for collect students more effectively. Besides, the researcher obviously operates researching based on the theoretical framework as well as to design and develop by using research procedure as a basic approach.

### **ACKNOWLEDGEMENT**

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# **Designing Framework of Constructivist Multimedia Learning Environment Model Using Byod to Enhancing Creative Thinking for Higher Education Students**

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## **ABSTRACT**

The purpose of this research was to synthesize theoretical framework and designing framework of Constructivist multimedia learning environment Model using BYOD to enhance Creative Thinking for higher education students. Document analysis was employed in this study. The procedures were as follows: 1) to examine and analyze the principles, theories and related researches, 2) to study the context teaching and learning 3) to synthesize the theoretical framework and the designing framework of Constructivist multimedia learning environment Model using BYOD. The results revealed that the theoretical framework consists of 5 bases were as follows: 1) Psychological base, 2) Pedagogical base, 3) Technological and Media theory base, 4) Contextual base and 5) Creative Thinking base. The designing framework of Constructivist multimedia learning environment using BYOD consisted of 5 stages and 8 elements. 5 stages of the designing framework as following: 1) Activating cognitive structures and promote Creative Thinking 2) Supporting for adjusting cognitive equilibrium 3) Supporting for enlarge cognitive equilibrium 4) Fostering for Creative Thinking 5) Supporting and enhancing knowledge construction. For 8 components were as following: 1) Problem base and learning task 2) Resources 3) Collaboration 4) Cognitive Tool 5) Center for enhancing Creative Thinking 6) Scaffolding, and 7) Coaching.

**Keywords:** (BYOD) Learning Environment Model, constructivist theory, Creative Thinking

## **INTRODUCTION**

Today's society all over the world is making progress in the science, technology. This affects the society has changed rapidly and constantly. This change brings humanity to the full digital society, knowledge – based society and information society. Therefore, human being need to learn throughout their life or life- long learning. In addition, the 21 century learning that focus on learning and innovation skills which required creative thinking (Vicharn, panich. 2012). However, at present teaching management in higher education focus on lectures, still lacking of promoting creative thinking as well as seeking skills and construct the knowledge using digital technology. For above mentioned reason, it is necessary to adjust instructional management design to meet the above crucial characteristics such as creative thinking, seeking skills and knowledge construction by using digital technology. In particular, digital technology used in a learning environment that allows learners to learn by themselves, anywhere, anytime by bringing their own devices (BYOD). Instructional design theory (ID Theory) is required to use in the design. Theories used as foundation are Constructivist theories: Socail Constructivist and Cognitive Constructivist, Cognitive theory: Information Processing and Creative thinking. These theories may help the knowledge construction and creative thinking of the learners. In addition, the media attribute and symbols system of web base comprises of hypertext, hyperlink, and hypermedia. my support knowledge construction and creative thinking. (Sumalee Chaijaroen. 2559). Moreover. the BYOD concept that focus on bringing your own devices for promoting knowledge construction in anywhere, anytime.

Therefore, the researchers recognize the of importance of synthesizing the theoretical framework and designing framework of the Constructivist Multimedia learning environment Model using BYOD, as a guide line for developing

creative thinking for higher education student. This framework may help to confirm the validity in design the Constructivist Multimedia learning environment Model using BYOD.

### **THE PURPOSE OF THIS STUDY**

To synthesize theoretical framework of Constructivist Multimedia learning environment Model using (BYOD) to Enhance Creative Thinking for Higher education students.

To synthesize Designing framework of Constructivist Multimedia learning environment Model using (BYOD) to Enhance Creative Thinking for Higher education students.

### **Research design**

Model Research design is documentary research. consisted of to examine and analyze the principle, theories and related researches, to study the context teaching and learning. to synthesize the theoretical framework and the designing framework of Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking for Higher education students.

### **Target Group**

The target groups of this study consisted of 3 experts to assess the Designing framework of the Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking.

### **Research instruments**

The instrument in this study consisted of instrument as following:

- 1)The expert review recording form for checking the quality of the designing framework.
- 2)The recording form for synthesis of the theatrical framework of the Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking.
- 3)The recording form for synthesis of the designing framework of the Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking.

### **Data collecting and analysis**

The procedure of gathering and analysis data ware as follows:

- 1)Synthesis of the theoretical framework of the Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking. The data ware collected by using the recording form for synthesis of the theoretical framework. Summarization, interpretation and analytical description ware used to analyze the data.
- 2)Synthesis of designing framework of the Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking. The data ware collected by using the recording form for synthesis of the designing framework. Summarization, interpretation and analytical description ware used to analyze the data.

## **RESEARCH RESULTS**

### **Theoretical framework**

Designing theoretical of Constructivist Multimedia learning environment Model using (BYOD) to Enhance Creative Thinking for Higher education students. Researcher is documentary analyze. about principle, theories and related researches. study the context teaching and learning, synthesize the theoretical framework and the designing framework of Constructivist Multimedia learning environment Model using (BYOD) to Enhancing Creative Thinking for Higher education students. Then synthesize theoretical framework: 1) Theoretical framework of Constructivist Multimedia learning environment Model using (BYOD) to Enhance Creative Thinking The result revealed that the theoretical framework consists of 5 bases were as follows: 1) Psychological base, the basic design has led to a major. Constraint theory to promote self-knowledge and cognitive theory to help promote creativity. 2) Pedagogical base, Study of principles, theories and teaching methods. to provide a basis for designing a learning environment model that promotes creativity. The basis of pedagogy to be the basis of this design is. (1) OLEs, (2) CLEs, (3) SOI model (4) Intellectual training 3) Contextual base, The researcher studied the context of teaching and learning management. And learning management that promotes creativity and knowledge creation. 4) Technological Media theory base, this is a web-based learning and cloud system that can be learned anywhere, anytime. and 5) Creative Thinking base. Education related to cognitive processes. This study will be used as a measurement tool. and

assess the effect on cognitive processes, which are creative. consists of 4 bases were as follows: Fluency, Flexibility, Originality, Elaboration. as show in figure 1 individual's ability to think in a multitude of directions. Also known as divergent thinking. By expression of thought or action resulting from learning and Hyper linking prior knowledge with new experiences together. And create a new work or outcome. Including the discovery of a solution to the problem. Creativity consists of four different thinking abilities: 1) original 2) Fluency 3) Flexibility 4) Elaboration. as show in figure 1.

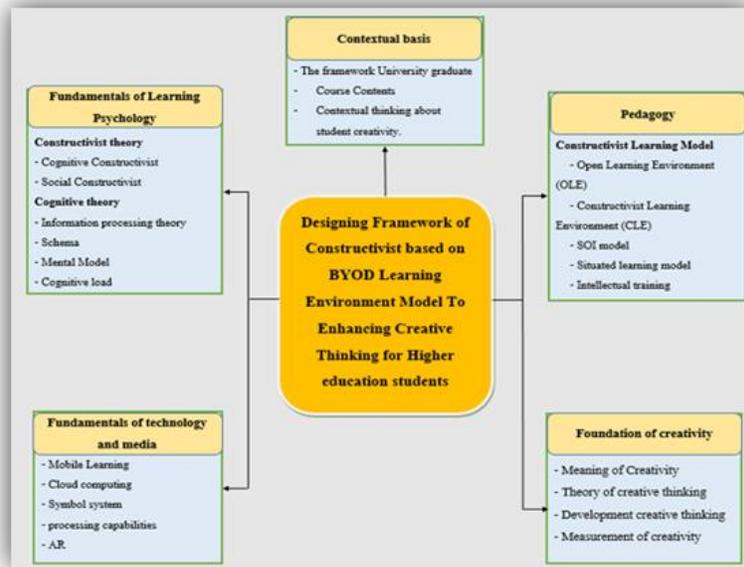


Figure 1. The Theoretical framework: Activating cognitive structure and promoting Creative Thinking.

**The Designing framework**

According to this study. The findings of syntesis of the designing framework of the learning environment model to promote Creative Thinking found 5 crucial bases as the following details:

1 . Activating cognitive structure and Creative Thinking The first crucial bases of the designing framework was Activating cognitive Structure, creative thinking, Thinking, it illustrated the underlined theories used in design the component called “Problem bases” of the learning environment to for promote Creative thinking. The underlined theories used for activating cognitive structure ware as follows: Cognitive constructivist (Piaget,1992): cognitive conflict, Enabling contexts OLE (Hanafin,1999): Externally induced, individually induced. OLEs (Hanafin,1999). These theories ware transformed into practice as problem situation in order to induce the learners into discovery learning process. Ac for 4 abilities of Creative thinking (Guilford, 1967) as following: Fluency, Flexibility, Originality, Elaboration ware transformed into practice as learning task in order to promote Creative thinking. This may help activating cognitive structure and Creative thinking of the student as show in figure 2.

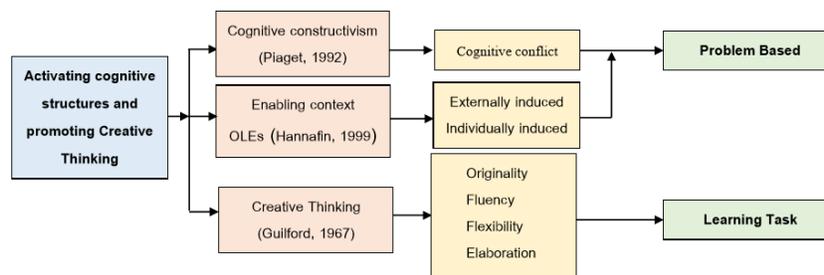


Figure 2. The designing framework: Activating cognitive structure and promoting Creative Thinking.

**2. Supporting for adjusting of cognitive disequilibrium**

Supporting for adjusting of cognitive disequilibrium. The second crucial bases of the designing framework was Supporting for adjusting of cognitive disequilibrium, it illustrated the underlined theories used in design the

component called “Resources” of the learning environments to for promote Creative Thinking. The underlined theories used for Supporting for adjusting of cognitive disequilibrium were as follows: information processing theory (Klausmeier, 1985): sensory register, short-term memory, long-term memory): Cognitive load theory (sweller,1994): Chunking, Hierarchical network and media attribute symbol system of Multimedia; still picture, motion picture, text, sound Schema theory: Schema as memory structure, Schema as context, Schema as network; SOI model (Mayer, 1996): selection, organizing, integrating, Mental model theory (Johnsonlaird, 1983): Conceptual model. These theories were transformed into practice as learning resources in order to provide information for the learners to construct the knowledge. This may help learner processing information effectively and understand easily as shown Figure 3.

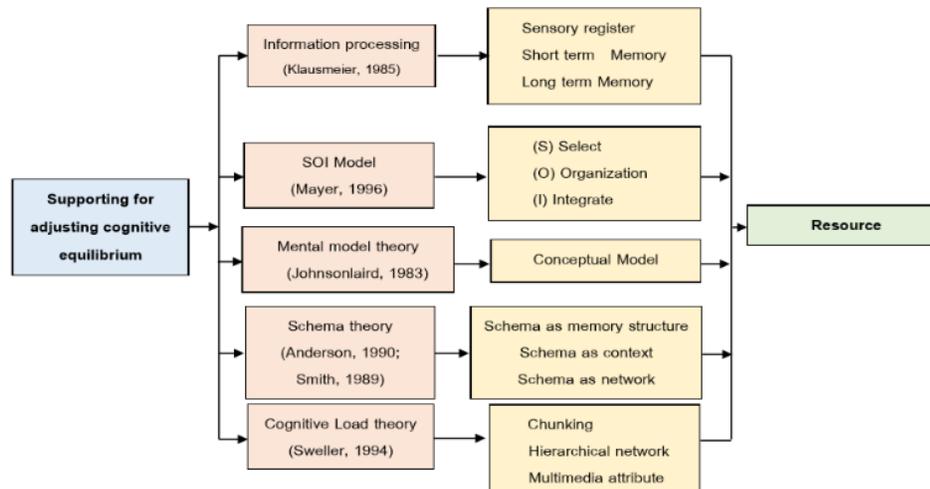


Figure 3. The designing framework: Supporting for adjusting of cognitive disequilibrium.

### 3. Supporting for enlarging cognitive structure

Supporting for enlarging cognitive structure. The third crucial bases of the designing framework was Supporting for enlarging cognitive structure. it illustrated the underlined theories used in design the component called “Collaboration base” of the learning environments to for promote Creative Thinking. The underlined theories used for Supporting for enlarging cognitive structure were as follows: Social constructivist (Vygotsky, 1978): Collaboration, social, Language, Culture. These theories were transformed into practice as learning Collaboration in order to provide the learners sharing experiences, multiple perspectives, adjust misconception, and collaboration problem solving.

Ac for 5 Cognitive Tool (OLEs, Hannafin, 1999): Seeking tool, collecting tool, generating tool, organizing tool, Integrating tool. These theories were transformed into practice as cognitive tools base in order to provide the learners knowledge contracture. as shown Figure 4.

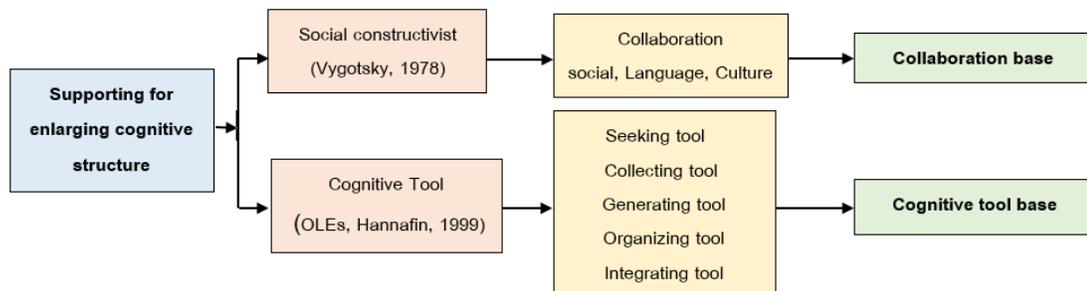


Figure 4. The designing framework: Supporting for enlarging cognitive structure.

### 4. Fostering for Creative Thinking

Fostering for Creative Thinking. The fourth crucial bases of the designing framework was Supporting for Fostering for Creative Thinking. it illustrated the underlined theories used in design the component called “Creative thinking

base” of the learning environments to for promote Creative Thinking. The underlined theories used for Fostering for Creative Thinking were as follows: Creative Thinking (Guilford, 1967): Fluency, Flexibility, Originality, Elaboration. These theories were transformed into practice as Creative thinking base in order to promote Creative thinking. This may help Fostering for Creative thinking of the student as show in figure 5.

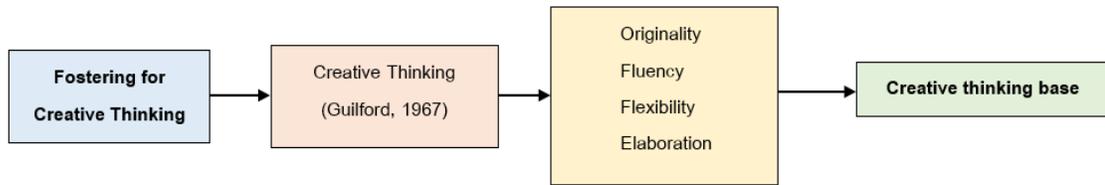


Figure 5. The designing framework: Fostering for Creative Thinking.

### 5. Fostering and assist Knowledge construction

Fostering and assist Knowledge construction. The fifth crucial bases of the designing framework was Supporting for Fostering for Creative Thinking. it illustrated the underlined theories used in design the component called “Scaffolding” of the learning environments to for promote Creative Thinking. The underlined theories used for Fostering for Creative Thinking were as follows: Social constructivist (Vygotsky, 1978): Zone of proximal development, Scaffolding (Hannafin, 1999): Conceptual Scaffolding, Strategic Scaffolding, Metacognition Scaffolding, Procedural Scaffolding. These theories were transformed into practice as Scaffolding base in order to provide help with learning and adjusting of cognitive disequilibrium.

Ac for Cognitive apprenticeship (Brown, 1989): Coaching. Elaboration ware transformed into practice as Coach base in order to provide the learners enlarging knowledge construct. as shown Figure 6.

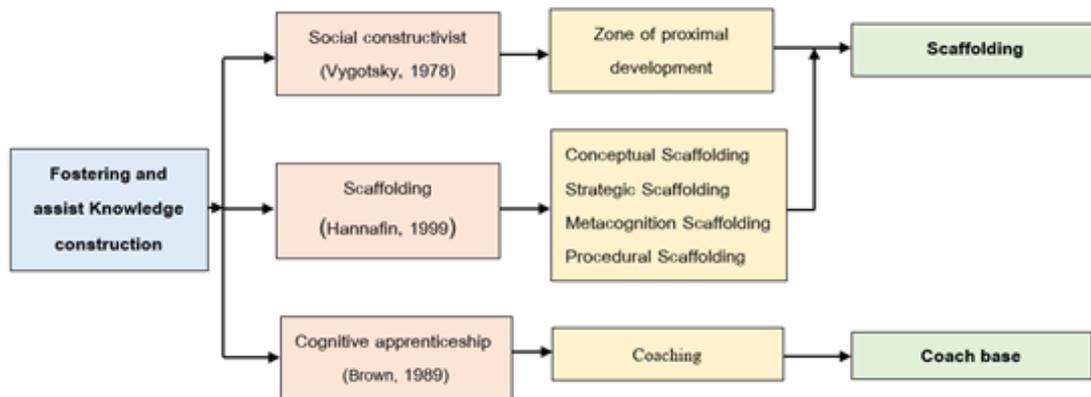


Figure 6. The designing framework: Fostering and assist Knowledge construction.

A. The Designing Framework: Thinking Constructivist learning environment to promote Creative thinking comprised of 8 components as follows:

Element Describe the elements Example of design Shot	Describe the designing elements of the Constructivist Learning Environment model
Problem Base	Problem base was designed frame work to activate cognitive structure into disequilibrium by using enabling contexts: Externally Induced (Hannafin, 1999) as open problem situation in order to induce the learners into discovery learning process. and 4 abilities of Creative Thinking (Guilford,1967): Fluency, Flexibility Originality, Elaboration were used to design learning task for promoting Creative Thinking.
Learning Task	Learning task was designed to promote Creative thinking. This may help activating cognitive structure and Creative thinking of the student.

Resources	Resources was designed to support for adjusting cognitive disequilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), SOI model (Mayer, 1996), Mental model theory (Johnsonlaird, 1983), Schema theory (Anderson, 1990; Smith, 1989), and Cognitive load theory. (sweller,1994), media attribution, symbol system of multimedia, These theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively and understand easily.
Collaboration base	Social Collaboration base was designed to support for enlarging cognitive structure and promoting Creative Thinking. Social constructivism (Vygotsky,1962) was used to design the Social Collaboration base. It may help support the learners for sharing experiences, multiple perspectives, adjust misconception, and collaboration problem solving.
Cognitive Tool base	Cognitive Tool base was designed to support the learners to enable and facilitate the cognitive processing tasks associated with open-ended learning. Cognitive Tool (OLE, hannafin,1999) was used to design the Cognitive Tool base. This may help the learners to enlarge their cognitive structure (Hannafin,1999)
Creative Thinking base	Creative Thinking base was designed to foster Creative Thinking. Guilford (1967). 4 abilities of Creative thinking theory: Fluency, Flexibility, Originality, Elaboration were used to design the Creative Thinking base. It may help the learners to foster creative thinking.
Scaffolding	Scaffolding was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding. It may help the learners to guide and support learning efforts in their knowledge construction process.
Coaching base	Coaching base was designed to support for providing hints and helps when needed, monitor learners, performance and help learners reflect on their performance. Cognitive apprenticeship (Collins, Brown and Newman,1989) used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

B. Assessment of the designing framework of the Constructivist Multimedia learning environment Model using (BYOD) to enhance Creative thinking by experts found the congruence between the underlined theories and the design.

## CONCLUSION

The designing framework of the Constructivist Multimedia learning environment Model using (BYOD) comprised of crucial bases as following: 1) Activating cognitive structure and promoting Creative Thinking, 2) Supporting for adjusting of cognitive disequilibrium, 3) Supporting for enlarging cognitive structure, 4) Fostering for Creative Thinking and 5) Fostering and assist Knowledge construction. According to above 5 bases of the designing framework were transformed into practice as 8 elements the Constructivist based on (BYOD) Learning Environment Model to enhance Creative thinking as following: 1) Problem base, 2) Learning Resource, 3) Social Collaboration Center, 4) Cognitive Tool Center, 5) Creative Thinking Center, 6) Scaffolding center 7) Coaching Center. This finding was consistent with Chaijareon, S., Samat, C., Kanjug, I., (2012); Techapornpong, O., Chaijaroen,S., (2017) These previous research found that the students showed their creative thinking and the framework of Constructivist Multimedia learning environment Model using (BYOD) used creative thinking as foundation of the design. As for this research finding may be the result of Instructional design Theory (ID Theory) that used underlined theories especially the creative Thinking theory (Guilford,1967): Fluency, Flexibility Originality, Elaboration as the foundation of the design. This was shown in the designing framework of the of Constructivist Multimedia learning environment Model using (BYOD) to enhance Creative thinking. This may help learners to foster creative thinking. In addition, the theoretical validity of the designing framework of Constructivist Multimedia learning environment Model using (BYOD) was found from assessment by experts. As mentioned findings can be supported the designing framework of the of Constructivist Multimedia learning environment Model using (BYOD) to enhance Creative thinking.

## ACKNOWLEDGEMENT

This research was supported by Ph.D. Program in Educational Technology, Faculty of Education, Research Group for Innovation and Cognitive Technology, Khon Kaen, University, and Research and Technology Transfer Affairs Division, Khon Kaen University which hereby giving the thankfulness all through this.

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# **Designing Framework of Constructivist Text Based Learning Environments with Augmented Reality to Enhance Analytical Thinking on Computer Equipment for Primary School**

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## **ABSTRACT**

This research aimed to synthesize theoretical framework and develop the AR-Book learning environment to enhance analytical thinking on computer components' subject for grade 4 students. Research methodology is developmental research; developmental research consisted of 3 processes which were designing process, developing process, and evaluating process. The procedures were as following: )1( to examine the principles and theories, 2( to synthesize designing framework, )3( to design and develop the AR-Book learning environment according to above mentioned designing framework, and )4( to evaluate the efficiency of the AR-Book learning environment. And survey. The procedures were as following: )1( designing process and )2( developing process research methods are document analysis, and survey. The procedures were as following: )1( to examine and analyze the principles and theories )2( to synthesize theoretical framework (3( to synthesize designing framework.1( to synthesize theoretical framework comprise of 6 components as following that. Contextual base, Psychological base, Technologies base, Analytical base and Pedagogies base Model learning environments .2( to synthesize theoretical design framework of constructivist augmented reality web-based learning environments to enhance Analytical of 6 components as following that. )1( Problem base )2( Resource )3( Analytical thinking Center )4( Collaboration )5( Coaching )6( Scaffolding. The efficiency of this learning environment was evaluated by expert review. It was found that the learning environment is appropriate on 3 aspects: content, Text-based learning and learning environment.

Keywords: AR-Book, Augmented Reality, Learning Environment, Analytical Thinking

## **INTRODUCTION**

Nowadays, society transforms fast to period which is believed knowledge is information which develops from thinking and technology stimulates to create new knowledge ability for learners so technology ability is equipment to learn fast for new generation by encourage learners apply thinking to solve problems which set learner's preparation for complicated real life. Therefore, education will be prepared with society transfer to 21<sup>st</sup> century. Analytical thinking is an important feature of the educational development of children that should be developed continuously at every school level. According to analytical thinking which is deep thinking. The theories used to serve the above mentioned learning is rooted in the theory of Piaget )Piaget( called Cognitive Constructivist. The theory indicates that if the students encounter with the problem that cause them have cognitive conflicts and they should try to adjust their cognitive structure into equilibrium state by integration between prior knowledge and new information until they can understand. That is they can construct the knowledge. For above mentioned reason, this study intent to synthesize the Theoretical framework and the Designing framework of cognitive innovation to enhance the knowledge construction This may help to clarify the internal process of the learners that can be lead to effective learning.

## **METHODOLOGY**

The researchers collected the data as follows: 1( Synthesis of theoretical framework and Components of the learning environment. The data were collected by analyzing principles, theories, related research of the constructivism theory, cognitive theory, media and technology theory, pedagogy and contextual study. 2( Synthesis of Designing framework of the learning environment: The above synthesized theoretical framework was taken into this process and related literature regarding design and development, context of school base, constructivist base, pedagogical base, analytical thinking base, and technology and media base )AR technology and media symbol system( for the synthesis of the theoretical framework of the learning environment. 3( Design and develop of the learning environment based on foundation of creating designing framework was adopted. 4( Evaluate of the learning environment by experts. The analytical description, summarization and interpretation were used to analyze data

### **A.Target Groups of this study**

Target Group in the design and development process consisted of 3 expert reviewers. )1( Experts in content validity. )2( Experts in Text-based learning design. )3( Experts in learning environment design.

### **B. Research Instruments**

The instruments in this study as following details: )1( The document examination and analysis recoding form to synthesize a theoretical framework, )2( The recoding form for synthesis of the design framework to learning environment to enhance analytical thinking, and )3( The evaluation form for synthesize theoretical framework and designing of constructivist augmented reality text-based learning environments to enhance creative thinking.

## **RESEARCHDESIGN**

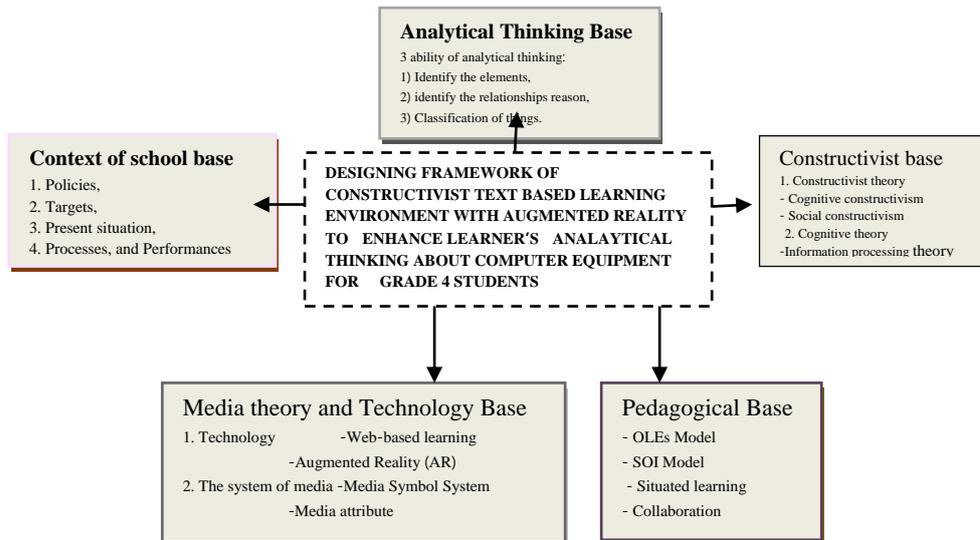
This research methodology was documentary research and survey research comprised of 1( the synthesis of theory concept, 2( the synthesis of the constructivist learning environment design concept through augment reality to promote the analytical thinking, 3( development of the constructivist augment reality learning environment, and 4( evaluation of the learning environment

## **RESEARCH RESULTS**

The design and development of the learning environment that promote students' analytical thinking are follows:

### **A. SYNTHESIS OF THEORETICAL FRAMEWORK**

The results show that the theoretical framework of text based learning environment with augmented reality to enhance learner's analytical thinking comprised of five basic theories: )1( Context of school base are follows: Policies, Targets, Present situation, Processes, and Performances, )2( Analytical thinking base are follows: Identify the elements, Identify the relationships reason, Classification of things )Sumalee, 2007( The above synthesized theoretical framework was taken into this process )3( Constructivist base are follows: Constructivist cognitive )Piaget, 1992( and social constructivist )Vygotsky, 1992( theory and cognitivism; and Information processing theory )Klausmeier,1985(, )4( Pedagogical base are follows: OLEs Model )Hannafin,1999(, SOI Model )Mayer,1996(, Situated learning )Brown, Collins, and Dugoid, 1989(, Cognitive apprenticeship )Brown and Collins, 1991(, )5( Media theory and technology base are follows: Web-based learning )Khan, 1998(, Augmented Reality )Donald Douglas McMahon, 2014(, The system of media )Chaijaroen, 2009( The technology used in this study is multimedia. This study focuses on media attribution and symbol system which help.



**Figure.1.** Theoretical framework for text based learning environment with augmented reality to enhance learner's analytical thinking about Computer Equipment for grade 4 students.

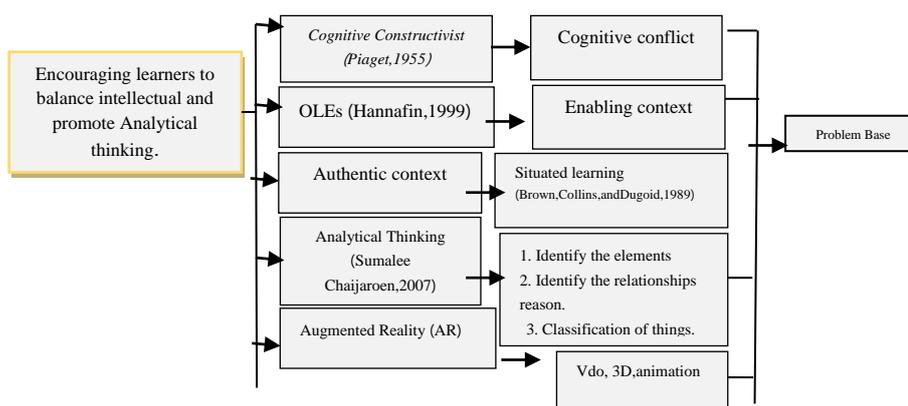
**B. SYNTHESIS OF DESINING FRANEWORK**

Synthesize theoretical framework comprise of 6 components as following that. Contextual base, Psychological base, Technologies base, Analytical base and Pedagogies base Model learning environments.

Synthesize theoretical design framework of constructivist augmented reality web-based learning environments to enhance Analytical of 6 components as following that. )1( Problem base )2( Resource )3( Analytical thinking Center )4( Collaboration )5( Coaching )6( Scaffolding

According to this study, the findings of synthesis of the theoretical framework which was used as foundation in synthesizing the designing framework of cognitive innovation to enhance knowledge construction and memory process found that

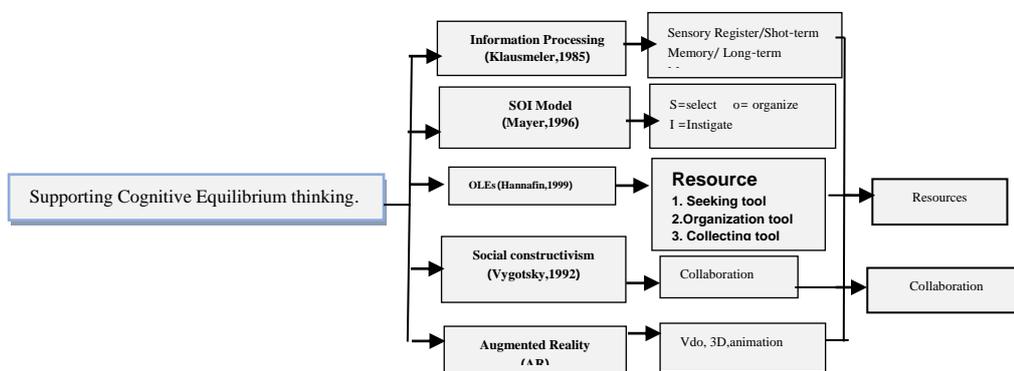
a) *Encouraging learners to balance intellectual and promote Analytical thinking. process:* It is illustrated the relationship between the underlined theories as follows: cognitive constructivism, OLEs model (Hannafin, 1999), Authentic context, Analytical Thinking (Sumalee Chaijaroen,2007) as follows of 3 ability: Identify the elements, Identify the relationships reason, Classification of things, Augmented Reality (AR) and the components of innovation which it's called Problem base. Fig 2 showed theoretical framework designing problem base.



**Figure2.** Theoretical framework designing problem base.

Problem Base Cognitive constructivism has its roots in cognitive psychology and biology and an approach to education that lays emphasis on how the individual learner "maker of meanings" and the ways knowledge is created in order to adapt to the world in which the mechanisms of accommodation and assimilation are key to this processing. In the design, Augmented Reality )AR(,visual, text, audio, and animation are provided to stimulate the students to have recognition and attention by using externally impose for helping student to associate with their own experience.

b( Supporting Cognitive Equilibrium thinking . process: It is illustrated the relationship between the underlined theories as follows: information processing theory )Klausmeier, 1985(; sensory register, short-term memory, long-term memory, analytical thinking )Sumalee, 2007(; conceptual model, SOI model )Mayer, 1996(; selection, organizing, integrating, OLEs )Hannafin,199( ; Resource, Seeking tool, Organization tool, Collecting tool, Social constructivism Vygotsky,1992(;Collaboration ,Augmented Reality )AR( and the components of innovation which it's called Resources. Fig 3 showed Theoretical framework designing resources.



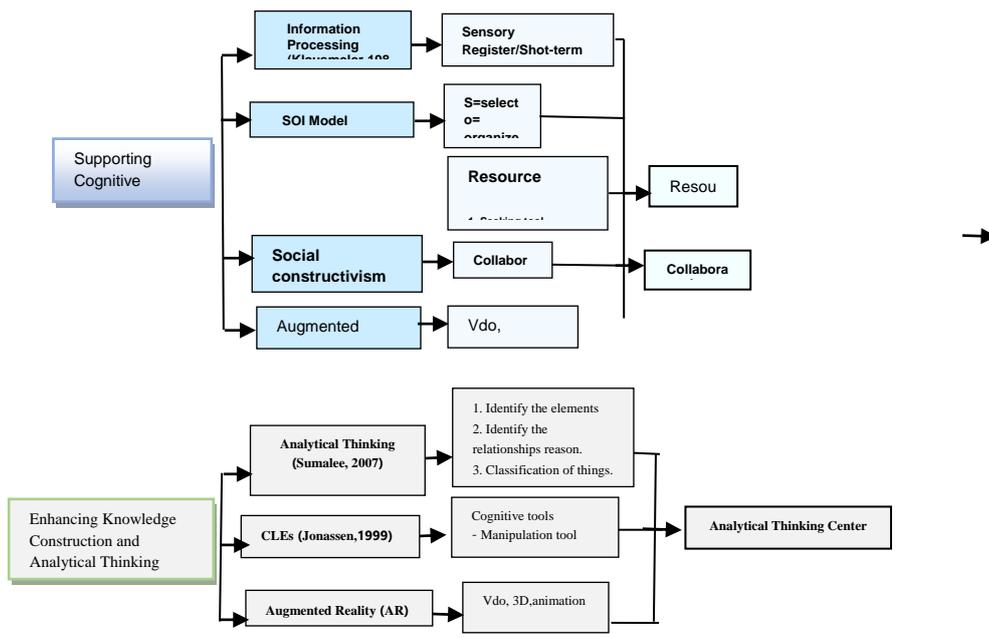
**Figure 3** showed Theoretical framework designing resources.

Resource is the collecting information that should be provided for students in the problem solving process. They use it to discovery learning through various information technologies. SOI model )Mayer, 1996( Techniques for encouraging student to selecting, organizing and integrating information

- 1( To help the learner select relevant information, highlight the important information, use instructional objectives and/or adjunct questions, provide a summary and eliminate irrelevant information
- 2( Organize information for the learner using text structure, outlines, headings, pointer words, and graphic representations;
- 3( Integrate information using advance organizers, illustrations, animation, worked-out examples, and elaborative questions

Collaboration The students collaborated problem solving. The students will exchange multiple perspectives to solve the problem and designed to collaborate in problem solving through Facebook, google classroom, web-board, e-mail which make the students could express their opinion.

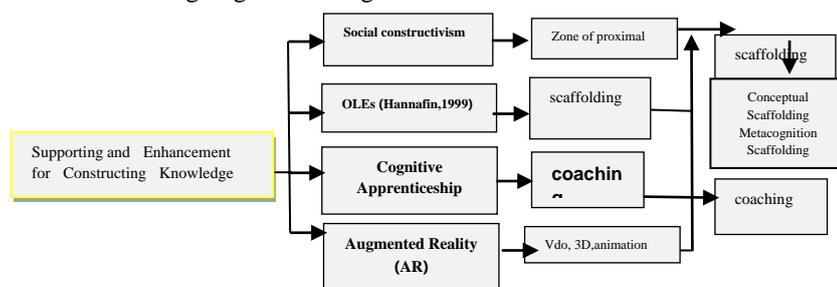
c( Enhancing Knowledge Construction and Analytical Thinking. process: It is illustrated the relationship between the underlined theories as follows: Analytical Thinking )Sumalee Chaijaroen,2007( as follows of 3 ability: Identify the elements, Identify the relationships reason, Classification of things, CLEs )Jonassen,1999(;Cognitive tools )Manipulation tool( Augmented Reality )AR( and the components of innovation which it's called Analytical Thinking Center. Fig 4 showed Theoretical framework designing analytical thinking center and collaboration



**Figure 4** Theoretical framework designing analytical thinking center and collaboration

Analytical Thinking is a critical component of visual thinking that gives one the ability to solve problems quickly and effectively. It involves a methodical step-by-step approach to thinking that allows you to break down complex problems into single and manageable components. This type of thinking also requires you to compare sets of data from different sources; identify possible cause and effect patterns, and draw appropriate conclusions from these datasets in order to arrive at appropriate solutions.

d( Supporting and Enhancement for Constructing Knowledge process: It is illustrated the relationship between the underlined theories as follows: social constructivism )Vygotsky,1962(; zone of proximal development, OLEs )Hannafin,1999(; Scaffolding, 1.Conceptual Scaffolding Metacognition 2.Scaffolding Procedural scaffolding 3.Strategic Scaffolding ,Cognitive Apprenticeship )Brow and Collins,1991(; Coaching, Augmented Reality )AR( and the components of innovation which it's called scaffolding. Fig 5 showed Theoretical framework designing scaffolding.



**Figure 5** showed Theoretical framework designing scaffolding and coaching

Scaffolding the concept of Social Constructivism of Vygotsky believed that if the student is under the Zone of Proximal Development can not learn on their own. Need to be rescued called Scaffolding, of assistance to support learners to solve problems or learning in not being able to complete the mission itself. Will support the creation of knowledge of the students

Coaching A good coach motivates learners, analyzes their performance, provides feedback and advice on the performance and how to learn about how to perform, and provokes reflection and articulation of what was learned. Evaluate the efficiency of the learning environments.

The results of the expert assessment on learning content, theoretical framework, and design framework, a way to check the quality of the specialists Content Design and Constructivist Text-based learning environment Design to learn from the evaluate form. The results of the expert synthesis design were show in table 1

No.	Lists of preconception towards the Constructivist Text-based learning environments	results of the expert )Percentage(
Learning Content		
1.	Appropriate learning content	88
Synthesis of theoretical framework		
2	Contextual base.	87
3	Psychological base.	89
4	Technologies and media base.	88
5	Analytical Thinking.	89
6	Pedagogies base Model learning environments	88
Text-based learning environments components		
7	Problem base	86
8	Resource	85
9	Collaboration	87
10	Analytical Thinking Center	89
11	Scaffolding	89
12	Coaching	87
	Total	87.6

**Table 1.** The results of an expert on learning content, the expert assessment. Theoretical framework synthesis and design framework.

In Table 1, the results of the assessment of the experts on consists of on the learning content, Synthesis of theoretical framework and the Constructivist Text-based learning environment Design, found that Learning Content ; Appropriate learning content 88 percent, Synthesis of theoretical framework ; Contextual base. 87 percent., Psychological base 89 percent Technologies and media base 88 percent , Analytical Thinking.

89 percent, Pedagogies base Model learning environments 88 percent, Text-based learning environments components; Problem base 86 percent, Resource 85 percent, Collaboration 87 percent, Analytical Thinking Center 89 percent, Scaffolding 89 percent , Coaching 87 percent , Total results of the expert 87.6 percent.

#### V. Conclusions and Future Work.

This study designed the augmented reality learning environment to promote analytical thinking about computer equipment for grade 4 students. Should take into account that both of theoretical framework and designing framework of the augment learning environment to promote analytical thinking.The synthesis of designing framework confirmed the 6 important components )1( problem base, )2( resources, )3( collaboration, )4( problem solving center, )5( scaffolding, and )6( coaching. However, to enhance students' analytical thinking ability, we are going to study about the effect of augmented reality learning environment to promote analytical thinking learning with mobile technology on students analytical thinking. It is consistent with Oakkarawong Preeyanan , Samat, Charuni )2016(which has Designing Framework of Augmented Reality Learning Environment to Promote Analytical Thinking for Grade 8 Student.

#### ACKNOWLEDGMENT

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# **Designing Framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving for Transfer of Practical Skills for Industrial Engineering Student**

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## **ABSTRACT**

This study aimed to synthesize theoretical and designing framework of Constructivist Web-based Learning Environment Model to enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student. Document analysis and survey research were employed in this study. The procedures were as follows: (1) to examine and analyze the principles, theories and related researches, (2) to study instructional context, (3) to synthesize the theoretical framework, and (4) to synthesize the designing framework. The results revealed that: 1) The theoretical Framework comprised of 6 bases were as follows: (1) Learning theory base, (2) pedagogical base, (3) Media theory base, (4) neurological base, (5) Technological base, and (6) Context of instructional base 2) The designing framework consisted of 5 stages and 9 elements, were as follows: (1) Activate cognitive structure and promote problem solving and transfer (2) Support for adjusting cognitive structure (3) Support for enlarge cognitive structures (4) Foster for problem solving and transfer Practical Skills (5) promote and assist knowledge construction and 9 components as following: (1) Problem base (2) Resources (3) Cognitive tool (4) Collaboration for problem solving (5) Center for enhancing problem solving (6) Center for transfer of Practice Skills (7) Related cases (8) Scaffoldings, and (9) Coaching.

**Keywords:** Web-based learning environment; Problem solving; Transfer of Practical Skills; Constructivist

## **INTRODUCTION**

The advancement of technology has influenced in increasing of information in knowledge based and digital society. At the same time, the current problems are increasing more serious and complicated. Therefore, necessary skill for learners is problem-solving especially for practical work of engineering student. However, the current instructional management focus on transmit the information from teacher to learners. This results in lacking of seeking skills, knowledge construction, especially problem solving of the learners. Thus, it need to adjust the instructional management to foster the learners to construct knowledge on their own, problem solving and transfer the knowledge to solve problems in other situations.

1. To synthesize the Theoretical framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving for Transfer of Practical Skills for Industrial Engineering Student.

2. To synthesize the Designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.

## **RESEARCH DESIGN**

Document analysis and survey research were employed in this study.

## **TARGET GROUP**

The target groups of this study consisted of 2 experts to assess the designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.

## RESEARCH INSTRUMENT

The instruments in this student consisted of 3 instruments as following:

1. The expert review recording form for checking the quality of the designing framework.
2. The recording from for synthesis of the theoretical framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.
3. The recording from for synthesis of the designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.

## DATA COLLECTING AND ANALYSIS

The procedure of gathering and analysis data were as follows:

1. Synthesis of The theoretical framework of Constructivist Web-Base Learning Environments Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student. The data were collected by using the recording form for synthesis of the theoretical framework. Summarization, interpretation and analytical description were used to analyze the data.
2. Synthesis of designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student. The data were collected by using the recording form for synthesis of the designing framework. Summarization, interpretation and analytical description were used to analyze the data.

## RESEARCH RESULT

### 1. The theoretical framework

It is found that the theoretical framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving for Transfer of Practical Skills for Industrial Engineering Student consist of 6 crucial bases which compose of: 1 Learning theory base: Several learning theories used are Constructivist theory and Cognitive theory2) Pedagogical base: The pedagogies which underlined this framework are Situated learning, Collaborative learning, and Constructivist learning model 3) Media theory base : The media theory used in this study is media symbol system and capability process 4) neurological base; Electroencephalography (EEG). 5) Technological base: The technology used in this study is multimedia 6) Context of instructional: The technology used in this study is Desirable graduate features, The concept of learning management, Industrial Education, Main Course in Electrical EngineeringThis study focuses on media attribution and symbol system which help to enhance knowledge construction and memory process.

After review literature, these all of 6 bases are analyzed, and synthesized the relationship between each of them as below illustration in Figure 1.

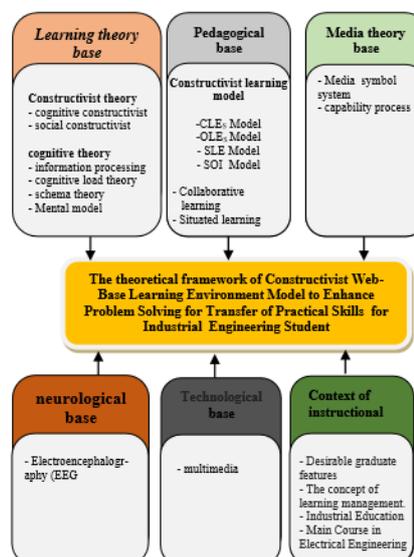


Figure 1: Theoretical Framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.

## 2. Designing Framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student.

According to this study, the findings of synthesis of the theoretical framework which was used as foundation in synthesizing the designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student. found that 5 crucial bases for enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student. which are:

### 2.1 The activation activating cognitive structure, problem solving, and transfer.

The first crucial base of designing framework was activating cognitive structure, problem solving, transfer ,it illustrated the underline theories used in design the component called “problem base” of the learning environments to for promote problem solving. The underlined theories used for activating cognitive structure were as follows:

Cognitive constructivism(piaget,1992); cognitive conflict, situated learning(Brown, Collins & Duguid, 1989); Authentic context. These theories were transformed into practice as problem situation in order to induce the learners into discovery learning process.

As for 7 step of problem solving (Jonassen,1987) as following: Step 1: Learners Articulate Problem Space and Contextual Constraints Step 2: Identify and Clarify Alternative Opinions, Positions, and Perspectives of Stakeholders Step 3: Generate Possible Problem Solutions

Step 4: Assess the Viability of Alternative Solutions by Constructing Arguments and Articulating Personal Beliefs

Step 5: Monitor the Problem Space and Solution Option

Step 6: Implement and Monitor the Solution Step 7: Adapt the Solution were transformed into practice as learning task in order to promote problem solving. This may help activating cognitive structure and problem solving of the student as show in figure 2.

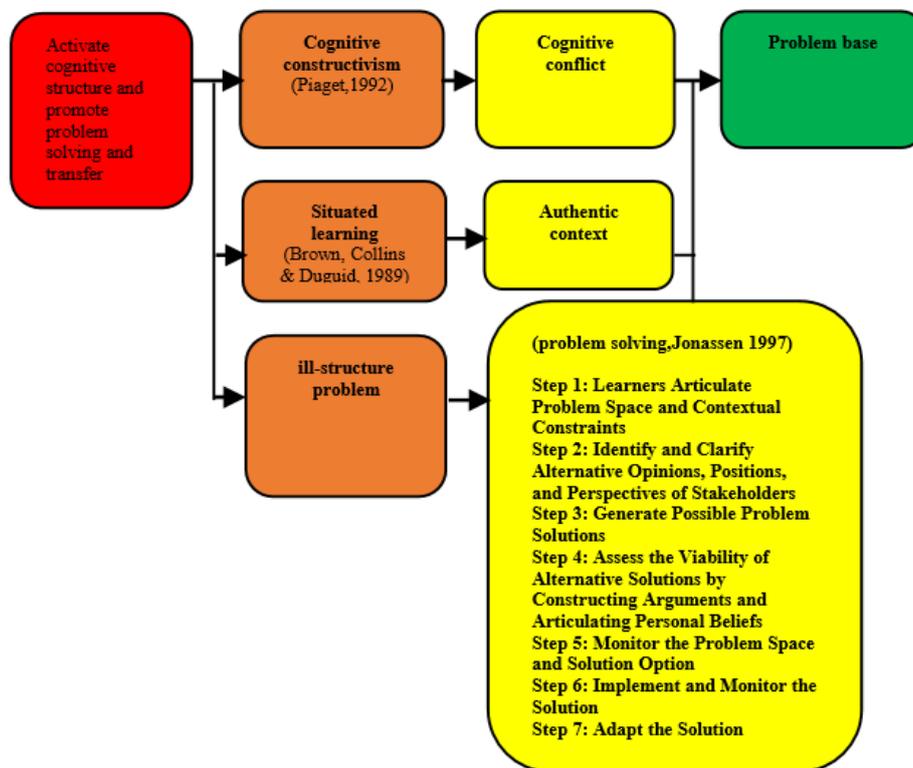


Figure 2: The designing framework: Activate cognitive structure and promote problem solving and transfer (1) Support for adjusting cognitive structure

The second crucial base of designing framework was Support for adjusting cognitive structure, it illustrated the underline theories used in design the component called “Resources” of the learning environments to for promote problem solving and transfer . The underlined theories used for Supporting for adjusting of cognitive structure were as follows: information processing theory (Klausmeier, 1985): sensory register, working-memory, long-term memory): Cognitive load theory (sweller,1994): Chunking, Hierarchical network and media attribute symbol. These theories were transformed into practice as learning resources in order to provide information for

the learners to construct the knowledge. This may help learner processing information effectively and understand easily as shown Figure 3.

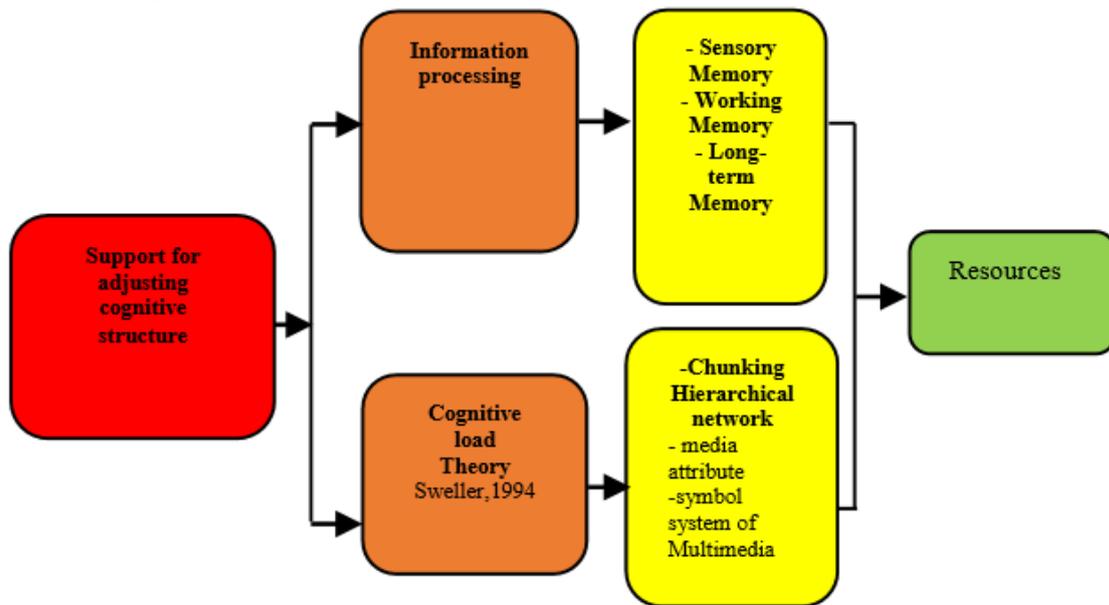


Figure 3: The designing framework: Support for adjusting cognitive structure  
(2) Support for enlarge cognitive equilibrium

The third crucial base of designing framework was Support enlarge cognitive equilibrium, it illustrated the underline theories used in design the component called “Collaboration for problem solving” and “Cognitive tool”. The underline theories used for Support for enlarge cognitive equilibrium were as follows: Social constructivist theory (Piaget,1992): Collaborative Activity Cognitive tool(OLEs,Hanafin,1999): Seeking tool, Collecting tool, Generating tool, Organizing tool, Integrating tool. These theories were transformed into practice as learning resources in order to provide information for the learners to construct the knowledge. This may help learner for enlarge cognitive equilibrium as shown Figure 4.

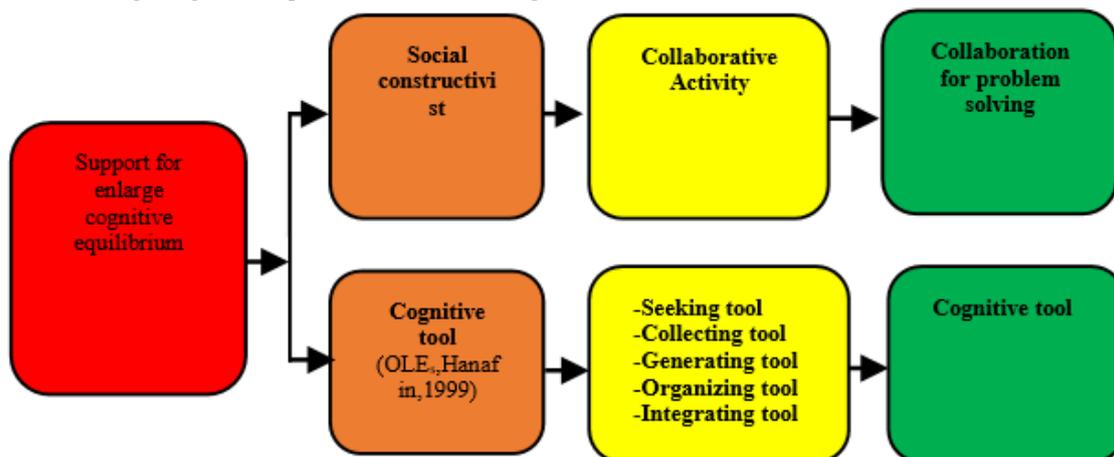


Figure 4: The designing framework: Support for enlarge cognitive equilibrium  
(3) Foster for problem solving and transfer Practical Skills

The fourth crucial base of designing framework was Support for Foster for problem solving and transfer Practical Skills, it illustrated the underline theories used in design the component called “Center for enhancing problem solving” and “Center for transfer of Practice Skills” of the learning environments to for promote problem solving and transfer. The underline theories used for Supporting for Foster for problem solving and transfer Practical Skills were as follows: ill-structure Problem (Jonassen,1997): Step 1) Learners Articulate Problem Space and Contextual Constraints Step 2) Identify and Clarify Alternative Opinions, Positions, and Perspectives of Stakeholders Step 3) Generate Possible Problem Solutions Step 4) Assess the Viability of Alternative Solutions by Constructing Arguments and Articulating Personal Beliefs Step 5) Monitor the Problem

Space and Solution Option Step 6) Implement and Monitor the Solution Step 7) Adapt the Solution were transformed into practice as learning task in order to promote problem solving. Analogical transfer (Gentner, Holyoak & Kokinov): retrieving a prior knowledge structure, mapping, mapping Practical skill : Training Practical skill. These theories were transformed into practice as learning resources in order to provide information for the learners to construct problem solving and transfer Practical Skills shown Figure 5.

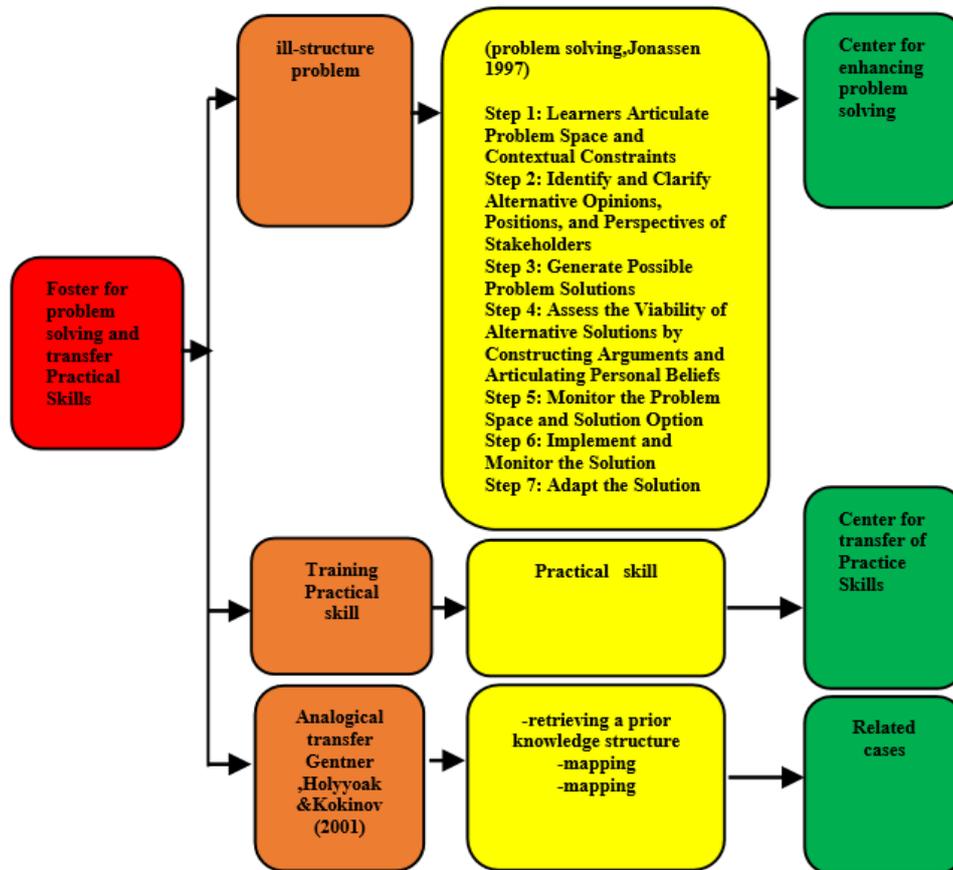


Figure 5: The designing framework: Foster for problem solving and transfer Practical Skills  
(4) Promote and assist knowledge construction

The fifth crucial base of designing framework was Support for promote and assist knowledge construction, it illustrated the underline theories used in design the component called “Scaffoldings” and “Coaching” of the learning environments to for promote and assist knowledge construction. The underlined theories used for promote and assist knowledge construction were as follows: Scaffolding (Hanafin, 1999): Conceptual Scaffolding, Strategic Scaffolding, Metacognition Scaffolding Cognitive apprenticeship (Brown, 1989): Coaching. These theories were transformed into practice as learning resources in order to provide information for the learners to construct the knowledge. This may help promote and assist learner as shown Figure 6.

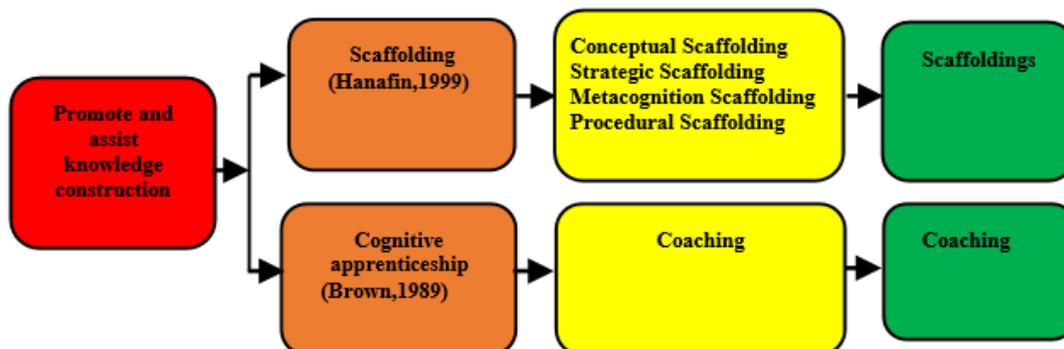


Figure 6: Promote and assist knowledge construction  
The element of the designing framework

The designing framework of Constructivist Web-Base Learning Environment Model to Enhance Problem Solving for Transfer of Practical Skills for Industrial Engineering Student showed 9 elements as following details:

Element Describe the elements Example of design Shot	Element Describe the elements Example of design Shot
Problem base	<p>Problem base was designed framework to activate cognitive structure into disequilibrium by using situated learning (Brown, Collins &amp; Duguid, 1989): Authentic context as simulate the real world in order to induce the learners into discovery learning process. And 7 step of problem solving (Jonassen,1987):</p> <p>Step 1 Learners Articulate Problem Space and Contextual Constraints</p> <p>Step 2: Identify and Clarify Alternative Opinions, Positions, and Perspectives of Stakeholders</p> <p>Step 3: Generate Possible Problem Solutions</p> <p>Step 4: Assess the Viability of Alternative Solutions by Constructing Arguments and Articulating Personal Beliefs</p> <p>Step 5: Monitor the Problem Space and Solution Option</p> <p>Step 6: Implement and Monitor the Solution Step</p>

Element Describe the elements Example of design Shot	Element Describe the elements Example of design Shot
Problem base	<p>Problem base was designed framework to activate cognitive structure into disequilibrium by using situated learning (Brown, Collins &amp; Duguid, 1989): Authentic context as simulate the real world in order to induce the learners into discovery learning process. And 7 step of problem solving (Jonassen,1987):</p> <p>Step 1 Learners Articulate Problem Space and Contextual Constraints</p> <p>Step 2: Identify and Clarify Alternative Opinions, Positions, and Perspectives of Stakeholders</p> <p>Step 3: Generate Possible Problem Solutions</p> <p>Step 4: Assess the Viability of Alternative Solutions by Constructing Arguments and Articulating Personal Beliefs</p> <p>Step 5: Monitor the Problem Space and Solution Option</p> <p>Step 6: Implement and Monitor the Solution Step</p> <p>Step 7: Adapt the Solution were transformed into practice as learning task in order to promote problem solving were used to design learning task for promoting Problem solving and transfer .</p>
Resources	<p>Resources was designed to support for adjusting cognitive disequilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), and Cognitive load theory. (sweller,1994), media attribution, symbol system of multimedia, These theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively.</p>

Cognitive tool	Cognitive Tool Center was designed to support the learners to enable and facilitate the cognitive processing tasks associated with open-ended learning. Cognitive Tool (OLE, hannafin,1999) was used to design the Cognitive Tool Center. This may help the learners to enlarge their cognitive structure (Hannafin,1999)
Collaboration for problem solving	Collaboration for problem solving Center was designed to support for collaborate solve problem. Social constructivism (Vygotsky,1962) was used to design the Social Collaboration Center. It may help support the learners for sharing experiences, multiple perspectives, and adjust misconception.
Center for enhancing problem solving	Center for enhancing problem solving was designed to learner's drill for solve problem with authentic context . problem solving (Jonassen,1987) used to design center for enhancing problem solving . It may help the learners to solve ill-structure problem .
Center for transfer of Practice Skills	Center for transfer of Practice Skills was designed to support for transfer of learner's Practice Skills. Analogical transfer(Gentner ,Holyoak &Kokinov,2001) used to design center for enhancing transfer of Practice Skills. It may help the learner's transfer of Practice Skills from one context to each.
Related cases	Related cases was designed to present related cases for learner in order to solve problem and help learners meaningful learning. Analogical transfer(Gentner ,Holyoak &Kokinov,2001) used to design Related cases. It may help the learners to transfer knowledge for solve problem
Scaffoldings	Scaffolding center was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding Center. It help the learners to learning or practical when them can not with themselves.
Coaching	Coaching Center was designed to support for providing hints and helps when needed, monitor learners' performance and help learners reflect on their performance. Cognitive apprenticeship (Collins, Brown and Newman,1989) used to design Coaching Center. It may help from novice learners to expert learner and prevent misconception of the learners.

## CONCLUSION AND DISCUSSION

The designing framework of Constructivist Web-based Learning Environment Model to enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student bases as following: (1) Activate cognitive structure and promote problem solving and transfer (2) Support for adjusting cognitive structure (3) Support for enlarge cognitive structures (4) Foster for problem solving and transfer Practical Skills (5) promote and assist knowledge construction. According to above 6 bases of the designing framework were transformed into practice as 9 elements the Constructivist Web-based Learning Environment Model to enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student as following: (1) Problem base (2) Resources (3) Cognitive tool (4) Collaboration for problem solving (5) Center for enhancing problem solving (6) Center for transfer of Practice Skills (7) Related cases (8) Scaffoldings, and (9) Coaching.

This finding was consistent with Chajjareon, S., Charuni S (2016); Suchat, W., Charisa,P., (2010) These previous research found that the students showed their problem solving and transfer and the framework of constructivist web-based learning environment model used problem solving and transfer foundation of the design. As for this research finding may be the result of Instructional design Theory (ID Theory) that used underlined theories especially the problem solving theory (Jonassen,1997) and transfer theory (Gentner ,Holyoak &Kokinov,2001) as the foundation of the design. This was shown in the designing framework of the Constructivist web-based learning environments model to enhance problem solving and transfer of practical skills . This may help learners to foster problem solving and transfer of practical skills . In addition, the

theoretical validity of the designing framework of the Constructivist web-based learning environment model was found from assessment by experts. As mentioned findings can be supported the designing framework of the Constructivist Web-based Learning Environment Model to enhance Problem Solving and Transfer of Practical Skills for Industrial Engineering Student

#### **ACKNOWLEDGEMENT**

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# Designing Framework of Constructivist Web-Based Learning Environment to Enhance the Creative Thinking for Junior High School

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## ABSTRACT

The purpose of this research was to synthesize theoretical framework and designing framework of constructivist web-based learning environment to enhance Creative thinking for Junior high school. The procedures were as follow: 1.) study of principles involved in creating a conceptual framework. 2) Synthetic frame theoretical framework in the learning environment on web base. The results revealed that 1) The theoretical framework of 6 base were as follows: (1) Psychological base (2) Pedagogical base (3) Technological base (4) Media theory base (5) Creative thinking base and (6) Learning and Teaching Contextual base. 2) Synthesis of theoretical and conceptual framework to design a model learning environment on the network Consists of 4 steps and 7 elements include: 1) Activate Cognitive to structure that promotes creativity. 2) Support to accommodation of intellectual 3) Supporting and enlarge for constructing knowledge creativity 4) Supporting and enlarge for constructing knowledge 5) Promote the creation of knowledge and creativity. 5) Assist and support the creation of knowledge and creativity. And 7 elements as following: 1) Problem base 2) Resource 3) Collaboration 4) Cognitive tools 5) Creative thinking Center 6) Scaffolding and 7) Coaching

## INTRODUCTION

At present, Thai society is a rapidly changing society. And there are new problems all the time. Therefore, quality development is the most important. To prepare people for change. And to a new era firmly. And know the world the key development mechanism is people. Education by education must develop people to quality. Think of and there is a way to think logically. As can be seen from the National Education Act, 1999. Section 22 Education must be based on the principle that all learners have the ability to learn and develop themselves and that the learner is the most important. The educational process must encourage learners to develop. Natural and full of potential " Based on this principle, the focus is on students to act. And can be learned all over the place and at all times is consistent with web-based learning. This is an educational innovation with features that respond to knowledge creation. And promote creativity. It is evident that network learning is a media attribution. And the symbolic system of media (Symbol systems) in the form of hypermedia, presented both animated graphics, text, voice (Salomon, 1977; Hannanfin, 1999. Jonassen and Henning, 1999; Jordan, 2003; Sumalee Chaijaroen, 2008)

Thailand has made education reform a learning-oriented learning, the brain can develop their potential to cause to learn maximum and a solid foundation to your well-being. Valuable and creative (Sansani and Usa, 2544:11). Country of Thailand, critical to the development of creative thinking that is the important thing that is needed to support our students. Constantly because creativity affect developing countries in future by taken. Targeted to education, as defined in the Education Act 2542 (1999) Chapter 4 section 24 national 2 and 3 text messages saying "give school the Grand thought processes to manage the situation and knowledge application, tight encounter used to protect vehicles and fix the problem by arranging activities to students Learn from the real experience of training practices, do, think as a love of reading and knowledge continually "(Commission of national Education, 2002:13). Creativity is the process of the human brain that are important to humans. To make a human being born to discover new ways to solve problems can be invented, invention demonstrations including the discovery concept theory is very useful to be able to improve. Change in the living conditions and the environment in a manner that creative people can live in a society in today's world of comfort and joy. Creativity is an important one, in which there is in every human being and has the ability to generate ideas. Imagination can correct the situation or environment changed quickly. Creativity is therefore critical thinking power. If it has been encouraging and promoting development. Systematic and applied appropriately, it will be beneficial for themselves and the nation, and particularly if there are people in society who have a creative high, it will be driven to develop and progress rapidly. Creative person, there is a need of society. The development of a creative person, so it is a particularly important goal of societies and Nations (Sompon , 1999:1)

(Office of the National Education Committee , 2545:13) , creativity is a feature that is in every person at different levels and can promote and further promote this feature. (1997: Miler, 12) by Torrance (Torrance, 1965:8), said that creativity can be developed with teaching. Training and practice that is how. Based on the creative framework of Guilford (1967), it consists of originality thinking, fluent thinking, flexibility thinking, and Elaboration thinking.

For this reason, the researcher is aware of the importance. And memory to design some theoretical frameworks based on constructivist learning environments that promote creativity among junior high school students. Using a learner-centered instructional process is critical to designing a learning environment on the network. Can be used as a lane in the development of thinking. To use as a guideline in learning management aimed at students to learn the content along with creative development. The findings will lead to the development of the quality of students with the modern world. To be useful in bringing knowledge to self-development. It also leads to development in the promotion of creativity.

### **The purpose of this study**

To synthesize theoretical framework and designing framework of constructivist web-based learning environment to enhance Creative thinking for Junior high school.

### **Target Group**

The target groups of this study consisted of two experts to assess the designing framework of the constructivist web-based learning environment model to enhance creative thinking.

### **Research instrument**

the instrument in the study consisted of 4 instrument as following.

1. The expert review recoding form checking the quality of the designing framework.
2. The Recoding form for synthesis of the theoretical framework web-based learning environment model to enhance learner's creative thinking.
3. The Recoding form for synthesis of the Designing framework web-based learning environment model to enhance learner's creative thinking.

### **Data collection and analysis**

The procedure of gathering and analysis data were as follows:

1. The synthesis of a theoretical framework of the Constructivist web-based learning environment model to enhance creative thinking. The data were collected by using the recoding for synthesis of the theoretical framework. Summarization, interpretation and analytical description were use analyze data.
2. The synthesis of designing framework of the Constructivist web-based learning environment model to enhance creative thinking. The data were collected by using the recoding for synthesis of the theoretical framework. Summarization, interpretation and analytical description were use analyze data.

### **Research result**

#### **1. Theoretical framework**

Theoretical framework of creative learning environment based on constructive network. For junior high school students of 6 base were as follows: ( 1 Psychological base ( 2 Pedagogical base ( 3 Technological base ( 4 Media theory base ( 5Creative thinking base and ( 6Learning and Teaching Contextual base.

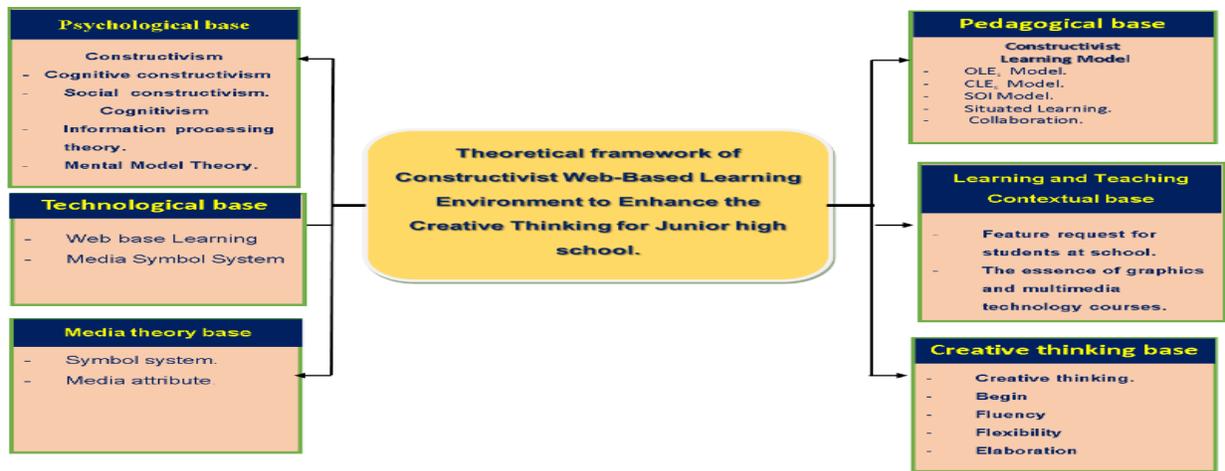


Figure 1. Theoretical framework of creative learning environment based on constructive network. For junior high school students

Psychological base (Instructional design) this is an important area where theories of learning are used as the basis for teaching design. To promote knowledge building among learners. And internal development (Cognitive process) Meaningful learning is more than just information acquisition. Therefore, the creative learning environment model based on constructive networks. Of junior high school students the basic psychology of learning is based on the two main theoretical concepts. Constructivist Theory and cognitive theory.

Pedagogical base Constructivism is the design of instructional design. The researcher has taken as a basis for the study. Includes OLEs model CLEs model SOI model Situated learning and Collaborations model.

Technology Basics It is a web based learning design. It provides a learning environment that mixes design and teaching. (Instructional design)And the application of Internet resources. To promote effective learning. Learning on the network consists of 2 major components. 1) web base learning And 2) media symbol system.

Media theory base the theory of media using the media symbol system. That explains the effect of media on learning. Each type of media has a different symbol system. This is the basis of design. It shows the characteristics of each type of media. The design does not take into account only media type or category.

Creative thinking base Foundation of creativity by introducing Guilford's Creative Theory (1967) it is an individual's ability to think in a multitude of directions. Also known as divergent thinking. By expression of thought or action resulting from learning And Hyper linking prior knowledge with new experiences together. And create a new work or outcome. Including the discovery of a solution to the problem. Creativity consists of four different thinking abilities: 1) original 2) Fluency 3) Flexibility 4) Elaboration

## 2. The Designing framework

According to this study, the findings of synthesis of the designing framework of the learning environments model to promote Creative Thinking found 5 crucial bases as the following details:

**Designing framework of Constructivist Web-Based Learning Environment to Enhance the Creative Thinking  
For Junior high school**

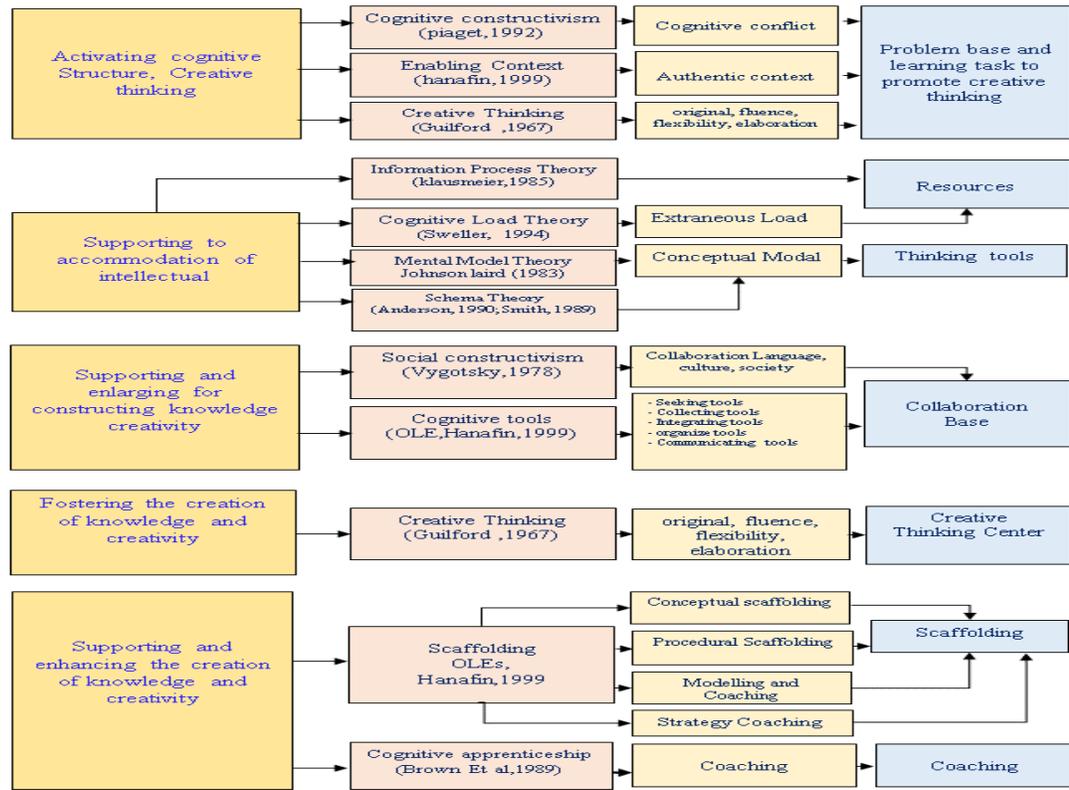


Figure 2. Designing framework of creative learning environment based on constructive network. For junior high school students

**1. Activating cognitive structure and Creative Thinking**



Figure 3 Activating cognitive structure and Creative Thinking

The first crucial bases of the designing framework was Activating cognitive Structure, creative Thinking, it illustrated the underlined theories used in design the component called “Problem bases” of the learning environments to for promote Creative Thinking. The underlined theories used for activating cognitive structure were as follows: Cognitive constructivism (Piaget, 1992); cognitive conflict, Enabling contexts OLE (Hannafin, 1999); Externally Induced, OLEs (Hannafin, 1999). These theories were transformed Ac for 4 abilities of Creative thinking (Guilford, 1967) as following: Fluency, Flexibility, Originality, Elaboration ware transformed into practice as learning task in order to promote Creative thinking. This may help activating cognitive structure and Creative thinking of the student as show in figure 3

## 2. Supporting to accommodation of intellectual

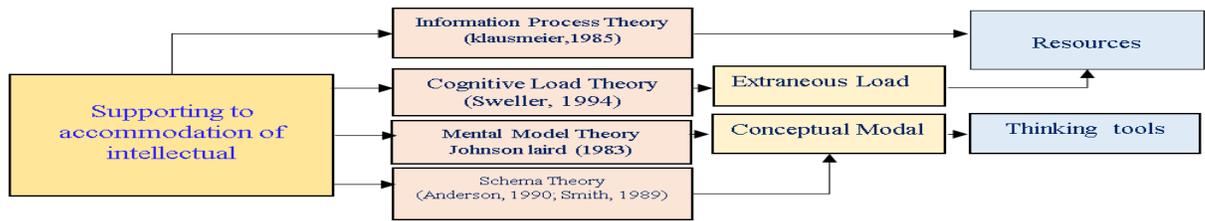


Figure 4. Supporting to accommodation of intellectual

Supporting to accommodation of intellectual. The second crucial bases of the designing framework was Supporting for adjusting of cognitive disequilibrium, it illustrated the underlined theories used in design the component called “Resources” and “thinking tools” of the learning environments to for promote Creative Thinking. The underlined theories used for Supporting for adjusting of cognitive disequilibrium were as follows: information processing theory (Klausmeier, 1985): sensory register, short-term memory, long-term memory): Cognitive load theory (sweller,1994): Chunking, Hierarchical network and media attribute symbol system of Multimedia; still picture, motion picture, text, sound Schema theory: Schema as memory structure, Schema as context, Schema as network; SOI model (Johnson-Larid,1983) Knowledge is stored in the mental model. With the linkage of information. The information inside the mental model can be re-created. (Restruction) with experience. (Learning) and the pattern of the problem. (Anderson, 1990; Smith, 1989) "What create Instead of an object or event within a "mental representation" and “script”. These theories were transformed into practice as learning resources and thinking tools in order to provide information for the learners to construct the knowledge. This may help learner processing information effectively and understand easily as shown Figure 4.

## 3. Supporting and enlarging for constructing knowledge creativity



Figure 5. Supporting and enlarging for constructing knowledge creativity

Supporting and enlarging for constructing knowledge creativity. The third crucial bases of the designing framework was Supporting for enlarging cognitive structure. it illustrated the underlined theories used in design the component called “Collaboration base” of the learning environments to for promote Creative Thinking. The underlined theories used for Supporting for enlarging cognitive structure were as follows: Social constructivist (Vygotsky, 1978); Collaboration, social, Language, Culture. These theories were transformed into practice as learning Collaboration in order to provide the learners collaboration problem solving and enlarging knowledge construct. Ac for 5 abilities Cognitive Tool (OLEs, Hannafin, 1999): Seeking tool, collecting tool, generating tool, organizing tool, integrating tool. Elaboration ware transformed into practice as cognitive tools base in order to provide the learners enlarging knowledge construct. As shown Figure 5.

## 4. Fostering the creation of knowledge and creativity.

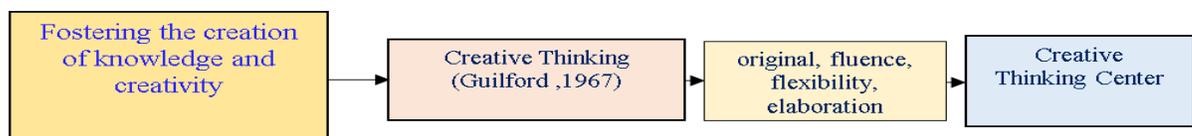


Figure 6. Fostering the creation of knowledge and creativity

Fostering the creation of knowledge and creativity. The fourth crucial bases of the designing framework was Supporting for Fostering for Creative Thinking. it illustrated the underlined theories used in design the component called “creative thinking center” of the learning environments to for promote Creative Thinking. The underlined theories used for Fostering for Creative Thinking were as follows: Creative Thinking (Guilford, 1967): Fluency,

Flexibility, Originality, Elaboration were transformed into practice as Intelligent thinking base in order to promote Creative thinking. This may help Fostering for Creative thinking of the student as show in figure 6

### 5. Supporting and enhancing the creation of knowledge and creativity

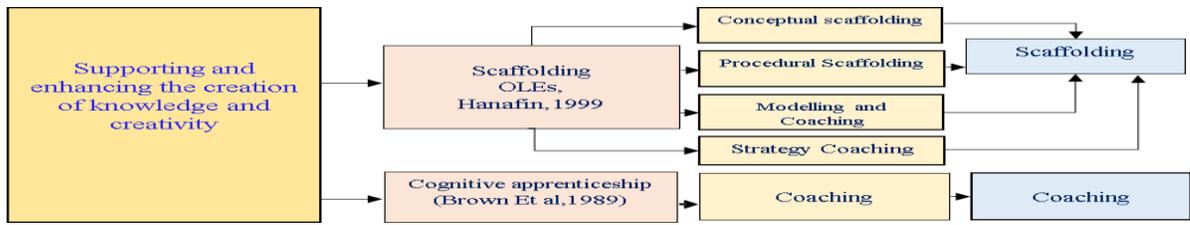


Figure 7. Supporting and enhancing the creation of knowledge and creativity

Supporting and enhancing the creation of knowledge and creativity. The fifth crucial bases of the designing framework was Supporting for enhancing for Creative Thinking. it illustrated the underlined theories used in design the component called “Scaffolding” and “Coaching” of the learning environments to for promote Creative Thinking. The underlined theories used for enhancing for Creative Thinking were as follows: Social constructivist Scaffolding (Hannafin, 1999): Conceptual Scaffolding, Strategic Scaffolding, Metacognition Scaffolding, and Procedural Scaffolding. These theories were transformed into practice as Scaffolding base in order to provide help with learning and adjusting of cognitive disequilibrium. Ac for Cognitive apprenticeship (Brown, 1989): Coaching. Elaboration were transformed into practice as Coach Base in order to provide the learners enlarging knowledge construct. As shown Figure 7.

The designing framework: Thinking Constructivist learning environment to promote Creative thinking comprised of 7 components as follows:

Element Describe the elements Example of design Shot	Element Describe the elements Example of design Shot
Problem base and learning task to promote creative thinking	Problem base and learning task to promote creative thinking was designed framework to activate cognitive structure into disequilibrium by using enabling contexts: Externally Induced (Hannafin, 1999) as open problem situation in order to induce the learners into discovery learning process. And 4 abilities of Creative Thinking (Guilford, 1967): Fluency, Flexibility Originality, and Elaboration were used to design learning task for promoting Creative Thinking.
Resources	Resources was designed to support for adjusting cognitive disequilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), SOI model (Mayer, 1996) Mental model theory 0, Schema theory, and Cognitive load theory. (sweller,1994), media attribution, symbol system of multimedia, these theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively.
Thinking Tools	Thinking tools was designed to support the learners to enable and facilitate the cognitive processing tasks associated with open-ended learning. Cognitive Tool (OLE, hannafin, 1999) was used to design the Cognitive Tool Center. This may help the learners to enlarge their cognitive structure (Hannafin, 1999)

Collaboration base	Collaboration Base was designed to support for enlarging cognitive structure and promoting Creative Thinking. Social constructivism (Vygotsky, 1962) was used to design the Social Collaboration Center. It may help support the learners for sharing experiences, multiple perspectives, and adjust misconception.
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Element Describe the elements Example of design Shot	Element Describe the elements Example of design Shot
Cognitive Tool base	enlarge their cognitive structure (Hannafin, 1999)
Creative Thinking Center	Creative Thinking Center was designed to foster Creative Thinking. Guilford (1967). 4 abilities of Creative thinking theory: Fluency, Flexibility Originality, Elaboration were used to design the Creative Thinking Center. It may help the learners to foster creative thinking.
Scaffolding	Scaffolding center was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding Center. It may help the learners to guide and support learning efforts in their knowledge construction process.
Coaching	Coaching Center was designed to support for providing hints and helps when needed, monitor learners' performance and help learners reflect on their performance. Cognitive apprenticeship (Collins, Brown and Newman, 1989) used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

**SUMMARY AND DISCUSSION RESULTS**

The result of the design of the learning environment on the network along the construction of Martin wit to promote creativity. For junior high school students found that theoretical framework comprises 6 Basic were as follows: (1) Psychological base (2) Pedagogical base (3) Technological base (4) Media theory base (5) Creative thinking base and (6) Learning and Teaching Contextual base. And Designing framework of the learning environments model to promote Creative Thinking found 5 crucial bases as the following details: 1) Activating cognitive structure and Creative Thinking 2) Supporting to accommodation of intellectual 3) Supporting and enlarging for constructing knowledge creativity 4) Fostering the creation of knowledge and creativity 5) Supporting and enhancing the creation of knowledge and creativity And 7 elements as following: 1) Problem base 2) Resource 3) Collaboration 4) Cognitive tools 5) Creative thinking Center 6) Scaffolding and 7) Coaching.

This study focuses on theoretical synthesis of theoretical framework. It is the first factor that is critical to the design and development of a learning environment based on a Constructivist learning environment. To promote creativity for junior high school students. The next effective, It also allows designers to perform clearly based on theoretical frameworks. As well as the use of research processes as a basis for design and development.

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# Designing Framework of Constructivist Web-Based Learning Environment Model to Enhance Creative Thinking

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## ABSTRACT

The purpose of this research was to synthesize theoretical and designing framework of constructivist web-based learning environment model to enhance creative thinking. Document analysis and survey research were employed in this study. The procedures were as follows: 1. to examine and analyze principles, theories and related researches, 2. to study instructional context 3. to synthesize the theoretical and the designing framework. The result revealed that: 1) The theoretical framework consisted of 5 bases were as follows: (1) pedagogical base, (2) psychological base, (3) Technological and media theory base, (4) Contextual base and (5) Neuroscience base 2) The designing framework consisted of 5 stages and 7 elements, were as follows: (1) Activating cognitive structure and promoting Creative Thinking (2) Supporting for adjusting of cognitive equilibrium (3) Supporting for enlarging cognitive structure (4) Fostering creative thinking (5) Supporting and encouraging knowledge construction and 7 element as following: (1) Problem Bases, (2) Learning Resources, (3) Social Collaboration Center (4) Cognitive Tools (5) Creative Thinking Center (6) Scaffolding center (7) Coaching Center

Keywords— Web-based learning environment, Constructivist theory, Creative thinking

## INTRODUCTION

The changing of world society and advancement of technology is influenced society in globalization. This change affects human being need to learn all their life or life- long learning, especially 21 century learning focuses on learning and creative skills. However, at present instructional management focuses on transmitting and memorizing information. This results in lacking of creativity and information seeking skills of the learners.

Above mentioned reasons, it is necessary to adapt the learning strategies to meet the 21 century learners' characteristics. Therefore, the instruction design must be changed in order to foster creative thinking and information seeking skills and knowledge construction rather than passively receive the knowledge. Instructional Design Theory (ID Theory) was used in this design. Crucial theories used as foundation were Constructivist theories: Social Constructivism and Cognitive Constructivism, Cognitive theories: Information processing and the Creative thinking. These theories may help the knowledge construction and creative thinking of the learners, especially in the course Multimedia Production and Presentation for Education. Moreover, the media attribute and symbols system of web base comprises of hypertext, hyperlink, and hyperlink media may support the knowledge construction and creative thinking.

For the above reasons, researchers realize the importance of synthesizing the designing framework of the Constructivist web based learning model to enhance creative thinking. This framework may help designer to effectively design the Constructivist web based learning environment model. In addition, it will help to confirm the credibility and provide beneficial guideline for the designer to design the Constructivist web based learning environment model.

## THE PURPOSE OF THIS STUDY

To synthesize the designing framework of constructivist web-based learning environment model to enhance creative thinking.

### Research design

Document analysis and survey research were employed in this study

### Target Group

The target groups of this study consisted of 3 experts to assess the designing framework of the Constructivist web-based learning environment model to enhance Creative thinking.

### Research instruments

The instruments in this study consisted of 2 instruments as following:

- 1) The expert review record form for checking the quality of the designing framework.
- 2) The synthesis of the designing framework record form for record the data for synthesis of the designing framework of the web-based learning environments model to enhance the learner's creative thinking.

### Data collecting and analysis

The procedure of gathering and analysis data were as follows:

- 1) Synthesis of theoretical framework of the constructivist web-based learning environment model to enhance creative thinking. The data were collected by using the recording form for synthesis of the theoretical framework. Summarization, interpretation and analytical description were used to analyze the data.
- 2) Synthesis of designing framework of cognitive web-based learning environment model to enhance Creative thinking. The data were collected by using the recording form for synthesis of the designing framework. Summarization, interpretation and analytical description were used to analyze the data.

## Research Results

### 1. The stage of the designing framework

According to this study, the findings of synthesis of the designing framework of the constructivist learning environments model to promote Creative Thinking showed 5 stages were as follows: (1) Activating cognitive structure and promoting Creative Thinking (2) Supporting for adjusting of cognitive equilibrium (3) Supporting for enlarging cognitive structure (4) Fostering creative thinking (5) Supporting and encouraging knowledge construction. The details of these 5 stages as the following:

#### 1. Activating cognitive structure and promoting Creative Thinking

The first crucial bases of the designing framework was activating cognitive structure and promoting creative thinking. It illustrated underlined theories used to design the component called "Problem Base" of the learning environments to promote creative thinking. The underlined theories used for activating cognitive structure were as follows: cognitive constructivism (Piaget, 1964); cognitive conflict, enabling contexts OLE (Hanafin,1999); externally induced, OLEs (Hannafin,1999); these theories were transformed into design problem situation in order to induce the learners into discovery learning process. As for 4 abilities of creative thinking (Guilford, 1967); fluency, flexibility originality, elaboration were transformed into practice as learning task in order to promote creative thinking. This may help activating cognitive structure and creative thinking of the learners as shown in figure 1

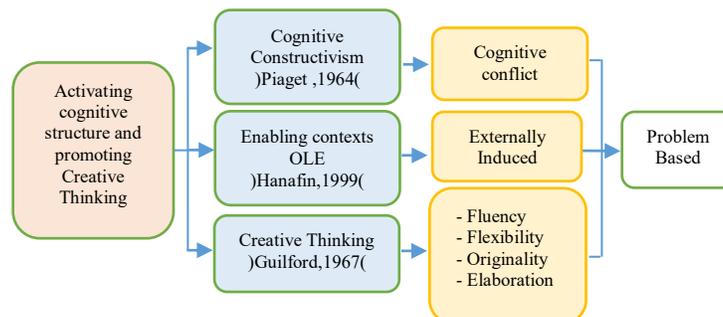


Figure 1. The designing framework: Activating cognitive structure and promoting Creative Thinking

#### 2. Supporting for adjusting of cognitive equilibrium

The second crucial bases of the designing framework was supporting for adjusting of cognitive equilibrium, it illustrated the underlined theories used to design the component called “Learning Resources” of the learning environments to promote creative thinking. The underlined theories used for supporting for adjusting of cognitive equilibrium were as follows: information processing theory (Klausmeier, 1985); sensory register, short-term memory, long-term memory; cognitive load theory (sweller,1994); chunking, hierarchical network and media attribute symbol system of multimedia; still pictures, motion pictures, text, sound: schema theory; schema as context, schema as network: SOI model (Mayer, 1996) selecting, organizing, integrating; mental model theory; conceptual model. These theories were transformed into practice as learning resources in order to provide information for the learners to construct the knowledge. This may help the learners processing information effectively and understand easily as shown in Figure 2

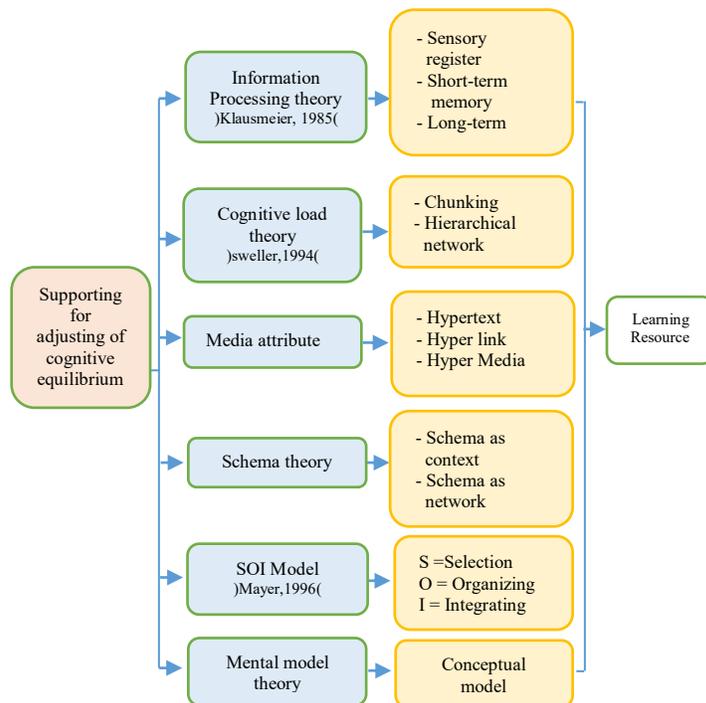


Figure 2. The designing framework supporting for adjusting of cognitive equilibrium

### 3. Supporting for enlarging cognitive structure

The third crucial bases of the designing framework was supporting for enlarging cognitive structure, it illustrated the underlined theories used to design the component called “Social Collaboration Center” of the learning environments to promote Creative Thinking. The underlined theories used for supporting for enlarge cognitive structure were as follows: Social constructivism (Vygotsky,1962); language, culture and society. These help support learners to share experiences, multiple perspectives, and adjust misconceptions. Cognitive tools (Hannafin,1999) comprise of Seeking Tool, Collecting Tool, Organization Tool, Integrating Tool, Generation Tool. These 5 tools help support learners to enable and facilitate the cognitive processing associated with open-ended learning. This may help learners supporting for enlarging cognitive structure as shown in figure 3.

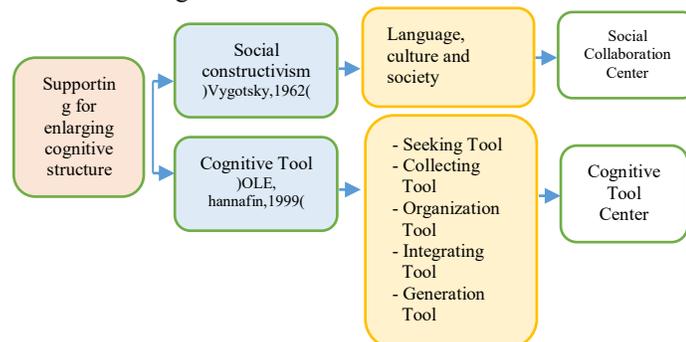


Figure 3. The designing framework supporting for enlarging cognitive structure

#### 4. Fostering creative thinking

The fourth crucial bases of the designing framework was fostering creative thinking it illustrated the underlined theories used to design the component called “Creative Thinking Center” of the learning environments to promote creative thinking. The underlined theories used for fostering creative thinking: fluency, flexibility originality, elaboration Guilford (1967). This may help learners to foster creative thinking as shown in Figure 4

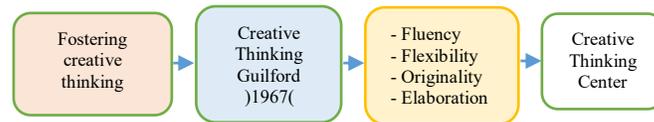


Figure 4. The designing framework fostering creative thinking

#### 5. Supporting and encouraging knowledge construction

The fifth crucial bases of the designing framework was supporting and encouraging knowledge construction, it illustrated the underlined theories used to design the component called “Scaffolding center” of the learning environments to promote creative thinking. The underlined theories used for supporting and encouraging knowledge construction were as follows: Social Constructivism (Vygotsky, 1978): Zone of Proximal Development; 4 scaffolding (Hannafin, 1999): conceptual scaffolding, metacognitive scaffolding, procedural scaffolding, strategic scaffolding, and cognitive apprenticeship; coaching. These theories were transformed into practice as scaffolding center in order to guide and support learning efforts of learners. This may support and encourage the learners to construction knowledge. As shown in Figure 5

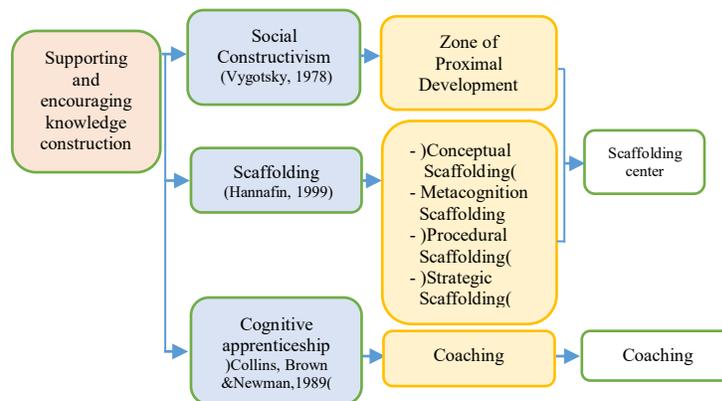


Figure 5. The designing framework supporting and encouraging knowledge construction

## 2. The elements of the designing framework

The designing framework of the constructivist learning environments models to promote creative thinking showed 7 elements as following details:

Element Describe the elements	Describe the designing elements of the Constructivist Learning Environment model
Problem Base	Problem base was designed to activate the cognitive structure into disequilibrium by using enabling contexts: Externally Induced (Hannafin, 1999) as open problem situation in order to induce the learners into discovery learning process. And 4 abilities of Creative Thinking (Guilford,1967): Fluency, Flexibility Originality, Elaboration were used to design learning task for promoting Creative Thinking.
Learning Resources	Learning Resources was designed to support for adjusting cognitive equilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), Cognitive load theory (sweller,1994), media attribution, symbol system of multimedia, Schema theory, SOI model (Mayer, 1996) and Mental model. Theory. These theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively.
Social Collaboration Center	Social Collaboration Center was designed to support for enlarging cognitive structure and promoting Creative Thinking. Social constructivism (Vygotsky,1962) was used to design the Social Collaboration Center. It may help support the learners for sharing experiences, multiple perspectives, and adjust misconception.
Cognitive Tool Center	Cognitive Tool Center was designed to support the learners to enable and facilitate the cognitive processing tasks associated with open-ended learning. Cognitive Tool )OLE, hannafin,1999( was used to design the Cognitive Tool Center. This may help the learners to enlarge their cognitive structure (Hannafin,1999)
Creative Thinking Center	Creative Thinking Center was designed to foster Creative Thinking. Guilford (1967). 4 abilities of Creative thinking theory: Fluency, Flexibility Originality, Elaboration were used to design the Creative Thinking Center. It may help the learners to foster creative thinking.
Scaffolding Center	Scaffolding center was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding Center. It may help the learners to guide and support learning efforts in their knowledge construction process.
Coaching Center	Coaching Center was designed to support for providing hints and helps while learners needed, monitor learners' performance and help learners to reflect on their performance. Cognitive apprenticeship )Collins, Brown and Newman,1989( used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

3. Assessment of the designing framework of the Constructivist web-based learning environment model to enhance Creative thinking by experts. It showed the congruence between the underlined theories and the design of all 7 elements.

## CONCLUSION

The designing framework of the Constructivist web-based learning environments model comprised of 5 stage as following: 1) Activating cognitive structure and promoting Creative Thinking, 2) Supporting for adjusting of cognitive equilibrium, 3) Supporting for enlarging cognitive structure, 4) Fostering Creative Thinking and 5) Supporting and encouraging knowledge construction. According to above 5 stages of the designing framework were transformed into practice as 7 elements the Constructivist web-based learning environments model to enhance Creative thinking as following: 1) Problem base, 2) Learning Resource, 3) Social Collaboration Center, 4) Cognitive Tool Center, 5) Creative Thinking Center, 6) Scaffolding center 7) Coaching Center.

This finding was consistent with Chajareon, S., Samat, C., Kanjug, I., (2012); Techapornpong, O., Chajaroen, S., (2017) These previous research found that the students showed their creative thinking and the framework of constructivist web-based learning environment models. As for this research finding may be the result of Instructional design Theory (ID Theory) that used underlined theories especially the creative Thinking theory (Guilford, 1967): Fluency, Flexibility Originality, Elaboration as the foundation of the design. This was shown in the designing framework of the Constructivist web-based learning environments model to enhance Creative thinking. This may help learners to foster creative thinking. In addition, the theoretical validity of the designing framework of the Constructivist web-based learning environment model was found by experts reviewed. As mentioned findings can be supported the designing framework of the Constructivist web-based learning environment model to enhance Creative thinking. The designing framework of the Constructivist web-based learning environments model was recognized as the important one. Since it can support and help the designers to design effectively and clearly. If lacking of this framework how can the designer perform it effectively.

## ACKNOWLEDGEMENT

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# **Designing Framework of Constructivist Web-Based Learning Environment Model to Enhance Information Processing**

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## **ABSTRACT**

The purpose of this research was to synthesize designing framework of constructivist web-based learning environment model to enhance information processing. Document analysis and survey research were employed in this study. The procedures were as follows: 1. To examine and analyze the principles, theories and related researches, 2. To study instructional context 3. To synthesize the theoretical framework, and 4. To synthesize the designing framework. The results revealed that: 1) The theoretical framework consists of 5 crucial bases were as follows: (1) Psychological base, (2) Pedagogical base, (3) Technological base, (4) Context base, and (5) Neuroscience base 2) The designing framework consisted of 5 stages and 7 element as following: 1) Activating cognitive structure and promoting information processing 2) Supporting for adjusting of cognitive equilibrium 3) Supporting for enlarge cognitive structure, 4) fostering information processing, and 5) supporting and encouraging knowledge construction and 7 element as following: (1) Problem Base, (2) Learning Center (3) cognitive tool Center, (4) Social Collaboration Center, (5) Information Processing Center, (6) Scaffolding Center and (7) Coaching Center.

## **INTRODUCTION**

Due to the changes of society in the world and technological changed has influenced on the knowledge based and digital society. This change affect learning skill of the learners especially information processing. In addition, the teaching and learning management also focused on the transmission and memorization. It results in lacking of seeking skill, information processing and knowledge construction.

Therefore, it is necessary to adapt the learning strategies to keep pace with above mentioned change. Therefore, the instruction design must be changed in order to foster information processing and information seeking skills and knowledge construction rather than passively receive the knowledge.

Instructional Design Theory (ID Theory) need to use in this design. Theory used as foundation were Constructivist theory: Social constructivism and cognitive constructivism, Cognitive theory: Information Processing. These theories may help the knowledge construction and information processing of the learners, especially on English vocabulary. Moreover, the media attribute and symbol system of web baes comprises of hypertext, hyperlink, and hyperlink media may support the knowledge construction and information processing. For the above reasons. researchers recognize the importance of synthesizing the designing framework of the Constructivist web based learning model to enhance information processing. This framework may help designer to effectively design the Constructivist web based learning environment model. In addition, it will help to confirm the credibility and provide obvious guideline for the designer to design the Constructivist web based learning environment model to enhance information processing.

## **THE PURPOSE OF THIS STUDY**

To synthesize the designing framework of the constructivist learning environment to enhance information processing.

## **Research design**

Document analysis and survey research were employed in this study.

## Target Group

The target groups of this study consisted of 3 experts to assess the Designing framework of the Constructivist web-based learning environment model to enhance information processing.

## Research instruments

The instruments in this study consisted of 2 instruments as following:

- 1) The expert review recording form for checking the quality of the designing framework.
- 2) The recording form for synthesis of the designing framework of the constructivist learning environment to enhance information processing.

## Data collecting and analysis

The procedure of gathering and analysis data were as follows:

- 1) Synthesis of the theoretical framework of the constructivist learning environment to enhance information processing. The data were collected by using the recording form for synthesis of the theoretical framework. Summarization, interpretation and analytical description were used to analyze the data.
- 2) Synthesis of the designing framework of the constructivist learning environment to enhance information processing. The data were collected by using the recording form for synthesis of the designing framework. Summarization, interpretation and analytical description were used to analyze the data.

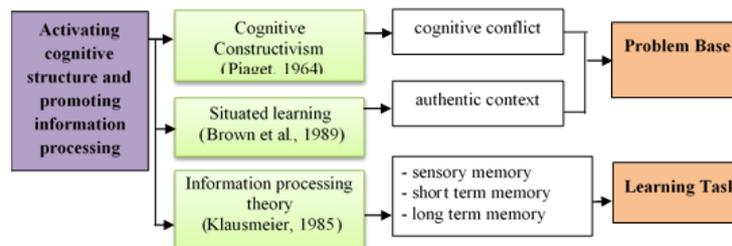
## Research Results

### 1. The designing framework

According to this study, the finding of synthesis of the designing framework of the constructivist learning environment to enhance information processing. found 5 crucial bases as the following details:

#### 1. Activating cognitive structure and promoting information processing

The first crucial bases of the designing framework was activating cognitive structure and promoting information processing, It illustrated the underlined theories used in design the component called “Problem Based” of the constructivist learning environment to promote information processing the underlined theories used for activating cognitive structure as following: cognitive constructivism (Piaget, 1964): cognitive conflict, situated learning (Brown et al., 1989): authentic context. These theories were transformed into practices as problem situations in order to induce the learners into discovery learning process. As for 4 abilities of information processing (Klausmeier, 1985) as following: sensory memory, short term memory, and long term memory. Elaboration were transformed into practices as learning task in order to promote information processing. This may help activating cognitive structure and information processing of the learners as shown in **Figure 1**.

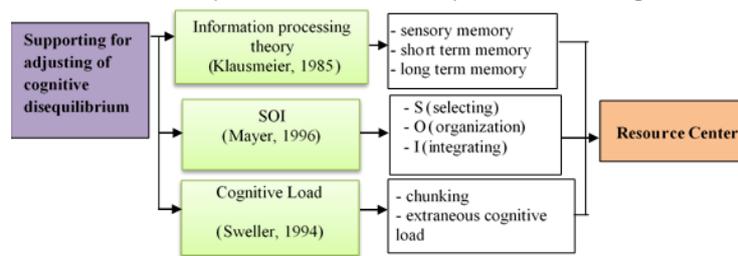


**Figure 1.** The designing framework: Activating cognitive structure and promoting information processing

#### 2. Supporting for adjusting of cognitive disequilibrium

The second crucial bases of the designing framework was supporting for adjusting of cognitive disequilibrium, it illustrated the underlined theories used in design the component called “Resources Center” of the constructivist learning environment to promote information processing. The underlined theories used for supporting for adjusting of cognitive disequilibrium were as follows: information processing theory (Klausmeier, 1985): sensory register, short-term memory, long-term memory, Cognitive Load theory (sweller,1994): chunking, hierarchical network and media attribute symbol system of multimedia; still picture, motion picture, text, sound, and SOI model (Mayer, 1996); selection, organizing, integrating, These theories were transformed into practice

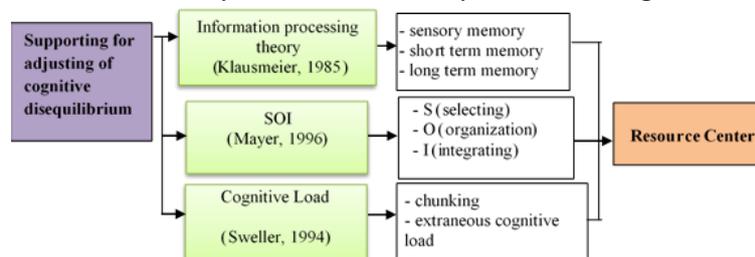
as resources center in order to provide information for the learners to construct the knowledge. This may help learner processing information effectively and understand easily as shown in **Figure 2**.



**Figure 2.** The designing framework: Activating cognitive structure and promoting information processing

### 3. Supporting for adjusting of cognitive disequilibrium

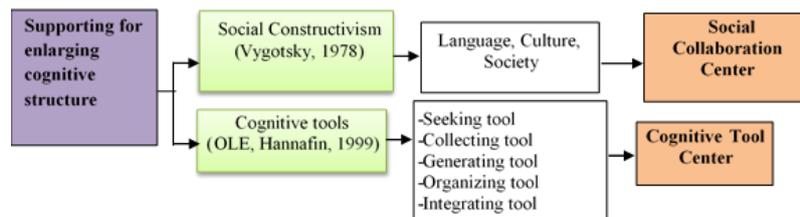
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**Figure 3.** The designing framework: Supporting for adjusting of cognitive disequilibrium.

### 4. Supporting for enlarging cognitive structure

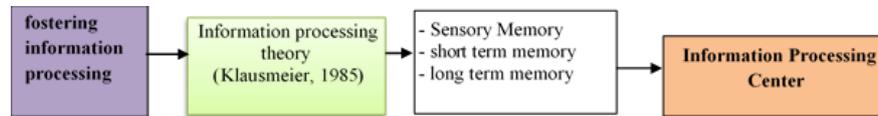
The third crucial bases of the designing framework was supporting for enlarging cognitive structure, It illustrated the underlined theories used in design the component called “Social Collaboration Center” of the constructivist learning environment to promote information processing. The underlined theories used for supporting for enlarging cognitive structure as following: Social constructivism (Vygotsky, 1978); language, culture, and society. These help support learners to share experiences, multiple perspectives, and adjust misconception. Cognitive tools (Hannafin, 1999) comprise of seeking tool, collecting tool, generating tool, organizing tool, and integrating tool. These 5 tools help support learners to enable and facilitate the cognitive processing tasks associated with learning. This may help learners supporting for enlarging cognitive structure as shown in **Figure 4**.



**Figure 4.** The designing framework: supporting for enlarge cognitive structure

## 5. Fostering information processing

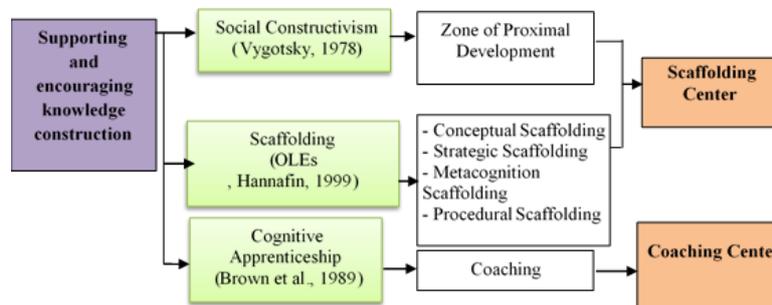
The fourth crucial bases of the designing framework was fostering Information Processing, it illustrated the underlined theories used in design the component called “Information Processing Center” of the constructivist learning environment to promote information processing. The underlined theories used for information processing theory (Klausmeier, 1985): sensory memory, short term memory, and long term memory. This may help learner to foster information processing as shown in **Figure 5**.



**Figure 5.** The designing framework: Fostering of information processing

## 6. Supporting and encouraging knowledge construction

The fifth crucial bases of the designing framework was supporting and encouraging knowledge construction, it illustrated the underlined theories used in design the component called “Scaffolding Center” of the constructivist learning environment to promote information processing. The underlined theories used for supporting and encouraging knowledge construction were as follows: social constructivism (Vygotsky, 1978): zone of proximal development, 4 scaffolding (Hannafin, 1999) : conceptual scaffolding, strategic scaffolding, metacognitive scaffolding, and procedural Scaffolding, and cognitive apprenticeship (Brown et al., 1989). These theories were transformed into practice as Coaching Center in order to guide and support learning efforts of learners. This may support and encourage the learners to knowledge construction as shown in **Figure 6**.



**Figure 6.** The designing framework: Supporting and encouraging knowledge construction

## 2. The constructivist learning environment to promote information processing.

The constructivist learning environment to promote information processing designing framework comprised of 7 components as follows:

Element	Describe the elements
Problem base	Problem base is designed to activating cognitive structure into disequilibrium by using Cognitive constructivism (Piaget, 1964) and Situated learning: authentic context (Brown et al., 1989) as problem situation in order to induce the learners into discovery learning process. And 3 abilities of Information processing theory (Klausmeier, 1985): sensory memory, short term memory, long term memory were used to design learning task for promoting Information processing.
Resources Center	Resources Center was designed to support for adjusting cognitive equilibrium by using essential principles and theories as following: information processing theory (Klausmeier,1985), Cognitive Load theory (sweller,1994), media attribution, symbol system of multimedia, and SOI model (Mayer, 1996). These theories were applied to design the Resources Center for providing information for the learners to construct the knowledge. This may help the learners processing information effectively.
Social Collaboration Center	Social Collaboration Center was designed to support for enlarging cognitive structure and promoting Information Processing. Social constructivism (Vygotsky,1962) was used to design the Social Collaboration Center. It may help support the learners for sharing experiences, multiple perspectives, and adjust misconception.
Cognitive Tool Center	Cognitive Tool Center was designed to support the learners to enable and facilitate the cognitive processing tasks associated with learning. Cognitive tools (OLE, Hannafin,1999) was used to design the Cognitive Tool Center.
Element	Describe the elements
	This may help the learners to enlarge their cognitive structure (Hannafin,1999).
Information Processing Center	Information Processing Center was designed to foster Information Processing. (Klausmeier, 1985). 3 abilities of Information Processing theory: sensory memory, short term memory, and long term memory were used to design the Information Processing Center. It may help the learners to foster information processing.
Scaffolding Center	Scaffolding Center was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): conceptual scaffolding, metacognitive scaffolding, procedural scaffolding, strategic scaffolding were used to design Scaffolding Center. It may help the learners to guide and support learning efforts in their knowledge construction process.
Coaching Center	Coaching Center was designed to support for providing hints and helps when needed, monitor learners' performance and help learners reflect on their performance. Cognitive Apprenticeship (Brown et al., 1989) used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

3.=Assessment of the designing framework of the Constructivist web-based learning environment model to enhance Information Processing by experts found the congruence between the underlined theories and the design.

## CONCLUSION

The designing framework of the Constructivist web-based learning environments model comprised of crucial bases as following: 1) activating cognitive structure and promoting information processing 2) supporting for adjusting of cognitive equilibrium 3) supporting for enlarge cognitive structure, 4) fostering information processing, and 5) supporting and encouraging knowledge construction. According to above 5 bases of the designing framework were transformed into practice as 7 elements the Constructivist web-based learning environments model to enhance Information Processing as following: (1) Problem Base, (2) Learning Center (3) cognitive tool Center, (4) Social Collaboration Center, (5) Information Processing Center, (6) Scaffolding Center and (7) Coaching Center.

This finding was consistent with Kwangmuang, P., Chaijareon, S., Samat, C., Kanjug, I., (2012); Ployphan, N., Chaijareon, S., Phonimdaeng, Ch., (2006); Paisarn, J., Chaijareon, S., Phonimdaeng, Ch., (2006) These previous research found that the students showed their information processing and the framework for development of cognitive innovation to enhance knowledge construction and memory process as foundation of the design. As for this research finding may be the result of Instructional design theory (ID Theory) that used underlined theories especially the Information Processing theory (Klausmeier, 1985): sensory memory, short term memory, long term memory as the foundation of the design. This was shown in the designing framework of the Constructivist web-based learning environments model to enhance information processing. This may help learners to foster information processing. In addition, the theoretical validity of the designing framework of the Constructivist web-based learning environment model was found from assessment by experts. As mentioned findings can be supported the designing framework of the Constructivist web-based learning environment model to enhance information processing.

## ACKNOWLEDGEMENT

This research was supported by Ph.D. Program in Educational Technology, Faculty of Education, Research Group for Innovation and Cognitive Technology, Khon Kaen, University, and Research and Technology Transfer Affairs Division, Khon Kaen University which hereby giving the thankfulness all through this.

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# Designing Framework of Constructivist Web-Based Learning Environment to Enhance Problem Solving

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## ABSTRACT

The purpose of this research was to synthesize theoretical framework and designing framework of constructivist web-based learning environment to enhance Problem Solving. The procedures were as follow: 1.) To study and analyze principles, theories and related researches. 2.) To synthesize the theoretical framework 3.) To survey instructional context 3) To synthesize the designing framework. The results revealed that 1) The theoretical framework consisted of 6 bases as following: (1) Psychological base (2) Pedagogical base (3) Technological base (4) Media theory base (5) Problem Solving base and (6) Learning and Teaching Contextual base. 2) The designing framework consisted of 4 steps and 7 elements included: 1) To activate Cognitive structure and promotes problem solving. 2) To support for adjusting cognitive equilibrium 3) To support for enlarging cognitive structure 4) To promote the knowledge construction and problem solving. 5) To support and enhance knowledge construction and Problem Solving. And 7 elements of the constructivist web-based learning environment as following: 1) Problem base 2) Resource 3) Collaboration 4) Cognitive tools 5) Problem Solving Center 6) Scaffolding and 7) Coaching.

**Key words:** Learning environment, Problem Solving

## INTRODUCTION

The important and the need of the recent Education. The learners should be given a high- Higher-Order Thinking Skills such: Critical thinking, Analysis thinking, problem solving, and information transfer which focus on the use of methods. Simulation, discovery, problem solving and collaboration. Learners were receive the authentic experience, it can be congruent with the real life. Therefore, the instruction design must be changed in order to foster Problem Solving and information seeking skills and knowledge construction rather than passively receive the knowledge.

Instructional Design Theory (ID Theory) was used in this design. Essential theories used as foundation were as follows: Constructivist Theories, problem solving, transfer knowledge theories and media attribute, symbol system of web-base comprises of hyperlink hypertext , and hyperlink media my support the knowledge construction and problem solving.

## THE PURPOSE OF THIS STUDY

To synthesize the designing framework of constructivist web-based learning environment model to enhance Problem Solving.

## Research design

Document analysis and survey research were employed in this study

## Target Group

The target groups of this study consisted of 3 experts to assess the designing framework of the Constructivist web-based learning environment model to enhance Problem Solving.

## Research instruments

The instruments in this study consisted of 2 instruments as following:

- 1) The expert review record form for checking the quality of the designing framework.
- 2) The synthesis of the designing framework record form for record the data for synthesis of the designing framework of the web-based learning environments model to enhance the learner's Problem Solving.

## Data collecting and analysis

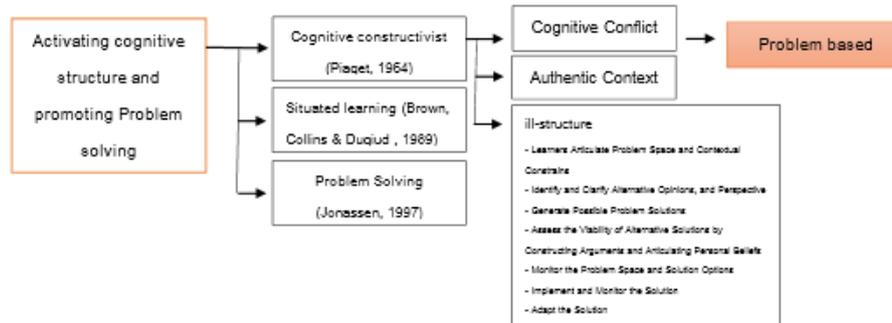
The procedure of gathering and analysis data were as follows: 1) Synthesis of theoretical framework of the constructivist web-based learning environment model to enhance Problem Solving. The data were collected by using the recording from for synthesis of the theoretical framework. Summarization, interpretation and analytical description were used to analyze the data. 2) Synthesis of designing framework of cognitive web-based learning environment model to enhance Problem Solving. The data were collected by using the recording

from for synthesis of the designing framework. Summarization, interpretation and analytical description were used to analyze the data.

### Research Results

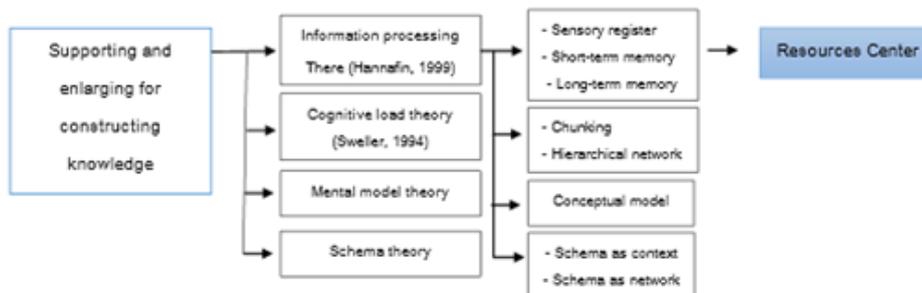
1. The stage of the designing framework According to this study, the findings of synthesis of the designing framework of the constructivist learning environments model to promote problem solving. showed 5 stages were as follows: (1) Activating cognitive structure and promoting problem solving (2) Supporting for adjusting of cognitive equilibrium (3) Supporting for enlarging cognitive structure (4) Promoting the knowledge construction and problem solving (5) Supporting and enhance knowledge construction and problem solving. The details of these 5 stages as the following:

#### Activating cognitive structure and promoting Problem Solving



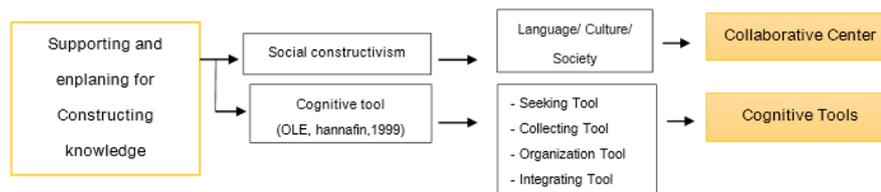
**Figure 1.** The designing framework: Activating cognitive structure and promoting Problem Solving

#### 2. Supporting for adjusting of cognitive equilibrium



**Figure 2.** The designing framework supporting for adjusting of cognitive equilibrium

#### 3. Supporting for enlarging cognitive structure



**Figure 3.** The designing framework supporting for enlarging cognitive structure

#### 4. Promoting the knowledge construction and problem solving

Element elements	Describe the	Describe the designing elements of the Constructivist Learning Environment model
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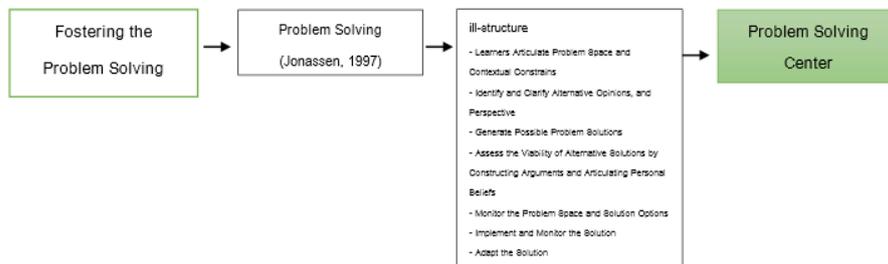


Figure 4. The designing framework Promoting the knowledge construction and problem solving

#### 5. Supporting and enhance knowledge construction and problem solving

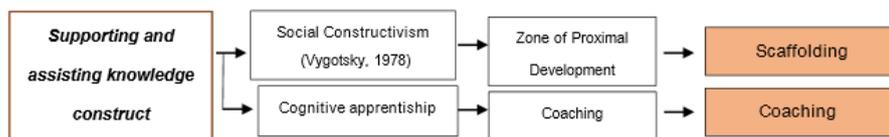


Figure 5. The designing framework supporting and enhance knowledge construction and problem solving

#### 2. The elements of the designing framework

The designing framework of the constructivist learning environments models to promote problem solving showed 7 elements as following details:

<b>Problem Base</b>	Problem base was designed frame work to activate cognitive structure into disequilibrium by using enabling contexts: Externally Induced and Individually Induced (Hannafin, 1999) as open problem situation in order to induce the learners into discovery learning process and 4 abilities of Creative Thinking (Guilford,1967): Fluency, Flexibility Originality, Elaboration were used to design learning task for promoting Problem Base.
<b>Resources</b>	Resources was designed to support for adjusting cognitive disequilibrium by using essential principles and theories as following: information processing theory (Klausmeier, 1985), SOI model (Mayer, 1996), Mental model theory (Johnsonlaird, 1983), Schema theory (Anderson, 1990; Smith, 1989), and Cognitive load theory. (sweller, 1994), media attribution, symbol system of multimedia, These theories were applied to design the learning resources for providing information for the learners to construct the knowledge. This may help the learners processing information effectively and understand easily.
<b>Collaboration</b>	Social Collaboration base was designed to support for enlarging cognitive structure and promoting Problem Solving . Social constructivism( Vygotsky, 1962) was used to design the Social Collaboration base. It may help support the learners for sharing experiences, multiple perspectives, adjust misconception, and collaboration problem solving.
<b>Cognitive Tool</b>	Cognitive Tool base was designed to support the learners to enable and facilitate the cognitive processing tasks associated with open-ended learning. Cognitive Tool (OLE, hannafin, 1999) was used to design the Cognitive Tool base. This may help the learners to enlarge their cognitive structure (Hannafin,1999)
<b>Problem Solving Center</b>	Problem situation in order to induce the learners into discovery learning process. And 7 abilities of Problem Solving (Jonassen, 1997) as following: ill-structure 1) Learners Articulate Problem Space and Contextual Constrains 2) Identify and Clarify Alternative Opinions, and Perspective 3) Generate Possible Problem Solutions 4) Assess the Viability of Alternative Solutions by Constructing Arguments and Articulating Personal Beliefs 5) Monitor the Problem Space and Solution Options 6) Implement and Monitor the Solution 7) Adapt the Solution were used to design learning task for promoting Problem Solving.
<b>Scaffolding</b>	Scaffolding was designed to support and encourage knowledge construction of the learners. 4 scaffolding (Hannafin, 1999): Conceptual Scaffolding, Metacognitive Scaffolding, Procedural Scaffolding, Strategic Scaffolding were used to design Scaffolding. It may help the learners to guide and support learning efforts in their knowledge construction process.
<b>Coaching</b>	Coaching base was designed to support for providing hints and helps when needed, monitor learners, performance and help learners reflect on their performance. Cognitive apprentice (Collins, Brown and Newman, 1989) used to design Coaching Center. It may help the learners to conduct their performance effectively and prevent misconception of the learners.

3. Assessment of the designing framework of the Constructivist web-based learning environment model to enhance Problem Solving by experts. It showed the congruence between the underlined theories and the design of all 7 elements.

## CONCLUSION

The designing framework of the constructivist web-based learning environment to enhance Problem Solving. The procedures were as follow: 1.) To study and analyze principles, theories and related researches. 2.) To synthesize the theoretical framework 3.) To survey instructional context 3) To synthesize the designing framework. The results revealed that 1) The theoretical framework consisted of 6 bases as following: (1) Psychological base (2) Pedagogical base (3) Technological base (4) Media theory base (5) Problem Solving base and (6) Learning and Teaching Contextual base. 2) The designing framework consisted of 4 steps and 7 elements included: 1) To activate Cognitive structure and promotes problem solving. 2) To support for adjusting cognitive equilibrium 3) To support for enlarging cognitive structure 4) To promote the knowledge construction and problem solving. 5) To support and enhance knowledge construction and Problem Solving. And 7 elements of the constructivist web-based learning environment as following: 1) Problem base 2) Resource 3) Collaboration 4) Cognitive tools 5) Problem Solving Center 6) Scaffolding and 7) Coaching This finding was consistent with Chaijareon, S., Samat, C., Kanjug, I., (2012); Techapornpong, O., Chaijaroen,S., ( 2017) These previous research found that the students showed their Problem Solving and the framework of constructivist web-based learning environment models. As for this research finding may be the result of Instructional design Theory (ID Theory) . This was shown in the designing framework of the Constructivist web-based learning environments model to enhance Problem Solving. The designing framework of the Constructivist web-based learning environments model was recognized as the important one. Since it can support and help the designers to design effectively and clearly. If lacking of this framework how can the designer perform it effectively. This study focuses on theoretical synthesis of theoretical framework. It is the first factor that is critical to the design and development of a learning environment based on a Constructivist learning environment. To Enhance the Problem Solving. The next effective, It also allows designers to perform clearly based on theoretical frameworks. As well as the use of research processes as a basis for design and development.

## ACKNOWLEDGEMENT

This research was supported by Ph.D. Program in Educational Technology, Faculty of Education, Research Group for Innovation and Cognitive Technology, Khon Kaen, University, and Research and Technology Transfer Affairs Division, Khon Kaen University which hereby giving the thankfulness all through this.

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# Designing framework of Supervision Models Integrating Between Technological Competency and Participatory

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## ABSTRACT

The purpose of this research was to synthesize a theoretical framework and design framework of supervision models integrating technological competency and participatory supervision. Using the model of research (Model research) (Richey and Klein, 2007) in this study is Phase I research. 1) Theories and related research 2) Synthesis of theoretical frameworks. 3) Synthesis of designing frameworks for supervision models Integrating technological competency of Thailand 4.0 with participatory supervision. The results revealed that: 1) The theoretical framework of 8 base were as follows: (1) Supervision base (2) Learning and Teaching Contextual base (3) Psychological base (4) Pedagogical base (5) Technological base (6) Media theory base (7) Professional Learning Community base and (8) Competency teacher base. Consists of 5 steps and 8 elements include : (1) awareness (2) create knowledge (3) enhance experience (4) reflect on the development and (5) praise. The 8 elements are as follows: (1) knowledge & realize (2) workshop (3) web-based training with the environment constructivist learning (4) deceptive supervision (5) online supervision (6) learn & share (7) community learning and (8) showcase innovations.

**Keywords:** Participatory Supervision, technological competency of Thailand 4.0, constructivist

## INTRODUCTION

The changing world society and the advancement of technology, society is influenced by globalization. Human beings need lifelong learning and 21<sup>st</sup> century learning that focuses on critical thinking skills and problem solving. In addition, the teaching-oriented teaching of relativity has resulted in the lack of critical thinking and problem solving. Knowledge building and lifelong learning which is necessary to respond to changing conditions. For the above reasons. Therefore, it is necessary to adjust the teaching methodology in response to the learners' characteristics. The teaching and learning management should change the knowledge transfer in the course. Come to promote encourage students to learn by themselves for life. Through the practice of learning skills. based on the current 21<sup>st</sup> century teaching concept. By focusing on students to act. Learn from the real experience. More than lectures Therefore, the learning design. It needs to be transformed to focus on learners as a means of seeking knowledge and critical thinking and problem solving based on a theoretical teaching design, Constructivist Theory supports self-knowledge, Critical thinking and problem solving Theory. It encourages students to be ready for the world of increasingly sophisticated work today. It is the basis for the design of teaching and learning individuals who play an important role in student development and teaching process are teachers. By stimulating attention and engaging classroom participation with technology advanced thinking skills development to promote learning both in and out of the classroom. Include the use of various measurement and evaluation of learning and focus on assessment to develop learners. Teachers were the most important role; including the concept of teacher development and new educational personnel, focusing on the development of teachers and educational personnel. It must bring about changes in the students that conjunction with

the concept of educational supervision, it is a work process that can be used in teacher professional development. Because it is a process that has helped and encourage elevation and improve the quality of education with the goal of student quality. The supervisors an important role in helping to improve teachers' teaching behaviors in with changing global environment.

For the above reasons researchers are aware of the importance of designing and developing models for integration in collaborative work with the introduction of concepts related to teacher professional development, educational supervision, and information and communication technology by integrating and working principles together to achieve a holistic, holistic work each element can harmonize with each other. It creates a balance that is holistic, as well as based on contextual studies. The education is based on the development of theoretical framework that study of relevant documents and research to develop an integrated supervision of innovation and information technology education with participatory supervision. As a guideline for the design and development of supervisory models to promote quality teachers that preparing to study in Thailand 4.0

### **THE PURPOSE OF THIS STUDY**

To synthesize the theoretical framework and the designing framework of supervision models integrating technological competency and participatory.

#### **Target Group**

The target groups of this study consisted of three experts to assess the designing framework of supervision models integrating technological competency and participatory.

#### **Research methodology**

The research methodology of this study is the documentary research consisting of the documentary research, the principle and theory, related research, context condition about thinking and analyzing as well as synthesizing the theoretical framework in designing framework of supervision models Integrating technological competency and participatory supervision and the survey research used to collect the qualitative data.

#### **Research instrument**

The instrument in this study consisted of 4 instruments as following:

1. The expert review recording form for checking the quality of the designing framework.
2. The recording form for synthesis of the theoretical framework.
3. The recording form for synthesis of the designing framework.
4. The teacher's opinion on context of teaching and learning.

#### **Data Collection and Data Analysis**

The procedure of gathering and analysis data were as follows:

1. Synthesis of the theoretical framework of supervision models integrating technological competency and participatory.

The data were collected by using the recording form synthesis of the theoretical framework. Summarization, interpretation and analytical description were used to analyze the data.

2. Synthesis of the designing framework of supervision models Integrating technological competency and participatory.

The data were collected by using the recording form synthesis of the designing framework. Summarization, interpretation and analytical description were used to analyze the data.

### **Research Results**

#### **1. Theoretical framework**

The theoretical framework of 8 base were as follows : )1( Supervision base )2( Learning and Teaching Contextual base

(3) Psychological base (4) Pedagogical base (5) Technological base (6) Media theory base (7) Knowledge management base and (8) Competency teacher base as shown in Figure 1

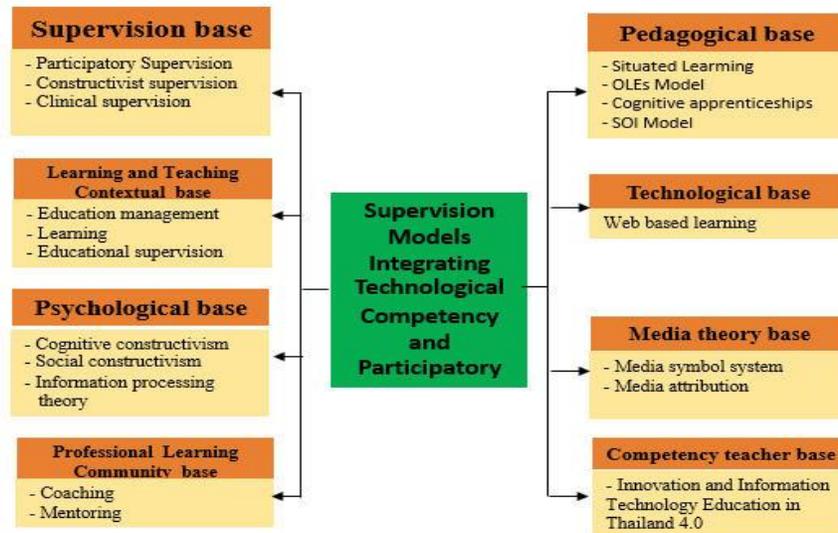


Figure 1: The theoretical framework of supervision models integrating technological and participatory.

## 2. The Designing framework

According to this study, the findings of synthesis of the designing framework for supervision models Integrating technological competency in Thailand 4.0 with participatory supervision found 5 crucial base as the following details :

### 1) Awareness

Is a conceptual framework for designing that enhance teacher knowledge, based on Smith's (2004) conceptual involvement and knowledge and competencies related to teacher performance (Teachers Council, 2005).Based on the theory, the researcher designed the element called **Know and realize** as shown in Figure 2

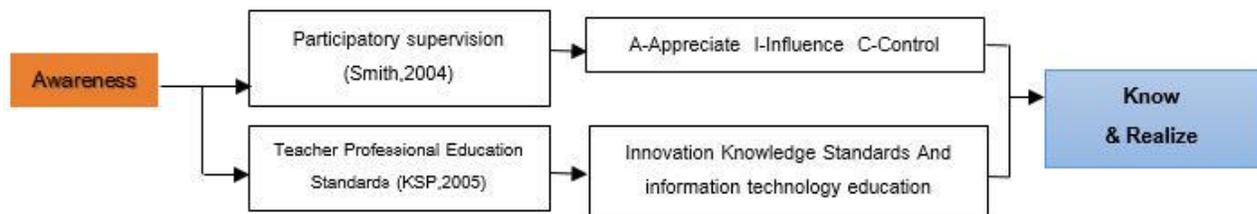


Figure 2: Awareness

### 2) Create knowledge

Is a designing framework that encourages teachers to develop competencies by allowing teachers to practice and build their own knowledge through cognitive processes based on previous experiences or knowledge, linked to new experiences to build teacher competencies. The design relied on Piaget's cognitive constructivism concept, along with Smith's concept of participation and teacher development, which were professionally standardized and standardized knowledge that includes knowledge and performance related to the work (Teachers Council, 2005) researcher have designed two elements ;

#### 2.1 Workshop

2.2 Web-based training ; with a learning environment on a network based on Constructivist. This is a learning medium designed based on the conceptual basis of the constructivist theory, technological theory, media theory as shown in Figure 3

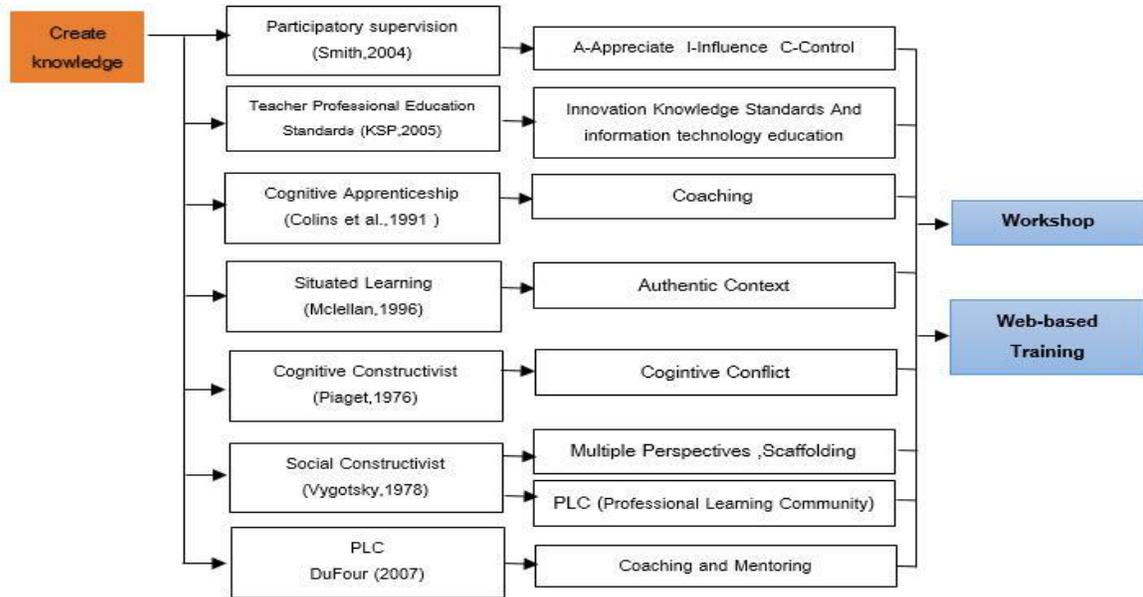


Figure 3 : Create knowledge

The designing framework: Web-based training; with a learning environment on a network based on Constructivist comprised of 7 components as follows as shown in Figure 4



Figure 4 : The designing framework : Web-based training with a learning environment

### 3) Enhance experience.

Introduce the Zepeda (2000) Constructivist conceptual basis with Smith's (2004) conceptual involvement and the Clinical supervision concepts of Goldhammer (1993) and the knowledge-based approach knowledge and competencies related to the performance of the teachers council (2005)

Researcher rely on the principles mentioned above. The basic design features are: 1) **Deceptive supervision** and 2) **Online supervision** as shown in figure 5

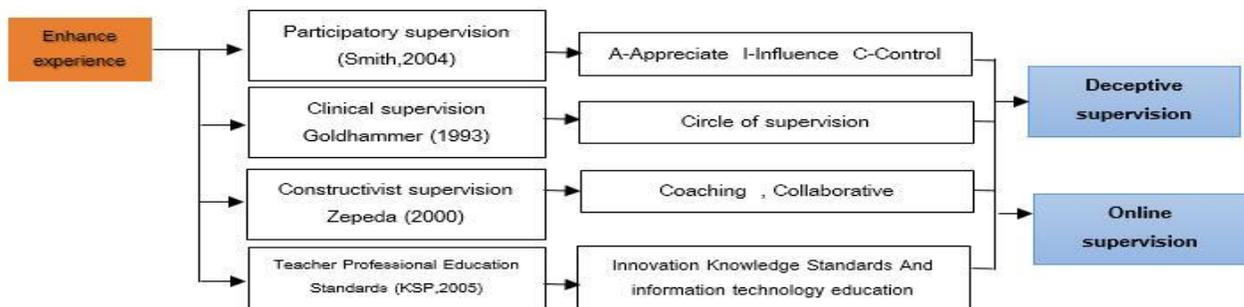


Figure 5: Enhance experience

**4) Reflect on the development.**

A designing framework that enhance the professional of teachers based on Professional Learning Community: PLC (Dufour,2007) Researcher rely on the principle as mentioned above, the basic design element is the 1) **Learn & Share** and 2) **Community Learning**. The researcher design was in the form of activities to support work and learning management by teachers or supervisors. Experienced by spending time together in various forms such and learning management by teachers or supervisors. Experienced by spending time together in various forms such as coaching, mentoring training between teachers as shown in figure 6

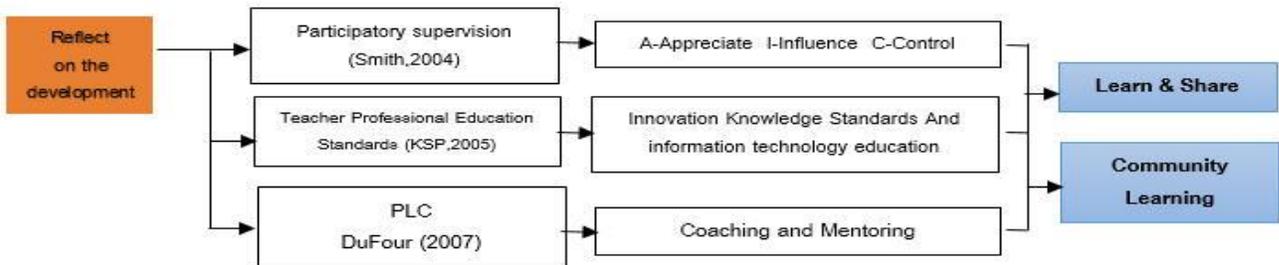


Figure 6 : Reflect on the development

**5) Praise**

Designing framework that enhance teacher performance on the basis of performance management (preservation and utilization) in accordance with the principles of the Office of Civil Service Commission (CSC) performance management for performance. Agencies should retain employees or take full advantage of their work. With continuous follow-up assignments. Improve employee capabilities evaluate performance and reward with good performance.

Researcher rely on the above principles as the basis for design elements called **Showcase Innovation** It is designed in a way that is assigned to the teacher create, design and develop learning innovations. And continuous follow up by the supervisor As well as the development of teachers' abilities through training and evaluate the performance to reward good performance so teachers have the ability to create and develop innovative learning and create a sustainable learning network as shown in figure 7

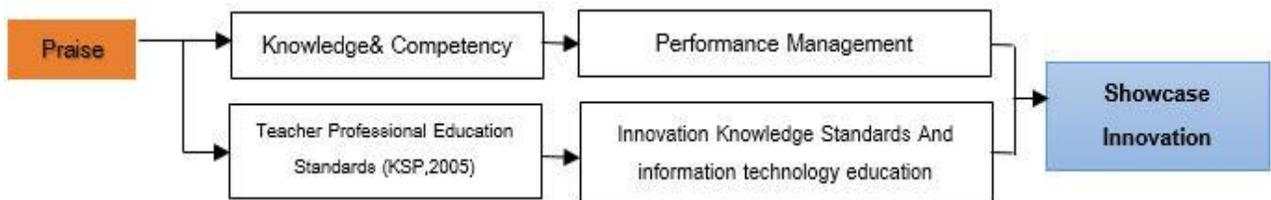


Figure 7 : Praise

## CONCLUSION

The synthesis of the design of supervision models Integrating technological competency and participatory . by synthesis of the results of document research. The study of theoretical principles as the basis for theoretical frameworks found that:

1. Theoretical frameworks of 8 base were as follows: 1) ( Supervision base ) 2) ( Learning and Teaching Contextual base ) 3) Psychological base 4) Pedagogical base 5) Technological base 6) Media theory base 7) Professional Learning Community base and 8) Competency teacher base

2. The designing framework of supervision models integrating technological competency and participatory consists of 5 elements: 1) awareness ; is a framework in design that helps enhance teachers' knowledge based on Smith's (2004) participation concept and the knowledge and competencies involved in the implementation of teacher (Teachers Council, 2005) Researcher have designed an element called Know and realize, 2) create of knowledge ; It is a designing framework that focuses on encouraging teachers to build competency by allowing teachers to practice and build their own knowledge thought processes. The experience or knowledge to create new experiences linked to the performance of teachers. The design relied on Piaget's cognitive constructivism, along with Smith's concept of participation and teacher development, which were professionally standardized and standardized knowledge consists of knowledge and performance related to the work (Teachers Council, 2005). The researcher has designed two elements: (1) workshop and (2) web-based training with environment learning developed by the constructivist. This is a learning designed based on the conceptual basis of the constructivist theory. Technological theory, media theory, 3) Enhance experience ; applying Zepeda's (2000) Constructivist theory, participatory based on Smith's (2004) and the Clinical supervision concepts of Goldhammer (1993), the researcher has designed two elements are: (1) Deceptive supervision; (2) Online supervision; 4) Reflection on the development based on the Professional Learning Community: PLC (Dufour,2007). Researcher design element called learn & share and Community learning 5) Praise it is a presentation of a best practice (Smart teacher) and to develop community learning which corresponds to the research of Nutchrat Prasitsinchai (2012), who studied of the integrating teacher's competency and participative supervision model which professional competency and the opinions of teachers who learned by integrating models between teacher professional development and participatory supervision, the model was appropriate and enhances professional competencies for teachers.

## ACKNOWLEDGEMENT

This research was supported by Ph.D. Program in Educational Technology, Faculty of Education, Research Group for Innovation and Cognitive Technology, Khon Kaen, University, and Research and Technology Transfer Affairs Division, Khon Kaen University which hereby giving the thankfulness all through this.

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# Determinants of Effectiveness of e-learning for College Students in South Korea

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## ABSTRACT

This paper focused on certain factors influencing the effectiveness of e-learning for college students in South Korea. For the study, a questionnaire was developed to measure the determinants of the effectiveness of e-learning and their effects on the effectiveness for students at Korean universities. A sample of randomly selected five hundred students from eight universities participated in the study. In order to find the answer to the question of effects of selected factors on the effectiveness of e-learning for college students, regression analysis of the collected data was made. It was found that all the selected factors were positively correlated with effectiveness of e-learning. Individual characteristics of students, such as motivation and experience of student, proved as strongest determinant followed by system characteristics as interaction and practice with significant predictive powers. Moreover, environmental factors, such as support and resources, moderated the relationship between both individual and system characteristics and the effectiveness of e-learning.

**Key Words:** E-learning, effectiveness, college students

## INTRODUCTION

The development of e-learning system and the increased supply of e-learning opportunities are the most rapidly growing areas among all educational and training services. Effective e-learning is considered to have a potential to enhance the quality of learning, the access to education and training, and the cost-efficiency of education (Alexander, 2001). By reason of such advantages of e-learning, many on-campus colleges have adopted the use of on-line course delivery besides traditional class-room learning. However, despite such initiatives, e-learning adoption does not show in every case high level of effectiveness from the perspective of students' responses. Research has attempted to identify particular individual characteristics or other factors that can be used to predict the effectiveness of e-learning for students (Bouhnik & Marcus, 2006). Individual characteristics and other circumstances like system characteristics and environmental factors identified in previous studies, including clarity of design, interaction with instructors, and active discussion in the context of the course (Swan, 2001), will enhance the effectiveness of e-learning. Understanding individual and system characteristics of e-learning is a critical issue for improving the effectiveness of e-learning. Furthermore, a systematic understanding is required on internal and external environment of e-learning. This paper specifically focuses on the effectiveness of e-learning and the related precedent variables. So, this study reports the results of an analysis of factors that influence the effectiveness of e-learning.

## LITERATURE REVIEW AND HYPOTHESIS

E-learning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online. There are many terms used to describe learning that is delivered online, via the internet, ranging from Distance Education, to computerized electronic learning, online learning, internet learning and many others. In this study, e-learning is defined as courses that are specifically delivered via the internet to somewhere other than the classroom where the instructor is teaching. Although e-learning has advantages over traditional classroom education (Piccoli et al., 2001), concerns include time, technology, support and resources involved in running e-learning environments. The high failure rate of e-learning implementations discussed by Arbaugh and Duray (2002) deserves attention from management and system designers.

Important variables concerning e-learning have been identified in previous studies. Liaw (2008) identified six critical dimensions that affect the effectiveness of e-learning: learner, instructor, course, technology, design, and environmental dimension. Liaw and Huang (2007) suggested that four elements should be considered when developing e-learning environments: learners' characteristics, learning activities, environmental characteristics, and environmental satisfaction. In e-learning environments, learning activities give learners and instructors a great chance to share their experience and knowledge. Additionally, environmental characteristics, such as synchronous or asynchronous interaction, will create a high-level communicative environment that allows learners not only to share information, but also to determine how to retrieve useful information. Moreover, environmental satisfaction will improve learners' perceptions of technology that might raise their participation in the learning processes. Basically, when users feel less self-confident toward information technology, they also

show less positive feelings toward the technology. According to existing research on the effectiveness of e-learning, there are several characteristics of e-learning systems that determine the level of the effectiveness of e-learning. For designing effective e-learning systems, Noesgaard and Orngreen (2015) suggested three considerations: individual factors, contextual factors, and e-learning solution and process. In developing e-learning system, it is necessary to understand the targeted population. Learner characteristics, such as motivation, learner preference, and previous e-learning experience need to be identified. Contextual factors refer to learning environment, support, technological resources available to user, and time available to learn. E-learning solution and process include interaction, practice, technological constraints, and usability.

## **Hypothesis**

### ***Individual characteristics and e-learning effectiveness***

With regards to individual factors, the papers generally agree that effectiveness of e-learning varies according to individual differences (e.g. Armatas et al, 2003; Aydoğdu Karaaslan, 2013). Some papers refer to learner characteristics broadly and others discuss particular issues relevant to their study. The individual factors largely fit into two categories related to learner characteristics: experience and motivation. It is not surprising that the experience of learners, in terms of previous relevant work experience and online experiences, affects the effectiveness of e-learning. This factor seemed to determine the kind of attitude that learners 'go into the learning process with'; previous experience can be beneficial, if the previous work and online experiences related the e-learning (Bennison and Goos, 2010; Haverila, 2010). Motivation to learn and engage with the e-learning is a key to the effectiveness of e-learning, especially when effectiveness is defined as the time spent using the product: 'Results suggest the importance of motivation to learn and workload in determining aggregate time spent in e-learning courses' (Brown, 2005: 465).

H1a. Experience of learner relates positively to the effectiveness of e-learning.

H1b. Motivation of learner relates positively to the effectiveness of e-learning.

### ***System characteristics and e-learning effectiveness***

For the e-learning solution and process, interaction and practice belong to the key factors (Noesgaard and Orngreen, 2015). The importance of these factors was determined as a result of the coding of the factors that influence effectiveness as well as the codes including the reasons that e-learning was or was not effective. Interaction is combined into interrelated factors, such as 'instructional scaffolding', 'modeling' and 'support'. Though e-learning is often considered to be equally or more effective than classroom learning, interaction is generally considered very important for the effectiveness of e-learning. Practice is a recurring factor contributing to e-learning effectiveness. The learner is given the opportunity or is required to practice the educational material presented via the e-learning solution in case studies, simulations or actual work situations. This type of education is very valuable to equip students with a minimum of technical and non-technical skills before they use them in practice settings' (Alinier et al, 2006).

H2a. Interaction relates positively to the effectiveness of e-learning.

H2b. Practice relates positively to the effectiveness of e-learning.

### ***Environmental characteristics and e-learning effectiveness***

In general, concerning the contextual factors, the key factors are quite clearly 'resources' (time, technology) and 'support' (from managers, IT personnel or peers) in the learning environment (Noesgaard and Orngreen, 2015). These factors are essential for using e-learning initiatives to improve performance and change behaviours. Technological resources market influences the effectiveness of e-learning. Especially, when there are not enough technological resources, learner has difficulties in attaining learning goal efficiently. Moreover, effectiveness of e-learning may be lower when there is not enough support from manager, IT personal or peers. Therefore, the following hypotheses are proposed:

H3a: Support moderates positively the relationship between experience and the effectiveness of e-learning.

H3b: Support moderates positively the relationship between motivation and the effectiveness of e-learning.

H3c: Resources moderate positively the relationship between experience and the effectiveness of e-learning.

H3d: Resources moderate positively the relationship between motivation and the effectiveness of e-learning.

## **DATA AND METHODS**

The sample data were collected by mailing out questionnaires; 500 questionnaires were mailed to students at South Korean Universities. The duration of the study was three weeks and 349 effective questionnaires were returned, resulting in a valid response rate of 69.8%. The non-respondent bias was checked by observing the gender, age, and major of the targeted students. It was found that the non-responding students were not

statistically different in these dimensions from those that responded, suggesting that the sample represented the target population.

The questionnaires were designed by evaluating the related literature to determine the scales that demonstrate favorable reliability and validity before modifying the scales according to the study environment. In order to develop constructs for the study, seven-point Likert-type scales were used. Measurement scales had with reliable psychometric properties, validated in previous empirical studies. Reliability for each scale was determined using Cronbach's alpha. The reliability score is a measure of the internal consistency of the construct (Nunnally, 1978), and alpha values over 0.70 indicates sound reliable measures. Construct validity was assessed in using factor analysis described by Deshpande (1982). Principal component factor analysis provided factor loadings in order to assess construct validity. The factor loadings of the operationalized measurement scales provided indication of convergent and discriminant validity of the constructs. Although the researcher has discretion to determine the cut-off point for assessment of validity, many studies proposed that convergent validity is attained when factor loadings are  $\geq 0.70$  (Bagozzi, 1981; Nunnally, 1967) and the average variance extracted for each factor component is  $\geq 50\%$  (Anderson and Gerbing, 1988).

The effectiveness of e-learning is operationalized by three indicators: learning efficiency, learning performance and learning motivation (Liaw, 2007). These indicators were measured using a Likert-type seven-point scale. Learner characteristics measured in this study made use of the subjective measurement of the experience and motivation. Experience and motivation have been used as proxy learner characteristics in previous studies. The variables were measured using a seven-point ordinal scale. Experience involved three items: previous online experience, computer competency, and prior knowledge about online course. Motivation was operationalized by three items: attitude toward learning, attitude toward self-development and attitude toward achievement. System characteristics in this study consisted of two dimensions: interaction and practice. Interaction dimension was operationalized by three indicators: interaction with instructor, interaction with peers, and interaction with materials. Practice dimension was made up of three items: practice the education material in case studies, simulations, and actual work situations. For environmental dimensions, we asked to evaluate the learner perceived support and resources available to user. Each variable was measured on a seven-point ordinal scale. The support concept consisted of three items: support from peers, manager and IT personnel. The resources concept involved three items: technological resources, time available to learn and usability. As control variables, two variables were used: gender and age of the respondent. Gender was classified as male (coded as one) and female (coded as zero). The age was defined by the number of years.

Table 1 presents a summary of the measurement scales, sample item used for the constructs, and the reliability of the constructs.

**Table 1:** Sample items, source and reliability of the constructs

Scale (Cronbach)	# of items	Sample items	Prior research
Experience (Cronbach Alpha=0.76)	3	previous online experience computer competency	(Noesgaard and Orngreen, 2015)
Motivation (Cronbach Alpha=0.79)	3	attitude toward learning attitude toward achievement	Sun et al. (2006)
Interaction (Cronbach Alpha=0.75)	3	interaction with instructor interaction with peers	(Noesgaard and Orngreen, 2015)
Practice (Cronbach Alpha=0.73)	3	practice the material in case studies practice the material in simulations	(Noesgaard and Orngreen, 2015)
Support (Cronbach Alpha=0.81)	3	support from peers support from IT personnel	Liaw (2007)
Resources (Cronbach Alpha=0.83)	3	technological resources time available to learn	Sun et al. (2006)
Effectiveness (Cronbach Alpha=0.82)	3	learning efficiency learning performance	Liaw (2007)

## RESULTS

The analysis examined the correlations of the variables used in the study. Table 2 shows the correlation matrix of the variables. None of the correlations appeared to be large enough to warrant concern about the issue of multicollinearity (Hair et al., 1998).

**Table 2:** Correlation matrix

Variables	1	2	3	4	5	6	7	8	9
1. Effectiveness	1								
2. Experience	0.24 <sup>b</sup>	1							
3. Motivation	0.20 <sup>b</sup>	0.18 <sup>b</sup>	1						
4. Interaction	0.18 <sup>b</sup>	0.14 <sup>a</sup>	0.45 <sup>b</sup>	1					
5. Practice	0.15 <sup>b</sup>	0.27 <sup>b</sup>	0.08	0.12 <sup>a</sup>	1				
6. Support	0.02	0.04	0.05	0.04	0.07	1			
7. Resources	0.04	0.05	0.04	0.10	0.06	0.03	1		
8. Gender	0.05	0.09	-0.14 <sup>a</sup>	-0.20 <sup>b</sup>	0.19 <sup>a</sup>	0.05	0.06	1	
9. Age	0.03	0.04	0.04	0.07	0.07	0.05	0.04	0.06	1

<sup>a</sup> p<0.05, <sup>b</sup> p<0.01

Table 3 shows the estimation results of the predictor for the effectiveness of e-learning. As can be seen from Table 3, the percent of cases classified is 81%, indicating the fact that the independent variable is a good predictor of the effectiveness of e-learning variable. As shown in Table 3, the results provide support for H1, which confirms that learner characteristics are positively related to the effectiveness of e-learning, i.e. both individual experience (H1a: beta = 0.58; p<0.05) and motivation of learner (H1b: beta = 0.47; p<0.01) were significant. Also interaction (H2a: beta = 0.27, p<0.01) and practice (H2b: beta = 0.33, p<0.01) were significant; thus confirming that system characteristics of e-learning were positively related to the effectiveness of e-learning, confirming hypotheses H2.

As shown in Table 3, the coefficient of the moderator variables were not significant (support: beta = 0.06, p<0.30; resources: beta = 0.04, p<0.30); however, the coefficient of the multiplicative interaction term was in some interactions significant, confirming hypothesis H3. Specifically, support between learners' characteristics and the effectiveness of e-learning (beta = 0.37, p<0.01), between the system characteristics and the effectiveness of e-learning (beta = 0.21, p<0.01), confirming H3a and H3b.

This result implies that the moderator variable support modified the relationship between experience and the effectiveness of e-learning (H3a: beta = 0.42, p<0.01) as well as motivation and the effectiveness of e-learning (H3b: beta = 0.48, p<0.01). However, by the moderator resources, the interaction terms related to experience and the effectiveness of e-learning was not statistically significant (beta = 0.11, p<0.30), thus hypothesis H3c was not supported. The same applies to the interaction terms related to motivation and the effectiveness of e-learning (beta = 0.06, p<0.30), thus hypothesis H3d was also not supported.

**Table 3:** Logistic regression results

Variables	Parameter Estimates
Experience	0.58 <sup>a</sup>
Motivation	0.47 <sup>b</sup>
Interaction	0.27 <sup>b</sup>
Practice	0.33 <sup>b</sup>
Support	0.06
Resources	0.04
Moderator	
Support x Experience	0.42 <sup>b</sup>
Support x Motivation	0.48 <sup>b</sup>
Resources x Experience	0.11
Resources x Motivation	0.06
Control variables	
Gender	0.21 <sup>a</sup>
Age	0.16 <sup>a</sup>

Note: Percent of case: correctly classified = 81%, Chi-Square = 32.88, -2 log likelihood = 89.42

<sup>a</sup> p<0.05, <sup>b</sup> p<0.01

## CONCLUSIONS

The result implies that e-learning system at university should be prepared to consider the student's individual characteristics such as learning motivation and experience as well as system characteristics such as interaction and practice. And more systematically aggressive support and resources are needed to prepare an effective e-learning system to students.

According to the study, motivation and experience of learner influenced the effectiveness of e-learning significantly. Helping students build their confidence in using computers will make e-learning more effective. A fundamental computer course could be a prerequisite to better prepare students. The study found that students of e-learning assume dual roles: learners and computer users. For this reason, the level of familiarity with computer and internet technology plays an important role. New technologies emerge and the technological skills and functional expectations of users evolve. Thus, new information systems and new designs can and should be combined to continuously improve user friendliness of e-learning interfaces and the functionality that help learner learn the technology conveniently and easily. Technology education to improve overall familiarity of the learner will also contribute to the expansion of the learner pool who would take e-learning courses and to the improvement of the effectiveness of e-learning (Sun et al., 2006).

Not surprisingly, support and resources were found to be an important variable. The level of support and resources affects the effectiveness of e-learning. Students seem to be sensitive to the influence, opinion, and pressure of their peer group and instructor. Educators and the managers of e-learning should keep paying attention to both the general response of the students and social networks among students to help them use the new e-learning facility more efficiently and effectively. This study found that instructors' attitudes toward e-learning positively influence the effectiveness of e-learning. When instructors are committed to e-learning and exhibit active and positive attitudes, their enthusiasm will be perceived and further motivate students. Thus, college administration must be very careful in selecting instructors for e-learning courses. Certain instructor training might be very helpful.

Although this study represents a systemic effort to investigate the determinants of the effectiveness of e-learning for students, it is not without limitations. First, the study proposes an integrated model covering important factors influencing the effectiveness of e-learning; it might not be comprehensive because of the limitations of resources and time. Second, this study focuses on metrics from a specific digital learning system. The variance in different systems is not further investigated. Third, the dependent variable of this study is a single indicator, perceived effectiveness of e-learning. Some studies suggest that student scores and learning performance could also be considered as dependent variables (Piccoli et al., 2001; Vogel, Davison, & Shroff, 2001). Future research might include more variables and analyze variance across different e-learning systems.

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# Determinants of Ict Integration: A Path Model of Teacher-Related Factors

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## ABSTRACT

A growing body of research has dealt with the role of teachers' internal factors facilitating information and communication technology (ICT) in classroom. Previous findings have shown a series of external and internal obstacles which hinder the successful integration of ICT into the learning environment. The present study aimed at examining the direct and indirect effects of those internal factors (e.g., socio-cognitive-motivational factors) that could ensure the efficient integration of technology into educational settings. A sample of 198 teachers ( $F = 85.9\%$ ,  $M_{\text{age}} = 49.86$ ,  $DS = 7.00$ ) was selected to respond to a questionnaire composed by a socio-demographic section and four scales (teachers' constructivist belief scale, attitudes toward computer, motivational factors and ITC classroom use). Causal analyses were applied to data. Path modeling was used to explore the direct and indirect effects of the teacher-related variables on the ICT classroom integration. Results confirmed the hypothesized relationships showing the mediating role of attitudes toward computer and motivational factors in predicting the linkage between constructivist belief and integration of technology into teaching practices. Findings suggested some useful practical implications to plan a successful ITC integration in education.

**Key words:** ICT integration, Constructivist beliefs, Attitudes toward computer, Motivation

## INTRODUCTION

Over the last decades, the rapid spread of information and communication technology (ICT), i.e., computers and related technologies, in schools has become one of the most important topics discussed by educational researchers due to the capability of these tools in providing a proactive teaching and learning environment. Their mere presence in educational institutions, however, does not automatically promote the benefits for teaching and learning (Gülbahar & Güven, 2008; Shaunessy, 2007), which can only be attained if teachers know how to use the technology well and appreciate the significance of the *information revolution*. As a matter of fact, classrooms must be organized differently, teachers require considerable shifts in their pre-existing competencies, skills, and behaviors, and need to accept that some pupils may know more about computers and software than they do. A series of external and internal obstacles have been recorded, hindering the successful integration of ICT into the learning environment. At the end of the 1990s Ertmer (1999) individualized two types of barriers that would preclude technology integration in education and that can still be valid (Konstantinos, Andreas, & Karakiza, 2013; Pyle & Esslinger, 2014; Villalba & González-Rivera, 2016; Villalba, González-Rivera, & Díaz-Pulido, 2017): external (first-order) barriers and internal (second-order) barriers. The first-order barriers include some factors extrinsic to teachers, such as lack of adequate access, lack of time (Legrain, Grillet, Gernigon, & Lafreniere, 2015), bandwidth, training and institutional support (e.g., Galanouli, Murphy, & Gardner, 2004). The underlying assumption is that these obstacles can be removed via governmental policies. The second-order

barriers, which are more intrinsic to teachers, comprise teachers' pedagogical and technology beliefs, and their willingness to change (e.g., Inan & Lowther, 2010; Koehler & Mishra, 2008; Könings, Brand-Gruwel, & van Merriënboer, 2007; Lane & Lyle, 2011; Liu & Szabo, 2009). However, as Ertmer himself documented, even though the external barriers are removed, "teachers do not automatically use technology to achieve advocated meaningful outcomes" (Ertmer, 1999, p. 51).

A growing body of research has also dealt with the role of teachers as actors of new curricula in the classroom, thus facilitating technology integration that is most likely to achieve when (1) teachers are informed how to implement the innovation (how to use technologies and how the innovation might support their teaching practice); (2) when the distance between innovative and existing teacher practices are small; and (3) when teachers could take small steps during the implementation of technology (Cviko, McKenney, & Voogt, 2012; Ertmer, 2005; Grossman & Thompson, 2008; Zhao, Pugh, Sheldon, & Byers, 2002).

Researchers' attention has been also addressed to those personal factors influencing the integration of technology into teaching practices. To this purpose, two general categories of professional computer use have been identified (Hogarty, Lang, & Kromrey, 2003; van Braak, Tondeur, & Valcke, 2004). The first, supportive computer use, refers to the use of computers for pro-active and administrative tasks, such as student administration and evaluation, preparing worksheets and keeping track of pupils' learning progress. The second, class use of computers, refers to the use of computers to support and/or enhance the teaching or learning process, such as demonstration, drill and practice, instruction, and differentiation.

A growing body of research has also dealt with the role of teachers as enactors of new curricula in the classroom, thus facilitating technology integration that is most likely to achieve when: (a) teachers are informed how to implement the innovation (how to use technologies and how the innovation might support their teaching practice); (b) when the distance between innovative and existing teacher practices are small; and (c) when teachers could take small steps during the implementation of technology (Cviko, McKenney, & Voogt, 2012; Ertmer, 2005; Grossman & Thompson, 2008; Zhao et al., 2002).

In this context, if the influence of teachers' perceptions on the technology design and implementation processes has been enough investigated (e.g., Wang et al., 2012), less emphasis has been placed on the evaluation of the direct and indirect effects of teachers' psychological characteristics, such as motivation, teacher self-efficacy, computer self-efficacy, computer attitudes, gender, teaching constructivist beliefs, etc. (Holden & Rada, 2011; Sang, Valcke, van Braak, & Tondeur, 2010; Sang, Valcke, van Braak, & Tondeur, 2011).

However, in the 1980s Davis (1989) and Davis, Bagozzi, and Warshaw (1989) theorized one of the well-known models in helping to predict user behavior of information technology, i.e., the Technology Acceptance Model (TAM) (King & He, 2006; Legris, Ingham, & Collette, 2003; McCoy, Galletta, & King, 2007). Its origins came from Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA), according to which beliefs and attitudes should be related to individuals' intentions to perform: attitude toward a behavior is determined by behavioral beliefs about the consequences of the behavior and evaluation of those consequences on the part of the individual. Beliefs were defined as the individual's estimated probability that performing a given behavior will result in a given consequence. With regard to Davis' model (1989), two specific constructs, perceived usefulness and perceived ease of use, were hypothesized to be beliefs that lead to favorable attitudes and intentions to accept and use technology. In 2008 the theory of motivational self-determination, that foresaw a dichotomy between intrinsic and extrinsic motivation (Deci & Ryan, 1985), was included into the model, therefore defined Integrated Model of Technology Acceptance (IMTA; Fagan, Neill, & Wooldridge, 2008). Adopting this model, recent research (Mueller, Wood, Willoughby, Ross, & Specht, 2008; Teo, Lee, Chai, & Wong, 2009) has clearly shown how a holistic perspective, i.e., the interaction of various variables such as perceived usefulness, perceived ease of use, attitude towards computer use, comfort with computers, teaching efficacy, etc., could better define teachers' behavioral intention.

On these premises, the present study aimed at identifying the social-cognitive factors that could ensure the efficient, effective, and satisfactory use of technology in educational settings. In particular, along with the constructs of the TAM, constructivist beliefs and attitude towards computer were taken into account.

Constructivist belief has been generally considered a key construct in teaching, since it affects teachers' decision-making processes about the types of learning objectives and contents, organisational issues, the selection of media, the choice of instructional strategies, and the adoption of approaches towards assessment and evaluation. As constructivist perspective foresees that learning occurs when learners are the makers of meaning and knowledge, in contrast to traditional learners who receive passively information, past research has demonstrated that teachers' constructivist beliefs are strong predictors of class use of computers (Higgins & Moseley, 2001; Tondeur, Van Keer, van Braak, & Valcke, 2008), while traditional teaching seems to have a negative impact on the integrated ITC use (Hermans, Tondeur, van Braak, & Valcke, 2008).

Attitude towards computer is another important construct given its influence on the acceptance of computer technology: a negative or low attitude towards technology would not allow an effective integration of computer technology into teaching, even when sophisticated ICT infrastructures are provided (Selwyn, 1997; Sang et al., 2010; Teo et al., 2009; Huang & Liaw, 2005; van Braak, Tondeur, & Valcke, 2004). Consequently, a path model with direct and indirect effects was hypothesized. Inspired by Sang and colleagues' (2011) model, constructivist beliefs were expected to predict directly attitudes toward computers and motivational components (intrinsic motivation, perceived usefulness, and perceived ease of use), and indirectly ITC use in classroom. Moreover, attitudes towards computers were expected to influence directly ITC use in classroom and indirectly via motivational components.

## **METHODOLOGY**

### **Participants**

The target population for this study consisted of 198 teachers from primary and secondary schools in Southern Italy. The schools were selected on the basis of their convenience and/or accessibility. The teachers attended a training course in innovative technology. The mean age was 49.86 years (SD = 7.00) and the majority was female (85.9%, n = 170).

### **Procedure**

The respondents completed the battery of tests in Autumn 2016. They were told the participation was voluntary and were assured their data would remain anonymous. The questionnaires were completed under the supervision of two experienced researchers. The time taken for the completion of the battery was approximately 20 minutes. The scales were translated into Italian by three authors of our group expert in English and was back translated into English by a native English-speaker.

### **Instruments**

1. The *socio-anagraphic section*, including gender, age, and school category (primary, middle, and high school);
2. The *Teacher's Beliefs Scale – Constructivist Teaching* (TBS-CT; Woolley, Benjamin, & Woolley, 2004) assesses teachers' beliefs related to the student-centred pedagogical perspective which fosters computer use in education (Higgins & Moseley, 2001; Niederhauser & Stoddart, 2001; Sang et al., 2010; Tondeur et al., 2008). It contains 7 items (e.g., "I involve students in evaluating their own work and setting their own goals"; "I make it a priority in my classroom to give students time to work together when I am not directing them"). The instrument obtained a sufficient level of reliability (Cronbach's  $\alpha = .64$ );
3. The *Attitudes toward Computers in Education Scale* (ACES; van Braak, 2001) assesses teachers' attitudes (perceived usefulness, computer confidence, anxiety, liking, etc.) towards the effects of computer adoption in the classroom (Abedalaziz, Jamaluddin, & Hai Leng, 2013; Garland & Noyes, 2005). It is composed of 12 items (e.g., "The computer provides opportunity for improving the learning performance"; "The use of computer helps students to achieve better text writing"). The internal consistency level was high (Cronbach's  $\alpha = .90$ );
4. The *Intrinsic Motivation-Computer Enjoyment Scale* (Fagan, Neill, & Wooldridge, 2008) assesses the extent to which the activity of using the computer is perceived to be enjoyable. The scale is composed of 3 items (e.g., "I find using a computer to be enjoyable"). The internal consistency level was high (Cronbach's  $\alpha = .93$ );

5. The *Perceived Ease of Use Scale* (Fagan, Neill, & Wooldridge, 2008) is composed of 5 items and measures the degree to which a person believes that using technology would be free of difficulty or effort (e.g., “My interaction with a computer is clear and understandable”). The internal consistency was good (Cronbach’s  $\alpha = .85$ );
6. The *Behavioural Intention to Use Computer Scale* (Fagan, Neill, & Wooldridge, 2008) is composed of 3 items (e.g., “Assuming I had access to a computer, I intend to use it”). The internal consistency level was good (Cronbach’s  $\alpha = .87$ ).
7. The *ICT Class Use Scale* (ICT-class; van Braak et al., 2004) measures the frequency (from never to daily) of the didactic use of computer in classroom. It consists of six items (e.g., “I use ICT for independent work/ individual learning”). The internal consistency level was good (Cronbach’s  $\alpha = .86$ ).

All of the above described scales are rated on a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*). As for the motivational component, a total score was calculated by adding the scores of the *Intrinsic Motivation-Computer Enjoyment Scale*, the *Perceived Ease of Use Scale*, and the *Behavioural Intention to Use Computer Scale*.

### Analysis strategies

Descriptive and causal analyses were carried out. As for the descriptive analyses, frequencies, means, and standard deviations were calculated. Means differences between males and females and among teachers belonging to the three levels of education (primary, middle, and high schools) were analyzed by using independent samples t-test and one-way ANOVA. The bivariate Pearson correlations were also calculated to analyse the associations between the variables of interest. With regard to causal analyses, a path model was performed to test direct and indirect effects of beliefs, attitudes, and motivational factors on the didactic use of computer. Data analyses were conducted by means of the statistical software SPSS 20.0 and Mplus 7.0.

## RESULTS

The results of the descriptive analyses are reported in Tables 1.

- self-Efficacy
- (6 items), Outcome Expectations (9 items), Interest (6 items), and Behavioral Intentions (4 items). Subjects indicated their level of agreement with each statement on a five-point Likert scale: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5)

**Table 1.** Descriptive statistics: Mean and standard deviation for each variable

	<b>N</b>	<b>Min – Max</b>	<b>Mean</b>	<b>S D.</b>
<b>Age</b>	198	31 – 62	49.86	7.00
<b>TBS-CT</b>	198	17 – 34	26.16	3.16
<b>ACES</b>	198	39 – 60	51.29	5.61
<b>Motivational factors</b>	198	21 – 55	43.83	6.11
<b>ICT integration</b>	198	22 – 40	33.52	3.72

No gender effects emerged in the scores of constructivist belief,  $t(196) = .224, p = .823$ , attitudes toward computer,  $t(196) = .391, p = .696$ , acceptance technology,  $t(196) = 1.732, p = .085$ , and classroom use of technology,  $t(196) = .031, p = .975$ . Moreover, there were not significant effects of schools levels on teachers’ beliefs [ $F(2, 195) = 2.59, p = 0, 077$ ], on computer-related attitudes [ $F(2, 195) = 1.67, p = 0, 191$ ], on motivational constructs [ $F(2, 195) = 0.895, p = 0, 410$ ] and on ICT integration [ $F(2, 195) = 0.119, p = 0, 888$ ] at the  $p < .05$  level for the three conditions.

### Correlations

Findings from bivariate correlations showed a first picture of the interrelationships among the constructs: all associations with the classroom use of technology were strong and positive. Moreover, teachers' constructivist beliefs were strongly related to attitudes toward computer and motivational factors, and attitudes toward computer were positively related to motivational factors.

**Table 3.** Bivariate correlations among the variables.

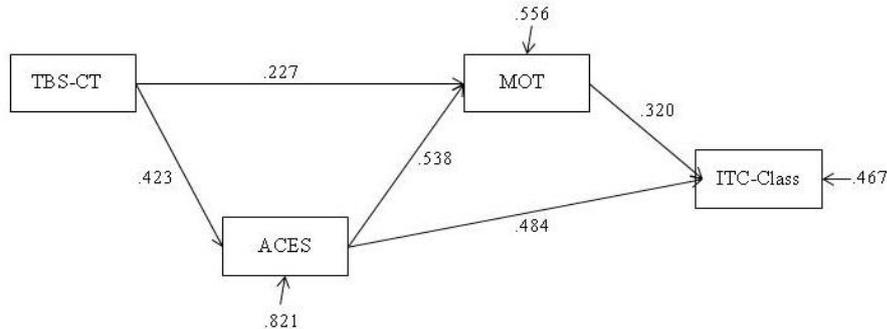
	TBS-CT	ACES	ICT integration
ACES	.423**	-	
Motivational factors	.455**	.634**	-
ICT integration	.487**	.687**	.627**

\*\* $p < .01$

### Path model

A path model was used to test the hypothesized links. Direct and indirect effects on the dependent variable were calculated as standardized beta-weight (path coefficients or  $\beta$ 's). Fit indices showed good values,  $\chi^2 = 10.647$ ,  $df = 1$ ,  $p > .001$ ; CFI = .97; RMSEA = .221, 90% C.I. = .115 - .349. The model explained 53% of the variance of ICT classroom use, 44.4% of the variance of motivational aspects, and 17.9% of the variance of attitudes toward computer. The final path diagram with the standardized estimates is shown in Figure 1. ICT classroom use was directly predicted by attitudes toward computer ( $\beta = .484$ ,  $p < .001$ ) and by motivational constructs ( $\beta = .320$ ,  $p < .001$ ). These variables also played an indirect role, since ICT classroom was positively predicted by constructivist beliefs via attitudes toward computer and motivational aspects and by attitudes toward computer via motivational aspects. Table 4 shows indirect effects.

**Figure 1.** Path diagram



**Table 4.** Indirect effects. Standardized estimates

	Estimate	P-Value
<b>Effects from TBS-CT to ITC-class</b>		
Total indirect	.350	.001
<b>Specific indirect</b>		
TBS-CT on ITC-class via ACES	.205	.001
TBS-CT on ITC-class via MOT	.073	.002
TBS-CT on ITC-class via ACES and MOT	.073	.001
<b>Effects from ACES to ITC-class</b>		
Total	.656	.000
Total indirect	.172	.000
<b>Specific indirect</b>		
ACES on ITC-class via MOT	.172	.000
<b>Specific direct</b>		
ACES on ITC-class	.484	.000

## DISCUSSION

The current study aimed at analyzing the role of internal teacher variables in explaining ICT integration by testing a path model that interlinks constructivist beliefs, attitudes towards computer, and motivational components. Overall, findings supported the hypothesized direct and indirect effects of teacher-related variables on ICT classroom use and provided further empirical evidence to the results reported in Sang and colleagues' research (2011).

In particular, the indirect relationship between constructivist beliefs and ICT integration via attitudes towards computer was confirmed in accordance with previous studies (Chai, Hong, & Teo, 2009; Ertmer, 2005; van Braak, 2001; van Braak, Tondeur, & Valcke, 2004): teachers with a student-centered approach to teaching adopt favorable attitudes towards ICT in education and, consequently, they seem to be more eager to integrate technologies into teaching. From a theoretical point of view, this relationship could be explained by the Theory of Reasoned Action (Ajzen & Fishbein, 1980), according to which attitudes represent strong determinants of a person's behavior toward a certain target. Similarly, Hew and Brush (2007) argued that, even though attitudes and beliefs are two separate, but intertwined constructs, beliefs are actually determinant precursors of attitudes. Along with attitudes toward computer, the motivational components of computer use analyzed in the current research mediated the relation between constructivist beliefs and ICT integration. Stated in a different way, the beliefs related to the constructivist approach in teaching affect directly the extent to which teachers perceive the use of computer as enjoyable and free of effort, thus determining the classroom use of ICT. This is in line with the assumption that internal motivation should be considered as a state of beliefs influencing individuals' decision-making (Czubaj, 1996). A multiple mediation was also observed with attitudes towards computer impacting teachers' motivation. This effect was higher than the effect of constructivist beliefs on motivation. The indirect relationship between attitudes toward computer and ITC integration via motivational factors was also found, this consistently with Abdullah and colleagues' (2006) research.

Some limitations should be stressed. First, the sample size was too small to reflect the Italian teacher population in a representative way, thus affecting the generalizability of the current findings. Second, this research did not analyze variables related to school (i.e., leadership, school culture, etc.), to social background (economic status, social culture, etc.), and to national school-policies. Third, as the data were obtained only via self-report measures excluding classroom observations and interviews with teachers, they could be affected by some respondents' bias.

Despite these limitations, practical implications could be inferred. For instance, to achieve a successful ITC integration, teachers' motivation should be enhanced by involving them in school policies. Moreover, the degree of computer use in educational process should be affected by both teachers and students' individual differences in terms of cognitive styles (Di Bitonto, Roselli, Rossano, Monacis, & Sinatra, 2010; de Palo et al., 2012). Consequently, future research is important to better ascertain the influence of individual factors on technology acceptance.

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## **Determination of Talented / Gifted Students Cyber Victimization**

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### **ABSTRACT**

Rapid changes and developments in technology can bring positive results as well as negative consequences. One of them is a cyber victimization. In this study; To study the cases of cyber victimization of gifted students. The working group of the study is gifted students in Sakarya in the academic year 2016/2017. In addition to the demographic information of the students, data collected with "Ciber Victimization" scale were analyzed by SPSS program. Frequency, percentage, Mann Whitney U,Kruskal Wallis H, Kay-Kare test and statistical techniques were used in the analysis of collected data. The results of the research; To determine the cyber victimization that students are exposed to and to take necessary measures in this regard, It is thought to contribute to the related literature.

**Key words:** gifted, talented, cyber victimization

### **INTRODUCTION**

Rapid development and widespread use in the field of technology has led to the realization of bullying using technology. Serin (2012) notes that the abusive use of information and communication technologies has led to the emergence of bullying, known as cyber bullying, among the types of bullying that occur among students in schools. Arıcak (2011) defined cybercrime as the whole of technical or relational damaging behaviors against persons, private or legal persons, using information and communication technologies. The rapid spread of mobile communication tools along with evolving technology and the ease of social sharing brought by Web 2.0 technologies are leading people to tend to share their personal knowledge and thoughts. Especially the use of social networks which spread rapidly among the adolescents and spreading the personal information in an uncontrolled manner increases the negative behavior of the adolescents (Arıcak et al., 2012). Çetinkaya (2010) states that the virtual environments that emerged with the development of technology have become indispensable parts of human life, that individuals can hide their identities and that they are in harmful behavior. Çetin et al. (2012) in electronic vehicles to reach unlimited number of people It is more difficult to control the cyber bullying because of the presence of the witness and many people witnessed that the suffering experienced by the victim increases. Hidden numbered calls, spam e-mails sent with confidential identification, voice, images and texts spread by e-mail or text messages to smear a person or group with insults and threats, virus e-mails, the images to send to other people, to remove rumors about other people, gossiping, threatening, insulting, all this has led to the definition under cyberbullying of harmful actions (Arıcak 2009, Peker, 2013). Arıcak et al. (2013) describe the three different groups of victims (victims), cyber bullies (bullies) and potential victims exposed to cyber bullying. Private (2013) states that individuals exposed to cyber bullying behaviors are considered cyber victims. Arıcak, Tanrıku and Kınay (2012) are also exposed to cyber victimization, information and communication technologies through an individual or a group, a private or legal person, a technical or relational way of harmful behavior, it is defined as a state.

#### **Purpose of the research:**

The purpose of this study is to identify the views of gifted and talented students regarding the cases of victimization of cyber and to contribute to other work to be done in this regard.

### **METHOD**

In this section, information about the researcher's model, study group, data collection tool, data collection and analysis will be given.

### Model of Research

Survey screening model was applied. The main purpose of screening research is to describe the situation as it exists. Everything that is subject to research is tried to be defined as if it is within its own conditions (Karasar, 2005). The students' demographic information constitutes the screening section for the views on the cases of cyber victimization.

### Working Group

The study group of the study is composed of outstanding gifted students in Sakarya. The socio-demographic information of the students in the study group is shown in Table1.

**Table 1:** Socio-Demographic Information of Students in the Study Group

		Frequency	%
<b>Gender</b>	Female	14	21,2
	Male	52	78,8
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>Age</b>	7 years	14	21,2
	8 years	20	30,3
	9 years	9	25
	10 years	10	7
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>Which device do you mostly prefer to use the Internet?</b>	Computer	32	48,5
	Telephone	7	10,6
	Tablet	27	40,9
	Other	-	-
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>What is your average weekly use of the Internet?</b>	Less than 5 hours	58	87,9
	5-10 hours	8	12,1
	11-20 hours	-	-
	21 hours and over	-	-
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>How often do you hide your identity on Internet events (such as Facebook, chat, games) Or are you involved with a different identity than your actual identity?</b>	Never	34	51,5
	Rarely	6	9,1
	Sometimes	6	9,1
	Mostly	20	30,3
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>How often do you use social networks (Facebook, Twitter, Instagram, etc.)?</b>	Never	53	80,3
	Rarely	-	-
	Sometimes	7	10,6
	Mostly	6	9,1
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>Cyber-bullying came to me in my life.</b>	Never	53	80,3
	Once	7	10,6
	Once or twice	-	-
	Many times	-	-
	Too many times	6	9,1
	<b>Total</b>	<b>66</b>	<b>100</b>
<b>I've been bullied to others.</b>	Never	60	90,9
	Once	-	-
	Once or twice	-	-
	Many times	6	9,1
	Too many times	-	-
	<b>Total</b>	<b>66</b>	<b>100</b>

According to Table 1, 21.2% of the respondents were female and 78.8% were male students. 21.2% of the students are 7 years old, 30.3% are 8 years old, 25% are 9 years old and 7% are 10 years old. When the devices preferred by the students participating in the research are examined, it is seen that 48.5% of them are using computers, 10.6% are telephones and 40.9% are tablets. 87.9% of the students stated that they use the internet less than 5 hours a week and 12,1% 5-10 hours a week.

51.5% of the students who participated in the study never, 9.1% rarely, 9.1% occasionally, 30.3% mostly stated that they hid their identities on internet or use a different identity. 80.3% of the students stated that they never used social networks (facebook, twitter, instagram etc.), 10.6% occasionally use 9.1% mostly. 80.3% of the students stated that they never had cyber bullyin, and 10.6% stated that they were exposed once. 90.9% stated that they never made cyber bullying, and 9.1% stated that they did it many times.

### Data Collection Tool

In order to collect data in the survey, "Ciber Victimization Scale" developed by Arıcak, Tanrikulu and Kinay (2012) was applied in order to determine the students' victim status. The scale consists of 24 items and is answered on a scale of 2 (No, Yes). "No" is evaluated as one point, and "Yes" response is evaluated as two points. Thus, the lowest score that can be taken from the scale is 24 and the highest score is 48. The increase in the scores indicates the high level of being victimization. In order to obtain the demographic information of the students in the study group participated in the research, the information form developed by the researchers was used.

### Data Collection and Analysis

The data obtained by means of quantitative data collection in the study were analyzed using SPSS 16.0 (Statistical Package for Social Sciences) statistical program and the significance level was accepted as 0.05 in all the analyzes made in the research. The frequency, percentage, Mann Whitney U, Kruskal Wallis H, Kay-Square test and statistical techniques were used in the examination of the quantitative data.

## RESULTS

**Table 2.** Descriptive Statistics of the Cyber Victimization Scale

Scale	Item number	Min \ Max Score to be taken	$\bar{X}$
Cyber Victimization Scale	24	24-48	24,56

The average score of the Siberian victimization scale was measured as 24.56. The lowest score that can be taken from the scale is 24 and the highest score is 48. It can be said that those who participated in the study had a "very low" level of cyber victimization points.

**Table 3.** Comparison by Gender of Cyber Victimization Level

Gender	N	$\bar{X}$	U	p
Female	14	27,21	276,00	,09
Male	52	35,19		

\*p<0,05

When the results of Mann Whitney U test are examined in Table 3, the average of male students is 35,19 and the average of female students is 27,21. There was no significant difference between male and female students (U = 276.00; p> 0.05).

**Table 4.** Age Variable comparison with Cyber Victimization Level

Age	N	Average Rank	sd	X <sup>2</sup>	p
7 years	14	29,32	3	26,81	,00
8 years	20	27,42			
9 years	25	32,74			
10 years	7	61,93			

\*p<0,05

When the results of the Kruskal Wallis H test are examined in Table 4, the mean scores of the cyber victimization scale of the participants were significantly different according to age ( $X^2 = 26,81$ ;  $p < 0,05$ ). While the students who are in the age group of 10 and 9 are higher than the other age groups, the students who are in the age group of 10 have the highest level of cyber victimization.

**Table 5.** Cyber Victimization in Internet use with Level Preferred Device Comparison

	N	Average Rank	sd	X <sup>2</sup>	p
Computer	32	40,05	2	10,72	,00
Telephone	7	27,21			
Tablet	27	27,37			
Other	-	-			

\*p<0,05

When the results of the Kruskal Wallis H test were examined in Table 5, it was found that the mean scores of the cyber victimization scales of the participants were significantly different ( $X^2 = 10,72$ ;  $p < 0,05$ ) compared to the device used in internet use. It can be said that the students who use computers have the highest levels of cyber victimization followed by those who use tablets.

**Table 6.** Comparison of Cyber Victimization Level with Weekly Average Internet Usage Time

	N	Average Rank	sd	X <sup>2</sup>	p
Less than 5 hours	58	33,93	1	,358	,54
5-10 hours	-	-			
11-20 hours	-	-			
21 hours and over	8	30,38			

\*p<0,05

When the results of Kruskal Wallis H test are examined in Table 6, it was found that there was no significant difference ( $X^2 = ,358$ ;  $p > 0,05$ ) in relation to the relationship between cyber victimization scale scores and internet use time of the participants.

**Table 7.** Results of Kay-Square Test Regarding Identity Hiding Situations in the Internet Environment (Facebook, Chat, Game, etc.) by Gender of Students

Gender	Identity Hiding Situations in the Internet Environment (such as Facebook, chat, gaming)			
	Never	Rarely	Sometimes	Mostly
Male	7 %50	-	-	7 %50
Female	27 %51,9	6 %11,5	6 %11,5	13 %25

$X^2=5,51$   $sd=3$   $P=,138$

According to Table 7, when the results of the Kay-Square test regarding the hiding of the identities of the students in the internet environment (such as facebook, chat, game) are examined according to gender ( $p >, 005$ ), it can be said that there is no significant difference.

**Table 8.** Results of the Kay-Square Test Regarding the Use of Students' Gender-Based Social Networks (Facebook, Twitter, Instagram, etc.)

Gender	Social Networks (Facebook, Twitter, Instagram, etc.) Usage Situations			
	Never	Rarely	Sometimes	Mostly
Female	14 %100	-	-	-
Male	39 %75	7 %13,5	6 %9,1	

$$X^2=4,35 \quad sd=2 \quad P=,113$$

According to Table 8; It can be said that there is no meaningful difference when the results of Kay-Square test regarding the use of social networks (facebook, twitter, instagram etc.) of the students according to their genders are examined ( $p >, 005$ ).

**Table 9.** Regarding cyber victimization status of students by gender Chi-Square Test Results

Gender	Cyber Victimization Status				
	Never	Once	Once twice	or Many times	Too many times
Female	14 %100	-	-	-	-
Male	39 %75	7 %13,5	-	-	6 %9,1

$$X^2=4,35 \quad sd=2 \quad P=,113$$

According to Table 9, when the results of Kay-Square test on the status of victims of cyber in relation to the gender of the students are examined ( $p >, 005$ ), it can be said that there is no significant difference.

**Table 10.** Results of Kay-Square Test Regarding Cyber Bullying Situations of Others According to Their Gender

Gender	Cyber Bullying Situations				
	Never	Once	Once twice	or Many times	Too many times
Female	14 %100	-	-	-	-
Male	46 %88,5	-	-	6 %11,5	-

$$X^2=1,77 \quad sd=1 \quad P=,183$$

According to Table 10; It can be said that there is not a significant difference when the results of Kay-Square test ( $p >, 005$ ) regarding the cases of students cyber bullying others according to their genders are examined.

## CONCLUSIONS

In this study, the cases of cyber victimization of gifted / talented students were examined. A total of 66 students, 14 female and 52 male, participated in the research. 14 of the students are 7 years old, 20 are 8 years old, 9 are 9 years old and 10 are 10 years old. It is observed that most students prefer to use the computer and the tablet after

entering the internet. When the average weekly internet use period was examined, they stated that they entered less than 5 hours. In this case, it can be said that students use internet in a controlled way.

Most of the students stated that they do not hide their identities in internet events (such as facebook, chat, play). Most of the gifted / talented students stated that they did not use social networks (facebook, twitter, instagram etc.). In addition, most of the students stated that they did not live cyber bullying and they did not do cyber bullying.

According to the obtained data, it can be said that gifted/talented students do not have cyber bullying and cyber victimization because their internet usage time is low and they use limited social networks. According to the average of the data obtained by the cyber victimization scale, it can be said that the most gifted / gifted students participating in the study are at a very low level of the cyber victimization status. It is seen that Dalmaz (2014) has a very low level of victimization of cyber in the last study with university students.

There was no difference between male and female students as a result of sex comparison of cyber victimization level. There are researches that show that there are no differences between male and female students as well as research on girls being exposed to cyber victimization (Dilmaç, 2009; Akbulut vd., 2010; Peker vd., 2012; Özel, 2013; Dalmaz, 2014; Alkan vd., 2016). As a result of comparing the level of cyber victimization with age variation, it can be said that the age of cyber victimization increases as the age increases. The cyber victimization status is at most 10 years old, then 9 years old and it is 8 and 7 years old. Compared to the cyber victimization level and the devices that are preferred for internet use, it is seen that most computers use the tablet afterwards.

Students also not a significant difference compared to the average weekly duration of use Internet with cyber victimization levels seen less than 5 hours per week they use the internet. There was no significant difference regarding the use of social networks (facebook, twitter, instagram, etc.) according to the gender of the students, as there was no meaningful difference regarding the status of students hiding their identities on internet based events (such as facebook, chat, game). It can also be said that there is no meaningful difference between the sexes of the students regarding the cases of cyber victimization and there is no significant difference regarding the cases of cyber bullying according to their sex.

## RECOMMENDATIONS

- Students, families and teachers can be informed about cyber victimization and cyber bullying.
- Students may be informed that they should not be able to hide from the teachers and their parents the situation of victimization of the cybercrime they may encounter.
- Teachers and parents can be told that victims of cybercrime can affect the social life, academic achievement and psychology of students.
- Siberia can be brought to a more deterrent situation with bullying laws.

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# **Determination of Maturity Level of Human Resource Capability Based on the Pattern of (PCMM) in Azad University of BUSHEHR. IRAN**

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## **ABSTRACT**

Nowadays a lot of organizations try to gain more maturity for their development in process. A large percentage of these organizations tend to the expansion model. People resource capability model is one of these models which concentrate on expanding organization human skills. People capability maturity model is a process-driven framework which carries out people resources step by step in an organization .The motive of this model is to guide the organizations in improving their people resources .This model contains five maturity levels and twenty two process area. Each of these maturity levels has different qualities from one another. In fact, each of these levels a unique way in changing the organizations culture by equipping it with more effective actions for attracting expansion organizing, provocation and keep in its human resources. The present research has been performed with propose of studding process areas connected to each of maturity levels in human resources maturity model that determines the maturity in Islamic Azad University of Bushehr. Methodology research design is a non-experimental and from description-collection, that researcher with the Cochran community statistical formula to determine the statistical sample size 410 people that the result was 199, and researcher distributed Carnegie Mellon questionnaire about 210 pcs between Islamic Azad University of blusher's staffs, and identified the first and second levels of maturity requirements on base of PCMM model in 2016. The objectives of the research with using SPSS software were analysed and with use descriptive statistics according to the research questions. Results from this study showed that Processes of: The recruiter, Communication and Coordination, Workplace, Training and Development, Compensation system, Analysis of competency, Workforce Planning System, Rising of competency system was more attention from the society of the Islamic Azad University of Bushehr, however, this organization not completely covered the level 2 of mature PCMM model.

**Keywords:** Maturity Level, Performance evaluation, Human Resource. PCMM. Capability

## **INTRODUCTION**

In the 1980s the use of performance measurement systems primarily focused on economy and efficiency because cost saving and operational control purposes was unable to support organizational objectives (Pollitt, 1986; Ghobadian and Ashworth, 1994; Guthrie and English, 1997) and this infirmity was the main reason of BSC appearance. The BSC was developed by Robert Kaplan and David Norton after an extensive research project in 1990 and their first refereed paper published in 1992 (Kaplan and Norton, 1992). Kaplan and Norton's (1992)

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Balanced Scorecard (BSC) has become a widely used framework for performance measurement, although the authors originally intended the framework to be used as a tool for communicating strategy (Meyer, 2005). In general, at least three different explanations of the stages of the evolution of BSC exist in the literature (Morisawa, 2002; Miyake, 2002; Lawrie and Cobbold, 2004; Speckbacher et al., 2003) which are called as generations of BSC. All authors agree that the first generation of BSC combines financial and non-financial Indicators with the four perspectives (financial, customer, internal business process and learning and growth). At this stage, measurement systems without cause-and-effect logic may also qualify as Balanced Scorecards (Malmi, 2001, p.216).

In fact, this generation of BSC was a set of indicators arranged by perspectives derived from mission and vision of organization. Speckbacher et al. (2003) and Lawrie and Cobbold (2004) argue that the second generation BSC emphasized the cause-and-effect relationships between measures and strategic objectives. It became a strategic management tool, usually utilizing a strategy map to illustrate the linkage between measures and strategies. In contrast there is a view in the literature (Morisawa, 2002; Miyake, 2002) that the key contribution of second generation BSC was the formal linkage of strategic management with performance management.

Concept of the strategy-focused organization (Kaplan and Norton, 2001) reflected the third-generation application of the BSC. Two basic concepts in all generations of BSC are perspectives and indicators. Kaplan and Norton (2001) have argued that organizations should develop the best set of perspectives that reflect their strategy. The earliest BSC papers (Kaplan and Norton, 1992) advocated the use of the four perspectives – financial, customer, internal business process and learning and growth. Although only four perspectives defined in original BSC, but Kaplan and Norton (1996) describes where it's required, organization can add other perspectives to own scorecard.

Another basic concept of BSC is indicator (or measure). One goal of balanced scorecard is to identify a core set of indicators that can be used to summarize an organization's performance (Chan and Ho, 2000) and also to provide a clear set of metrics to evaluate the organization's strategy (Kaplan and Norton, 2001). Therefore, the aim of a well-structured BSC is to establish a balanced set of indicators, which consist of both financial and non-financial measures that control all activities and operations of organization.

## **LITERATURE REVIEW**

Meenchavan (2009) has done a research entitled "BSC, new challenge" the researcher has concluded that this model, as a culture change and development to accept new suggestions and members, is a suitable model.

Deem (2009) also has done a research entitled "studying the relationship of organizational culture and BSC effectiveness". The results of this research have shown that each of the four organizational features, partnership, solidarity, adaptability and mission have significant and positive- relationship with BSC effectiveness.

Another research has been done by Soleimani (2011) and entitled "studying the relationship of organizational culture and BSC effectiveness". By analyzing the questionnaire with Pierson correlation method and regression analysis, a direct relationship between organizational culture and each of its components, partnership, sohдарity, adaptability, assignment and BSC effectiveness, was concluded.

In addition, Asaadi has done a research entitled "performance appraisal of Yazd province public hospital using a combination of BSC, data envelope analysis. The researcher concluded that mean relative efficiency of the hospital was 0.945, 9 out of 13 were on the efficiency frontier and the efficiency of 4 hospitals was less than one.

### **RESEARCH HYPOTHESIS**

The following research Hypothesis is established based on the above literature review. The research hypotheses are:

1. Using the Balance Scorecard, improve the performance of managers in keeping financial indicators of organization.
2. Using the Balance Scorecard, improve the performance of managers in customer retention.
3. Using the Balance Scorecard, improve the performance of managers in processes within the organization.
4. Using the Balance Scorecard, improve the performance of managers in growth of the organization learning process.

### **PARTICIPANTS AND PROCEDURE**

The population of this study consists university presidents and heads of departments in three higher education institutes in Bushehr. Since the population was small (136 people), sampling is not done and all members are chosen as samples.

This research is descriptive – survey and library resource and internet are used for the research literature.

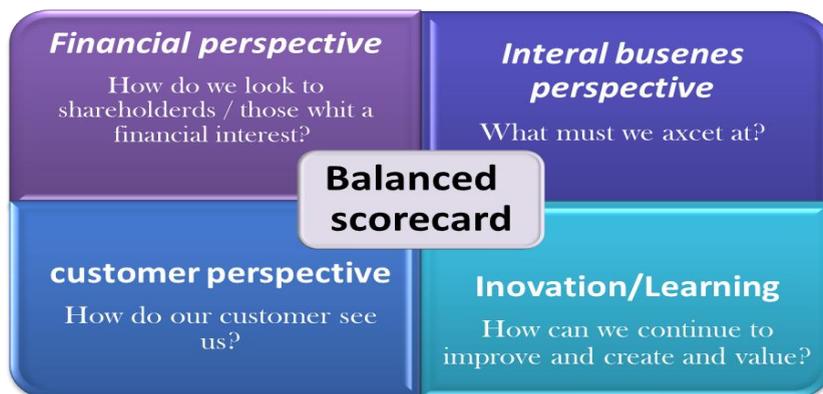
### **MEASURE**

The questionnaire data collection tools are researcher-made which the reliability of it is confirmed by the supervisor professor. To calculate the validity of questionnaire, Cronbach's Alfa is used. (Alfa=0.88). Questionnaire consists of 20 questions: 4 questions for the financial indicators variable, 3 questions for the customer retention variable, 7 questions for the processes within the organization variable and 5 questions for the growth process and organization learning variable. Likert 5 point scale is used in this questionnaire and to analyze the research hypothesis, the average test is used.

## FINDINGS

**Table 1.** The result of comparison between hypotheses mean

Dependent Variable	Statistic Value t	Significan t Level (sig)	Degree of freedom (df)	Confidence Interval		Result
				High limit	Low limit	
The performance of managers in keeping financial indicators	6.227	0.000	114	0.3926	0.2031	Accept
The performance of managers in customer retentio	5.481	0.000	114	0.4972	0.2332	Accept
The performance of managers in processes within the organization	3.204	0.002	114	0.2171	0.0512	Accept
The performance of managers in growth of the organization learning process	0.764	0.429	114	0.1543	-0.0661	Failed



**Figure 1.** Balanced scorecard's perspective

## CONCLUSION

The purpose of this research is studying the role of BSC in appraisal of higher education institutes performance. According to the results of test and test results interpretation table, using BSC, in population's opinion, leads up to development of managers' performance in keeping financial indicators of organization, customer retention and within the organization processes, which were similar to Chen (2008), Umashankar& Dutta (2007), and Gullen (2003), researches. However it doesn't lead up learning process growth in organization, which differs from result of Amaratunga&BaldAry (2000) and Einstein (2006) researches.

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# **Determining the Relationship and Influencing Factors of High School Students' Performances and achievements in Mathematics**

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## **ABSTRACT**

This study examined 86 high school (Year 11) students' basic proficiencies in Mathematics were examined, and the connections between language proficiency, gender, family socio-economic background and family factors to their performances were also identified. A 'proficiency test' paper was developed to investigate students' proficiency in Mathematics, and semi-structured interviews were utilized to gather data regarding parental involvement in students' academic activities. Several different statistical tests were employed for the data analyse. Although the findings revealed a positive correlation between students' proficiency test score and their yearly Mathematics achievements, the relationship between students' basic proficiency in Mathematics and their gender were not found to be significant. The students' English language literacy was significantly related to their achievements in Mathematics. And the students' basic proficiency in Mathematics and parents' income was significantly correlated, but the students' proficiency and parents' education was not significantly correlated. Students' English language proficiency and parental involvement in terms of emotional or financial support (such as attending private tuition class) were also determined to be the contributing factors in the students' achievement in Mathematics.

**Keywords:** Mathematics Basic Proficiency, Performance and Achievements, Family Socio-Economic Background, Gender

## **INTRODUCTION**

Fundamental skills comprised of basic or elementary abilities in an idea or a system. Every field of life has their own definition of fundamental skills. When fundamental skills are not taught properly, the least privileged in our society are those affected most, and thus also added that mastering fundamental skills were necessary to advance in mathematics (Loveless, 2003).

The Ministry of Education of Brunei Darussalam is committed in providing quality education. It is believed that quality education will provide a firm foundation for the country to become a peaceful and developed nation (Ministry of Education, 2012). In 2008, Brunei introduced an education system that brought about massive changes (Ministry of Education, 2013). The onset of *Sistem Pendidikan Negara Abad ke-21* (SPN21), which translated in the English language as the National Education System for the 21<sup>st</sup> Century curriculum sets out to provide a holistic education, and it is worth noting that solid foundation in Mathematics needs to be established at the primary school level (Ministry of Education, 2013). Previous studies showed that error patterns of students in public examination in Brunei are caused by exposure to the drilling of application of rules and formulae, at the expense of Mathematical understanding (Veloo & Lopez-Real, 1994; Wong & Veloo, 1996; Shahrill, 2009; Veloo, 2012; Sarwadi & Shahrill, 2014; Botty et al., 2015; Othman et al., 2016; Yunus et al., 2016; Mahanin et al., 2017).

This present study investigates the relationship between students' basic proficiencies and achievements in

Mathematics as well as identifying the factors influencing it. The initial focus explored the relation between students' basic mathematical skills and their achievements, by monitoring the students' Mathematics results throughout their school years. These findings will help determine the factors that contribute to their poor performance. Next, the students' family socio-economic backgrounds were also investigated. In addition, the students' English language proficiencies were also examined.

The following research questions were developed as guidance for this study:

1. Is the students' yearly achievements in Mathematics influenced by the students' basic Mathematical proficiency?
2. Does the students' gender affect their basic proficiency?
3. Can we detect any significant correlations between the students' English language proficiency and their achievement in Mathematics?
4. Can we detect any significant correlations between the students' proficiency in Mathematics and their families' socio-economic background?
5. To what extent does the family's socioeconomic background impact on students' basic proficiency and achievement in Mathematics?

Referring to the above-guided questions, the following null hypotheses (H) were identified;

H<sub>01</sub>: Significant correlation was not detected between the students' Mathematics basic proficiency and their gender.

H<sub>02</sub>: Significant correlation was not detected between the students' English language literacy and their Mathematics performance.

H<sub>03</sub>: Significant correlation was not detected between the students' proficiency in mathematics and their family background.

One limitation of this study is that only students from one high school were chosen. Moreover, the number of student-participation is only 86. Another limitation is that only Year 9 to Year 11 students' yearly performances were considered due to unavoidable circumstance.

## **REVIEW OF THE LITERATURE**

### **Family Socio-Economic Background**

According to Reardon (2011), one of the greatest predicting factors of the child's academic achievement is the Socio-Economic Status (SES) of his or her parents. Furthermore, the cognitive abilities and educational achievements of a child are deeply affected by parental SES (Jednoróg et al., 2012). And it is well established that there is a gap in academic achievements between students from the high and low socio-economic family backgrounds (Frederickson et al., 2008). Children with better SES backgrounds are more likely to excel in Mathematics (Coley, 2002). Interestingly, the rate of college completion by students with families from the high-income background has increased in comparison to the students' completion rate from low-income families (Bailey & Dynarski, 2011). Income also has significant impact on the students' education and IQ from the low-income category (Løken et al., 2012). However, Dahl and Lochner (2012) found that these effects decreased significantly for the higher-income families. Previous studies have reported that educated parents are more efficient teachers at home (Alexander et al., 1994; Davis-Kean, 2005). Moreover, Zakaria et al. (2013) found that the parents who are involved in their children's schoolwork can contribute positively towards their children's academic achievement. Knowing the type of home environment the children come from will be useful in order to assist educators in assessing and providing the best support strategy in schools. Milne and Plourde (2006) believed that if given sufficient support to the families, then there could be success for the children.

### **Gender Differences**

Several researchers have regarded Mathematics as a subject dominated by the male gender (Burton, 2001; Blömeke et al., 2011). Which led to the question, why do boys performed better in mathematics than girls? Findings from Beilock et al.'s study indicated that girls tend to worry more, thus eroding the mental resources needed for problem-solving. Hyde and colleagues (2008) found that there was little or no difference in Mathematics performance between girls and boys in ten of the states in the United States. In some states, girls performed fractionally better than boys. They also asserted that gender differences did not exist anymore in math performance. The issue of 'gender gap' in achievement between boys and girls remained the focus of attention and the gaps appeared to be growing rather than receding. In the context of Brunei, female students outperform male students academically (Yong, 2010; Metussin, 2015, 2016).

## Language Literacy

For English Language Learners (ELL), the language factors could have an effect on assessments (Abedi, 2002; Abedi et al., 2003). Furthermore, Abedi et al. (2004) found that the language background of a student has a strong connection to their performance in tests. Walter and Taskinen (2007) stated that differences in language are a major concern as it may impede academic achievement. Students who learn using their second language have been found to perform significantly worse in comparison to those learning using their first language (Yushau & Omar, 2015). Meanwhile, Khalid and Tengah (2007) reiterated that pupils in Brunei with limited English language proficiency usually encounter difficulty in learning Mathematics. As a result, teachers often translate certain problems using the Malay language. On the contrary, Pungut and Shahrill (2014) discovered only weak relationship between the English language competency and the students' ability to solve mathematics word problems. Alternative strategies for second language learners, such as graphics organizers and journal writing have shown to be useful tools when learning mathematics (Khoo et al., 2016; Suhaimi et al., 2016, 2017). Meanwhile, disadvantaged and language-diverse learners have an important characteristic in common, as both have difficulty expressing their difficulties to students. This could produce a classroom of many silent learners (Nieto & Bode, 2012).

## METHODOLOGY

This study employed a mixed method combination of quantitative and qualitative research strategies. This study adapted Hammersley (1996) classification of approaches to mixed methods research. Hammersley proposed the use of mixed method for *triangulation* approach. The target population for this study consisted only of one high school in one of the four districts in Brunei. The participants comprised of 86 high school students (47 male students and 39 female students) from four selected Year 11 classes, with their ages ranging from 15 – 19 years old (mean age of 16.87 years and standard deviation of 0.72). Data on students' background and academic information was accessed, with prior permission from the school Registration Department and Academic and Examination Department. The data extracted includes students' socio-demographic factors that focused on age, gender and students' family background including parents' income and education, as well as the students' examination results.

In this study, a 'proficiency test' paper was developed to investigate students' proficiency in Mathematics. The test paper consisted of five content strands that complied with the content areas used in the Trends in International Mathematics and Science Study (TIMSS) for the Mathematics curriculum. This comprised of Number, Measurement Algebra, Geometry and Data. There were 38 items altogether within the five components; Number (21 items), Measurement (2 items), Algebra (4 items), Geometry (4 items), and Data (6 items).

To determine the reliability of the instrument, a pilot study was conducted on 24 students from the general science classes of Years 9 and 10 who were not part of the study sample. This small sample size is deemed sufficient for cases involving pilot studies. However statistical significance is unlikely to be obtained with this sample size (Hill, 1998). Therefore a typical scale reliability measure will be based on the Cronbach alpha (Field, 2009). And for this pilot study, the reliability coefficient showed a reading of 0.832 and can be considered as 'great'. Meanwhile, semi structured interviews were conducted on selected students based on their basic proficiency test score results. According to Thomas (2010), this method of interview has features of both structured and unstructured interviews and therefore uses both closed and open questions. As a result, it has the advantage of both methods of interview. In order to be consistent, pre-planned core questions were set for guidance so that the same areas were covered with each interviewee. The questions were based on family context and parental involvement.

## Data Collection Procedure

The paper and pencil test was conducted on 86 participants. The Mathematics teachers of the selected classes assisted in administering the participants to complete the standardized tests within 60 minutes. Data collection was done immediately upon completion. The reliability coefficient of the test items yielded a score of 0.889 on the Cronbach's alpha. The mean score for the entire five content strands are shown in Table 1. It shows that most students managed to answer questions on *Algebra* with a mean score of 0.433 compared to *Measurement* that only yielded a mean score of 0.128.

**Table 1: The mean score of the five content strands**

Content Strands	N	Mean	Std. Deviation
Numbers	21	0.389	0.443
Measurement	2	0.128	0.332
Algebra	5	0.433	0.488
Geometry	4	0.430	0.430
Data	6	0.384	0.390

### Description of Variables

The different variables were subsequently identified, and the students' basic proficiency test score was labelled as proficiency score, and the students' yearly performance in Mathematics which were collected from the Year 9 and 10 end of year examination, Year 11 preliminary assessment and Year 11 qualifying examination marks were labelled as ME9, ME10, MP11 and MQ11 respectively. Meanwhile, the students' English language qualifying examination marks was labelled as language literacy. All of the scores were then transformed into grades, which was adapted from the school's grading system and given as; A (90 –100), B (80 – 89), C (70 – 79), D (60 – 69), E (50 – 59), and U (40 – 49). Whereas, the variables for family socio-economic background was labelled as 'Parent Income' which is represented by the highest income gainer in the family and categorised as (1) Less than \$1000, (2) \$1000 – \$2000, and (3) \$2000 and above. As for the variable 'Parent Education', it represents the parents' highest qualifications with the categorizations: (1) Below high school, (2) High school, (3) Certificate, (4) Diploma or Technical, and (5) Degree or Professionals.

### Data Analysis

The data obtained were inputted in Microsoft Office Excel for Windows 8, and further analysed using SPSS version 21.0 (IBM Corp., 2012). Thus different statistical tests were employed as follows:

- The reliability of the test items were analyzed using reliability tests scale for Cronbach's alpha.
- The descriptive statistics was utilized in deducing mean, standard deviations, frequency and percentages for the content strand, proficiency tests, parents' income and education level, as well as English language qualifying marks.
- The independent (two-sample) *t*-tests were used to determine the significant effect between gender and proficiency tests.
- A set of Pearson product-moment correlation coefficient tests were also used in examining the linear relationships between:
  - Students' proficiency tests as well as their yearly performance in Mathematics.
  - Students' achievement in Mathematics and family socioeconomic background (parents' income and education level)
- The chi square analysis with cross-tabulation were used to examine the correlations between
  - Gender differences and students' proficiency in Mathematics.
  - Students' achievement and their English language literacy.

### RESULTS AND DISCUSSIONS

Based on the results of the proficiency tests score shown in Table 2, 64% scored below 50 marks thus indicating they have weak basic foundations in Mathematics, with 33.7% having a moderate basic Mathematical foundation and only 9.3% was considered as having strong basic foundations in Mathematics.

**Table 2:** Proficiency tests score according to grade

Coding	Value	Frequency	Percent (%)
1	A (90 – 100)	0	0.0
2	B (80 – 89)	2	2.3
3	C (70 – 79)	6	7.0
4	D (60 – 69)	7	8.1
5	E (50 – 59)	16	18.6
6	U (0 – 49)	55	64.0

Table 3 reveals the sample population of students with their parents' income level. It seems that a significant proportion of students are from low-income family.

**Table 3:** Proficiency tests score categorized into parents' income level

Coding	Value	Frequency	Percent (%)
1	Less than \$1000	38	44.2
2	\$1000 – \$2000	25	29.1
3	More than \$2000	23	26.7

Table 4 shows the students population according to parents' level of education. And for Table 5, the students' English language qualifying examinations results were shown according to grades, and 18.6% of the population failed their qualifying examinations.

**Table 4:** Level of education for the parents

Coding	Value	Frequency	Percent (%)
1	Below High School	11	12.8
2	High School	54	62.8
3	Certificate	7	8.1
4	Diploma or Technical	6	7.0
5	Degree or Professional	8	9.3

**Table 5:** English language qualifying results according to grade

Coding	Value	Frequency	Percent (%)
1	A (90 – 100)	0	0.0
2	B (80 – 89)	5	5.8
3	C (70 – 79)	12	14.0
4	D (60 – 69)	24	27.9
5	E (50 – 59)	29	33.7
6	U (0 – 49)	16	18.6

*Is the students' yearly achievements in Mathematics influenced by the students' basic mathematical proficiency?* A Pearson correlation analysis was utilized in exploring the connection between the students' proficiency test and their Mathematics yearly achievements. The results are summarized in Table 6. The analysis of these correlations shows that all the variables are moderately to strongly-related. We also observed that the students' basic proficiency is positively and significantly related to students' yearly achievement in Mathematics.

**Table 6:** Correlations matrix between proficiency test score and students yearly achievement

	Proficiency	MQ11	MP11	ME10	ME9
Proficiency	1				
MQ11	0.587**	1			
MP11	0.628**	0.874**	1		
M10	0.411**	0.302**	0.434**	1	
M9	0.592**	0.761**	0.812**	0.583**	1

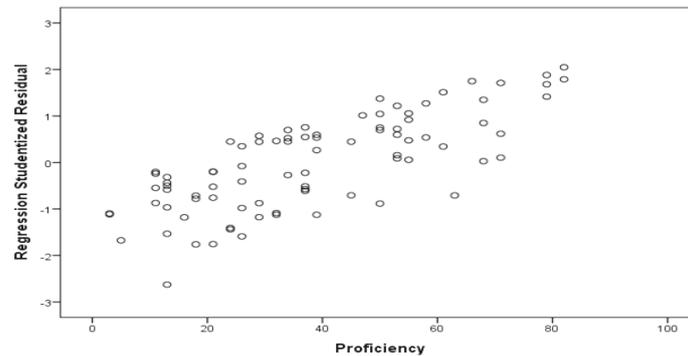
\*\* . Correlation is significant at 0.01 level (2-tailed)

To validate the results obtained above, the variables were then tested. We compared the means to examine the relationship between two variables. This procedure is often accompanied by the test of association between variables called *eta*. The level for the *eta* for the data in Table 7 shows a strong relationship between proficiency test scores and the variables. The test for linear regression shows a 43.2% variation among the variables with the F value of 15.421 ( $R^2$  changed ( $df_1 = 4, df_2 = 41$ ) = 0.432,  $p = 0.000$ ). As shown in Figure 1, the scatterplot indicated a positive correlation between the proficiency test and students' yearly achievements. As mentioned by Harrington (2007), doing a basic skills review is worthwhile as it allowed students to refresh their memory.

**Table 7:** Measures of association

	Eta	df	Sig.
Proficiency * MQ11	0.885	55	0.024*
Proficiency * MP11	0.848	44	0.003**
Proficiency * ME10	0.823	47	0.047*
Proficiency * ME9	0.772	39	0.036*

Note: \* $p < 0.05$ , \*\* $p < 0.01$



**Figure 1:** The scatterplot between proficiency and regression studentized residual on ME9, ME10, MP11 and MQ11

*Does the students' gender affect their basic proficiency?*

Before performing the t-tests, the data were checked to verify the assumptions of normality and equality of variances. Since the preliminary Levene's test for equality of variances implied that the two groups' variances were significantly different, a two-sample t-test, which does not assume equal variances, was then performed (Elliot & Woodward, 2006). The proficiency test score has a mean score of 37.06 (SD = 22.53) for males and 40.10 (SD = 18.87) for females. This indicated that females have a slightly better Mathematical foundation than males. However, this difference is not statistically significant based on the results of the t-test ( $t(86) = -0.681, P = 0.498 > 0.05$ ) by taking the reading of "equal variances not assumed".

The correlation is then checked with a cross-tabulation table (see Table 8), and chi-square test for associations between variables (see Table 9 and Table 10). One obvious explanation is that there are more males compared to female participants. From Table 10, there is no relation between gender and their proficiency tests where,  $X^2(df = 4) = 0.524, p = 0.971$  and  $phi = 0.578, p = 0.324$ . Therefore, the relationship for gender differences and proficiency tests cannot be established. And, we accept the null hypothesis ( $H_0$ ), and this coincided with Lindberg et al.'s (2010) findings.

**Table 8:** Gender and proficiency test score cross-tabulation

		Proficiency Grade					Total
		B (80 – 89)	C (70 – 79)	D (60 – 69)	E (50 – 59)	U (0 – 49)	
Gender	Male	1	4	4	8	30	47
	Female	1	2	3	8	25	39
Total		2	6	7	16	55	86

**Table 9:** The chi-square test (gender and proficiency)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.524 <sup>a</sup>	4	0.971
Likelihood Ratio	0.533	4	0.970
Linear-by-Linear Association	0.083	1	0.773
N of Valid Cases	86		

<sup>a</sup>6 cells (60.0%) have expected count less than 5. The minimum expected count is 0.91

**Table 10:** Symmetric measures (gender and proficiency)

		Value	Approx. Sig.
Nominal by Nominal	Phi	0.578	0.324
	Cramer's V	0.578	0.324
N of Valid Cases		86	

*Can we detect any significant correlations between the students' English language proficiency and their achievements in Mathematics?*

We performed a Pearson chi-square test to determine the relationship between the two nominal variables (the students' English language qualifying results and the students' Mathematics qualifying results). In order to conduct this test, it was best to determine the critical value of the chi-square, which is 21.0261, before the relationship can be confirmed. As depicted in Table 11, the chi square ( $X^2$ ) value of 21.684 exceeds the critical value of 21.0261 and the  $p$ -value of 0.041 is less than the Cronbach alpha of 0.05. The  $phi$  coefficient was 0.502 with  $p$ -value of 0.041 (see Table 12). Therefore, the alternative hypothesis is accepted. The results indicated a

weak correlation between the students' English language literacy and their achievements in Mathematics (which supported the findings by Blömeke et al., 2011).

**Table 11: The chi-square tests (English language and Mathematics)**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.684 <sup>a</sup>	12	0.041
Likelihood Ratio	20.045	12	0.066
Linear-by-Linear Association	0.661	1	0.416
N of Valid Cases	86		

<sup>a</sup>16 cells (80.0%) have expected count less than 5. The minimum expected count is 0.12

**Table 12: Symmetric measures (English language and Mathematics)**

		Value	Approx. Sig.
Nominal by Nominal	Phi	0.502	0.041
	Cramer's V	0.290	0.041
N of Valid Cases		86	

*Can we detect any significant correlations between the students' proficiency in Mathematics and their families' socio-economic background (i.e. parents' education and income)?*

A Pearson's moment correlation coefficient test was done to examine the relationship between students' basic proficiency in Mathematics and family's socio-economic background. From Table 13, the results of the analysis show a weak correlation between proficiency and the parents' income ( $r = 0.227$ ,  $p = 0.036 < 0.05$ ), and no correlation between proficiency and the parents' education ( $r = 0.084$ ,  $p = 0.444 > 0.05$ ). However, we observed a strong correlation between the parents' income and education ( $r = 0.590$ ,  $p = 0.000 < 0.001$ ). And this finding is consistent with study made by Dahl and Lochner (2012).

**Table 13: Correlations between proficiency test score and family background (income and education)**

		Proficiency	Parent Income	Parent Education
Proficiency	Pearson Correlation	1		
	Sig. (2-tailed)			
Parent Income	Pearson Correlation	0.227*	1	
	Sig. (2-tailed)	0.036		
Parent Education	Pearson Correlation	0.084	0.590**	1
	Sig. (2-tailed)	0.444	0.000	

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

*To what extent does the family's socioeconomic background has an impact on students' basic proficiency and achievement in mathematics?*

Semi-structured interview sessions were conducted to seven participants based on their proficiency tests score. The interview feedbacks are divided into three sub groups above average, average and below average. Further insights on the students' interviews are summarized below.

#### *Above average*

All three students in this category had scores between 80 and 82. There was only one male participant in this group. They had a few things in common which were not common to the rest, such as speaking English language at home most of the time, their parents always enquired about their school work, and they also attended tuition classes. They answered the basic Maths proficiency test questions very well, and they also wished to attend university.

#### *Average*

This student managed to score 50 marks on the proficiency tests. She sometimes practiced speaking English language at home and claimed that her parents showed concern about her schoolwork. She did not attend any tuition classes, and she looked forward to furthering her studies in one of the engineering colleges in Brunei.

#### *Below Average*

All the three students in this group are male and aged between 16 and 17 years old. They scored between 3 and 11 marks in the test. None of them spoke English language at home and their parents generally showed no concern towards their schoolwork. They did not attend any tuition classes, and they had problems answering the basic Mathematics proficiency test questions. They also showed interest in going to a vocational school.

To conclude, the main factor affecting students' Mathematics proficiency is their English language literacy. English as a second language applied to most of these students in this study. In addition, parental involvement also contributed to students' achievement in schools. These findings support the findings from Zakaria et al. (2013) as well as Milne and Plourde (2006). There is also considerable evidence suggesting that students with parents on the higher income bracket tend to do well possibly because their parents can afford to send them to tuition classes.

## CONCLUSIONS AND RECOMMENDATIONS

The findings of this present study reveal that a relationship exists between the students' basic proficiency and their Mathematics achievements. English language literacy also has a significant impact on students' achievement in Mathematics. In contrast, gender and parents' level of education does not affect the students' basic proficiency in Mathematics. We also deduced that parents' income has a significant effect on the students' basic proficiency and their achievements in Mathematics.

Moreover, the students' basic mathematical proficiency is highly correlated to their achievements in Mathematics. A stronger basic foundation will allow the students to handle higher-level Mathematics more readily. In addition, monitoring students' achievement in Mathematics will allow teachers to alter their lessons to suit the students' needs. If the teachers are aware of their students' progress, then the teachers will be in a better position to identify the problems faced by their students. Similarly, monitoring their performance in Mathematics will allow students to observe their own progress throughout the school year. This might help them identify their own weaknesses and motivate themselves to improve further.

As the sample is quite small and limited, a bigger sample is required from a more diverse source for future research. In addition, we recommend future study in investigating why attending private tuition class has positive effects on achievement test scores. One suggestion is for the school to provide one period of lesson every week just to review student basic Mathematical skills. Borich (2014) suggested that teachers should include parents in the planning and implementation of important changes in instructional techniques and assessment aimed at eliminating the differences in the performance among learners. Teachers also need to learn and experiment with different instructional techniques as learners have a quite diverse background (Golijani-Moghadam et al., 2012; Shahrill, 2017). In short, a good rapport between teachers and parents is crucial as it might produce a better educational system. Teachers also need to be robust in their teaching style to cater for diverse group of students.

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# **Determining the Wounding Potential of Shooting Weapons in the Course Forensic Science at the Faculty of Applied Informatics Tomas Bata University in Zlin**

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## **ABSTRACT**

The aim is to teach students to gauge the wounding potential of shooting weapon and ammunition. Part of Forensic Science course is dedicated to shooting weapons. These lessons deal with finding the wounding potential of shooting weapons. For this educational purpose, weapons of category D are used. In the Czech Republic, these weapons are freely sold from 18 years. The principles of controlling some weapons of category D (e.g. expansion weapon, Flobert rifle, airsoft pistol) which provide lower projectile speeds, are the same as for other firearms. Before measuring, students characterize the used alternative material. Then, they measure the speed of projectiles and the depth of incomplete penetration in this material. The students process results and prepare a report on the measurement including the measurement errors. Finally, the students correlate the velocity of projectiles (momentum), the weight and dimensions of the ammunition, and the depth of incomplete penetration, which was measured earlier. Obtained data are compared with those from previous measurements.

## **INTRODUCTION**

Forensic sciences are an integral part of all investigations and evidence in criminal or civil proceedings in front of state authorities. These are the procedures leading to the proof of the identity of the persons, the authenticity of the documents etc. One part of forensic science is forensic ballistics or forensic medicine.

Forensic ballistics try to identify a shooting weapon mainly by using a projectile stop. After passing off the projectile from the barrel of shooting weapon, identification markers remain on the projectile. From these markers, it is possible with a certain probability to determine the shooting weapon from which the projectile was shot according to the reference sample. The following scientific publications have concerned with the identification of the projectiles according to the marks created after the shot (Martínek et al.).

On the contrary, forensic medicine determines the time and the cause of death or damage. From our point of view, it is the determination of the lethal effect that arises in a gunshot wound. The wounded effect is determined on living tissues (e.g. the human body, determined by doctors or forensics doctors); however, the wounded potential is determined on the alternative material. The wounding potential is researched by scientists and experts, who determine the wounding potential of the ammunition or test a new type of ammunition. This can be seen in the following scientific publications e.g. (Gracla, Chocholatý, and Maláník 2017; Hanna et al. 2015; Humphrey and Kumaratilake 2016; Juříček, Plíhal, and Komenda 2003; Martínek et al.; Mattijssen et al. 2016; Mikuličová et al. 2017; Werner et al. 2017). The wounded effect can be estimated from the wounding potential. This is aided by the experience of forensic doctors who deal directly with forensic medicine. Based on their experience and measured values on the alternative material, it is possible to determine the wounded effect.

Forensic ballistics is taught in the subject of forensic science at the Faculty of Applied Informatics at Tomas Bata University in Zlin. The students get acquainted with the shooting weapon, which they then test and attempt to estimate its wounding potential. Weapons of category D are used for testing. In the Czech Republic, these weapons are freely sold since the age of 18 without the need for a gun license. These shooting weapons, that provide lower velocities, can be traced to their effect. Most commonly, air gun (air guns or airsoft weapons on CO<sub>2</sub>), but also firearms (Flobert) or other shooting weapons are used.

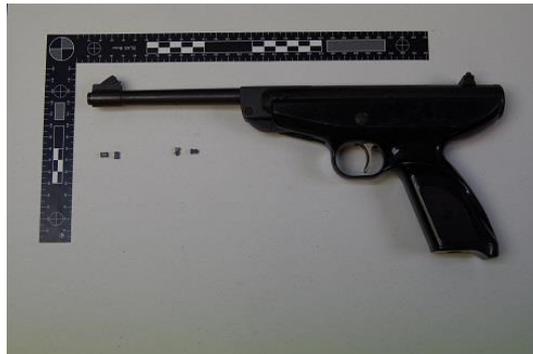
## THE STUDY

Based on the assignment of a laboratory task (Determination of the velocity of the projectiles and determination of the depth of incomplete penetration to the alternative material), the student obtain a firearm and ammunition intended for the tested shooting weapon. The student become acquainted with the theoretical basis of the laboratory task and with the basics of the safe handling of shooting weapon. Then, he follows the instructions to prepare the necessary equipment, aids, the shooting weapon and tested ammunition. For each tested ammunition, the student determines dimensions and weight.

### Equipment

For this experiment, an air gun (air pistol) and four types of ammunition (diabolo pellets) were selected.

#### Air pistol – TEX 086



*Figure 1. Air pistol model TEX 086*

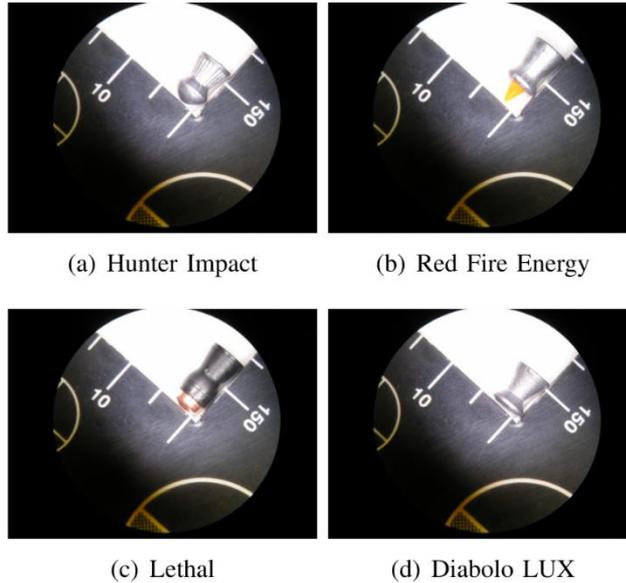
*Table 1. Parameters of air pistol model TEX 086*

Parameters	Value
Type	Pistol
Length of pistol	346 mm
Length of barrel	185 mm
Caliber	4.5 mm (.177)
Groove number	12
Groove step	450 mm
Aiming line	292 mm
Mass of pistol	1.22 kg
Speed of projectile	90 m/s (diabolo pellets)
Trigger pull adjustable	Max. 3.72 N
Cocking strength	Max. 11.77 N

This pistol (Figure 1) is a spring-piston air gun made in Czechoslovakia. Other parameters can be found in Table 1. The production was discontinued in the 80s.

#### Diabolo pellets

For the comparison of momentum, dimensions and the depth of incomplete penetration of the different types of projectiles, four types of diabolo pellets (Figure 2) were selected.



**Figure 2.** Microscopic photos of selected diablo pellets

The digital caliper with the accuracy of 0.01 mm was used to measure the dimensions. To determine the exact weight, the students used the laboratory scale PLT 2000-3DM from company KERN. Measurement of dimensions and weight was done with each type of diablo pellets and 30 samples. The results are shown in the Table 2.

**Table 2.** Parameters of diablo pellets

	<b>Hunter Impact</b>	<b>Red Fire Energy</b>	<b>Lethal</b>	<b>Diabolo LUX</b>
Producer	GAMO	GAMO	GAMO	Kovohute Pribram
Caliber	4.5 mm (.177)	4.5 mm (.177)	4.5 mm (.177)	4.5 mm (.177)
Weight	0.49 g	0.51 g	0.36 g	0.55 g
Weight	7.56 gr	7.87 gr	5.56 gr	8.49 gr
Measured length	6.408 ± 0.048 mm	8.656 ± 0.065 mm	8.774 ± 0.078 mm	5.635 ± 0.049 mm
Measured width	4.648 ± 0.084 mm	4.630 ± 0.053 mm	3.466 ± 0.005 mm	4.624 ± 0.073 mm
Measured weight	0.485 ± 0.004 g	0.506 ± 0.002 g	0.356 ± 0.002 g	0.559 ± 0.008 g

For measuring velocity of projectiles, the electronic gates (Figure 3) Caldwell Chronograph Premium Kit with IR light were used. These gates measure velocity in m/s, but also in ft/s. They can measure velocities from 1.5 to 3,000 m/s and their equivalent in ft/s. Speed is displayed directly on the display or can be connected to your mobile phone or PC.



**Figure 3.** Ballistic chronograph used to measure velocity of diablo pellets

Then, the student measures the density of alternative material, that serve to stop the projectile, and he determine the depth of incomplete penetration in the alternative material. In this case, it was a modeling material (plastic alternative material). In the end, these results are correlated with a ballistic gel that was measured in another laboratory task.

Measurement of the density of the modeling mass was carried out using a pycnometer and distilled water at 20 °C. The measurement was carried out by considering the weight of the alternative material, followed by the weight of the distilled water in the pycnometer, and finally, the weight of the distilled water with the alternative material in the pycnometer.

According to mathematical relations:

$$M = m_1 + m_2 - m_3 \quad (1)$$

$$M = 1,129 + 76,816 - 77,298 \quad (2)$$

$$M = 0,647 \text{ g} \quad (3)$$

Where:

M - the total weight of the spilled water

m<sub>1</sub> - weight of alternative material

m<sub>2</sub> - mass of the pycnometer with distilled water

m<sub>3</sub> - mass of pycnometer with distilled water and alternative material

$$V = \frac{M}{\rho_{\text{spilled water}}} \quad (4)$$

$$V = \frac{0,647}{0,998} \quad (5)$$

$$V = 0,648 \quad (6)$$

Where:

V - volume of alternative material

ρ<sub>spilled water</sub> - density of distilled water at 20 °C (0.998 g/cm<sup>3</sup>)

$$\rho_{\text{alternative material}} = \frac{m_1}{V} \quad (7)$$

$$\rho = \frac{1,129}{0,648} \quad (8)$$

$$\rho = 1,742 \text{ g/cm}^3 \quad (9)$$

Once the student defines the used shooting weapon, diabolo pellets, and alternative material, he can proceed to the experiment itself. He creates a workplace (Figure 4) in which a shooting stand is used to maintain the same distance between the tested shooting weapon, the electronic gates, and the alternative material. At a distance of 1 meter from the muzzle of the tested shooting weapon, the electronic gates are placed to measure projectiles velocity. At a distance of 2 meters from the muzzle of shooting weapon, the alternative material is located. The student shoots 10 times into alternative material and determines the values of the velocity and depth of incomplete penetration of diabolo pellets. Then, he calculates the momentum of the individual diabolo pellets and records the minimum, maximum, average and standard deviations of the individual kinds of diabolo pellets to the tables.



**Figure 4.** Experimental setup of measurement chain

## FINDINGS

The measurement was carried out at a constant temperature of 26.9 °C. The velocity measurement of diablo pellets were measured at each shot. From the results obtained, the average velocities and the standard deviation of the measurements were determined. Additionally, the individual depths of incomplete penetration and their mean values and the standard deviation of the measurements were determined. From the measurement, the student creates a measurement report. Then he correlates its measured results with the results that have been measured earlier.

The findings are divided up into two parts (Table 3). The first part focuses on the velocity measurements (momentum) of each type of diablo pellets.

**Table 3.** Findings for velocity and momentum

		Hunter Impact	Red Fire Energy	Lethal	Diablo Lux
Velocity	Min	105 m/s	74 m/s	88 m/s	86 m/s
	Max	112 m/s	91 m/s	106 m/s	92 m/s
	Average	107.8 m/s	81.4 m/s	93.0 m/s	89.4 m/s
	Standard deviation	2.95 m/s	6.47 m/s	7.35 m/s	2.41 m/s
Momentum	Min	51.45*10 <sup>-3</sup> kg.m/s	37.74*10 <sup>-3</sup> kg.m/s	31.68*10 <sup>-3</sup> kg.m/s	47.3*10 <sup>-3</sup> kg.m/s
	Max	54.88*10 <sup>-3</sup> kg.m/s	46.41*10 <sup>-3</sup> kg.m/s	38.16*10 <sup>-3</sup> kg.m/s	50.6*10 <sup>-3</sup> kg.m/s
	Average	52.82*10 <sup>-3</sup> kg.m/s	41.51*10 <sup>-3</sup> kg.m/s	33.48*10 <sup>-3</sup> kg.m/s	49.17*10 <sup>-3</sup> kg.m/s
	Standard deviation	1.45*10 <sup>-3</sup> kg.m/s	3.30*10 <sup>-3</sup> kg.m/s	2.65*10 <sup>-3</sup> kg.m/s	1.32*10 <sup>-3</sup> kg.m/s

The weights and dimensions of the used ammunition are the same as those used in the previous measurement. Velocities and momentums differ in average values, except diablo Hunter Impact. This is due to a higher temperature in the laboratory during the experiment.

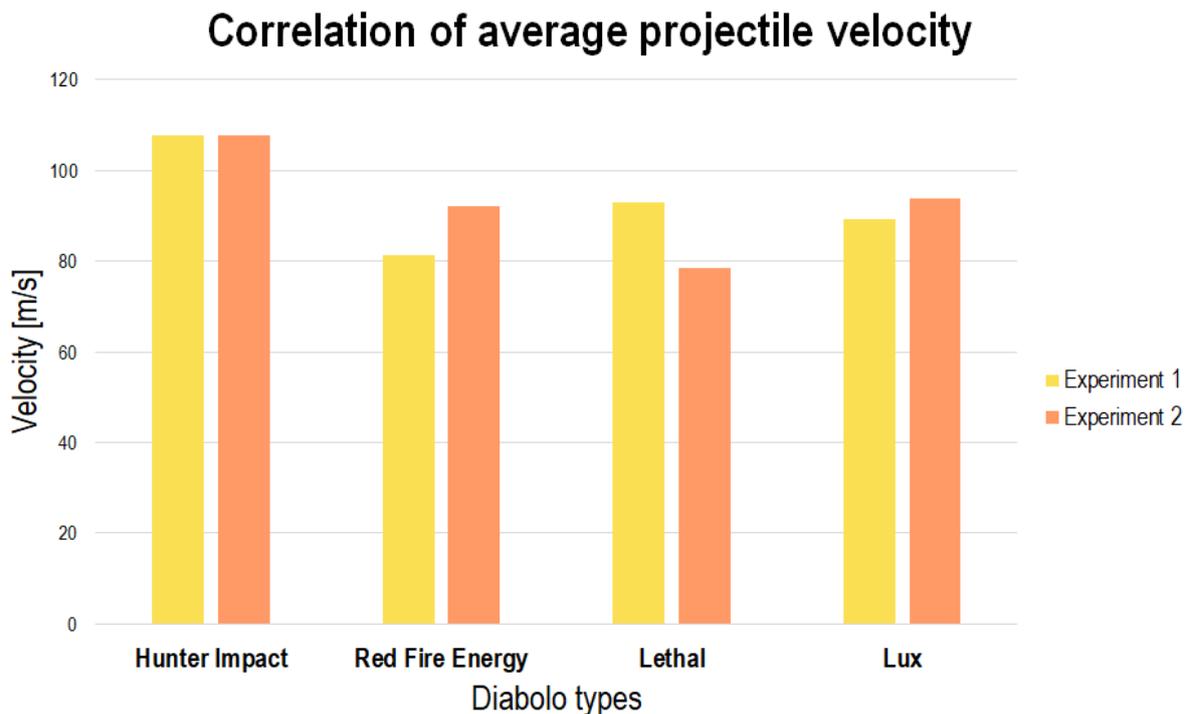
## Depth of incomplete penetration

**Table 4.** Results of Depth of incomplete penetration

	Hunter Impact	Red Fire Energy	Lethal	Diabolo Lux
Min	21.61 mm	9.83 mm	7.97 mm	18.41 mm
Max	30.89 mm	14.29 mm	10.93 mm	22.16 mm
Average	25.70 mm	12.01 mm	9.89 mm	20.30 mm
Standard deviation	3.53 mm	2.00 mm	1.20 mm	1.33 mm

The depth of incomplete penetration in the alternative plastic material (modelling mass) with a density of 1,742 kg/m<sup>3</sup> (Table 4) behaved differently than in the second alternative material (ballistic gel), which had a density of 1,055 kg/m<sup>3</sup> and was cooled to 7 °C. This ballistic gel was not blended with a standard concentration of 10% or 20% but had a concentration of 16.78 % to bring the soft tissues of the human body as close as possible. The soft tissue of the human body corresponds to a density of approximately 1,100 kg/m<sup>3</sup> (Juricek, Matenko and Vojtechovska). Alternative plastic material (modelling mass) corresponds rather to density of bones in the human body. Human bones have a density of about 1,650 kg/m<sup>3</sup>. During the experiment of the depth of incomplete penetration into the alternative plastic material, the temperature of 26.9 °C in the laboratory had an important role because it passed a part of its temperature to an alternative plastic material. Due to this, the modeling mass became more plastic and diabolo pellets went deeper into this alternative material.

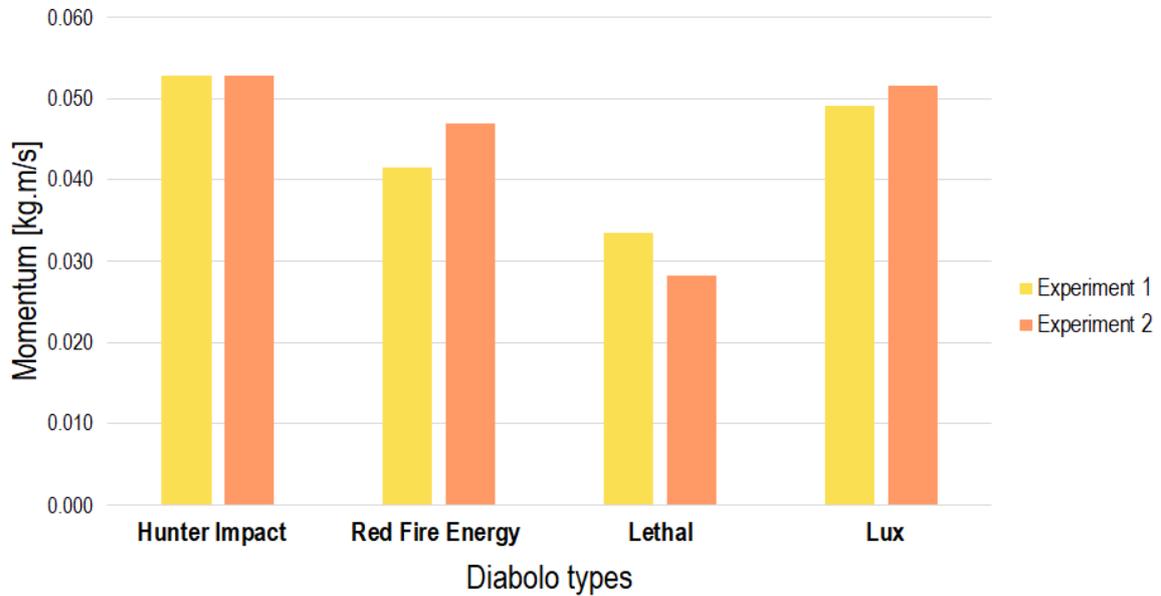
Correlating the results from the previous measurement on the ballistic gel, the results are shown in graphs for better clarity.



**Graph 1.** Correlation of average projectile velocity

As can be seen in graph (Graph 1), the diabolo Hunter Impact had the same speed in the previous measurement as in this. For other diabolo pellets, the average velocity values were more or less different. This is due to the fact that all diabolo pellets do not have the exact value and they move within certain tolerances.

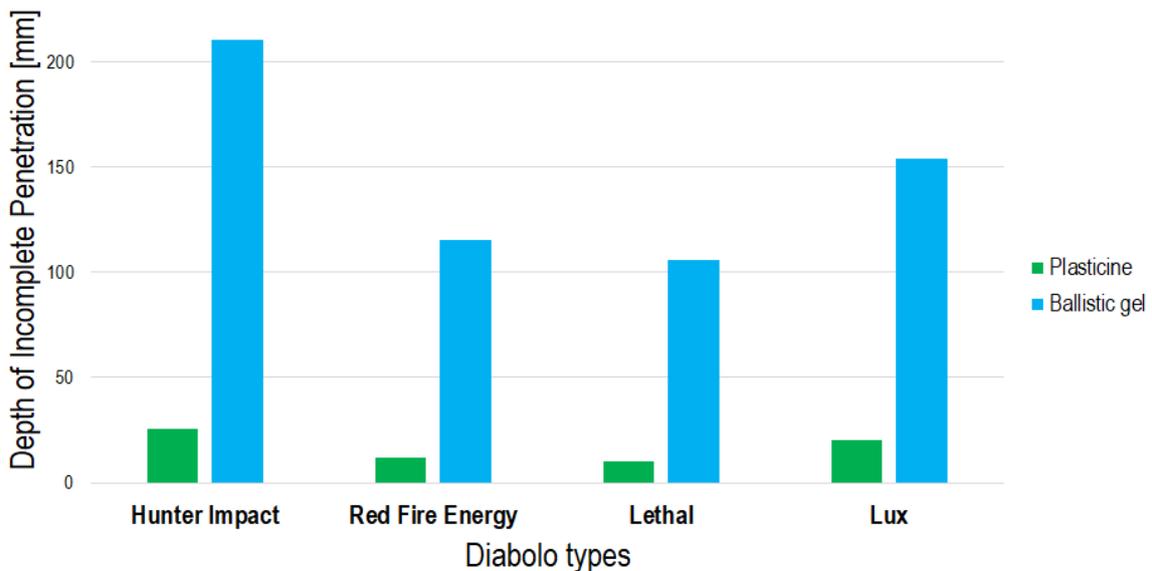
## Correlation of the average momentums of the diabolo pellets



**Graph 2.** Correlation of the average momentums of the diabolo pellets

The following graph (Graph 2) builds on the previous one, where the momentum is derived from the velocity of the individual diabolo pellets and their weights. Although the diabolo Lethal is similar in velocity to the diabolo Red Fire Energy, its momentum is much smaller because it is lighter. On the other hand, the diabolo Lux has the highest weight and therefore it can cope with its momentum to the diabolo Hunter Impact.

## Correlation of average depth of incomplete penetration of diabolo pellets



**Graph 3.** Correlation of average depth of incomplete penetration of diabolo pellets

The final correlation graph (Graph 3) shows the difference of used alternative materials. The first was an alternative plastic material - plasticine and the second was a ballistic gel. As was previously mentioned, the density

of plasticine corresponds more to the density of human bones; therefore, the depth of incomplete penetration to this alternative material is small. On the contrary, the ballistic gel is very close to human tissue. Because of this, the depth of incomplete penetration is so great.

## CONCLUSIONS

Within the course of forensic science at the Faculty of Applied Informatics at Tomas Bata University in Zlín, students get acquainted with shooting weapons. Used shooting weapons are safe at manipulation. These are weapons of category D which are, according to Czech law 119/2002 Coll., freely sold from 18 years of age in the Czech Republic. The weapons of category D do not have the same penetration as weapons of category A, B or C; even though, they have enough power to cause relatively serious gunshot injuries. Laboratory task in forensic science is fun to students because it is practical thing that students test and see practical results. Then, they realize that no shooting weapon is a toy and must be treated safely. The same applies to the other means that do not appear to be weapons at first sight, but serve to prepare lunches (knives, scissors) or as the means of transport (cars). Once things are used according to security rules, these things are useful and not dangerous. Due to the knowledge gained from the results of the laboratory task, the students are able to compare and to investigate the differences between the individual alternative materials and to apply them independently.

## ACKNOWLEDGMENT

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# Developing A Country Reputation Measurement Scale for Higher Education: The Case of North Cyprus

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## ABSTRACT

A growing education systems and increased competition amongst countries resulting from globalisation create enormous pressure amongst higher education institutions. It is critical for the administrators of higher education institutions to understand factors influencing students' perceptions since it is acknowledged in the literature that the reputation of the countries affects students' choice of higher education institutions. Therefore, the aim of this study is to understand the factors affecting the choice of students studying in North Cyprus universities and to develop a scale to measure Country Reputation for Higher Education. 11 focus groups were conducted with 71 students and a twenty item "Country Reputation for Higher Education measurement scale for higher education" is developed to be tested in a further research. Our findings can be used both by the educational institutions and the government officials to understand the factors important on the choice of students studying in North Cyprus and to make necessary improvements according to the findings of this research.

**Keywords:** Higher Education, Education Administration, Country Reputation for Higher Education Measurement.

## INTRODUCTION

Increased competition between countries (Kerr, 2006) especially due to globalisation, has given extra importance to education. In 2007, there were over 2.8 million international students (UNESCO, 2009) and this figure is expected to increase to 25 million by 2025 (Bohm *et al.*, 2002). These figures indicate a growing education market which creates fierce competition within the international education industry (Lawley and Perry, 1998; Kemp, 2005).

Higher education within the goods-service continuum is at the pure service end (Harvey and Busher, 1996; Patterson *et al.*, 1998; Srikatanyoo and Gnoth, 2002) which makes it difficult for a clear pre-purchase evaluation especially for the overseas students. The reputation of the provider therefore plays an important role in the decision-making process of the service purchaser (Bourke, 2000). Studies suggest that students opting to study overseas tend to choose a country first and then select an institution second (Bourke, 2000; Mazzarol and Soutar, 2002; Srikatanyoo and Gnoth, 2002). Moreover, both in Bourke's (2000) and in Srikatanyoo and Gnoth's, (2002) studies, it is found that countries' good reputation for higher education have a positive effect on prospective students' perception of their higher education institutions. Toros (2017) also found in her recent research that despite of many similarities, a measurement tool comprising aspects of country reputation for higher education is important to be used instead of a general country reputation measurement to understand the perceptions of students towards the higher education provided in a country.

On the other hand, push and pull theory (McMahon, 1992) is one of the most popular theory in the discussions of understanding the reasons international students choose to study overseas rather than their home country (Sanghyeop *et al.*, 2017)

North Cyprus is the Turkish part of a divided island which is recognised by only Turkey and this internationally unrecognized country is exposed to much negative publicity. The main source of this negative exposure is the Republic of Cyprus with which it has had a ceasefire since 1974. Since then, the main political objective of the Greek Cypriot authorities has been to prevent any normalisation of the regime in the north. Especially since the establishment of the Turkish Republic of Northern Cyprus (TRNC) state in 1983, aggressive measures have

assiduously been applied by the Greek Cypriot authorities to block Turkish Cypriots from participating any international events.

These efforts have been effective in the international arena, spreading negative perceptions to other countries leading to the rejection of any official existence of the TRNC. However, despite of all these discouraging engagements, North Cyprus currently has 15 universities and 93,292 students, 85% of whom are non-Cypriots (State Planning Organisation of the TRNC, 2017). Moreover, further growth is expected in the number of universities in North Cyprus.

Higher education therefore can be said that is one of the most predominant businesses on the island and it has a priority in North Cyprus' economy. Hence, it is crucial for both the government and institution authorities to understand how to manage the reputation of higher education in the TRNC. In order to manage reputation, it is necessary to measure it, which is why it is very important to know how to do so. Given the facts above, the purpose of this research is twofold. Firstly, it aims to understand the factors which affect the decisions of students' choice to study in North Cyprus. It is important for the university managers and country officials to know if there are some country specific factors being effective on the choice of students studying in North Cyprus to make necessary adjustments both in their policies and resources. Secondly, the purpose of this study is to develop a measurement scale for the country reputation in the context of higher education in North Cyprus which is essential in managing the reputation of higher education of North Cyprus.

As indicated earlier, higher education within the goods-service continuum is at the pure service end (Harvey and Busher, 1996; Patterson *et al.*, 1998; Srikatanyoo and Gnoth, 2002), since many of its key quality aspects are intangible such as the way materials are covered, the instructors' teaching methods, and communication with students. Therefore, the quality of higher education can vary according to the students, lecturer, class, and year (Owlia and Spinwall, 1996; Patterson *et al.*, 1998; Cubillo *et al.*, 2006). As Cubillo *et al.* (2006) points out, much of the education marketing literature focuses on institutions (Qureshi, 1995; Lin, 1997; Mazzarol, 1998; Ivy, 2001; Soutar and Turner, 2002; Price *et al.*, 2003) and ignores other factors like the influence of the country itself on the choice of students. For this reason, some research indicates the reputation of the institution as the key factor swaying the student's decision (Pimpa, 2003; Chen, 2007). However, there are some other research findings which point to the reputation of a country as the most important factor (Bourke, 2000; Mazzarol and Soutar, 2002), and one which is frequently used to signal quality (Sapir and Winter, 1994). In either case, the reputation of higher education – whatever the education marketing literature focuses on – is an important aspect in the international trade of services and it is affected by the reputation of countries (Bourke, 2000; Srikatanyoo and Gnoth, 2002).

Many researchers directed their research on exploring the reasons international students choose to study overseas rather than their home country. McMahon (1992) was the first scholar who proposed the push and pull theory to explain the flow of students from eighteen developing countries to the world and to the United States during the 1960s and 1970s. In a later study similar to McMahon, Altbach (1998) used pushed and pull theory and he indicated that some students were pushed by the existence of unpleasant conditions in their home countries, while others were pulled by other opportunities, such as scholarships provided by their host countries' governments. As pointed out by Li and Bray (2007) student mobility in higher education is now viewed "less as aid and more as trade" since many students are now looking for their higher education outside their countries without the sponsorship of their governments. This, in turn, has changed the role of governments from direct sponsors of students into regulators and facilitators.

The factors of a country which draw international students, considered as "pull factors" of a country, are mainly explained by the host country's economic wealth. Moreover, other factors attracting international students are the cultural and economic links between the host and home country (McMahon, 1992); the international recognition / reputation of the host country; ease of immigration procedures and university entrance for foreign students (Binsardi and Ekwulugo, 2003; Maringe and Carter, 2007), advanced research facilities; congenial socio-economic and political environments and the internationality of the classmates (Li and Bray, 2007), improve employment prospects; experience different culture; improve English; quality of education; reputation of university; quality and content of programme and rankings (Wilkins and Huisman, 2011a).

The unfavourable factors of a country which drive students out of their own countries are called “push factors”. The slow economic growth of the home country (Lee and Tan, 1984; Agarwal and Winkler, 1985; McMahon, 1992) which limits the opportunities in students’ home countries (Wilkins et al., 2012), limited science or technology base programmes, perception of the poorer quality of higher education in the home country are some of the most common push factors mentioned in the literature. For such students, constrained by circumstance to search elsewhere for higher education, the commonality of the language and geographic proximity of the host country (Mazzarol and Soutar, 2002) are important factors in encouraging students to study away from their home countries. It is important to note that the push factors of a country create a generalised desire and interest in overseas education, but do not give a specific direction to students. On the other hand, pull factors are specific to potential host countries and institutions (Davis, 1995). For that reason, it can be concluded that reputation of a country as much as that of the institutions themselves can play a key role in students’ decision making in relation to the choice of their host country for higher education.

## **METHODOLOGY**

This section includes the model of research, working group, data collection and explanations on the data analysis.

### **METHOD**

Focus groups are decided to be used in this qualitative research to gain a comprehensive view on two issues. Firstly, it was done to understand the reasons behind the students’ choice of a country for higher education to find out which push and pull factors are effective on their decision to study in North Cyprus and secondly, it aimed to clarify the meaning of solid country reputation for education, so that reputation measurement tool could be developed for North Cyprus’ higher education reputation.

### **WORKING GROUP**

This study is limited with the universities in North Cyprus includes Turkish, Turkish Cypriot and international students, the original plan was to conduct two groups in the most populated six universities; one with Turkish and Turkish Cypriot students and the other with international students. 11 focus groups were conducted with 71 students and a twenty item “reputation measurement scale for higher education” is developed to be tested in a further research. The former group discussions were held in Turkish and the latter were held in English. This was the case for all the universities except the North Cyprus Campus of the Middle East Technical University. As the number of international students was very limited in this university there was only one focus group organised with Turkish students only. Many students were unwilling to spend valuable time participating in any research, and for this reason, convenience sampling was used. However, a compilation of differing profiles of students from each university was completed (see Table 1) which was important for the collection of diversified ideas. The main target for the focus groups was to gather a minimum of 6 and a maximum of 8 students, as the recommended number in a group would seem to be 6-8 people in general (MacIntosh, 1993).

### **DATA COLLECTION TOOL**

In the qualitative research approach, in order to collect data generally the depth interview (face to face interview), direct observation and document analysis technics are used (Legard , Keegan and Ward, 2003). The data of this research has been gathered through “face to face interview technique” which is generally preferred in qualitative research approach providing the possibility of deeply understanding the views of the participants about the matter and which cannot be observed directly by other data collection tools. The depth or face to face interviews have some major advantages like having a high response rate, providing flexibility on the order of questions, ensuring control possibility on the environment and giving deep information about the subject that is researched (Yıldırım and Şimşek, 2011). This method is a source of many dimensions such as the reasons forming the basis of response of the participants, emotions, thoughts and beliefs (Legard, Keegan and Ward, 2003).

**Table 1. Demographics of the Focus Groups**

University	Gender	Age	Nationality for International Students / Cities for Turkish Students	Major
EMU (international Group)	2 Female 4 Male	23, 31, 27, 22, 23, 29	Azerbaijan, 2 from Iran, 2 from Nigeria, Tajikistan	MS student in Economics, 3 PhD students in Economics, 2 Master students in Banking and Finance
EMU (Turkish Group)	2 Female 6 Male	23, 22, 24, 23, 19,19, 22,25	Ankara, İstanbul, Uşak, Mersin, Denizli, İzmir, Konya, Famagusta	3 BS students in PR, 1 BS students in Journalism, 1 BS student in Business Administration, 1 BS student in Political Science, 1 MS student in Architecture, 1 BS student in International Relations
CIU (International Group)	2 Female 4 Male	23, 23, 23, 24,14,24	3 students from Nigeria, 1 Pakistan, 1 Zimbawe, 1 Iran	All BA Tourism and Hospitality Management students
CIU (Turkish Group)	1 Female 5 Male	21, 21, 24, 24, 25, 26	Elazığ, Ankara, İstanbul, Samsun, Mersin, Tekirdağ, Famagusta	All BA Tourism and Hospitality Management students
EUL (International Group)	2 Female 4 Male	23, 29, 24,25,21,25	3 from Nigeria, 3 from Pakistan	3 BS students in PR, 3 BS students in Civil Engineering,
EUL (Turkish Group)	3 Female 3 Male	22,22, 23, 24, 25, 25,	İstanbul, Diyarbakır, Ağrı, Giresun, Zonguldak, Rize	3 BS students in Architecture, 3 BS students in PR
NEU (International Group)	2 Female 4 Male	17, 19, 19, 22, 22, 27	2 from Iran, 2 from Saudi Arabia, 2 from Nigeria	3 BS students in Architecture, 3 BS student in Economics
NEU (Turkish Group)	2 Female 4 Male	21,21,22,20,24,25	İzmir, Adıyaman, Ankara, Adana, İstanbul, Antalya	All BS students in Interior Design
GAU (International Group)	5 Female 2 Male	18, 19, 20, 22, 22, 26, 26	Russia, 2 students from Belarus, Kyrgyzistan, Nigeria, Sudan	2 BS in Banking and Finance, 3 BS in International Management, IT, Marketing
GAU (Turkish Group)	2 Female 4 Male	21, 21, 21, 24, 25, 25	2 from Kyrenia, Samsun, 2 from Istanbul, Giresun	All BS students in Business
METU-MCC (Turkish Group)	3 Female 4 Male	20, 21, 21, 21, 22, 23, 23	3 from Izmir, Istanbul, Ankara, Mersin, Uşak	2 BS students in Civil Engineering, 2 BS students in Psychology, 2 BS students in English Teaching, 1 Business student

The first two questions were designed to clarify the initial objective of the research, which was to understand the reasons why students chose to study abroad. The last question was prepared to design reputation scale for the country reputation for higher of North Cyprus.

The first question, “why study abroad?” was asked to understand why students chose to study abroad. This was an important question to understand the push factors which aimed to identify any unfavourable factors in the students’ home countries which were driving them abroad.

The second question, “once you had decided to go abroad, how you chose which country” was designed to understand the pull factors; thus, the rationale behind the students’ choice of country which mainly highlighted the attractive factors in the host country.

The third question “what are the important factors to establish a solid country reputation for education?” was to elucidate the factors in a solid country reputation for higher education.

## **DATA ANALYSIS**

The answers given for each question according to the views of the interviewed participants were categorized separately and put in the tables. After this first categorization, data was examined again by the researcher and the basic themes and categories were formed. The themes and categories that are determined have been observed again by taking into consideration the related literature and the categories having similar patterns have been unified and the different ones were coded by being gathered in another category. After the interview form was applied in the research, the data obtained from the answers of the questions in interview form were resolved by content analysis (Yıldırım et al., 2011).

## **FINDINGS**

In this section, the data collected through data collection tools are analysed and the results are interpreted accordingly.

### **1. Push and Pull Factors**

In all the Turkish groups, the challenge of the university entrance examination (OSS) in Turkey was indicated as their main reason for studying in North Cyprus. OSS is the University Entrance Examination in Turkey administered by OSYM (Student Selection and Placement Centre). This examination is the only way to obtain a place in a university within the Turkish education system. North Cyprus universities are a part of this system, but they require lower OSS scores for acceptance as do many other private universities in Turkey. Consequently, many Turkish students studying currently in North Cyprus are there not because they want to study abroad but because of their exam results, with the exception of students studying at the North Cyprus Campus of the Middle East Technical University. These students could have studied in relatively good universities in Turkey; however, they wanted to have a degree from a well-known university which was the main reason for their choice of North Cyprus.

Some students from Nigeria and Iran also pointed out that the challenging university entrance exams in their own countries were their main reason for choosing to study abroad.

Many of the international student groups emphasised the importance of being exposed to different cultures and having the opportunity to develop international perspectives. This parallels the findings for the pull factors in the literature. Another very common reason for studying abroad amongst international students was the push factors within their home countries. Limited university facilities, being unable to take their courses in the English language, disruption in education due to political instability, were the main reasons raised for not choosing an education in their home countries. A few of both international and Turkish students pointed out the lack of a democratic environment as the main factor for looking at higher education opportunities abroad.

Another very popular reason for international students to study abroad was the respect given to foreign education by their home countries. Some emphasised the fact that foreign education enhances their career opportunities. However, since most of the Turkish students did not consider Cyprus as a foreign country, the intention to study abroad did not really exist for most of them. Thus, the responses of the international students were of a greater variety than those of the Turkish students. Yet many Turkish students indicated that North Cyprus universities did not have a positive image in Turkey.

Four Turkish Cypriot students participated in three of the Turkish focus groups (see Table 2) to explain why they preferred to study in their home country rather than abroad. The main reasons were found to be twofold: firstly, Turkish Cypriot students did not need to take an entrance examination at some Cypriot universities and secondly, some students were reluctant to study abroad and live by themselves.

The last topic to be discussed was what factors a country needed to have a solid reputation for higher education. The most emphatic answers among focus groups were a high standard of education, together with the opportunity it provides for its graduates. Parallel to a high standard of education, the second most frequently given answer was the quality of the education especially in universities, which accorded with the literature.

Some students needed to be reminded that the question was specific to a country rather than universities since some of them started to divert the conversation toward the universities in which they studied. “Quality of educators”, “democracy of the country”, “and the number of successful graduates” and “the use of high technology” were other frequently given answers. “Social life provided for students”, “the level of government investment in education” and “flexibility in giving permission to students to work while they study” were responses that were given in three groups. Two of the focus groups mentioned “safety”, “literacy rate”, “accommodation”, “provision of good facilities” and “reasonableness of fees”. In only one group, was leadership of the country associated with a strong higher education reputation of a country (see Table 2).

**Table 2. Summary of the Focus Group Results**

<b>Why study abroad (push factors)</b>	<b>How country choice is given (pull factors)</b>	<b>Factors for solid country reputation for education</b>
Challenging university entrance exams in the home country (7) - OSS exam in Turkey - Nigeria entrance exam - Iran entrance exam Desire to be exposed to different cultures / develop international perspective(4) Push factors of home country (4) - Limited facilities - No English education - Interruption in education due to political instability - No democratic environment More respected to get a degree abroad (3) - Indicated by students from Nigeria and Sudan -Easier to find a job Develop language (2) Hesitation to be exposed to a totally new culture (2)	Tuition fees (6) Other alternatives’ living expenditures are higher (5) Visa requirement (5) - Students from Iran and Nigeria indicated that it is harder to get visa for UK, USA and Australia Similarity of the culture (4) Teaching language being in English (4) Accredited by YOK (3) Safe environment (3) Scholarship (2) Offered programs (2) A friend or family member studying in N. Cyprus (2)	Provides worldwide opportunities to graduates (9) High standard of education in the country (9) - Balance of standard among universities - High standards in every level of education - Offering contemporary education - Real-life teaching - Guiding students towards their skills - Stable politics on education - Accredited by other countries Quality of education offered in universities (7) - Ranking of the universities - Accreditations of the universities Quality of the educators (4) Democratic country (4) Successful graduates / alumni (4) High technology (4) Social life of students (3) Investment in education (3) Gives permission to work while study (3) Safe (2) Literacy rate of the country (2) Accomodation (2) Good facilities provided to students (2) Reasonable fees (2) Leadership of the country (1)

Note: Numbers on the side of the focus group findings indicate total number of responses

## **2. Scale Development for Country Reputation for Higher Education**

The results of the focus groups revealed similarities with the modified RQ known as the Country Reputation Index (CRI) of Passow *et al.* (2005) and the country reputation scale of Yang *et al.* (2008).

Since there was no indication of either social or emotional appeal in the focus groups, these two facets were omitted from the scale (see Table 4). On the other hand, all the components in the physical and cultural appeals were maintained. Only one component of the leadership appeal (has charismatic leaders) was kept in the new scale since this was similar to the findings in both the literature and the focus groups, and one component of the political appeal (is a democratic country) was included and combined under the facet name of “management appeal” since both these factors are related to the management of a country. Financial appeal as a heading was kept, but the components were modified according to the financial aspects of higher education based on the findings in the focus groups and the literature review. A new facet, the quality of higher education appeal, was added which was the main facet in the scale directly related to higher education (see Table 3).

The results obtained from the focus groups were coded together with one marketing academician. Since there was more than one researcher coding the results of the focus groups, inter-coder reliability was applied by using percent agreement. Inter-coder reliability is an important step to ensure the reliability of the research and it measures “*the extent to which different judges tend to assign the same rating to each object*” (Tinsley and Weiss, 2000). Percent agreement method, “*is the percentage of all coding decisions made by pairs of coders on which the coders agree*” (Lombard *et al.*, 2002) and it is an easy way to calculate the coder reliability. A high inter-coder reliability of 0.90 was obtained and later two PhD students along with one marketing academic were asked to assess the readability of the items.

**Table 3. Comparison of the Focus Group Findings of the Country Reputation for Higher Education Scale with the Adapted Country Reputation Scales and the Literature**

Adapted Instrument of RQ Fombrun-RI Country Reputation Index (Passow <i>et al.</i> , 2005)	Adapted Instrument of CRI (Yang <i>et al.</i> , 2008)	Developed Country Reputation for Higher Education Facets	Focus Groups Findings	Literature Findings on Country Choice of International Students
N/A	N/A	<b>Quality of Higher Education</b>	High standard of education in the country (9) Balance of standard among universities High standards in every level of education Offering contemporary education Real-life teaching Guiding students towards their skills Stable politics on education Accredited by other countries Quality of education offered in universities (7) Ranking of the universities Accreditations of the universities Quality of the educators (4) Successful graduates / alumni (4) Safety of the place (2) Literacy rate of the country (2) Good facilities provided to students (2) Accommodation (2)	Education standards of the country (Binsardi and Ekwulugo, 2003) Recognition of host's qualifications in the home country (Mazzarol, 1996; Mazzarol <i>et al.</i> , 1997; Cubillo <i>et al.</i> , 2006) Staff expertise (Lin, 1997; Mazzarol, 1988; Soutar and Turner, 2002) Safety (Lawley and Perry, 1998)
<b>Physical Appeal</b> (Country) is a beautiful place (Country) has well-educated residents (Country) has a good infrastructure of roads, housing, services, health care, and communications	<b>Physical Appeal</b> (Country) is a beautiful place (Country) has a good infrastructure of roads, housing, infrastructure of roads, housing, services, health care, and communications (Country) is a safe place	<b>Physical Appeal</b>		

Adapted Instrument of RQ Fombrun-RI Country Reputation Index (Passow <i>et al.</i> , 2005)	Adapted Instrument of CRI (Yang <i>et al.</i> , 2008)	Developed Country Reputation for Higher Education Facets	Focus Groups Findings	Literature Findings on Country Choice of International Students
<p><b>Financial Appeal</b>            (Country) is an inviting place to do business            (Country) has a well-developed industrial sector            (Country) is a low tax country            (Country) is a safe place in which to invest</p>	<p><b>Financial Appeal</b>            (Country) is an inviting place to do business            (Country) has a well-developed industrial sector            (Country) maintains a stable economic environment</p>	<b>Financial Appeal</b>	<p>Provides worldwide opportunities to graduates (Job opportunities it possesses) (5)            Gives permission to work while study (4)            Reasonable fees (2)</p>	<p>Ease of finding employment (Cant, 2004)</p>
<p><b>Leadership Appeal</b>            (Country) has charismatic leaders            (Country) communicates an appealing vision of the country            (Country) is well-managed            (Country) upholds international laws</p>	<p><b>Leadership Appeal</b>            (Country) has charismatic leaders            (Country) communicates an appealing vision of the country</p>		<p>Leadership of the country (1)</p>	<p>N/A</p>
	<p><b>Political Appeal</b>            (Country) maintains good international relations            (Country) is a democratic country            (Country) maintains a stable political environment</p>	<b>Management Appeal</b>	<p>Democratic country (4)</p>	<p>N/A</p>

Adapted Instrument of RQ Fombrun-RI Country Reputation Index (Passow <i>et al.</i> , 2005)	Adapted Instrument of CRI (Yang <i>et al.</i> , 2008)	Developed Country Reputation for Higher Education Facets	Focus Groups Findings	Literature Findings on Country Choice of International Students
<b>Cultural Appeal</b> (Country) is socially and culturally diverse (Country) has a rich historical past (Country) offers enjoyable entertainment activities	<b>Cultural Appeal</b> (Country) has a rich historical past (Country) has distinct culture (Country) has an appealing culture	<b>Cultural Appeal</b>	Social life of students (3) Internationality (2) Historical attractions (1)	Culture (McMahon, 1992; Binsardi and Ekwulugo, 2003; Cubillo <i>et al.</i> , 2006)
<b>Social Appeal</b> (Country) supports good causes (Country) is a responsible member of the global community (Country) supports responsible environmental policies	<b>Global Appeal</b> (Country) supports good causes (Country) is a responsible member of the global community (Country) supports responsible environmental policies	N/A	N/A	N/A
<b>Emotional Appeal</b> I respect (country) I like (country) I trust (country)	<b>Emotional Appeal</b> I like (country) I trust (country)	N/A	N/A	N/A

As can be seen from Table 4, the country reputation for higher education scale is developed with five different appeals.

**Table 4. Scale Developed for the Country Reputation for Higher Education**

**Physical Appeal**

North Cyprus has well-educated residents

North Cyprus has a good infrastructure of roads, housing, services, health care and communications

North Cyprus is a safe place

North Cyprus provides satisfactory accommodation facilities for students

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**Financial Appeal**

North Cyprus provides worldwide opportunities for graduates

North Cyprus universities have reasonable fees

North Cyprus gives permission to work while studying

**Management Appeal**

North Cyprus is a democratic country

North Cyprus has charismatic leaders

**Cultural Appeal**

North Cyprus is socially and culturally diverse

North Cyprus has a rich historical past

North Cyprus offers enjoyable entertainment activities

**Quality of Higher Education Appeal**

North Cyprus universities have high rankings

North Cyprus universities have recognised qualifications

North Cyprus universities have qualified educators

North Cyprus universities have a balance of standards among universities

North Cyprus has high educational standards

North Cyprus offers contemporary education

North Cyprus has a clear policy on education

North Cyprus has successful graduates / alumni

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## CONCLUSION

In summation, it appears that there are some North Cyprus specific factors being effective on the decision making of overseas students. One of the main pull factors which is North Cyprus specific is the university entrance examination. Turkish students need to take the University Entrance Examination in Turkey administered by OSYM. Since this examination is the only way to obtain a place in a university within the Turkish education system and North Cyprus universities are a part of this system, those Turkish students who scores lower points choose to study in North Cyprus instead of re-taking the entrance exam for acceptance. Hence, the main reason of choosing North Cyprus is not the quality of the education or the reputation of the country's higher education but Turkish students' need for a placement to a university. Of course this is not a sustainable reason to attract students especially after the significant increase in the number of private universities in Turkey. On the other hand, overseas students who are not Turkish stated the cost of living and easier visa procedures for favouring North Cyprus over other destinations. Again, increasing number of private universities in Turkey is a big threat for North Cyprus since they started to accept more international students. Moreover, work opportunities after graduation is superior in Turkey which can be effective in international students' choice of place for university since many of them indicated high intentions not to go back to their home countries.

It is very important for the officials to focus on the pull factors indicated by overseas students which can provide competitive advantages over other countries. One of the most important one is the tuition fee policy of the universities which is significantly lower than Turkish private universities and the other important factor is the teaching language of the universities which is mainly English.

It is important to acknowledge that focus group findings on the solid reputation for country reputation for higher education are in accordance with the literature findings of country choice of international students. A high standard of education, together with the opportunity provided for graduates are the main associations for the higher education reputation.

The scale developed for higher education reputation has shown that quality for higher education is the primary facet in this scale. Therefore, it is strategically very crucial for the policy makers to ensure that high standard of education is provided by the universities in order to increase the country reputation of the country in higher education. This is the only way to sustain its potential within the growing regional and international competition.

As a last note, the developed scale needs to be tested to see if it can be a generic tool to be used in the evaluation of a country's reputation for Higher Education.

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## **Development and Validation of Guidance Module for Children in Prison: A Study at Kajang Women's Prison, Malaysia**

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### **ABSTRACT**

In Kajang Women's Prison in Malaysia, there are some inmates who have children, those who were either born while their mothers were in detention or were still small and lactating when their mothers were detained. These children are allowed to stay with their mothers in the prison until they reach the age of 3 years. After the age of 3, they will be sent to their families to be raised if their mothers are still serving the remaining sentence. Preliminary studies regarding children's upbringing while in prison found that the prison authorities would merely use the general module for children supplied by the Social Welfare Department. There is no specific module designed for children's education in prison. Due to this void, a draft module (10 sub-modules and 42 sessions) has been developed based on 'A Study on Requirement & Development of Guidance Module for the Children of Inmates at Kajang Women's Prison' and the module was tested on study 'Validation and Implementation of Guidance Module for Children of Inmates'. The objectives of these two studies are to develop a specific module for the guidance of children in prison, and to test the validity and suitability of the module for implementation by taking into account the appropriate circumstances and situations in the prison. It is developed based on interviews with child guidance experts, prison officers, and round-table discussions attended by health experts and those related to children's guidance in general. It also involves the use of questionnaires. This module was examined to gauge its validity and suitability, and tested on twenty-one (21) inmates who had children, either living with them in prison or outside. The module is found to be suitable and is acknowledged as appropriate for use by the respondents since the mean score of their understanding was increased exceeding 4 at the end of the study. This module is able to fulfill the need to provide specific guidance to inmates who have children, living inside or outside of prison.

### **INTRODUCTION**

In Kajang Women's Prison, there are some prisoners with children, who were born in prison or were still small or lactating when their mothers were detained. These children are allowed to stay in prison with their mothers,

from birth until the age of three years. After age three, they will be raised by their families if their mothers are still serving sentence. However, mothers may appeal to the Prison Department of Malaysia for permission to keep their children with them in prison until age four years. There are only between 5-10 children in Kajang Women's Prison at any one time (depending on the mothers' sentence duration). The children are placed in a daytime special childcare unit, and will spend nighttime with their mothers in the detention cells. In the daytime, the mothers will attend skill workshops available in the prison. The children will be looked after by other prisoners supervised by a nursery teacher/governess from among female prison wardens trained from time to time. In addition, many children of women prisoners are raised outside the prison by their families. Some of them also have their fathers serving time in prison or rehabilitation centres. Psychologically, these children may be susceptible to emotional or mood disorders due to imprisonment of their parents or mothers.

Research on the Guidance Module for Children of Women Prisoners is based on reading and improvements on past studies conducted. Rachel Taylor (2004) in *Women in Prison and Children of Imprisoned Mothers* discussed babies and children who are brought to live with their mothers in prison. She emphasized on issues such as adequate facilities to ensure that babies thrive physically, mentally and emotionally as well as to socialize with other children. Even though childcare centres (nursery) are available in prisons, the number is still small and not very practical. Furthermore, there is also question of how long or up to which age the children should be allowed to stay in prison. When the children reach the age which requires them to leave the prison, how will the mother and child cope with the situation and what is the effect to their well-being. Marlene Alejos (2005) in her study, *Babies and Small Children Residing in Prisons*, found that children were affected when their mothers lost their freedom because they were also in detention with their mothers. A few number of children were born when their mothers were in detention. In addition to that, Oliver Robertson (2007) explained in *The Impact of Parental Imprisonment on Children*, that children were affected by their parents' imprisonment, before, during and after incarceration. The effects may be perceived in terms of behaviour, health, relations, emotions, education and so on. His study also found that children of incarcerated parents has a tendency to be involved in future delinquency/criminal activities in future. Other studies conducted by Laurel Townhead's (2006) known as *Women in Prison & Children of Imprisoned Mothers*, discussed the status and rights of a prisoner's child within and outside the prison. This study stated that the child should be entitled to his rights. Patrick Yeagle (2010) in his study *Kids in Prison* held the opinion that children got involved in crime due to exposure to violence and the absence of a good role model. Thus, in order to change their mindset and make them productive, they need protection and a healthy environment to grow. A study by Lefkowitz et al. (1977) found that unawareness of parents to their children and lack of proper discipline are associated with juvenile delinquency such as theft, running away from home and fighting. Erroneous patterns of communication may trigger in-house problems and as a consequence it built the tendency for children to make bad behaviour. In addition, Prison Advice & Care Trust (2011) in research of *Protecting the Welfare of Children when a Parent is Imprisoned*, explained that about 17,700 children were separated from their imprisoned mothers annually. Further, only 5% of the children remain in their own homes after their mothers were detained and 9% were raised by their fathers throughout their mothers' absence. However, 40% of them were raised by their grandparents or relatives. At least a third (1/3) of women prisoners are single mothers. Jaana Wikgren (2011) in his study, *An Infant or a Small Child in Prison with a Parent- could a prison be a good place to raise a child?*, examined how far the facilities in prison provide a comfortable environment to children of prisoners. From the research found that such action of bringing a child into prison is the best alternative to teach and create awareness of inmates on how real life goes on.

In Malaysia, past studies conducted found that the prison authority used the general module for children provided by the Social Welfare Department or Jabatan Kebajikan Masyarakat (JKM). There was no specific educational module used for children in prison (Jawiah Dakir et al. 2011 – 2012). Thus, in order to realised it, a group of researchers drafted a module in Study on the Requirement and Development of Guidance Module for Children of Inmates at Kajang Women's Prison, (*Kajian Keperluan & Pembinaan Modul Bimbingan Untuk Anak-anak Banduan Penjara Wanita Kajang* with the code: KOMUNITI-2011-033) and Validation and Implementation of Guidance Module for Children of Inmates (*Menguji Kesahan dan Mengimplementasi Modul Bimbingan Anak-anak Banduan Penjara* with the code: KOMUNITI 2-2014-001). Research conducted by Jawiah Dakir et al. (2011-2012) resulted in a Guidance Module for Children in Kajang Women's Prison. This module contains 10 sub-modules/chapters and 42 sessions. The main purpose of the research is to develop a suitable module to be implemented in prison. The research was conducted over a period of two years. On completion of the module, another study was required to verify its validity before it can be implement officially in Women's Prison in Malaysia. Thus, the second important study is for validation of the module (Jawiah Dakir et al. 2005-2017). The main purpose of this study is to test the validity of the module, implement it and improve it.

## THE STUDY

**Development of Module:** The module was developed using quantitative and qualitative methods (mixed method). The survey method was the main method as well as round-table discussions among education experts. A total of 93 respondents from five prisons, that is, Kajang Prison, Sungai Udang Prison, Pokok Sena Prison,

Kluang Prison and Bentong Prison were involved. The main purpose is to determine their satisfaction from different angles while in prison.

**Testing Validity of Module:** A study to test the validity of the module developed were conducted for three (3) months beginning January until March 2017. A total of 21 inmates were drawn as sample in this study comprising of Malays, Chinese and Indians. This study were using purposive sampling method. A small sample size was taken as it only involved Malaysian inmates who were pregnant or who have ever been pregnant and have child inside or outside the prison. This is to ensure that the sample tested is relevant to the purpose of developing the module. The constraints in getting the sample size is because only 30% of the inmates in Kajang Women's Prison were Malaysians while 70% were non-citizens. According to the prison officers involved, only 3 out of 11 children in the nursery are Malaysian citizenship. During the process of testing the module, other constraints involved were lack of understanding of some inmates because of the difference in mother-tongue language used by the facilitator as well as illiteracy causing inability to fill up the evaluation forms. The method used is conducting guidance class to pregnant inmates or those who have children in or outside the prison. Classes were held two (2) to three (3) times weekly. The approach used in each class consisted of lectures, discussions, video presentations, simulations, problem-solving and question and answer. In addition, inmates were given evaluation forms before and after the module. There were twelve question asked to evaluate the inmates before going through the module and two more items were added in the evaluation after completion of the module. The items were evaluated according to Likert Scale, SDA = Strongly Disagree, DA = DisAgree, Ave = Average, A = Agree and SA =Strongly Agree.

## RESEARCH RESULTS

**Module construction:** This module provides guidance to inmates who are pregnant or who have children in and outside of prison. Inmates need guidance because a child's personality is shaped from the time it is still in the womb. In fact from the Islamic perspectives it should starts from the selection of life partner itself. Meanwhile, this module focuses guidance during the time of pregnancy and after birth until the age of three years. The module developed was named *Guidance Module for Children of Inmates in Prison*. It is emphasize on early exposure to pregnant inmates or those who have children, whether with them or raised by relatives outside the prison. The main purpose of developing the module is to expose the inmates to the importance of knowledge relating to pregnancy and various aspects of childcare. It starts from early, during and after pregnancy. In addition to that, the module also focused on personal care of the mother and baby/child.

**Module Content and Method of Implementation:** The Guidance Module constructed consists of 10 chapters /sub-modules and 42 sessions, as follows: i) Education for unborn child ii) Preparation for delivery iii) Mother's responsibility for self and child healthcare iv) Lactation/breast-feeding v) Baby's security in prison vi) Mother's security in prison vii) Newborn baby care and development (0-6 months) viii) Baby care and development (6-12 months) ix) Toddler care and development (1-2 years) x) Toddler care and development (2-3 years). It is suggested that the implementation of each session lasts 2 hours, and the total time of 100 hours for all modules and sessions. It is to be implemented in prison premises according to time scheduled proposed by the prison authority. The prison officer should be informed beforehand of any changes in activity, time, teaching aid etc. in order to comply with the objectives assigned for each session. There should be a flexible approach in implementing suggested activities and teaching aids uses which may be diversified. I can be depending on the creativity of the facilitator to make the session interesting and in compliance with prison regulations. The suggested time period of 2 hours may be divided according to suitability, without affecting the module contents. This likely modification is based on the time situation of inmates, who are constantly changing from time to time, as well as the current situation of the prison which has tight and controlled regulations.

**Testing Validity of Module and Respondent's Perception:** This module was tested for its validity for 3 months from January until March 2017. A number of 21 inmates selected by the prison authority. The respondents were selected among inmates who were pregnant or had children/babies who live inside or outside, or raised by family members outside the prison; who were not involved with serious crime; and were among Malay, Chinese and Indian inmates who showed motherly and loving characteristics towards their offspring. At the beginning and end of the validation test, evaluation forms were distributed to inmates to test their understanding of module contents. The process of testing was done in the form of class instruction and guidance by the researcher/fassilitator, once to thrice weekly. At the same time, the researcher played the role as guide, adviser and motivator to the inmates. Based on evaluation before implementing the module validity test, the mean score of respondents understanding was below 3.048 as shown in Table 1. It shows that respondents' understanding was low before attending the guidance module class on self and child healthcare before and during pregnancy as well as methods of nurturing and educating a child. However, for items S1, S2 dan S3, the percentage score for inmates for the scale Strongly DisAgree (SDA) is high, exceeding 50%. This score is appropriate as the question posed evaluates the respondents' understanding of the module content, objective and

methods of implementation before they attended the guidance module class. Thus the percentage score is very high, meaning the respondents did not understand the module contents, objectives and methods of implementation intended at the initial stage.

Table 1 Inmates' Understanding before Undergoing Guidance Module

Item	Frequency (%)					Mean
	SDA	DA	Ave	A	SA	
S1	15 (71.43%)	3 (14.29%)	1 (4.76%)	0	2 (9.52%)	1.619
S2	12 (57.14%)	3 (14.29%)	4 (19.05%)	0	2 (9.52%)	1.905
S3	12 (57.14%)	3 (14.29%)	5 (23.81%)	1 (4.76%)	0	1.762
S4	6 (28.57%)	2 (9.52%)	7 (33.33%)	2 (9.52%)	4 (19.05%)	2.810
S5	5 (23.81%)	2 (9.52%)	7 (33.33%)	3 (14.29%)	4 (19.05%)	2.952
S6	4 (19.05%)	2 (9.52%)	7 (33.33%)	5 (23.81%)	3 (14.29%)	3.048
S7	4 (19.05%)	1 (4.76%)	8 (38.10%)	7 (33.33%)	1 (4.76%)	3.000
S8	5 (23.81%)	4 (19.05%)	8 (38.10%)	2 (9.52%)	2 (9.52%)	2.619
S9	2 (9.52%)	2 (9.52%)	13 (61.90%)	4 (19.05%)	0	2.905
S10	5 (23.81%)	2 (9.52%)	5 (23.81%)	8 (38.10%)	1 (4.76%)	2.905
S11	4 (19.05%)	2 (9.52%)	7 (33.33%)	6 (28.57%)	2 (9.52%)	3.000
S12	4 (19.05%)	1 (4.76%)	7 (33.33%)	8 (38.10%)	1 (4.76%)	3.048

Further, upon completion of the entire Guidance Module, the results shows an increase of mean score exceeding 4 for each item evaluated as presented in Table 2. Two additional questions were inserted compared to twelve questions at the onset before the validation test. These items evaluated inmates' knowledge and understanding in managing her ownself and baby/child after undergoing the guidance module class. The increased mean score clearly shows that their understanding of self-management and baby/child care was improved after completing the module. Although the number of 21 inmates who underwent the module decreased to 15 at the end of the sessions, there was notably one inmate who became interested to follow the guidance class after she was invited by her fellow inmate. The decrease in number of attendees was due to transfer to other jails by the order of the prison authority. In addition, for item S12 which evaluates the importance of religious/spiritual values during pregnant and after delivery, there remain only one inmate whose understanding remained at average level (5.88%).

**Table 2 Inmates' Understanding After Undergoing Guidance Module**

Item	SDA	DA	Frequency (%)			Mean
			Ave	A	SA	
S1	0	0	0	5 (29.41%)	12 (70.59%)	4.706
S2	0	0	0	8 (47.06%)	9 (52.94%)	4.529
S3	0	0	1 (5.88%)	6 (35.29%)	10 (58.82%)	4.529
S4	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S5	0	0	0	4 (23.53%)	13 (76.47%)	4.765
S6	0	0	0	2 (11.76%)	15 (88.24%)	4.882
S7	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S8	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S9	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S10	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S11	0	0	0	5 (29.41%)	12 (70.59%)	4.706
S12	0	0	1 (5.88%)	2 (11.76%)	14 (82.35%)	4.765
S13	0	0	0	3 (17.64%)	14 (82.35%)	4.824
S14	0	0	0	3 (17.64%)	14 (82.35%)	4.824

## CONCLUSION

On the whole, the purpose of developing this module is to guide and impart knowledge to inmates on nurturing and educating their children while in prison. Additionally, its purpose is also to ensure that inmates may nurture or bring up their children properly, maintaining the bonding with their children and ensure that both mother and child get their rights to education in the form of systematic instruction, while serving time in detention.

All the above stated objectives may be achieved through perceiving the reaction and feedback of each inmate in every guidance class conducted. The majority of inmates show a good response toward module content when they were given the opportunity to share their personal experiences. Interestingly, one of the inmates succeeded in attracting her fellow inmate to join in the guidance class although initially the latter was not one of the respondents in the research sample. In the meantime, the two-way interactive approach used by the facilitator was helpful in making it easier for the inmates to understand the module content conveyed. Thus, the purpose of imparting knowledge to inmates so that they understand each aspect of baby/child care and development was easily implemented.

The use of a simulation approach, that is, requesting inmates to think and reflect for a moment regarding the situations, which they previously experienced and react to their mother and baby/child, was found to affect their emotions. This approach is good because as an impact from their previous negative behaviour towards mother and baby/child, it raised positive consciousness. Consequently, this effect could broaden their views in order to behave properly and with good manner to their mother and offspring. The module is found to be suitable and is acknowledged as appropriate for use by the respondents. This also able to fulfill the need to provide specific guidance to inmates who have children, living inside or outside of prison.

Our thanks and great appreciation for researchers of the related research project entitled *Menguji Kesahan dan Mengimplimentasi Modul Bimbingan Anak-anak Banduan di Penjara* (Validation and Implimentation of Guidance Module for Children of Inmates in Prison), Code: KOMUNITI 2-2014-001, Bangi: Institut Islam Hadhari, Universiti Kebangsaan Malaysia

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# Development of A Hybrid Instructional Model For Learning Management of Pre-Service Teachers

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## ABSTRACT

The purposes of this study were to development of a hybrid instructional model for learning management of pre-service teachers, the justification of the components of the proposed model by a panel experts using the Delphi technique. The sample used in this research, researcher chooses a panel of 19 experts in teaching and learning management in faculty of education. The findings of an appropriate hybrid instructional model for learning management of pre-service teachers in Thailand which the expert judged to be appropriate consistently of major components as follows. 1. Principles, concepts and theories, By focusing on student-centered organize learning environment by mixing face to face classroom with e-learning and organize active learning activities and evaluate learning outcomes according to authentic assessment. 2. Teaching process, the learners create new knowledge and recognize content based on the insights gained from learning experience. And they should be able to transfer knowledge to friends. The learners demonstrate the empirical evidence of the knowledge acquired and present appropriately. And encourage the learners to use a learning contract to engage in the learning process. The instructor serves as a friendly supporter and counselor to create an appropriate learning environment and set a lesson plan that is consistent with the learning objectives and subject description. To engage learners in learning activities, the instructor should motivate them as using stimulating questions to communicate with each other. It should be a discussion and criticize the issue of knowledge between learners and set criteria of evaluation for learning specified in learning contract. Learning outcomes are situations where the learners and instructors cooperate with the planning of the content which meets the needs of learners. The instructional plan must cover the learning object by using a learning contract as a guideline and evaluate by authentic assessment. Including the learners can invent a new self-knowledge and relay to friends.

**Key words:** Instructional model, Learning management, Pre-service teacher

## INTRODUCTION

Development of learning model to be consistent with social progression and changing environment of communication technology rapidly is important. In present progression of application of Information and Communication Technology (ICT) is rapid. Learning management should be adjusted consistently with the changing of ICT which can be used in several forms such as e-learning via internet or off line and using distance learning that is an innovation to support learning more effectively and make learning process more completely. It essential for educational administrator and related personnel to modify learning model up to date and suitable for technology advancement according to National Education Act of Thailand 1999 (2nd amendment 2002). Combination of learning with communication make it convenient to access to knowledge and add data source to study that is appropriate for learning. It increases efficacy for learning also. Ndon (2007) has studied experience of instructors who used blended learning. The results found that learning model that is the best available because it combines study mode with communication that it is convenient, has variety of resources, interacts with learners and interacts between learners and teachers. In addition what has been from online classroom learning environment is accession information unlimited and supports learning activities both individual and group learning by contacting each other online. Face to face learning activities help learners to succeed in learning and support critical thinking skills. Which correspond to Gagné and Brigg, (1985, pp. 246-2560; Gagné et al. (2005, p. 205) that explained design of learning model within the blended learning theory (eclecticism). It is blending between behavioralism and cognitivism with emphasis environmental arrangement that is suitable for learning and supports learning process inside the brain by arrangement external condition favor for internal learning process of learners with emphasis using in learning management. Brown et al. (1983, pp. 3-15) emphasized learners-centered by consideration learning methods of each learner is important and let instructors to set learning to be consistent with the needs and interest of learners with 4 elements that are goals, conditions, resource and outcomes of learning process. This maybe judged from the success on achievement from learning objectives and considered the necessary factor to improve learning process. Researcher is interested to study hybrid instructional model for learning management of pre-service teachers correspond to advancement of technology in the context of learning society to achieve the most effective outcomes for learners.

## **OBJECTIVES**

1. Were to develop of a hybrid instructional model for learning management of pre-service teachers.
2. Were to study experts' opinions about hybrid instructional model for learning management of pre-service teachers.

## **METHODOLOGY**

Population and sample used in study layout of hybrid instructional model are used by Delphi technique. Population in this study are 19 experts who are experts in learning management in faculty of education and experts in learning management via e-learning. And selected snowball sampling to obtain 19 experts, be an expert in teaching and learning management and specialist in instructional management in faculty of education. Three rounds data collection with Delphi technique. The research will do the following. Round 1 the researcher will deliver by hand and ask for the convenience of submitting a questionnaire. After about 3 days the researcher will telephone to ask for a result back. And round 2 and 3 the researcher will deliver questionnaire by convenience of experts (such as deliver by hand or ems). Data analysis and statistic used in data analysis as, Round 1 analyze data from the answer to open-ended question to create a 5 level estimation question for the question in round 2. Round 2 Analyze data by calculating median and interquartile range to use as a basis for summarizing expert opinion and take median and interquartile range displayed in the questionnaire in round 3 in order for the expert to consider the answer already answered. Then, round 3 analyze data by calculating median and interquartile range data verified from the questionnaire in round 3 again to conclude expert opinion.

## **FINDINGS**

Expert opinion about elements of hybrid instructional model of learning management for pre-service teachers as follows:

1. Elements of a hybrid instructional model of learning management for pre-service teachers: Principles, concepts and theories should be consistent with National Education Act 1999 (2nd amendment 2002), National Education Plan and National Economic and Social Development Plan include other related policies. In addition, it should pay attention to current situation in technology and communication system with rapid progress. Technology adoption to apply in learning management consistently and suitably the needs of learners is essential to open opportunity for learners to learn happily and have internal reinforcement to pursue lifelong learning. Learning management should consider learners mainly and open opportunity to take part in the responsibility in their learning process. Guidelines in learning management include the following principles. Principle 1 In learner-centered instructional management, instructor has a role as source of knowledge and adviser. Principle 2 Learning environmental arrangement by mixing face to face classroom with electronic media to give learners opportunity to create workings by self-seeking knowledge to reflect ability for application knowledge both theory and practice. Principle 3 Active learning activity arrangement is to encourage learners' ability to create knowledge themselves and participate in learning process and self-assessment, promote in using electronic media as learning source which has variety of knowledge that can be reviewed it themselves. Principle 4 Authentic assessment by compiling and preparation portfolio, creativity and self-evaluation combined with the assessment of achievement by using the test in theory.

2. Learning process, when summarizing learner roles, instructor roles and expected results with the following issues. Learner roles; Let learners create knowledge and understanding, remember the content and principles by understanding received from learning experience. Learner must invent new ideas by themselves and transfer knowledge to friends. Learners comment and present work appropriately. Learning uses learning contract to bond with. Instructor roles; The Instructor acts as a supporters to give an advice, creates suitable environment for learning, has consistent instructional plans with the objectives and subject matters. Let learners participate in learning activities by encouraging motivation. The instructor should use questions to stimulate communication, discussion, critique among the learners and indicate in learning contract. Learning outcomes; Learning outcomes are learning situation that learners and instructor plan together appropriately with subject matters and meet the needs of learners. Determining the lesson plan must cover learning objectives, consistent with the content and suitable for learners by using learning contract to commit to learning and as a guideline to evaluate learning results. Learners can invent new ideas themselves and transfer to friends.

The results of analysis of data in round 2 and 3. It is analysis the opinion of experts on a hybrid instructional model for learning management of pre-service teachers. Analysis of data in this round is an analysis of the elements for a hybrid instructional model for learning management of pre-service teachers both in principles, concepts and theories, environmental arrangement according to a hybrid instructional model and evaluation of

learning outcomes by analyzing from rating scale questionnaire that the researcher summarized the results shown in the following table.

**Table 1:** Median and interquartile range of expert answers on a hybrid instructional model for learning management of pre-school teachers

Elements of a hybrid instructional model for Learning management of pre-service teachers	$\bar{x}$	Mnd	I.R.	level of agreement
Principles, concepts and theories				
1.1 learner-centered learning management	5.00	5	0	completely agree
1.2 organize learning environment by mixing face to face classroom with e-learning	4.95	5	0	completely agree
1.3 active learning activities	5.00	5	0	completely agree
1.4 authentic assessment by using portfolios, creativity and self evaluation	5.00	5	0	completely agree
average	4.99	5	0	completely agree

From table 1 showed that elements of a hybrid instruction model for learning management of pre-service teachers in principles, concepts and theories. Overview experts completely agree, highest fit and expert opinion is very consistent ( $\bar{x} = 4.99$ , Mdn = 5, I.R. = 0). When consider average value per item found that expert opinion completely agree 4 issues include learner-centered learning management, active learning activities and authentic assessment by using portfolio, creativity and self-evaluation. And subordinate is organization learning environment by mixing face to face classroom with e-learning ( $\bar{x} = 4.95$ , Mdn. = 5, I.R. = 0)

**Table 2:** Median and interquartile range of expert answers on a hybrid instructional model in environmental arrangement of hybrid instructional model

Elements of a hybrid instructional model for learning management of pre-service teachers	$\bar{x}$	Mnd	I.R.	level of agreement
2. environmental arrangement of hybrid instructional model				
2.1 learning support resources in the school	5.00	5	0	completely agree
2.2 learning support resources in the community	4.89	5	0	completely agree
2,3 learning support resources on the internet	5.00	5	0	completely agree
2.4 e-learning medias on the internet	5.00	5	0	completely agree
2.5 traditional classroom lecture activities	4.84	5	0	completely agree
2.6 learning activities on the internet	5.00	5	0	completely agree
2.7 mixing rate of e-learning : regular learning is about 30 : 70 of time in one semester	5.00	5	0	completely agree
average	4.96	5	0	completely agree

From table 2 showed that elements of a hybrid instructional model for learning management of pre-service teachers in environmental arrangement of hybrid instructional model. Overview experts completely agree, highest fit and expert opinion is very consistent ( $\bar{x} = 5.00$ , Mdn = 5, I.R. = 0). When consider average value per item found that expert completely agree 5 issues include learning support resources in the school, learning support resources on the internet, e-learning medias on the internet, learning activities on the internet and mixing rate of e-learning : regular learning is about 30 : 70 of time in one semester. And subordinates are learning support resources in the community ( $\bar{x} = 4.89$ , Mdn = 5, I.R. = 0) and traditional classroom lecture activities ( $\bar{x} = 4.84$ , Mdn = 5, I.R. = 0) respectively.

**Table 3:** Median and interquartile range of expert answers on learning process of a hybrid instructional model for learning management of pre-service teachers in aspect of learner role

Learning process according to a hybrid instructional model for learning management of pre-service teachers.	$\bar{x}$	Mnd	I.R.	level of agreement
Learner role				
- knowledge and understanding building	5.00	5	0	completely agree
- remember content and principles by understanding gained from the experience	4.95	5	0	completely agree
- invent new ideas by himself	4.95	5	0	completely agree
- transfer knowledge to friends	5.00	5	0	completely agree
- comment and present works properly	5.00	5	0	completely agree
- use a learning contract to engage in learning	5.00	5	0	completely agree
average	4.98	5	0	completely agree

From table 3 showed that learning process of a hybrid instructional model for learning management of pre-service teachers in aspect of learner role, overview experts completely agree, highest fit and expert opinion is very consistent ( $\bar{x} = 4.98$ , Mdn = 5, I.R. = 0). When consider average value per item found that expert completely agree 4 issues include knowledge and understanding building, transfer knowledge to friends, comment and present works properly and use a learning contract to engage in learning ( $\bar{x} = 5.00$ , Mdn = 5, I.R. = 0). And subordinates are remember content and principles by understanding gained from the experience and invent new ideas by himself ( $\bar{x} = 4.95$ , Mdn = 5, I.R. = 0).

**Table 4:** Median and interquartile range of expert answers on learning process of a hybrid instructional model for learning management of pre-service teachers in aspect of instructor role

learning process of a hybrid instructional model for learning management of pre-service teachers	$\bar{x}$	Mnd	I.R.	level of agreement
Instructor role				
- as a supporter to give an advice	5.00	5	0	completely agree
- create suitable environment and be friendly with learners	5.00	5	0	completely agree
- teaching plan that corresponds with learning objectives	5.00	5	0	completely agree
- design teaching plans that correspond with the content	4.95	5	0	completely agree
- participate in learning activities by encouraging motivation and use stimulating questions to communicate, discussion and critique between learners	5.00	5	0	completely agree
- set criteria for school record evaluation to indicate in the learning contract	5.00	5	0	completely agree
average	4.99	5.00	0	completely agree

From table 4 showed that learning process of a hybrid instructional model for learning management of pre-service teachers in aspect of instructor role, overview experts completely agree, highest fit and expert opinion is very consistent ( $\bar{x} = 4.99$ , Mdn = 5, I.R. = 0). When consider average value per item found that expert completely agree 5 issues include as a supporter to give an advice, create suitable environment and be friendly with learners, teaching plan that corresponds with learning objectives, participate in learning activities by encouraging motivation and use stimulating questions to communicate, discussion and critique between learners and set criteria for school record evaluation to indicate in the learning contract ( $\bar{x} = 5.00$ , Mdn = 5, I.R. = 0). And subordinate is design teaching plans that correspond with the content ( $\bar{x} = 4.95$ , Mdn = 5, I.R. = 0).

The conclusion of 2<sup>nd</sup> and 3<sup>rd</sup> delphi analysis which are analyze in expert's opinion for a hybrid instructional model for learning management of pre-service teachers. Components of a hybrid instructional for learning management of pre-service teachers are principles, concept, and theory. In overall image, experts' opinion chose agreed at "highest", suitable at "highest", and all the opinions are similar with each other. In more detail, from average value in each section, we found that experts have highest which are learner-centered instructional management, active learning activities and authentic assessment, using portfolio, the learner evaluates the results of the creative work. Followed by environmental aspects of the hybrid learning model, by mixing face to face classroom and e-learning. In part of learning environment in a hybrid instructional model overall experts' opinion are agreed in "highest", suitable at "highest" and all the opinions are similar with each other. In more detail, from average value in each section, we found that experts have highest in 5 aspects which are Institutional support resources, the learning support resources on the internet as the electronic media and e-learning, mixing online and face-to-face delivery. Proportion of content delivered online and typically has some face-to-face meetings 30-70 of a semester. Followed by the learning resources in the community, learning process

arrangement by mixing face to face classroom with electronic, respectively. In part of learning process of a hybrid instructional model in learner role aspect, overall experts' opinion agreed at "highest", suitable at "highest", and all the opinions are similar with each other. In more detail, from average value in each section, we found that experts have highest in 6 aspects which are the learners create self-knowledge, recognize content based on the insights gained from learning experience, the learners should be able to transfer knowledge to friends, the learners demonstrates the empirical evidence of the knowledge acquired and presented appropriately, encourage the learner to use a learning contract to engage in the learning process in instructor role aspect, experts' opinions in overall agreed at "highest", suitable at "highest", and all the opinions are similar with each other. In more detail, from average value in each section, found that experts have highest in 5 aspects which are serves as a friendly supporter, counseling, create an appropriate learning environment, set a lesson plan that is consistent with the learning objectives and subject description, to engage learners in learning activities by motivating them while using stimulating questions to communicate with each other, set a discussion, the issue of knowledge between learners. learning outcomes, found that experts have highest in 6 aspects which a situation where the learners and instructors cooperate in the content planning which meets the needs of learners, the instructional plan cover the learning object, using a learning contract as a guideline, evaluation by authentic assessment, the learners can invent a new self-knowledge and can relay to friends.

## **DISCUSSION**

The results of this research can be discussed as the following: Principles, concepts and theories of instructional model should according with education 1999 ( 2<sup>nd</sup> amendment 2002 ), National Education Plan and National Economic and Social Development Plan including associated other policies. In addition, it should be given priority of current situation of information and telecommunication system that is rapid progress. Applying technology for learning consistently and appropriately for the needs of the learners to open the opportunity for the learners to learn happily and reinforce them for pursuing lifelong learning. In learning management, the learners should be consider as important to take part in the responsibility in learning process themselves to reinforce ability in self-seeking knowledge another way also. Overview of concepts and theories, experts agree at the highest level and most appropriate and experts' opinions have in the most consistency with the principles such as learning by using learner-centered which correspond with learning model of Brown et al. (1983, pp. 3-15) that presented learning model that emphasize learning by using learner-centered by considering learning style of individual of each leaner as important. To teach to correspond with the needs, ability and interest of the learners, it should organize active learning activity and evaluate learning outcomes according to the authentic assessment by using portfolios, creativity and self- evaluation followed by learning environmental arrangement by mixing face to face classroom with e-learning. In learner-centered instructional management, instructor has a role as the source of knowledge and adviser. Learning environmental arrangement by mixing face to face classroom with e-learning including give opportunities for learners to create workings by self-seeking knowledge to reflect ability for application knowledge both theory and practice. Active learning activity arrangement is to encourage learners' ability to create knowledge themselves and participate in learning process and self-assessment, promote in using electronic media as a learning source which has variety of knowledge which can be reviewed the knowledge themselves. It corresponds with concepts of Gagné et al., (2005, p. 205) which emphasize external arrangement to support learners' internal learning process and using media in learning. And It correspond the study of Suwapat Srikassapa (2015) which studied Interactive learning via Internet: a case study of Studio in Design. The result of this research was that interactive learning via internet will promote learner to access information and understand content easier and clearer.

Overview mixed-use learning environment, experts agree with this in the highest level, most appropriate and experts' opinion is very consistent. Because in the present information technology and communication are very advance. Most people can access information rapidly anywhere and anytime and can communicate easily. It is information and knowledge accessment absolutely unlimitless. But education management in Thailand still prioritizes to classroom learning so that by the opinion of experts should be in the range 30-70 percent of one semester which corresponds to Allen and Seaman have explained that blended learning between face to face classroom and online learning. In general presentation most content should be online between 30-79 percent of all educational content. That mixing ratio at this level is coming from blended learning development for enhancing self-seeking both learning activities in classroom, e-learning and creating learners' portfolio. It makes us understand that learning models should be variety ways to suitable application for changing social learning changes, fully potential development in self-seeking and learning basics lifelong (Intira Robroo, 2010, p. 169). Recommendations should be further study to learning achievement of students learning through hybrid instructional model for pre-service teachers, and should be further to study the learning outcome through hybrid instructional model for pre-service teachers, in terms of responsibility, leadership and morality, ethics etc.

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## **Development of a Student Evaluation form Toward Peer Instruction**

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### **ABSTRACT**

Peer instruction is an interactive student-centered teaching method. Ensuring student interaction during the lesson and concentrating the attention of the students on the basic concepts are main aims of the peer instruction. A typical peer instruction sequence is similar to a strategy of learning a “Think-Pair-Share”, which students should think individually on questions before sharing their ideas and solutions with classmates in either in pairs or on groups of different sizes. In order to determine students’ views on peer instruction method, which is quite popular today and which has been studied much over the last 20 years, different data collection tools have been developed by different researchers under different names. When these data collection tools developed by different researchers are examined in detail, it is seen that it is needed that general evaluation form which can be used to determine views for all stages of the peer instruction method. For this reason, it was aimed to develop a student evaluation form toward peer instruction method within the scope of this research. Student assessments toward peer instruction method in the developed form were examined as 'student evaluation toward peer instruction', 'student evaluation toward questions asked' and 'student evaluation toward discussions made' in three sub-dimensions and 25 items.

### **INTRODUCTION**

Peer instruction is an interactive student-centered teaching method developed by Eric Mazur (Mazur, 1997), engages students during class through structured, frequent questioning and is often facilitated by classroom response systems (Miller, Schell, Ho, Lukoff, & Mazur, 2015). To provide a positive role for interaction among peers in the knowledge construction, this method has been extensively supported by a socio-constructivist approach to learning (Morice, Michinov, Delaval, Sideridou, & Ferrières, 2015). Ensuring student interaction during the lesson and concentrating the attention of the students on the basic concepts are main aims of the peer instruction (Mazur, 1997). In this context, it was indicated that the general format that each ConcepTest used in peer instruction by (Mazur, 1997) should have; 1) Question posed, 2) Students given time to think, 3) Students record individual answers (optional), 4) Students convince their neighbors (peer instruction), 5) Students record revised answers (optional), 6) Feedback to teacher: Tally of answers and 7) Explanation of correct answer. However, the PI method can be different for different learning scenarios because it is a flexible and student-centered approach (Chou & Lin, 2015; Crouch, Watkins, Fagen, & Mazur, 2007; Morice et al., 2015). In the study conducted by Dancy and Henderson (2010), it was revealed that less than 12.8% of the teachers using peer instruction do so as it was originally designed to be implemented (As cited in Michinov, Morice, & Ferrières, 2015). More generally, a typical peer instruction sequence is similar to a strategy of learning a "Think-Pair-Share" (e.g., Watkins & Mazur, 2010), which students should think individually on questions before sharing their ideas and solutions with classmates in either in pairs or on groups of different sizes (Michinov et al., 2015).

When the literature is examined, it is seen that the PI method has been developed in Physics to improve student understanding of deep conceptual concepts and has been used in other sciences such as biology (e.g., Perez et al., 2010) and computer science (e.g., Lee, Garcia, & Porter, 2013) have also been used successfully. In this context, in order to determine students' views on peer instruction method, which is quite popular today and which has been studied much over the last 20 years, different data collection tools have been developed by different researchers under different names. Within this scope; some scales such as "attitude toward peer instruction method survey" by Şekercioğlu Çirkinoğlu (2011), "student evaluation of peer instruction questionnaire" by Cortright, Collins, and DiCarlo (2005), "a survey to get students' impressions of the PI" by Lee et al., (2013) and a "peer Instruction self-efficacy instrument" by Miller et al. (2015) were developed. When these data collection tools developed by different researchers are examined in detail, it is seen that it is needed that general evaluation form which can be used to determine views for all stages of the peer instruction method. For this reason, it was aimed to develop a student evaluation form toward peer instruction method within the scope of this research.

## **METHOD**

In this section, research design, the participants, the data collection tool and the information about the analysis of the data are given.

### **Research Design and Participants**

Within the scope of the research, survey model was used to examine the views of pre-service teachers on the method of peer instruction. Participants of the study were 179 pre-service teachers who attended at least one course in which peer instruction method was used in the faculty of education in a state university during the 2016-2017 academic year. Pre-service teachers who attend the research study at the department of mathematics and science education and in department of computer and instructional technology education. When the distributions of pre-service teachers in terms of their gender characteristics are examined; it is seen that 65.3% (n = 117) were female and 34.7% (n = 62) were male.

### **Data Collection Tools**

The data in this study were obtained from a student evaluation form developed by the researchers. In the first stage of the student evaluation form development process, the problem situation is determined and appropriate themes were determined for this problem situation by reviewing the literature. These sub-themes are determined as 'student evaluation toward peer instruction', 'student evaluation toward questions asked' and 'student evaluation toward discussions made'. Following the determination of the sub-themes, an item pool including 55 items was established in line with the information obtained from the reviewing of the literature. 35 items which are suitable for inclusion in the draft of the student feedback form were selected from the item pool, and a pre-application form with Likert type rating was constituted. A Turkish language expert and three experts in educational technology who work in the field of computer and instructional technologies were consulted regarding the prepared pre-application form. The linguist examined the written materials in terms of clarity, language and expression. Educational technology field experts evaluated form in terms of content, criterion, construct and face validity. The necessary arrangements were made on the student evaluation form in line with the feedback obtained from the experts. Then, the pilot application of the student evaluation form was carried out on 65 pre-service teachers who are out of the sample and it was reevaluated in terms of language validity, comprehensibility, level of eligibility and was put into final form. Thus, the final form of student evaluation form toward peer instruction is structured as a five-point Likert type with three parts and 25 items.

### **Data Analysis**

Factor load values for the developed data collection tool, KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) coefficient for determining the suitability of the sample for measurements, Bartlett test for determining consistency between items and Cronbach  $\alpha$  reliability coefficient for reliability are examined. Factor loadings of 25 items range from .90 to .93. The value of KMO was found as .86. When values of KMO close to 1, factor analysis becomes more meaningful. If the average level of KMO is between .50 and .70, it is the medium-level, if it is between .71 and .80, it is the good level and if it is between .81 and .90, it is very good level and it will be the

excellent level if it is .91 and above (Field, 2005). From this point of view, it can be said that the sample is sufficient for data analysis. The Bartlett test showed that the results of the analyzes were significant (chi-square = 2329.147,  $p < 0.01$ ). When the reliability of the student assessment form for the peer instruction method was examined, it was determined that the reliability coefficient of Cronbach  $\alpha$  was .92. These results indicate that the data collection tool is reliable. In the analysis of collected data, frequency and percentage values are used.

## FINDINGS

In the process of preparing the data collection tool, certain themes have been set out. These include 'student evaluation toward peer instruction', 'student evaluation toward questions asked' and 'student evaluation toward discussions made'. The analysis results of the first theme which is student evaluation toward peer instruction are given in Table 1.

Table 1. Student Evaluation Toward Peer Instruction Items		Strongly Disagree →---← Strongly Agree					Total
			2	3	4	5	
	f	3	7	21	69	79	179
	%	1.7	3.9	11.7	38.5	44.1	100.0
Peer instruction method was easy to follow.	f	3	5	35	72	64	179
	%	1.7	2.8	19.6	40.2	35.8	100.0
Peer instruction method was interesting.	f	7	13	40	63	56	179
	%	3.9	7.3	22.3	35.2	31.3	100.0
Peer instruction method was enjoyable.	f	2	12	37	58	70	179
	%	1.1	6.7	20.7	32.4	39.1	100.0
Peer instruction method helped to better understand the course topics.	f	7	14	31	65	62	179
	%	3.9	7.8	17.3	36.3	34.6	100.0
Peer instruction method helped me to move beyond my previous level of knowledge.	f	7	13	42	64	53	179
	%	3.9	7.3	23.5	35.8	29.6	100.0
Peer instruction method helped to assess the level of knowledge regarding course subject.	f	4	7	24	80	64	179
	%	2.2	3.9	13.4	44.7	35.8	100.0
Immediate feedback with the peer instruction method helped me to complete my shortcomings.	f	5	12	40	58	64	179
	%	2.8	6.7	22.3	32.4	35.8	100.0
Peer instruction method has increased my confidence in the ability to do courses.	f	4	11	42	77	45	179
	%	2.2	6.1	23.5	43.0	25.1	100.0
10. Peer instruction method increased participation in class.	f	5	7	39	56	71	1
	%	2.8	3.9	21.8	31.3	39.7	.6
11. Peer instruction method increased my motivation towards the course.	f	4	8	32	72	63	179
	%	2.2	4.5	17.9	40.2	35.2	100.0
12. When I consider all the activities in the course, I think that the allocated time for the peer instruction method is sufficient.	f	11	22	49	58	39	179
	%	6.1	12.3	27.4	32.4	21.8	100.0
13. I think it is difficult to apply the peer instruction method.	f	34	63	36	28	18	179
	%	19.0	35.2	20.1	15.6	10.1	100.0
14. I think peer instruction method is useful.	f	5	3	29	64	78	179
	%	2.8	1.7	16.2	35.8	43.6	100.0
15. I think peer instruction method should be used in other courses as well.	f	11	10	50	57	51	179
	%	6.1	5.6	27.9	31.8	28.5	100.0
16. I think peer instruction method is educationally attractive.	f	5	6	31	76	61	179
	%	2.8	3.4	17.3	42.5	34.1	100.0

When Table 1 is examined, the majority of the students stated that peer instruction method is clear (f = 148, 82.6%) and follow-up is easy (f = 136, 76%). In addition, more than half of the students found peer instruction method as interesting (f = 119, 66.5%) and enjoyable (f = 128, 71.5%). When the student responses are examined in detail, it is seen that many of them believe that the peer instruction method helps to get better understanding of the course subjects (f = 127, 70.9%) and to go beyond previous knowledge levels (f = 117, 65.4%). In addition, they stated that this method helped to complete the deficiencies (f = 126, 68.2%) and evaluate the level of knowledge about the subjects (f = 144, 80.5%) by receiving immediate feedback. Nevertheless, they also stated that their confidence (f = 122, 68.1%), their participation (f = 127, 71%) and their motivation (f = 135, 75.4%) increased. Almost half of the students think that allocated time is enough for this method (f = 97, 54.2%) and that this method is not difficult to apply (f = 97, 54.2%). The majority of the students stated that this method is useful (f = 142, 79.4%) and that it can be used in other courses as well (f = 108, 60.3%) and educationally attractive (f = 137, 76.6%). The analysis results of the student evaluation toward questions asked which is second theme are given in Table 2.

**Table 2.** Student Evaluation Toward Questions Asked

Items		Strongly Disagree ←---→ Strongly Agree					Total
		1	2	3	4	5	
17. The questions posed in the question-and-answer process of the peer instruction method generated my interest.	f	7	10	47	72	43	179
	%	3.9	5.6	26.3	40.2	24.0	100.0
18. The questions posed in the question-and-answer process of the peer instruction method made it easier to understand the important points about the topic.	f	2	12	28	92	45	179
	%	1.1	6.7	15.6	51.4	25.1	100.0
19. The time allocated for the questions posed in the question-and-answer process of the peer instruction method was sufficient.	F	20	33	48	38	40	179
	%	11.2	18.4	26.8	21.2	22.3	100.0
20. The level of difficulty of the questions posed in the question-and-answer process of the peer instruction method was appropriate for my level.	F	7	15	43	83	31	179
	%	3.9	8.4	24.0	46.4	17.3	100.0

When Table 2 was examined, it was determined that the questions asked in the peer instruction method were interesting (f = 115, 64.2%) and facilitated to understand important points (f = 137, 76.6%). Furthermore, about half of the students stated that the time for the questions asked was satisfactory (f = 78, 43.5%) and more than half of them stated that questions were appropriate for the difficulty levels of the questions (f = 114, 63.7%). The point to note here is that the time allocated for the questions posed in the question-and-answer process is not sufficient for more than half of the students. As long as the given time is too long, students may be tempted to try to find answers using different sources, and in a very short period of time they may be answered without thinking. For this reason, while the period to be set aside for the questions asked in the process are determined; it is important to consider various variables such as the subject studied, the difficulty level of the question being asked, and the learning levels of the students. Table 3 shows the results of the analysis of student evaluation toward discussions made on the third theme.

**Tablo 3.** Student Evaluation Toward Discussions Made

Items		Strongly Disagree ←---→ Strongly Agree					Total
		1	2	3	4	5	
21. The discussion level in the process of peer instruction method was high.	f	9	19	36	71	44	179
	%	5.0	10.6	20.1	39.7	24.6	100.0
22. I participated actively in discussions in the process of peer instruction method.	f	3	14	28	67	67	179
	%	1.7	7.8	15.6	37.4	37.4	100.0
23. I liked expressing my ideas during discussions in the process of peer instruction method.	f	4	12	27	63	73	179
	%	2.2	6.7	15.1	35.2	40.8	100.0
24. The peer instruction method enabled me to be aware of the ideas of my classmates.	f	9	8	31	67	64	179
	%	5.0	4.5	17.3	37.4	35.8	100.0
25. I liked to see different perspectives with the peer instruction method.	f	3	11	34	71	60	179
	%	1.7	6.1	19.0	39.7	33.5	100.0

When Table 3 was examined, students reported that the level of discussion in the process of peer instruction method was high ( $f = 115$ , 64.2%) and they participated effectively in discussions ( $f = 134$ , 74.8%). Furthermore, they expressed that they liked to express their opinions ( $f = 136$ , 76%), they were aware of their friends' opinions ( $f = 131$ , 73.2%) and liked to see different views ( $f = 131$ , 73.2%).

## CONCLUSIONS

In this study, a student evaluation form toward peer instruction method was developed to determine the evaluation of university students toward peer instruction method and the evaluations of students who use peer instruction method were examined. Student evaluations toward peer instruction method in the developed form were examined as 'student evaluation toward peer instruction', 'student evaluation toward questions asked' and 'student evaluation toward discussions made' in three sub-dimensions.

When the student evaluations for the use of the peer instruction method are examined, the majority of the students stated that peer instruction method is clear and follow-up is easy. More than half of the students stated peer instruction method as interesting and enjoyable. Students stated that the peer instruction method helps to get better understanding of the course subjects and to go beyond previous knowledge levels. They stated that this method helped to complete the deficiencies about the subjects by receiving immediate feedback. It is seen that they also stated that using peer instruction method increased their confidences, their participations and their motivations. When the literature is examined it is seen that similar research results which support these results are obtained. For example, in the study conducted by Gok (2015), it was seen that peer instruction method has developed students problem solving strategies, academic achievements and homework performance, and students stated positive opinions toward peer instruction method. In a research conducted by Simon and Cutts (2012), it was seen that peer instruction method developed deep learning. Schmidt (2011) concluded that peer instruction method is effective to increase student satisfaction.

When students' evaluations are examined, it is seen that the questions asked were interesting and facilitated to understand important points. Furthermore, about half of the students stated that the time for the questions asked was satisfactory and more than half of them stated that difficulty levels of the questions were appropriate for their levels. When student evaluations toward discussions made are examined, it is seen that students reported that the level of discussion in the process of peer instruction method was high and they participated effectively in discussions. Furthermore, they expressed that they liked to express their opinions, they were aware of their classmates' opinions and liked to see different views. When the literature is examined it is seen that similar research results which support these results are obtained. For example, in the study conducted by Trottier, Kamp and Miranda (2011), it was revealed that the discussion process in peer instruction developed social interaction among students.

Some suggestions can be made about peer instruction practices that will be designed by taking into account student evaluations. Firstly; at the beginning of the teaching period, students can understand and follow the method by explaining them what peer instruction method is, how to apply it and what to watch out for. In the peer instruction process, it is important that the feedback provided to students is well structured. Through feedback, students must be aware of the deficiencies and mistakes in learning, and these deficiencies and mistakes should be removed. Strategies such as scaffolding and metacognitive support can be used in this process. Another point to note is the process of structuring and managing the discussion used in peer instruction. In this process, it should be encouraged to express students' opinions and ideas clearly. In the process of managing student discussions, different discussion methods such as individual and group discussion can be tried. Student discussions can also be conducted through virtual environments, such as social networking environments. Thus, it can be provided that discussions in the classroom are not applied only at classroom and it is also possible to reach discussion records in the desired place and time. Finally, in the future research; it is important that new studies considering different individual differences of students at different levels of education (primary school, secondary school, associate degree, post graduate, etc.) will provide information about more variables related to peer instruction method.

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# Development of a Teacher Training Curriculum in Enhancing Awareness on Water Resource Management

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## ABSTRACT

This study aimed to explore the development of water resource management (WRM) awareness in teacher training curriculum. The WRM awareness was urgency to study in order to solve the current water pollution problems. There were 12 informants involved in providing data to create the teacher training curriculum. This is followed by 12 experts to validate the created teacher training curriculum. Finally, a total of 38 Grade 6 science primary school teachers in Namphong sub-basin, Thailand were randomly selected to test their understanding and satisfaction. The research procedure of the curriculum developmental process was comprised of four stages namely diagnosis of needs, design a curriculum, produce curriculum package for tryout, and testing for the curriculum effectiveness. Hence, pretest-posttest result indicated a significant difference on teachers' understanding with a high level of satisfaction.

**Keywords:** Awareness; teacher training curriculum; water resource management

## INTRODUCTION

Education acts as a powerful tool in the socio-economic renovation of a society, community and nation. It sharpens the appreciation of knowledge, develops awareness and makes thoughts logical (Chaturvedi, Kumari and Singh, 2014). Teacher being the agent of social change, play an active role in shaping the behavior of students to promote desire for environmental awareness. The environmental awareness particularly in water resource management is urgency to develop due to the current water pollution problems in Thailand. On this line of reasoning, teacher development is very important as it is the key to the creation of citizen who are able to manage their lives and be connected with others in the ever-changing, dynamic and complex society (Mitkovska, 2010). In order to produce high quality teachers to fulfill the above demands, teacher training will be the most appropriate platform to be utilized to develop necessary knowledge and skills of teachers as well as their understanding (Art-in, 2014).

Currently, one of the critical environment problems in Thailand is water pollution and water resource management (WRM) due to low awareness of Thai people related to the value of water resources (Pongsasanongkul, 2004). Over the past 55 years of implementing National Economic and Social Development Plan in Thailand, it has caused serious water pollution problems resulted from the industrial economic development. There are 25 river basins with their sub-basins in Thailand. The Namphong sub-basin is one of the 20 watershed basins, which covers four provinces and 12 districts in northeastern of Thailand. Various factors such as rapid industrial advancement, increment of population and high demand for water have caused water contamination in the Namphong sub-basin area. Contamination in Nampong sub-basin would create problem to the communities who reside along the riverside.

Thailand's dramatic economic growth has caused numerous environmental problems such as water pollution, soil erosion, water scarcity, and waste issues. In order to control the situation, Thai government called for its Seventh Economic and Social Development Plan (1992-1996) declaring the environmental protection as a top priority (World Bank Team, 2001). A 2004 indicator in Environmental Monitor (2006) showed that the cost of air and water pollution for Thailand scales up to approximately 1.6 to 2.6 percent per year. Thailand's rivers are being increasingly polluted by industrial waste water and solid waste dumping, but Thai government has no clear strategy for water pollution (Runsuk, 2011). According to a World Health Organization report, diarrhea caused by this type of contaminated water causes 2.2 million deaths each year worldwide.

All these are greatly responsible for rapid degradation of the environmental quality at grass root level. The water resource management awareness moves people towards water resource protection and improvement. All these are possible only through water resource management awareness through education. As such, by water resource management awareness simply mean having the latest knowledge of/ or envisioning the possible dangers, threats of environmental degradation. It includes making the people conscious of the physical, social and aesthetic of the water pollution. These elements are interrelated and interdependent and are essential for the survival of the humanity. Awareness needs sensitivity (Chaturvedi et al., 2014). A sensitive teacher concerns the water pollution from its reckless exploitation. Researchers see the water resource management as the very potential of education, it can safely be concluded that such awareness can be realized through education, whatever mode it comes from.

Awareness means having update knowledge of recognizing the possible threat of a mechanism. Awareness to preserve, protect and conserve the environment is one of five goals that have been identified in the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) of Thailand. The new Basic Core Curriculum provides local communities and schools with a framework of learning standards and indicators. Schools are given freedom to increase learning time allotment, local wisdom, and desirable characteristics depending on their readiness and priorities. To achieve this end, schools should prepare all subjects as specified by the standards and may create additional contents or integrate subjects to form a new learning unit. However, teachers faced many problems to develop their school curriculum and also trying to integrate the local wisdom and additional contents into the core curriculum framework. Furthermore, Rungnapa (2002) found that principals and teachers generally were optimistic for the school-based curriculum project but these local schools were far from their readiness for this kind of radical change. Traditional hierarchical bureaucracy in organizational structure caused the schools tend to play a passive role rather than creating curriculum and units of learning based upon their own needs.

Teachers can play their significant roles in developing learners' awareness on water resource management. Teachers can provide opportunity to observe local environment features of water pollution, problems and phenomena and changes in community. They can allow learners to classify living and non-living things on the basis of criteria chosen by learners themselves regarding water pollution. Moreover, teachers can help learners to draw obvious inferences from their observation and such classification. Teachers organize out of class activities based on learning on immediate environment. Hence, teachers correlate the water resource issues while teaching the curricular subject. This is followed by creating awareness on renewal and non-renewal resources. This will enable learners to acquire basic knowledge and understanding of the total water resource, its problems and role of human being. During the usual classroom teaching, teachers encourage learners in acquiring social values through active participation in water resource protection activities. Finally, teachers can provide ample knowledge and skills regarding water resource management concept of development.

A teacher training provides a platform to teachers to acquire knowledge, skill and develop positive attitude, values, and beliefs. This can be done with the help of the provided curriculum. In other word, the quality of teacher produced invariably depends on the curriculum offered to them during their training period (Jadhav & Patankar, 2013). As curriculum is the best mean of overall development of students, teacher is the mediator between curriculum and students. In short the quality of teacher training is maintained by teacher training curriculum. The curriculum development process is a dynamic process which has to take into account society, learner and subject matter need.

## **RESEARCH AIMS**

The major aim of this study is to develop a primary school population aware of and concern about the water pollution and its associated problems by integrating water resource management (WRM) in a teacher training curriculum. More specifically, researchers sought to:

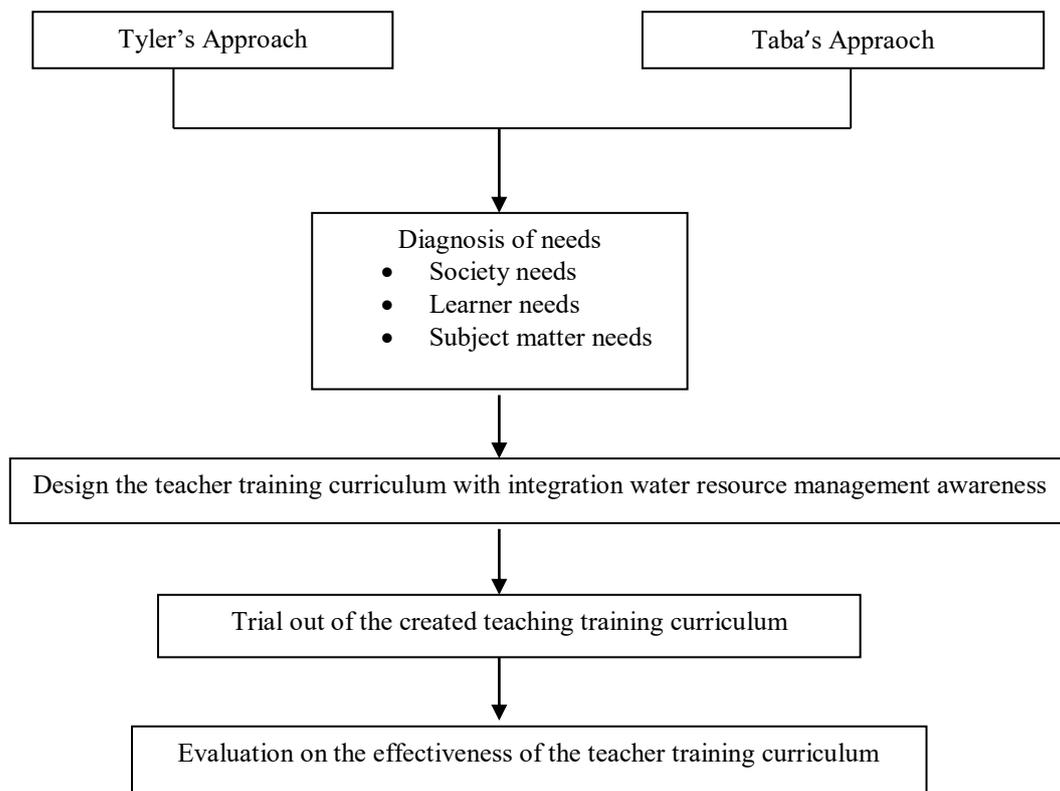
- a) Create a teacher training curriculum in enhancing awareness on water resource management.
- b) Validate the created teacher training curriculum by experts.
- c) Investigate the understanding and satisfaction of primary school teachers after trial out of the created teacher training curriculum.

## **METHOD**

Researchers employed a mixed mode method consists of philosophical assumptions that guide the way of the data collection and analysis and combination of qualitative and quantitative methods in three phases in the research process. The method employed here is a three-phase process that effectively captures most features inherent in a logical and structured approach to curriculum design. Essentially the research design identifies the following phases in the development of a curriculum to enhance awareness on water resource management.

Two approaches were employed to develop the teacher training curriculum namely Tyler's rational-linear

approach and Hilda Taba's approach. Tyler proposed four major concerns while developing a curriculum pertaining to selection of objectives, selection and organization of learning experiences, as well as evaluation. Taba further refined Tyler's curriculum model by adding another three concerns encompassing diagnosis of the learners' educational needs, formulating specific objectives, selection of content based on those objectives, organization of the content into the appropriate levels and sequences, selection of learning experiences that assist the learners in learning the content, organization of those learning experiences, and evaluation on the meeting of objectives. The conceptual framework was developed based on Tyler's and Taba's approaches coupled with the backward design proposed by Wiggins and McTighe (1998). The two approaches and the backward design were the guidelines for researchers in designing the created teacher training curriculum.



**Figure 1.** Conceptual framework of the teacher training developmental process

***Phase 1: Drafting a teacher training curriculum in enhancing awareness on water resource management***

This teacher training curriculum was created according to the types of diagnostic needs in the realms of societal, learning, and subject matter. Society needs refer to the current problems and context in water resource management areas. Focus group discussion was utilized to 12 informants consisted of three local knowledge wisdoms in the northeastern region, three leaders of Namphong sub-basin area, three supervisors from the office of Educational Service Area 4, Khon Kaen and three primary school Grade 6 teachers using purposive sampling. The number of participants who involved in the focus group discussion was a small group of six people led through an open discussion by a skilled moderator. The group of six would be sufficient to generate rich discussion. The participants who involved in the Phase 1 to collect diagnosis needs data mainly cover society needs, learner needs, and subject matter needs.

By investigating the current problems and context in water resource management area from the local knowledge wisdoms to obtain data related to society needs. On the other hand, learner needs and subject matter data were collected from supervisors and teachers. At phase 1, researchers planned to capture the most meaningful information to create the teacher training curriculum and manual courses to develop awareness related to water resource management for primary school teachers. The instrument used in Phase 1 was a semi-structured interview protocol. Data was collected from written field notes and audio recorded and analyzed using content analysis. Data was analyzed by comparing to the complete transcript in order summarize the meaningful information (Krueger & Casey, 2000). Researchers aligned the curriculum development process with the

information collected from Phase 1 to create teacher training curriculum and curriculum manual with integration water resource management awareness. The teacher training curriculum development process covers formulation of objectives, selection and organization of content, selection and organization of learning experiences and determination the measurement and evaluation.

### ***Phase 2: Validation of the WRM training curriculum***

The created teacher training curriculum and the manual courses with integration of water resource management was validated by a group of experts from Faculty of Education, Khon Kaen University. A total of nine experts from various specializations were purposively selected to revise the created teacher training curriculum. They were three experts from the field of curriculum and instruction, three professional scientists of water resource management, three experts in measurement and evaluation area, and three supervisors who are responsible of school curriculum standard.

The components of curriculum teacher training were containing introduction, vision, structure, goal, contents, activities, media and materials, and evaluation documents. Likewise, the components of curriculum manual were covering learning units with lesson plans, media, and assessment forms. A rating scale questionnaire was used to assess the validity of the created teacher training curriculum by the 12 experts. Data from rating scale questionnaire was analyzed using descriptive statistics such as mean score and standard deviation.

### ***Phase 3: Investigation on the understanding and satisfaction of primary school teachers***

The pretest-posttest design involves two measurements of the 38 primary school teachers who were teaching science in Grade 6 using simple random sampling. In this design, samples serve as their own control and comparisons are made before and after treatment. An assumption is made that differences between pretest and posttest are due to the treatment. There were two instruments used in Phase 3. The first instrument was an achievement test comprised of 30 multiple choice items to assess teachers' knowledge of understanding and the second instrument was a 30-items rating scale questionnaire used to evaluate teachers' satisfaction of water resource management training. The achievement test had an average value of the corresponding index of a rating scale questionnaire as 0.84 and reliability by KR20 as 0.87.

Quantitative data from Phase 3 was analyzed by descriptive statistic using the mean score and standard deviation and inferential statistic using paired t-test. Paired t-test was used in 'before-after' water resource management training. Paired t-test was identified to be suitable for this study because all the participants were matched pairs and it was considered as a case-control group. Researchers provided treatment that is water resource management training to these 38 primary school teachers and followed by the investigation on the impacts of treatment related to knowledge of understanding and their satisfaction on the created teacher training curriculum.

## **RESULTS**

Results are presented according to the aim as mentioned above. The results demonstrate in three parts and organized according to quantitative and qualitative methods. The initial results highlight the teacher training curriculum development process derived from the 12 informants through focus group discussion. This is followed by the results of feedback from the 12 experts through their ratings. Finally, the difference between the pretest and posttest was measured on primary school teachers' understanding about the teacher training curriculum thus measuring their satisfaction level as well.

### ***Phase 1: Identifying problems and suggestions from focus group informants to design the teacher training curriculum***

Focus group discussion findings provided by the six local wisdoms and leaders (R1 to R6) basically enable researchers to identify the society needs to diagnose while designing the teacher training curriculum. From the focus group discussion with R1 to R6, researchers identified the following water resource problems. These problems were explicitly pointed out by these six informants as follow:

*"The waste water in the river is caused by manufacturing process and the process of disposing chemicals from industrial facilities located near the river, such as from an ace factory, sugar factory, and paper mills." (R1)*

*"...lack of water during the drought season. In rural areas, there is not enough water. The village has no running water standards." (R2)*

*"People in the area dump garbage into the river and use chemicals in rice herbicide that kill snails and chemicals leach into the rives." (R3)*

*"Fish farming has the foulest stench. The settling of fish residues and dung results from fish in shallow water. This affects Namphong sub-basin water in its flow and water hyacinth weeds such as morning glory and cattail." (R4 and R5)*

*"Cutting wood near the river cause erosion of the banks." (R6)*

After analyzing the above problems raised by the six local wisdoms, researchers suggested to integrate the following contents to enhance water resource awareness as below:

- i. Accelerate the provision of the clean water sources and store clean water from consumption.
- ii. Focus on educating about water use efficiency and maximize the benefits to local residents, especially young people like school students.
- iii. Provide awareness through education to all sectors of the local population particularly highlighting the negative impact of the dirty water.

Besides the water resource problems, water resource management problems were also investigated. The following are the water resource management problems indicated by the six informants (R1 to R6):

*"People do not appreciate the importance of water and do not conserve water" (R1)*

*"Lack of water during draught means lack of water to farmers, which is the main occupation of the community." (R2 and R4)*

*"The government needs to promote conservation in Namphong sub-basin, as public awareness is lacking." (R3 and R6)*

*"The establishment of the restaurants on the waterfront is a problem. The dumping of food waste and sewage waste into the Namphong sub-basin is caused by them." (R5)*

By analyzing the qualitative findings based on water resource management, researchers determined the following contents to be put in the teacher training curriculum.

- i. Supply water for agriculture store and use it throughout the year.
- ii. Use the media to engage in public relations and educate the local population.
- iii. Focus on creating awareness among the new generation in schools.
- iv. Focus on diverse media in the course.

Focus group discussion results derived from the three supervisors of the office of Educational Service Area 4, Khon Kaen (R7 to R9) and three primary school Grade 6 teachers (R10 to R12) enable researchers to determine the learner and subject matter needs that researchers have to diagnose and integrate into the created teacher training curriculum. There were two major concerns that researchers have taken into consideration while interviewing namely school curriculum and curriculum training model. Qualitative results derived from R7 to R9 providing researchers with the following concerns in school curriculum:

*"Lack of regular and continuous activities on water resource management..." (R7)*

*"Education on water-saving practices and sustainable use is lacking. No one has talked about doing a course on water resources." (R8)*

*"There is no content knowledge or information about water resource management of Namphong sub-basin in the Basic Core Curriculum. Each school in Namphong sub-basin and in the cluster of Khon Kaen Educational Service Area 4 needs to develop their local curriculum by themselves." (R9)*

*"Teachers' knowledge and time are insufficient to create learning units about water resource management. Teachers need support from principals and supervisors or external experts to provide workshop training." (R8)*

*"Most of the schools in Namphong sub-basin have their awareness about environmental conservation in their school vision and mission." (R7)*

Basing on the above findings from the three supervisors, researchers concluded the following contents:

- i. Encourage activities related to water resource management as regular and continuous activities.
- ii. Raise the students' awareness regarding the necessity of water and knowledge related to water resource management to ensure water sufficiency.

Based on the discussion with R10 to R12 who are teachers in primary schools, researchers gathered the following information related to the suitability of teacher training curriculum model as such:

*"Teachers need knowledge about water resource management and teaching models to raise the awareness of students." (R10 and R11)*

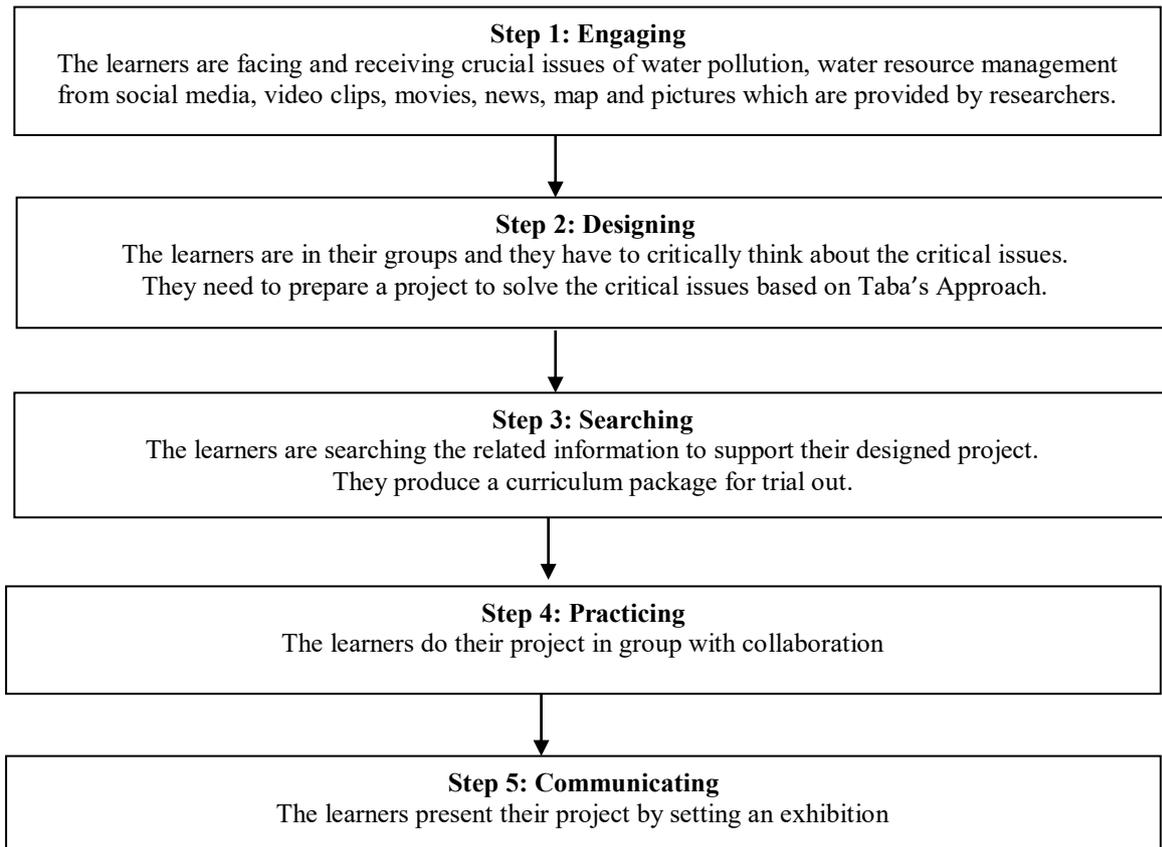
*"Teachers need to be good example of water resource management learning units or lesson plans and the materials or teaching aids for applying to their teaching." (R10 and R12)*

As a result, researchers concluded the following teacher training curriculum model as follow:

- i. Workshop training should be done within 3 to 5 days during the weekend or the end of the semester.
- ii. The content of training curriculum should focus on water resource management and awareness in

- protection and conservation of the environment around Namphong sub-basin.
- iii. Activities in the workshop training should be active learning, contextual learning and must be suitable to learners.
- iv. Materials in workshop training should support teachers' practices, completed with good examples.

After diagnosing the three perspectives of needs, researchers started to design the teacher training curriculum. It was designed based on learner centered, active and contextual learning. On top of that, the curriculum contents were focused on water resource management in the Namphong sub-basin and real life in the community. In addition, the suggested teaching strategies were problem-based, collaborative learning, critical thinking, problem-solving, searching skills, demonstration and exhibition. In regard to this, researchers proposed a 5-steps learning process as shown in Figure 2.



**Figure 2.** Learning process

**Phase 2: Validation of the WRM training curriculum**

The created teacher training curriculum documents were validated by a group of multidisciplinary experts as indicated before. Those experts evaluated the created teacher training curriculum documents by using the rating scale questionnaire. All the 12 experts had validated the teacher training curriculum according to each component. Results of the Phase 2 revealed all the components of the created teacher training curriculum were at good level except structural content. Table 1 shows the mean scores and standard deviations of components in the created teacher training curriculum namely introduction, vision and principles, structural content, learning objectives, contents, activities and teaching strategies, media and materials, and assessment method. As indicated in Table 1, the mean score for eight components ranged from 3.81 to 4.47 while the standard deviation ranged from 0.47 to 0.68.

The result of the study revealed that all the components in the created teacher training curriculum were highly rated by experts. Considering the first two orders, found that the highest mean score was media and materials ( $\bar{x} = 4.47, SD = 0.60$ ). The second order was introduction ( $\bar{x} = 4.42, SD = 0.59$ ). This is followed by activities and teaching strategies ( $\bar{x} = 4.33, SD = 0.69$ ), vision and principle ( $\bar{x} = 4.27, SD = 0.47$ ), learning objectives ( $\bar{x} = 3.97, SD = 0.67$ ), contents ( $\bar{x} = 3.95, SD = 0.63$ ), and assessment method ( $\bar{x} = 3.81, SD = 0.68$ ). The component with the lowest average value was structural content ( $\bar{x} = 3.27, SD = 0.47$ ). The overall mean score was at high

score ( $\bar{x}$  = 4.12,  $SD$  = 0.62).

Result implies that the experts' judgments were corresponding of water resource management curriculum in the same direction of our curriculum for developing awareness about water resource management for primary school teachers in the Namphong sub-basin by focusing on the three focal of needs namely society, learner, and subject matter needs in Phase 1. In addition, the curriculum package which consisted of learning units with lesson plans, media and assessment forms will lead to actual practices that reducing the teaching workload of teachers and enhance the potential of students' learning.

**Table 1:** Validation results of the created teacher training curriculum

Components	Mean score	Standard Deviation	Interpretation
Introduction	4.42	0.59	Good
Vision & Principles	4.27	0.47	Good
Structural content	3.27	0.47	Fair
Learning objectives	3.97	0.67	Good
Contents	3.95	0.63	Good
Activities/Teaching strategies	4.33	0.69	Good
Media and materials	4.47	0.60	Good
Assessment method	3.81	0.68	Good
Overall	4.12	0.62	Good

**Phase 3: Results on the understanding and satisfaction of primary school teachers**

The descriptive statistics of pretest versus posttest of 38 primary school teachers' understanding on water resource management awareness are presented in Table 2. All the posttest results show an increment compared to the pretest results after they attending the training. The assumption was made at the initial stage of the mean scores of the paired samples are equal which means that the pretest scores is equal to the posttest scores. The level of significant was identified as .05. Result of the study revealed that the mean score between the pretest and posttest was different between all the paired samples. In other words, all the 38 primary Grade 6 school teachers in Namphong sub-basin gained a higher score in their posttest compared to their pretest.

**Table 2:** Paired samples t-test

Treatment	$\bar{x}$	$SD$	t	p value
Pretest	15.34	4.19	9.891*	0.00
Posttest	21.79	3.13		

Additionally, the result indicates that these 38 Grade 6 primary school teachers were satisfied with the teacher training management with integration of water resource management awareness. The result of evaluation on their satisfaction level after the intervention that is the training was found to be encouraging, mean score ranged from 4.15 to 4.29. It can be concluded that teachers satisfied with the course, skills of trainer and learning climate of the teacher training.

**Table 3:** Teachers' satisfaction on curriculum for developing water resource management awareness

Aspects	Mean score	Standard deviation	Interpretation
Course	4.15	0.62	Good
Skills of trainer	4.28	0.63	Good
Learning climate	4.29	0.57	Good
Overall	4.21	0.61	Good

**DISCUSSION**

Environmental education like water resource management awareness can take the form of science enrichment curriculum, natural history field trips, community service projects, and participation in outdoor science schools. Therefore, water resource management awareness policies assist schools and organizations in developing and improving environmental education programs that provide learners with an in-depth understanding of the environment. School policies should focus on three main components namely curriculum, facilities, and training. School can integrate water resource management awareness into their teacher training curriculum so that teachers can play their significant roles during their teaching in the classroom.

Results of this study revealed that the created teacher training curriculum which consisted of eight components was found to be highly consistent with the Tyler's and Taba's curriculum model. On this line of reasoning, the created teacher training curriculum with integration of water resource management awareness is based on theoretical concepts on the basis of contextualized theory (Bray, Adamson & Mason, 2007). Since the created teacher training curriculum has been validated and assessed its effectiveness, teachers are encouraged to utilize what they learned to help learners as well as illiterate adults to know, to protect, and to enrich the environment from water pollution (Chaturvedi et al., 2014).

Traditionally, teacher has been regarded as an agent of social change and transformation. Learners imitate their teacher and draw stimulation from them especially in primary schools. A primary school teacher therefore plays an important role in providing water resource management awareness and developing a positive attitude towards environment among learners by shaping cognitive, affective, and psychomotor simultaneously. Water resource management awareness not only educates the population in Namphong sub-basin about the natural environment and its problem but also aims at developing them the knowledge, attitudes and skills necessary to protect the natural balance in water resource besides working for its enrichment.

Water resource management awareness has to be conceived in a sustainable way as long-term activities. School curriculum has to be integrated water resource management awareness in every subject especially in the seven subjects with 36 indicators such as sciences, social, religion and culture, career and technology, health, mathematic, and language and art. Moreover, parents and communities are encouraged to participate in the monitoring and evaluation of the curriculum implementation particularly in environmental and community accountability.

In order to develop the water resource management awareness through formal education, certain required activities under the various levels of formal education have to be carried out. At primary school level, the main focus must be the awareness or the consciousness of the water resource in general. The water resource material should be embedded with the contents in language, social science and natural sciences. The teacher concerned should follow the teaching strategies of direct observation supported by audio-visual aids. On the other hand, location orientation awareness and conservation knowledge and skill should be given due emphasis at the secondary level of formal education. The content of secondary school level can remain the same as it is at the primary school level, but the teaching strategies employed should be action oriented. Finally, higher education has the most important role in curbing environmental imbalances. Higher education should focus on the sustainable development, conservation, and recycling knowledge and skill depending upon the nature of the courses offered in teacher training. Research activities must be encouraged in this respect at the maximum including the extension works.

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# **Development of an Instructional Model Based on Reading Apprenticeship Approach and Semantic Mapping Strategy for Enhancing Analytical Reading Ability of Undergraduate Students**

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## **ABSTRACT**

The purposes of this study were to, develop an instructional model based on reading apprenticeship approach and semantic mapping strategy for enhancing analytical reading ability of undergraduate students; and evaluate the efficiency of the instructional model. The research procedure was divided into phases; 1) development of an instructional model based on real problem; and 2) effectiveness evaluation of an instructional model through implementation with the subjects who were thirty undergraduate students, Suan Sunandha Rajabhat University, Thailand. The duration of experiment was one semester. The research instruments were analytical reading test. The data were analyzed by using T-test dependent. The research result shows that: 1) The objectives of the developed instructional model were to enhancing analytical reading. This model consisted of 3 substages which were 1.1 Beginner and Reading Apprenticeship 1.2 Process of Reading Apprenticeship 1.3 Experiences Interchange. Quantitative and qualitative data measurement and evaluation were carried out during and after the instructional process. 2) The effectiveness of the instructional model after implementation, it was found; The score of analytical reading higher than before the experiment at .01 level of significance in all components. The ability with most significant improvement.

**Keywords:** Reading apprenticeship approach , Semantic mapping strategy, Analytical reading

## **INTRODUCTION**

Reading is important skills and really essential for educational system that is the major part and tools of the world purpose for seeking the knowledge, ideas creation, decision making and solutions. In addition, reading can help learners to be quickly and widely in mindset of academic from both inside and beyond classrooms entirely. 80-90 percentages activity of academic institutes have concerned to the reading and learners who have its skillful to encourage as well as acquisition of knowledge. Otherwise reading can improve individual working competency and be required for the knowledge based society (Minty of Education, 2009; OECD, 2010)

Ministry of Education has realized to this matter, so they contain this curriculum to improve the reading skill for all levels of education, especially, undergraduate study (Office of the Higher Education Commission, 2013) Every institute is highly interesting and contains it into general subject so as to be the principle and how to read academic writings namely fictions, non-fictions, prose and compose. Those emphasized knowledge, ideas, moral and value of words formation. This level of reading is in depth of vocational education and prepares completeness before occupation (Sinlarat, 2012, p.4) accompanying with understanding and preciosity in the contents by readers. Otherwise, they should interpret it reasonably so that why it is primary character of critical reading.

Therefore, the Department of Thai language would encourage collage students to have analytical reading. According to it was a knowledge and understanding skills then using in daily life, reflecting and giving the suggestion in contents with engagement in its for targets approach of each people. To develop knowledge and self-competency and social contribution (OECD, 2013; OECD, 2010, p. 37) the learners of University used reading to learn in their objectives with complex stories and specific interesting stories to encourage literacy in own academic contents (Lee and Spratley, 2010).

The result of study from concepts, theories, principles of literature reviews and researches related to analytical reading enhancement showed that the theories might be able to utilize in fundamental schooling development so as to encourage analytical reading for the learners in University based on the Reading Apprenticeship Approach And Semantic Mapping Strategy Therefore, the aim of this study is formulated as follows:

The purposes of this study were to, develop an instructional model based on reading apprenticeship approach and semantic mapping strategy for enhancing analytical reading of undergraduate students; and evaluate the efficiency of the developed instructional model.

## **LITERATURE**

### **Analytical reading**

Analytical reading is defined to intensive reading and considers writing intention to analyze context compartment such conceptual content, interpretation, significant and relevant content. Readers must purify the component of context structure to summarize its concept and value. Each part of the definition is explained further:

The competency of analytical reading defined to the ability of literature reading completely with writing style and structure, content, writing strategy and language idioms. By the way, readers could analyze text and interpretation for attitude of editors and their significant. Otherwise, reader could be diverse the ideas by reading information to evaluate from competency quiz of analytical reading and the result of examination.

Then, researchers designed as following components:-

1) Writing styles Analysis, precisely content analysis in conformity with type of writing, presentation strategy, and language idioms in the definition stories or events.

2) Interpretation was ability to explain precisely editors' attitude, emotion, feeling in the content, the purpose of editors, views of context, main ideas majority and minor in the definition stories or events.

3) Reasonable criticism was ability of reader comments in conformity with stories, giving the reason and example to relevant with point of view and brought applicable concept.

In order to achieve one's goals, to develop one's knowledge and potential, and to participate in society – this statement is intended to capture the full scope of situations in which analytical reading plays a role. To achieve one's goals and to develop one's knowledge and potential refers to the idea that analytical reading enables the fulfilment of individual aspirations. The word participate is used because it implies that analytical reading allows people to contribute to society as well as to meet their own needs. (OECD, 2010, p. 37; 2012, p. 61)

Therefore analytical reading development for the learners, teachers needed to focus on the development of the learners in reading skill for understanding and reflecting resulted to the objective of learners and good reader (Guthrie, 2000 cited in Loera, 2006)

### **Reading Apprenticeship Approach**

Reading Apprenticeship Approach was applied by fundamental of Social Constructivism and Social Cognitive Learning Theory. The major character of this concept was teachers, experts and friends to be practice guideline for the process of reading in various types (Schoenbach, 2000 cited in Mehdian, 2009, p. 4-5). Role of teachers was the original various systematic applications with extra practice and encouraged the learners to control self-systematic reading Knowledge acquisition was based on Metacognition Conversation how to choose the context and ensure comprehension while reading and evaluating the knowledge outcome, jobs assignment and appropriate reading system for complex contents (Matz, 2012, p. 37-38). The prior reading experiences of learners helped the understanding of content (Brenner, 2009). Learning was emphasized with interaction between learners, teachers and colleagues by group-knowledge sharing, independent group assignment namely pairs, small group, classroom debate and conclusion together (Mehdian, 2009, p. 5).

Moreover, Reading Apprenticeship Approach was the original pattern for all writing styles, reading development for all educational levels, and capability encouragement to utilize the various reading methods to concern with the contents. Reader could understand and gather from the main idea of contents. Otherwise it acquired skills of thinking and knowledge to extend for higher education and self-access. This method of reading raised teamwork and motivated all learners. As noticed, the Reading Apprenticeship Approach emphasized to understand and gather from the main ideas conforming to Pressley et al., (1992, p. 524-525) stated "General researchers did not study for the method of interpretation, but focusing on the main ideas and raising readers competency. The learners' interpretation happened during achievement test, which was provided by their teachers, because learners' interpretive capability was from their knowledge basis, attitude, ideas and method of reading entirely to explain vocabulary, idioms and context. They were shown by interaction between teachers, learners and text" In addition, Johnson Pittelman and Heimlich (1986, p.778) stated that most researchers aimed to reading comprehension, not in details of words. In fact, words were important components of reading and its interpretation from the meaning.

Students can use Reading Apprenticeship Approach for a variety of text types. In several instructional settings, including reading groups that focus on high-quality literature. When a child has difficulty decoding a word, the teacher prompts the child to choose one or two of several fix-up strategies that have been taught, such as: Sound out the word, Look for context clues, Reread and Skip the word. (Pressley et al., 1992, p. 257)

Therefore, the important guideline for learners to have ability of reading analysis and to know meaning of word for interpretation was Semantic Mapping Strategy.

### **Semantic Mapping Strategy**

That strategy explained to the meaning of word from interpretation of connotation context approach which was invisible and complexity in mapping form (Vadasy and Nelson, 2012, p. 104). It could help teachers to inspect obviously understanding of learners correlate with Semantic Mapping Strategy to develop reading. Coleman (1995, 15) was found that learners showed imagination of main ideas to relevant the structure of prior knowledge. It assisted readers to be visible comprehension in main ideas with supported information and mapping from which readers' selection. (Suphamonkhon, 2010; Coleman, 1995)

As the results, Reading Apprenticeship Approach and Semantic Mapping Strategy were efficiency to develop competency of the learners into analytical reading with good attitude from them, enthusiasm, and their showing the criticism of selecting context.

## **METHODOLOGY**

This study was a research and development based on Reading Apprenticeship Approach and Semantic Mapping Strategy to encourage analytical reading of undergraduate students by quasi-experimental research, with a one group pre-test post-test design . The purposes of this study were to, develop an instructional model based on Reading Apprenticeship Approach and Semantic Mapping Strategy for enhancing analytical reading on University students, Suan Sunandha Rajabhat University, Thailand; and evaluate the efficiency of the instructional model. The selected participant of 2nd semester 2016 was 30 college students 2<sup>th</sup> year in Bachelor Degree from Faculty of Education.

1. The research procedure was divided into phases

1.1 Development of an instructional model based on real problem; and

1.2 effectiveness evaluation of an instructional model through implementation with the subjects who were thirty University students. They learn Reading subject .

2. Research content was course syllabus in Bachelor of Reading for Intellectual Development. It was about analytical reading in academic writing, journals, documentaries and short stories by learner selection and it appeared on undergraduate study.

3. The research instruments

There was main research instrument and a RAA and SMP lesson plan such as: Analytical reading test (pre-test and post-test). It contained 38 multiple-choice items and Completion Question 12 items. Totally 50 items.

4. Efficiency evaluation for learning improvement. This Research variable consisted of Manipulate variable to define Reading Apprenticeship Approach and Semantic Mapping Strategy. Dependent variable was competency of analytical reading.

5. Period of data collective to study effective program for 16 weeks totally 32 studied periods in Semester 1 yearly 2016.

6. The data were analyzed by using T-test dependent and descriptive statistic: Frequency, Percentage, Mean, Maximum value, Mode, Standard Deviation and judged value of mean were examined to describe students' analytical reading ability

## **FINDINGS**

Reading Apprenticeship Approach and Semantic Mapping Strategy defined the circumstance of regulatory learning to bring them in the curriculum and encourage the learners in various reading strategy by lecturers, experts and colleagues advice. They were conducted to consider the content with the prior knowledge of vocabulary, idioms and content to interpret and mapping the meaning of words from reading context. This method emphasized from Metacognition Conversation and Semantic Mapping. The cumulative learning by interaction resulted to the competency of analytical reading as Reading Apprenticeship Approach and Semantic Mapping Strategy categorized by 4 basics.

1. Reading Apprenticeship Approach induced learners to bring their knowledge for planning how to select efficiently analytical reading, practice and self-evaluation.

2. Content learning by mapping prior knowledge with vocabulary, idioms and main idea toward better story comprehension.

3. Reading knowledge Indication and Explanation to categorize respectively for semantic mapping and to show in diagram. They were useful for all learners more understandable contents and reading structure.

4. Reading Inspection and Evaluation Involvement by interchanging, criticism with appropriate learning circumstance and to encourage learners' attention.

The instructional model based on Reading Apprenticeship Approach and Semantic Mapping Strategy had 3 teaching stages as follows:

### Stage 1 Beginner and Reading Apprenticeship Approach

- 1.1 Lecturers/ Experts share reading fundamental
- 1.2 Model presentation/ analytical reading demonstration
- 1.3 Learner practice by model

### Stage 2 Process of Reading Apprenticeship Approach

- 2.1 Learners indicated prior knowledge to relevant with context.
- 2.2 Learners chose Reading Apprenticeship Approach
- 2.3 Learners indicated vocabulary, idioms and important statement to definition
- 2.4 Learners used semantic mapping strategy with key words.

Learners Team diversified reading information.

### Stage 3 Experiences Interchange

- 3.1 Learner shared knowledge and criticism.
- 3.2 Lecturers inspected and gave suggestion for additional information
- 3.3 Learner concluded and gave important suggestion.

#### *Part 1 Quality Inspection of schooling by experiment*

The results of schooling model to experiment with University students, Suan Sunandha Rajabhat University total 30 students, they were as similar as the sample group in first semester year 2016 as following;

1. First experiment was found that the learners could not reflect ideas from reading contents and explain its content to apply reasonably. The researchers demonstrated conceptual reflection samples and brought ideas from reading contents to apply with the learners by using the technical questions so as to encourage the learners to think and make reasonable decision for some information properly.

2. Second experiment was found that the learners could reflect the ideas from reading contents. Nevertheless, the process of knowledge relaying, various learners could not bring the knowledge from reading contents to use appropriately. The researchers used a teaching by rising up the sample situations related to the reading contents and asking learners to analyze the issues with suggestion.

The result of teaching experiment was taken to enhance reading management plan of sample group.

#### *Part 2 The effectiveness of the instructional model based on Reading Apprenticeship Approach and Semantic Mapping Strategy*

**Table 1.** The comparison result of average score in analytical reading against the sample before and after the experiment (N = 30)

Analytical reading	Pre test		Post test		D	t	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.			
score 50	29.63	3.362	37.30	3.030	29	10.884	.000*

significant difference \*p < .01

As table 1 found that after experiment of the sample group had overall analytical reading higher than criterion 70 percentages and higher than before the experiment at .01 level of significant. Score of before experiment at 29.63 percentages and score of after experiment was increased at 37.30 percentages.

**Table 2.** The comparison result of average score in analytical reading against before and after the experiment categorized by component (N = 30)

Analytical reading	Pre test		Post test		t	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
1. Writing styles Analysis (24)	14.56	2.062	16.36	2.606	-3.366	.002*
2. Interpretation (14)	8.23	1.546	8.93	1.552	-1.948	.061
3. Reasonable criticism (12)	6.83	1.782	12.00	0.000	-15.874	.002*
Analytical reading (50)	14.56	2.062	16.36	2.606	-3.366	.002*

significant difference \*p <

.01

As table 2 found that after the experiment to the sample group had overall analytical reading higher than criteria at .01 levels. The average score of writing styles analysis, and reasonable criticism were higher than before the experiment at .01.level of significant. The interpretation of sample group had score higher than before the experiment, but not different at 0.01 level of significant.

## CONCLUSIONS

The population of this study was 30 students from University students. Findings were average score of analytical reading higher than before the experiment at .01 level of significance in all components. The teaching 3 stages were 1.beginner and reading apprenticeship approach 2.process of reading apprenticeship approach 3.experiences interchange. Students who were participant, provided activities and enjoyable learning. Students had reading skills performed best on the analytical reading test.

Reading Apprenticeship Approach and Semantic Mapping Strategy instruction had significant on students' analytical reading ability. The core reason that made Instructional model successful was that all stages, conducting research, self-reflection on own learning were constructed based on the 4 principles of Reading Apprenticeship Approach and Semantic Mapping Strategy

During the stages, students were used reading strategy support and guidance from Reading Apprenticeship. Teacher scaffolding was one of the most important factors. This support the instructional model by Lowery (2010) found that reading guidance assisted the learners understanding of what they read including used the knowledge and relayed its correctly on objective. Reading Apprenticeship Approach and Semantic Mapping Strategy make proficient readers. In investigations spanning several decades, researchers studied skilled reading to learn more about interpretive thinking and strategic actions. From this research, two models of expert reading emerged (Pressley & Afflerbach, 1995) and the Good Strategy User Model (Almasi, 2003). Both theories depict the knowledge and strategic resources that capable readers rely upon when reading. According to these models, good readers tap their academic and nonacademic knowledge, monitor their comprehension.

Mean while Reading Apprenticeship Approach and Semantic Mapping Strategy instructional model assisted all learners having motivation with reading habit, and interpreting. (Jesson and Lacey, 2011, p. 31; Sathaphong, 2015).The results of research in transactional strategies instruction assisted enhancement of reading for understanding. Students who practiced on that instructional, could understand and penetrate the main point of the contents. Moreover they could link and well relay on the reading (Gutkind, 2012). The Literacy Management strategies assisted enhancement the reading for understanding, attitude and motivation for University students.

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# Development of Analytical Thinking Skills Among Thai University Students

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## ABSTRACT

This study aimed to examine the analytical thinking skills development through learning management plans. Research and development design coupled with case study method was employed to Thai Basic Education University students from a public university in Khon Kaen province, Thailand. There were two groups of samples consisted of 45 teacher educators and 1,575 Basic Education university students. The quantitative finding indicated that teacher educators' analytical thinking score was 36.54 out of the full score as 45, higher than defined criterion of 70 percent while focus group interviews showed positive feedback including analytical thinking knowledge and practices in handling learning management.

**Key Words:** Analytical thinking, university students, learning management plans

## INTRODUCTION

Analytical thinking skills are critical in today advanced technology work place, particularly in the teaching profession. This is because analytical thinking skills help teachers or teacher trainees to gather information, articulate, visualize and solve complex problems in the rapid information age of changing trend world. Hence it becomes a necessity for every country to develop its future human resource to be able to think analytically, critically, know how to solve problems, acquire creative and initiative thinking skills, know how to acquire knowledge from multiple sources, learn and construct bodies of knowledge by themselves, adapt themselves in time for the ever-changing situations and be prepared to confront the challenge of the world. University students are expected to develop analytical thinking mind and they must not only understand what they read but also pick it up apart, question it, evaluate it and assess it. Analytical thinking involves questioning and reflecting upon ideas. University students must look deeper into what they are learning and think about its relation to the bigger picture. They must be able to present their critique and a structured, clear, and well-reasoned and supported way (UCL Transition Program, n.d.).

It is essential to develop teachers' analytical thinking skills so that they are able to integrate analytical thinking skills in their learning management. Even teachers have gone through comprehensive training, there will be many times where teachers will put on the spot to think analytically and the right or wrong answer could make a difference with regard to their upward mobility within the schools. To what extent teachers are able to incorporate training of analytical thinking skills, thinking process, management, and situation confrontation in their learning management so that students learn from real experiences is still questionable (Pamphilon, 2000). In order to develop analytical thinking skills among the learners in current rapid changes, the world is extremely vital because learners have to be prepared by teachers to face it. As a result, Basic Education pre-service teachers have to be appropriately equipped to practice the integration of analytical thinking skills in their learning management as they are going to become Basic Education teachers in the future. Pre-service teacher trainees or Basic Education university students have to be trained accordingly so that they will be responsible for developing their students with strong analytical thinking skills to live in the 21<sup>st</sup> Century (Jones, 1997; Wasee, 1999; Pamphilon, 2000; Makanong, 2001; Paziotopoulos & Kroll, 2004).

Thailand Basic Education Core Curriculum (2008) stipulated the significant competencies of students which mainly cover thinking competency especially analytical thinking, synthetic thinking, creative thinking, which will lead to the construction of bodies of knowledge or information, or to appropriate decision for themselves and the society (Ministry of Education, 2008). The importance analytical thinking skill-oriented instruction has been highlighted in National Education Act of 1999 and the amendment versions 2002 and 2010 (Ministry of Education, 2015) whereby teachers are required to incorporate analytical thinking process, situation confrontation practices, and application of knowledge in prevention and solution of problems in students' learning process. As a consequence, the capability of teachers to instill thinking skill in their teaching processes is extremely vital in order to fulfill the Thailand educational goal. Although some research studies had been carried out on students' analytical thinking for the past decades, findings revealed that Thai students' analytical

thinking still failed to optimally be developed and seemed to reach only at certain limitation (Office of Education Standard, Ministry of Education, 2006). The evaluation of students' analytical thinking competence indicated that the achievement level requires improvement and is not satisfied (Nonglak, Suwimon, & Uayporn, 2004; Office of National Education Standards and Quality Assessment (ONESQA), 2007).

### **ANALYTICAL THINKING THEORY (BLOOM, 1956)**

Researcher utilizes Benjamin Bloom and his associates' discussions about analytical thinking as the theoretical foundation of this study. Their taxonomy for information processing skills (Bloom, 1956) is one of most widely cited sources for educational practitioners when it comes to teaching and assessing higher order thinking skills like analytical thinking skills. Bloom's taxonomy is hierarchical, with 'comprehension' at the bottom and 'evaluation' at the top. The three highest levels (analysis, synthesis, and evaluation) are frequently said to represent analytical thinking (Kennedy, Fisher, & Ennis, 1991).

The benefit of this Bloom's educational approach is that it is based on years of classroom experience and observations of student learning (Sternberg, 1986). However, some have noted that the educational approach is limited in its vagueness. Concepts within the taxonomy lack the clarity necessary to guide instruction and assessment in a useful way (Ennis, 1985; Sternberg, 1986). Furthermore, the frameworks developed in education have not been tested as vigorously as those developed within philosophy or psychology (Sternberg, 1986). On this line of reasoning, researcher considers analytical thinking abilities according to past researchers of analytical thinking typically agree on the specific abilities encompassed by the definition, which includes:

- Analyzing argument, claims, or evidence (Ennis, 1985; Facione, 1990; Halpern, 1998; Paul, 1992).
- Making inferences using inductive or deductive reasoning (Ennis, 1985; Facione, 1990; Paul, 1992; Willingham, 2007).
- Judging or evaluating (Case, 2005; Ennis, 1985; Facione, 1990; Lipman, 1988; Tindal & Nolet, 1995), and
- Making decisions or solving problems (Ennis, 1985; Halpern, 1998; Willingham, 2007).

Other abilities or behaviors identified as relevant to analytical thinking include asking and answering questions for clarification (Ennis, 1985); defining terms (Ennis, 1985); identifying assumptions (Ennis, 1985; Paul, 1992); interpreting and explaining (Facione, 1990); reasoning verbally, especially in relation to concepts of likelihood and uncertainty (Halpern, 1998); predicting (Tindal & Nolet, 1995), and seeing both sides of an issue (Willingham, 2007). According to Bloom, Engelhart, Furst, Hill, and Krathwohl (1979), the analysis is the major component of analytical thinking skills in this study. Therefore analytical thinking skills have to be operationally defined into three types of analytical thinking namely analysis of elements, analysis of relationships, and analysis of organizational principles. At the first level, Basic Education university students are trained to break down the material into its constituent parts. This is followed by identification and classification process of the elements of the original material. At the second level, Basic Education university students are required to make explicit reports on the relationships among the elements, thus to determine their connections and interactions. The final level involves recognition of the organizational principles, the arrangement and structure, which hold together the learning process as a whole.

#### ***Analysis of elements***

Most of the learning management may be conceived as composed of a large number of elements. Some of these elements are explicitly stated or contained in the learning processes hence these elements can be recognized and classified easily and relatively. However, there are also high possibilities that learners have difficulty in recognizing the elements which are taught and identified by teachers. Learners may be unable to recognize the conclusions drawn by their teachers due to the analysis of elements are not explicitly stated by teachers. There are still many other elements during the learning management which are not clearly communicated, labeled or identified by the teachers that may cause the students cannot do their thinking appropriately. On top of that, many of these elements may be of paramount importance in determining the nature of learning management until the stage that learners cannot detect and have difficulty in fully comprehending or evaluating the whole learning. Thus there are some unstated assumptions being made by teachers which can only infer from an analysis of a series of statements within learning materials. It is also the value to the learner if he or she can detect the nature and function of particular statements including statements of fact, statements of value, and statements of content in the learning management.

The following are the analytical thinking skills related to an analysis of elements which should be considered to integrate into learning objectives.

- Ability to recognize unstated assumptions.
- Skill in distinguishing facts from hypotheses.

- Ability to distinguish factual from normative statements.
- Skill in identifying motives and in discriminating between mechanisms of behavior with reference to individuals and groups.
- Ability to distinguish a conclusion from statements which support it.

### ***Analysis of relationships***

Having identified the different elements within a learning management, learner still has to have the ability to determine some of the major relationships among the various parts of the learning process. Learners may need to determine the relationship of the hypotheses to the evidence and in turn the relationship between the conclusions and the hypotheses as well as the evidence. This type of analysis includes the relationship between different kinds of evidence presented. In addition, analysis of relationships can be quite difficult when the essential parts of learning are contradicted between each other, which in turn hinder learners to expand, develop, or support their learning progress. Most of this type of analysis may deal with the consistency of part to part, or element to element or the relevance of elements or parts to the central idea.

The following are the analytical thinking skills related to an analysis of relationships which should be considered to integrate into learning objectives.

- Skills in comprehending the interrelationships among the ideas in a passage.
- Ability to recognize what particulars are relevant to the validation of a judgment.
- Ability to recognize which facts or assumptions are essential to the main learning or to the argument in support of the learning.
- Ability to check the consistency of hypotheses with given information and assumption.
- Ability to distinguish cause-and-effect relationships from other sequential relationships.
- Ability to analyze the relations of statements in an argument, to distinguish relevant from irrelevant statements.
- Ability to detect logical fallacies in arguments.
- Ability to recognize the causal relations and the importance details from historical account.

### ***Analysis of organizational principles***

The most complex and difficult level of analytical thinking is analyzing the structure and organization of the learning process. It is rarely teachers will explicitly point out the organizational principles they have used frequently they may not be aware of the principles they have utilized. Thus their purpose, point of view, attitude or general conception of the learning process may be discerned in their teaching and learners may be unable to fully comprehend or evaluate the learning until they have determined them. Similarly, some teachers select some form, pattern or structure to organize their arguments, evidence or other elements. This type of analyzes underlying organizational qualities to assist in the comprehension as well as evaluation of the entire learning process. Frequently it is impossible to make an evaluation until the analytical thinking process has been done.

The following are the analytical thinking skills related to an analysis of organizational principles which should be considered to integrate into learning objectives.

- Ability to analyze, in a particular work of art, the relation of the materials and means of production to the 'elements' and to the 'organization'.
- Ability to recognize form and pattern in literacy or artistic works as a means of understanding their meaning.
- Ability to infer the teacher's purpose, the point of view or traits of thought and feeling as exhibited in his or her teaching.
- Ability to infer the teacher's concept of science, philosophy, history, or his or her art as exemplified in his or her practice.
- Ability to see the techniques used in persuasive materials, such as advertising, propaganda, etc.
- Ability to recognize the point of view or bias of a teacher in a historical account.

## **LITERATURE REVIEWS**

Researcher explores the teaching ability of analytical thinking, as well as the instructional implications of the empirical literature on analytical thinking skills. Specific instructional recommendations for fostering the development of analytical thinking will be summarized as follows:

### *The teaching ability of analytical thinking*

Many researchers argued that analytical thinking skills and abilities can be taught. For example, Halpern (1998) offers evidence of two instructional programs aimed at improving the analytical thinking skills and abilities of college students. In one of Halpern's study, students who were taught general problem-solving skills improved on Piaget-inspired measures of cognitive development. In the other study, Halpern found that college students instructed in a specific type of problem-solving strategy produced mental mathematics representations that were more like those of experts than of novices. Kennedy et al. (1991) concluded that instructional interventions on students' analytical thinking skills have generally shown positive results. In a meta-analysis of 117 empirical studies examining the impact of instructional interventions, in general, have a positive impact, with a mean effect size of 0.34. However, the distribution of effect sizes was highly homogeneous, with effect sizes varying dramatically by type of intervention and sample characteristics. For example, effect sizes for students in K-12 settings were higher than those observed among undergraduates.

#### ***Specific instructional strategies***

A number of past researchers have recommended using particular instructional strategies to encourage the development of analytical thinking skills and abilities namely explicit instruction, collaborative or cooperative learning, modeling and constructivist techniques. For instance, many researchers have noted that analytical thinking skills and abilities are unlikely to develop in the absence of explicit instruction (Abrami et al., 2008; Case, 2005; Facione, 1990; Halpern, 1998; Paul, 1992). Facione pointed out that this explicit instruction should also attend to the dispositional or affective component of analytical thinking. Proponents of collaborative or cooperative learning include Thayer-Bacon (2000), who emphasizes the importance of students' relationships with others in developing analytical thinking skills. Bailin, Case, Coombs, and Daniels (1999) argued that analytical thinking involves the ability to respond constructively to others during group discussion, which implies interacting in pro-social ways by encouraging and respecting the contributions of others. Similarly, Heyman (2008) indicated that social experiences can shape students' reasoning about the credibility of claims. On top of that, Abrami et al. (2008) found a small but positive and significant effect of collaborative learning approaches on analytical thinking.

Besides, teachers are urged to use constructivist learning methods, characterized as more student-centered than teacher-centered (Bonk & Smith, 1998; Paul, 1992). Constructivist instruction is less structured than traditional instruction, amplifying students' roles in their own learning and de-emphasizing the role of the teacher. Educators should model analytical thinking in their own instruction by making their reasoning visible to students.

#### **RESEARCH AIMS**

The major aim of this study was to investigate the analytical thinking skills in learning management for Basic Education students. Researchers seek to investigate: (i) Developmental process of integration of analytical thinking skills by Basic Education teacher educators while managing learning process through training; (ii) Teacher educators' achievement in integrating analytical thinking skills in learning management after training by evaluating their learning management plans; (iii) Basic Education university students' analytical thinking skills and satisfaction level after receiving intervention, and (iv) teacher educators' feedback after implementation of learning management plans.

#### **METHOD**

Researchers utilized Research and Development design to develop analytical thinking of Thai Basic Education university students from a public university located in Khon Kaen province, Thailand. Researcher aimed to develop pre-service teachers' competency to emphasize analytical thinking in their learning management. Case study research design was utilized. Case study research intensively investigates a small set of cases, focusing on many details within each case and context. In short, it examines both details within each case's internal features as well as the surrounding situations. Case study enables researchers to link the micro level that is undergraduate program pre-service university students to the macro level, or large-scale structures and processes (Vaughan, 1992). The logic of the case study is to demonstrate a causal argument about how general social forces shape and produce results in particular setting (Walton, 1992).

The research and development procedure was used as a guideline for the study and conducted in two phases. The first phase was to develop educators' learning management through training. Researchers worked with the sample group to identify problems and to find effective ways of solving them. Several meetings were organized in order to make the objectives of the project clear to the participants who are teacher educators and to discuss a training workshop which emphasizes on analytical thinking learning management. This is followed by evaluation of the results of the development.

The following was the research procedure: (i) Researchers held a meeting with research working group to explain the objectives for integrating analytical thinking skills in learning management, the training procedures, evaluating procedures, training schedule and value, and the roles as well as duties of research working group; (ii) Researchers invited four experts in the areas of development of analytical thinking skills and learning management to conduct a comprehensive training workshop; (iii) Subsequently researchers held several meetings with the four experts for common understanding of the use of the learning management model to develop analytical thinking (Sitthipon Art-in, 2011) and the planning of the training; (iv) A total of 45 teacher educators were volunteering to participate in training. These teacher educators were trained to develop learning management from October 20 to 21, 2014 at the Faculty of Education, a public university in Khon Khen city, Thailand; (v) The training activities emphasized three main competencies namely the basic knowledge of analytical thinking, training analytical thinking process, and learning management model to develop analytical thinking; (vi) By the end of the training, evaluation was carried to measure the outcomes of the training; (vii) Teacher educators' analytical thinking skills were tested and their learning management plans with analytical thinking skills integration were evaluated by the end of the training, and (viii) teacher educators were assigned to construct two analytical thinking learning management plans for their teaching within duration of four weeks and submitted their plans for evaluation.

The second phase of this study was to construct learning management plans, implementing learning management, and measure feedback from Basic Education university students and teacher educators. The following steps had been taken: (i) Researchers and the 45 trained teacher educators attended a workshop from January 18 to 19, 2014 at Faculty of Education, a public university at Khon Kaen city, Thailand; (ii) This workshop mainly aimed to plan and draft the learning management plans with integration of analytical thinking skills based on the learning model; (iii) The Learning Management Model emphasizing analytical thinking (Sitthipon Art-in, 2011) has six steps namely orientation, presentation of learning task, practice of analytical thinking individually or small group, presentation and discussion of ideas, and conclusion; (iv) A total of 12 learning management plans had been developed and would be implemented for 12 hours per one class for each cohort for a period as one semester; (v) Teacher educators who applied the 12 learning management plans were responsible for developing analytical thinking skills of their Basic Education university students in their respective classes; (vi) By the end of the 12 hours learning management processes, the Basic Education university students were tested on their analytical thinking skills; (vii) The test results of Basic Education university students were analyzed and interpreted by comparing with the defined criterion as 70 percent, and (viii) researchers interviewed teacher educators to collect their feedback after implementing learning management plans.

The target group in this study consisted of two groups of samples. The first target group consisted of 45 teacher educators from undergraduate programs in Khon Kaen city, Northeast of Thailand utilizing purposive sampling technique. All the 45 teacher educators agreed to participate in designing learning management plans that emphasizing analytical thinking skills. The second target group comprised of 1,575 Basic Education university students from nine undergraduate programs. This group of students has to attend the 12 hours learning management process for the first semester of 2014.

The instruments utilized in this study were learning management plans, evaluation tools, and interview protocol for teacher educators. There are two types of evaluation tools. The first type of evaluation tool is a 45 four-choice items test used to evaluate teacher educators' analytical thinking skills after the training. It had been tested for content validity with the Index-Objective Congruence (IOC) as within 0.80 to 1.00, item difficulty level as within 0.24 to 0.72, item discrimination factor as 0.35 to 0.86, and reliability value as 0.86. The second type of evaluation tool is a 16 five-scale rating items used to evaluate analytical thinking of the Basic Education University students.

## **RESULTS**

Results of this study are presented in accordance with the research aims that are indicated above. The initial finding is the result of analytical thinking test of teacher educators and evaluation of learning management plans after training. This is followed by the Basic Education university students' achievement test on analytical thinking skills according to defined criteria. Finally, results of feedback from teacher educators after implementing learning management. Results were organized according to quantitative and qualitative methods.

### ***Quantitative results***

The result indicates that teacher educators' analytical thinking score was 36.54 out of the full score as 45 (standard deviation = 3.68) after training. This shows that teacher educators' analytical thinking skills were higher than the defined criterion of 70 percent. Besides, the result of evaluation of their learning management

plans which emphasized analytical thinking skill after training was at ‘good’ and ‘very good’ quality level. As indicated in Table 1, a total of 34 and 11 teacher educators are able to construct the ‘very good’ and ‘good’ quality learning management plans respectively after training. On the other hand, the average score in analytical thinking skills for the overall Basic Education University students after the intervention was 78.19 percent which was higher than the defined criterion of 70 percent. The percentage for the nine programs ranged from 76.95 to 79.51.

**Table 1.** Evaluation on teacher educators after training

Quality level of learning management plan	Frequency	Percentage
Very good	34	75.56
Good	11	24.44
Mean score of analytical thinking test ( $\bar{x}$ ) = 36.54		
Standard deviation ( $SD$ ) = 3.68		

Additionally, the result indicates that Basic Education university students were satisfied with the learning management with integration of analytical thinking skills. The result of evaluation on their satisfaction level after the intervention was found to be encouraging, mean score ranged from 4.59 to 4.63. As a result, Basic Education university students’ achievement was higher than the defined criterion thus they were satisfied with the learning management.

### **Qualitative results**

The qualitative findings were found to support the quantitative findings above. From the focus group interview with teacher educators, researchers found that the training has been successfully assisted teacher educators to acquire better understanding and knowledge, be able to practice self-analytical thinking, be able to write learning management plans, and confidence to handle effective learning management. These points were explicitly pointed out by teacher educator 1 to teacher educator 11 (T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, and T11).

*“I acquire knowledge...a clear understanding of analytical thinking.”* (T2)

*“The analysis of elements, analysis of relationships, and analysis of organization principles including learning management model is very useful to emphasize analytical thinking.”* (T4)

*“I will use the learning management to develop analytical thinking of my students.”* (T1)

*“I now able to practice the process of self-analytical thinking.”* (T3)

*“As a result, I can practice a higher analytical thinking to my students.”* (T8)

*“And I will apply learning activities to develop my students’ analytical thinking”* (T5)

*“I have the practice to write learning management lesson plans that emphasize analytical thinking.”* (T6)

*“I always discuss with my friends and speakers of the training, I find myself good at writing learning management plans now.”* (T7)

*“Training makes me possible to write effective learning management plans”* (T9)

*“I am now very confident that I can handle learning management that emphasizing analytical thinking to develop analytical thinking of students effectively.”* (T10)

*“I will apply the knowledge gained from the training to learning management to develop analytical thinking of students.”* (T11)

### **DISCUSSION**

Findings of this study show that teacher educators’ analytical thinking achievement was improved after the training. This finding corresponds to Khaemmanee (2003), Baldwin (1984), National Council of Social Studies NCSS (1989) ideas. According to Khaemmanee, individual thinking process could be developed. On the other hand, statement from Baldwin and National Council of Social Studies indicated that there were three important activities namely provision of basic knowledge in analytical thinking, analytical thinking process, and provision of knowledge on the designed patterns of procedures for learning management that emphasizes analytical thinking are able to train them to think and understand the thinking process. Results from this study revealed that teacher educators acquired knowledge and clear understanding related to analytical thinking after the training. They found themselves are able to practice thinking analytically, exchange knowledge, share ideas with other teacher educators, and enable to know and understand the patterns or procedures of learning management model after the training. These teacher educators also had the chance to practice designing learning management plans that involve analytical thinking. They presented the plans and discussed their opinions and shared with others who criticized the plans. This is why those teacher educators had been trained to design quality learning management plans.

In addition, findings also indicated that teacher educators’ attitudes toward the training are positive. The majority

of them reflected that they obtained knowledge and understood analytical thinking process clearly. They are able to practice thinking analytically and their analytical thinking competency becomes higher than before. They also acquired knowledge and understanding related to the model of learning management that emphasizes analytical thinking and had a chance to practice designing the learning management plans that involve analytical thinking. They agreed to apply their knowledge obtained from the training to improve their students' analytical thinking skills. On this line of reasoning, the learning management plans enable students to practice thinking in order to find answers. The learning management plans consisted of situations, contents, stories, articles, events or interesting phenomena since the heart of process-based learning is the use of questions to encourage students to think. Therefore, the students became eager to know and search for the answers. All the students participated in the activities had practiced thinking both individually and as a small group. They practiced analyzing the importance, relationships, and principles and that was where students acquired thinking skills and shared their opinions together. Group discussion and learning in the group also promoted the atmosphere to encourage students' thinking. This implies an effect on the students' development of thinking process (Pollack, 1987; Takington, 1989).

Furthermore, presentation and discussion activities were found to assist in developing students' thinking process. The relationship between teacher educators and students as well as among the students enable students to extend the boundaries of their thinking at a wider and more complicated scale (Gall & Gall in Dillon, 1984), resulting in the students to achieve the higher level of analytical thinking. This finding is correlated to the work of Sitthipon Art-in (2012, 2014). Finally, the results were derived from the fact that learning management with integration of analytical thinking activities is learner-centered. Students are able to do the activities and construct their own knowledge to practice thinking analytically according to the given situations, stories or events. Students learned the content of the course and at the same time practiced analytical thinking.

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# Development of Flipped Classroom Instructional Model By Using Webquest Based on Constructivist Theory For Creating Critical Thinking and Problem-Solving Skills

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## ABSTRACT

This research aims to develop and evaluate the model of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills that divide into 2 stages: the first stage was to develop flipped classroom instructional model by using WebQuest with constructivist theory for creating critical thinking and problem-solving skills, the second stage was to assess the appropriateness of the model. Research findings showed that the model of flipped classroom instructional model by using WebQuest with constructivist theory for creating critical thinking and problem-solving skills that analyze and synthesis includes the 4 main parts: 1) Need analysis included the 2 elements: (1) Learning context analysis, and (2) Pre-learning activities, 2) Learning Process have included the 3 elements: (1) Homework with WebQuest, (2) Class Time, and (3) The major method's constructivist theory offer. 3) The authentic assessment was included the 1 element: Evaluation, and 4) Feedback. The samples were 10 experts selected by purposive sampling. The data was analyzed by means and standardized deviations statistically. The research result shows that the overall model evaluation scores were suitable ( $\bar{X}=4.59$ ).

**Keywords:** Flipped classroom, WebQuest, Constructivist Theory, Critical Thinking, Problem-solving

## 1. INTRODUCTION

Technology innovations are used in education for two main causes: as a tool for expanding the effectiveness of instruction and to coordinate technology into the curriculum (Gülbahar, Madran, & Kalelioglu, 2010). The flipped classroom instructional model by using WebQuest is based on constructivism. The constructivist view supports constructing meaningful knowledge based on student experiences and using social coordination during learning to establish the significance of knowledge. From a constructivist perspective, interaction and discussion among learners facilitate the construction of knowledge and skills (Duffy & Jonassen, 1992). Constructivism maintains that students learn through thinking and that they should contemplate on their learning processes. The source of learning is thinking, which affects learning (Jonassen, Peck, & Wilson, 1999). Scaffolding theory and collaborative learning extend from constructivism and are constituents of the development of the WebQuest model (Segers & Verhoeven, 2009). Scaffolding theory supports a teaching strategy derived from the zone of proximal development that was proposed by Vygotsky (1978). In the framework of learning in the 21st century is also concerned with critical thinking skills, problem-solving skills, skills of information and technology. The skills that complement recent technological innovations and that machine cannot easily substitute include problem solving and critical thinking abilities, as well as the ability to communicate effectively through oral and written means (Murnane & Levy, 1996).

The important characteristic of the flipped classroom is focusing on active learner of active learning in small group classes and comes from knowledge searching for using for solving problems that have been assigned. The process of learning will run systemically step by step, acquiring up-to-date knowledge and it can be applied for the student in the real life which is effective for teaching and also it is unlimited to disseminate the knowledge into others sciences. flipped classroom usage is a strategy that encourages students to develop critical thinking skills and the student is able to apply knowledge to solve problems effectively. Therefore, it is very necessary to develop critical thinking skills for making the learning skills to students. The researchers proposed in this study are as follows:

- (1) To development of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills.
- (2) To evaluate the flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills.

## 2. LITERATURE REVIEW

### 2.1 Flipped classroom

The flipped classroom (FC) model of instruction has become popular in recent years. In an FC environment, students can access to learning contents related to the new topics that they will learn through such materials as lecture videos outside the classroom where they have face-to-face classes. Later, students work on assimilating the new material they learned through such methods as cooperative learning activities in the classroom, project work and group discussions and through videos (Smith, 2015). The objective in this model is to provide online access to learning contents and materials and to help students' in-depth and active learning in the classroom. Studies revealed that active learning strategies increase students' participation in the learning environment and improved learning process and results (Freeman et al., 2014; Yilmaz, 2016). However, the strategies, methods and techniques used within the scope of active learning could consume the time that should be saved for the student in the classroom. In addition to many other benefits, FC model of instruction offers a solution to this problem as well. Thus, the concept of FC becomes a new fad with the need to reconstruct the learning environments in the light of the technologies advances and around student-centred instructional approached (Yemma, 2015).

### 2.2 Webquest

WebQuest teaching strategies can be used to enhance students' learning motivation (Halat & Peker, 2011). The WebQuest model is a comprehensive learning method by way of which learners understand and organize diverse learning content to construct a systematic context and ultimately consolidate various data (Allan & Street, 2007). Because WebQuest provides an accurate framework and successfully enables children to learn and complete tasks using the Internet, teachers have accepted and recognized the WebQuest model. Furthermore, teachers can create their own WebQuest activities, thereby generating themes that involve the interests of students (Segers & Verhoeven, 2009).

### 2.3 Constructivist theory

Constructivist learning theory considers knowledge as personal and context-bound, to be actively constructed by the learner in communication with others such as teachers, students, and practitioners (Ausubel, 1963; Vygotsky, 1978). In many countries, constructivist learning theory is applied in competency-based vocational and professional education to facilitate the integration of theoretical and other forms of professional knowledge and to prepare students for active, self-directed lifelong learning (Wheelahan, 2010). Throughout a constructivist program, integrated learning of knowledge, skills, and attitudes is stimulated by using authentic learning contexts (Lave, 2009). Authentic professional tasks are designed to invoke active inquiry, problem-solving and social interactions in real life or lifelike circumstances (Vygotsky, 1978). Theoretical lectures and skills trainings are planned just-in-time, when relevant for the task at hand (Van Merriënboer, 1997). Active knowledge building is stimulated by teaching students how to reflect on and subsequently regulate their own learning (Spiro & DeSchryster, 2009). Progress towards self-directed learning is supported by an increasing degree of freedom in task planning, execution, and evaluation and by expanding opportunities for choosing specializations (Vermunt & Verschaffel, 2000).

### 2.4 Critical thinking

Thinking combines the related structures and processes of perception, memory, forming ideas, language and use of symbols – the basic cognitive skills which underlie the ability to reason, learn and solve problems. Thinking is inclusive of imagining, recalling, solving problems, free association, daydreaming, concept formation, and a variety of other procedures (Psychology Dictionary, 2017). Critical thinking skills the goals for education, whether one asks developers of curricula, educational researchers, parents, or employers. Although there are some quite diverse definitions of critical thinking nearly all emphasize the ability and tendency to gather, evaluate, and use information effectively (Beyer, 1985). Whereas there are different explanations of widely-used critical thinking terms, each model describes similar elements of thinking, critical thinking, creative or all of them. Some researchers have quite completely studied critical thinking and developed useable explanations.

### 2.5 Problem Solving

Problem-solving has been studied by researchers for many decades (Gagné, 1959; Jonassen, 2003; Mayer & Wittrock, 2006) and is seen as one of the most important cognitive skills in any profession, as well as in daily life

(Jonassen, 2003). Mayer and Wittrock (1996, 2006) identified several characteristics of problem-solving: (a) it is a cognitive process; (b) it is goal-directed, and (c) the complexity (and hence difficulty) of the problem depends on one's current knowledge and skills.

### 3. METHODOLOGY

1) Study and analyze the relevant documents and researches of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills.

2) Development of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills

3) Assessment of the appropriateness of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills. The statistics utilized in this study were arithmetic means ( $\bar{x}$ ) and standard deviation (S.D.) following the weighing criteria of appropriateness of the design using five rating scales of Likert

### 4. POPULATION AND SAMPLES

1) Population:

Population is the experts in the field of computer education, or education technology.

2) Samples Groups:

Samples were selected from the experts in the population using purposive sampling technique. The 10 experts comprised of computer education, or education technology. They are highly-experienced experts in these fields for at least 5 years.

### 5. RESULT

Stage 1: The model of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills is composed of 4 key components which are:

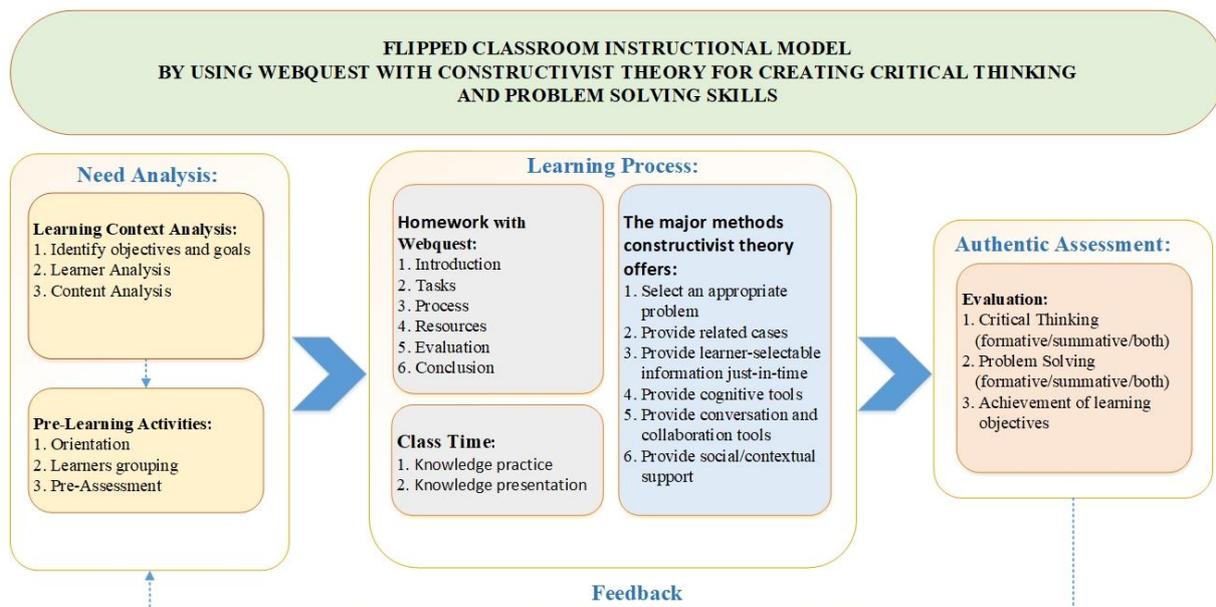


Figure 4. Flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills

1) Need analysis comprises of two components as follows:

1.1) Learning context analysis consists of five components as follows:

1.1.1) Identify objectives and goals: Establish clear learning objectives. Objectives are the desired outcomes of learning for each student. Students set goals and plan learning. The exchange of learning between the instructor and classmates is done via WebQuest, such as Wix, WordPress, and Blogger Application, to help the students practice initiatives.

1.1.2) Learner analysis

1.1.3) Content analysis

1.2) Pre-learning activities includes

1.2.1) Orientation: Orientation was the stage that the learners were presented content, teaching process, learning strategies, and criteria for grading and performance rules. The aim of this state was to guide and make understanding between teacher and learners

- 1.2.2) Learner grouping
- 1.2.3) Pre-assessment.
- 2) Learning Process are categorized as below:
  - 2.1) Homework with Webqest consists of six components as follows (Dodge, 1997):
    - 2.1.1) Introduction
    - 2.1.2) Tasks
    - 2.1.3) Process
    - 2.1.4) Resources
    - 2.1.5) Evaluation
    - 2.1.6) Conclusion
  - 2.2) Class Time includes
    - 2.2.1) Knowledge practice: Students learn through the use of the learning plan, using tools that they define, and conclude the learning of new knowledge.
    - 2.2.2) Knowledge presentation: The students and the instructor discuss and summarize knowledge via Webqest.
  - 2.3) The major methods constructivist theory offer (Jonassen, 1999):
    - 2.3.1) Select an appropriate problem
    - 2.3.2) Provide related cases
    - 2.3.3) Provide learner-selectable information just-in time
    - 2.3.4) Provide cognitive tools
    - 2.3.5) Provide conversation and collaboration tools
    - 2.3.6) Provide social/contextual support.
- 3) Authentic assessment consists of:
  - 3.1) Evaluation
  - 3.2) Critical Thinking skill
  - 3.3) Problem-Solving skill
  - 3.4) Achievement of learning objectives.
- 4) Feedback

**Stage 2:** The result of appropriateness measurement of the system architecture of business intelligence to AUN-QA Framework for higher education institution

Table 1: Explain the model assessment

Assessment Topics	$\bar{X}$	S.D.	Assessment Result
1. Basic elements of the model	4.66	0.47	Highest
2. Need analysis step	4.63	0.49	Highest
3. Learning Process step	4.53	0.50	Highest
4. Authentic assessment step	4.56	0.50	Highest
The overall results	4.59	0.49	Highest

In Table 1, the research found that the model of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills was evaluated at the highest level in Basic elements of the model, Need analysis step, Learning Process step, and Authentic assessment step. The model of flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills showed overall results at highest level (arithmetic mean=4.59, standard deviation = 0.49)

## 6. CONCLUSIONS

The flipped classroom instructional model by using WebQuest based on constructivist theory for creating critical thinking and problem-solving skills that composed of 4 components: Need analysis, Learning Process, Authentic assessment, and Feedback. The samples were 10 experts selected by purposive sampling. The data was analyzed by means and standardized deviations statistically. The research result shows that the overall model evaluation scores were suitable ( $\bar{X}$ =4.59).

## ACKNOWLEDGEMENT

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# **Development of Guskey Model Based Skills, Humanist, Mental (Shm) with Interactive Learning Simulation (Ils) to Development Professionalism Tutor**

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## **ABSTRACT**

Experiment study aimed to find out how Model-Based Skills Guskey, Humanist, Mental (SHM) with Interactive Learning Simulation (ILS) to develop the professionalism of tutors science of the 21st century is the research subject tutor activity of the Teaching and Learning Centre (CLC) in Serang city, tutors were selected randomly as much as 5 out of every CLC, Research-Based Model Guskey SHM to develop professionalism. The Tutor after the implementation of this model shows that the model Guskey has a positive impact on the quality of the learning process. In detail the impact of the implementation of the model Guskey it is (1) increased knowledge of the subject matter better; (2) Tutor-Tutor is able to plan the learning process to encourage participants to be more active Tutor; (3) Tutor skill in conducting the learning process CLC changed for the better; (4) Tutor efficacy in performing the learning process increases CLC better.

**Keywords:** Guskey Model, Skills, Humanist, Mental (SHM), Interactive Learning Simulation (ILS), Professionalism Tutor Science, Community Learning Center (CLC)

## **INTRODUCTION**

Throughout the first decade of the twenty-first century, the reform and reconstruction of professionalism in public service work have been a key goal of governments in countries such as Australia, New Zealand and the UK. This political project includes teachers, and has resulted in extensive debate about the de-professionalisation of teaching (Borg, 1983; Brown, 2001). However, current reforms might be alternatively seen as part of a revised discourse of professionalism, one comprising 'organisational' (Clarke, 2002) 'governmental' professionalism that is, professionalism imposed from above, by employers, managers and government agencies, involving 'externalized forms of regulation and accountability measures such as target-setting and performance review' (Clarke, 2002). While there is a consensus that a return to or defence of traditional forms of professionalism, which have been critiqued by Clarke and Newman (2009, p. 52) for 'mean and discriminatory paternalism', is not the way forward, there is less consensus about how public service work might be reformed against increasingly dominant discourses of professionalism from above.

Learning achievement is the result of learning achieved after going through the process of teaching and learning activities. Learning achievement can be demonstrated through the value provided by a Tutor of the number of subject areas that the Tutor Participants have learned. In the process of achievement, learning achievement is strongly influenced by various factors. One of the main factors that is very influential in the success of learning is the existence of Tutor. Tutors are agents of change (Johnson, 1996a), the term "Tutors are agents of change" (Clarke, 2002), Tutors as change agents have multiple meals, and each interpretation may be related to a particular perspective Tutor professional development (Carr, 2011; Opfera and Pedder, 2011).

Given the existence of Tutor in the process of teaching and learning activities are very influential, then it should be the quality of the Tutor should be considered. As noted above, that in an effort to improve the quality of education, the main aspect that is determined is the quality of the Tutor. For that, the initial effort made in improving the quality of education is the quality of the Tutor. The Tutor's educational qualifications correspond to the minimum requirements set by the requirements of a professional Tutor. Professional Tutor is a qualified

Tutor, competence, and Tutor desired to bring learning achievement and able to influence the teaching and learning process Participants Tutor which will result in good learning Practice Participants Tutor (Pantića, and Wubbelsb, 2010).

Tutors or educators are true leaders, wise counsellors and directors, sculptors and leaders of the human. The Tutor does understand according to Law no. Law is a professional educator with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating the Participants of the Tutor in the following chapters. Primary and secondary education. Professional Tutor defines that: "A professional tutor is a person who has the ability and special expertise in the field Tutor so he is able to perform tasks and functions as a Tutor with maximum ability". Conceptually, the Tutor's performance according to the Department of Education and Culture and Johson, as cited by Martinis Yamin includes three aspects, namely; (A) professional ability, (b) Social skills, and (c) personal (personal) abilities.

But looking at the reality that exists, the existence of professional Tutor is very far from what is aspired. The proliferation of CLC. The low quality community gives a hint that the professional Tutor is just a discourse that has not been realized evenly in all education in Indonesia. This raises a concern that not only comes from academics, but even laypeople comment on the irregularities of education and teaching staff. The fact inspires the academics, so they formulate to improve the qualification of Tutor through empowerment and professional enhancement Tutor from training to instruction to have a minimum education qualification of Bachelor (S1). The new problem is, Tutor only understands the instructions only as a formality to meet the demands of an administrative needs. So the competence of Tutor professional in terms of learning the maximum. Though this Tutor Participant is the target of education. Which is formed through guidance, exemplary, help, practice, maximal knowledge, skills, skills, values, good attitude of a Tutor (Chong, 2009). So only with a professional Tutor it can be realized in full, so it will create conditions that generate awareness and seriousness in the process of teaching and learning activities. Thus, what a Tutor says will affect the learning outcomes.

Conversely, if the above is not realized well, it will result in dissatisfaction of Tutor Participants in the process of teaching and learning activities. The incompetence of a Tutor in the delivery of teaching materials indirectly will affect the outcome of learning. Because the learning process can not only be achieved by courage, but the main factor is the competence that is in the person of a Tutor. Limitations of the Tutor's knowledge in the delivery of the material, whether in terms of methods or other basic learning support will affect the learning?

Attempts to improve the quality of Tutor include: Learning to love Tutor's work. This means learning to look for things that are positive from the Tutor's work, and then to be grateful for it. Loving work can happen, among other things, if we feel close to the work done and appreciate the work that is being done. Therefore learn to love work Tutor other learn familiar with the work of Tutor and learn to gain meaning in doing such work. Learning through work. In working, we can learn at once. The experiences of doing the Tutor work teach us what is right and right to do and what is not or is not right or right done. From there we can learn which work techniques should be established and which work techniques still need to undergo change, adjustment or replacement. Higher-level business operations will further intensify pre-service educations and Community Learning Centers (CLC) and their management agencies.

Based on the above problems, we proposed Model-Based Skills Guskey, Humanist, Mental (SHM) with Interactive Learning Simulation (ILS) to develop the professionalism of tutors science. Looking at the above discourse, it is very apparent that Tutor professionalism can have an effect on learning achievement. On the basis of existing discourse in the field, the authors want to prove whether the perception that exist in the community about the problem of professionalism Tutor is true or vice versa, by doing a research. According to the authors based on facts in the field, generally the condition of Community Learning Activities Center that there is still a Tutor who is not professional. The Tutor Competencies in the Center for Community Learning Activities have not fully met the criteria as required by the requirements of the Professional Tutor. Therefore, the government conducts certification programs to the Court by requiring teachers to have a minimum education qualification S1 in accordance with their respective fields. Based on the background of the above problems, the authors are interested in conducting research entitled "Model-Based Skills Guskey, Humanist, Mental (SHM) with

Interactive Learning Simulation (ILS) to develop the professionalism of tutors science of the 21st century is the research subject tutor activity of the Teaching and Learning Centre (CLC) in Serang city, Banten, Indonesia".

### THE STUDY

This research uses Quasi Experiment method with research design using The Randomized Posttest-Only Control Group Design Cresswell, (2014). The timing of the research is planned 10 months from the proposal submission to the reporting. The research location is CLC Serang city, academic year 2015/2016.

<b>Group</b>	<b>Random</b>	<b>Treatment</b>	<b>Post Test</b>
Eksperiment	<i>R</i>	<i>O</i>	<i>X<sub>1</sub></i>

**Figure 1.** Research Design The Randomized Posttest-Only Control Group Design

Information:

R: Selection of class at random O: Provision of the SHM Model in the experimental class.

X1: Final test with SHM Questionnaire in the experimental class.

Research subject in this research is CLC class level teacher in Serang City. With a random sample technique taken 5 Tutors from the total of all Tutors in proven Banten as an experiment. The steps taken in this research include 5 steps, namely: preliminary study, literature study, instrument design, instrument trial, implementation, and ending with result analysis and drawing the full conclusion can be seen in the flow of research picture.

### FINDINGS

The results of the study are presented in two parts, namely the results of research (1) on the implementation of CLC program, and (2) about the professional development model of CLC Tutor. In the first part, research on the implementation of CLC program basically seeks to evaluate and then describe the various weaknesses and ineffectiveness of the implementation of the program in achieving the expected goals. It is also intended to identify the various needs of CLC Tutors to be able to develop Professional Tutorial Teachers CLC manage the learning process better. Based on the weakness of CLC program implementation found, then developed CLC model which the result presented in second part of this research.

Implementation of CLC programs that have been running so far, identified there are still some weaknesses. The weaknesses include (1) no CLC program activities that require participants to share about learning problems and find appropriate solutions; (2) participants tend to be passive during the CLC program activities; (3) resource persons of CLC programs are often less qualified as conveying materials needed in order to improve learning practices; (4) lack of follow-up after the CLC program meeting is implemented; And (5) CLC programs are not conducted regularly within a certain time. Participants' feedback about the weakness of CLC program implementation is given by the following Tutor:

I see many (deficiencies in the CLC program), such as the lack of communication among CLC members; Lack of detailed information and guidance from CLC, for Tutors in providing competent speakers / instructors; Lack of supporting facilities at the CLC. The main complex; CLC program resource persons are often poorly qualified as conveying materials needed in order to improve classroom learning practices; And CLC program activities never ask participants to share about learning problems and find appropriate solutions (Interview, October 28, 2016). Quantitative identification showed that 38% of participants of CLC program stated never, 58% stated rarely, and only 12% of participants stated quite often that CLC program activities asked participants to identify learning difficulties Participants Tutor and seek solutions collaboratively. Thus, it can be mentioned that various CLC program activities have been focused on technical matters and have not touched substantive matters, ie activities to develop the quality of learning.

The results of observation on the learning practices conducted by the CLC Tutor at the time before the implementation of CLC model were identified by not paying much attention to the variation of the Participants' needs and conditions during the learning process. This is demonstrated by some facts that prior to the

implementation of the CLC model (1) Tutors often do not design activities intended to prepare the Physician and mentally the Tutor Participants to start learning; (2) learning activities are often inadequate with learning objectives, Tutor Participants' needs, changing situation, and environment; (3) the learning process has not used a lot of learning aids (media) in accordance with the purpose, condition of the Tutor Participants, and the demands of situation and environment ILS (learning context); And (4) the variation of learning activities has not been much emphasized based on individual, group or classical activities that need to be done to meet individual differences of the Tutor Participants and or form the impact of companion in the form of life skills.

Furthermore, it was also identified that the level of efficacy of Tutor-Tutor is also still relatively low. Some characteristics of the low level of efficacy of this Tutor are often criticized Tutor Participants as less creative, stupid, lazy, and rowdy-making individuals; Likes to control excessively the learners behaviour of Tutor Participants that result in the creativity of Participant Tutor as if open; Often neglecting Participant Tutor who has slow learning ability; And likes to punish Participant Tutor.

Empirical facts as described above have resulted in the learning process cannot develop well and ultimately the achievement of predetermined learning objectives is also not optimal. Different conditions are shown after the implementation of CLC model. By participating in the implementation of this CLC model, participants (CLC Tutors) are able to (1) implement a collaborative work mentality in an effort to improve the learning process conducted on a daily basis; (2) become more sensitive to the learning process problems faced by the Tutor Participants; And (3) able to anticipate various learning problems that may appear and faced by Tutor Participant, so that Tutor can prepare and determine anticipative solution that will be given. In addition there are changes in the behaviour of CLC Tutors, the Tutors are encouraged to want to talk about various issues of learning CLC intensively with fellow CLC Tutor. Another impact of the implementation of this CLC model is the change in the effectiveness of CLC Tutors for the better.

The change of efficacy level is marked by the Tutor's behaviour to always communicate high expectations related to the learners' learning outcomes; Help Tutor Leaders learn according to their conditions and needs; Shows a warm and friendly relationship with the Tutor's Participants; Looking at slow-learning Tutor participants not as a learning process constraint; Encourage confidence in the Tutor Participants who are slow to learn that the Tutor Participant can succeed in learning, and apply the appropriate management system to solve the learning problem faced. The occurrence of this level of efficacy has led CLC Tutors to adopt the latest CLC learning innovations. This is shown by the efforts of CLC Tutor to find teaching materials and learning models of CLC from internet. The changing of learning process quality, behaviour, attitude, and effectiveness level of CLC Tutor in the time before and after implementation of CLC model shows that the implementation of the model effectively has been able to improve the professionalism of the Tutor. Tutors become increasingly reflective of the learning process that has been done. In addition, the implementation of the CLC model has been able to provide opportunities for Tutors to discuss and exchange ideas that can encourage each Tutor to be able to understand the different perspectives of Participant Tutor. Furthermore, the CLC model has been able to create a mutual learning culture among actors through the real conditions that occur in the classroom. The change in professionalism this tutor is not an immediate event. There is a series of activities that need to be done, so that CLC Tutors are able to change this learning behaviour for the better.

After the developed CLC model was piloted in the field, it was found that some technical constraints resulting the modelling are sometimes difficult to achieve. The technical constraints refer to the model implementation procedure. The revised model, in addition to the four domain sequences and mechanisms that are the "triggers" of an activity on a domain within the model, as well as revisions intended to improve the model implementation procedure. The final product is a model of professional development of CLC Tutor (CLC model). The final product of this CLC model consists of five main domains, in contrast to the initial drafts of only four domains. The five domains are (1) Domain Requirement Analysis of CLC Teachers (English Teachers' Need Assessment / TNA); (2) Domain In-service Activity (IA); (3) Domain on service Activity (OA); (4) Climate Domains and Working Conditions in CLC; And (5) Domain Enhancement Professionalism of CLC Tutor (Outcomes). The relationship of these five domains does not show a rigid sequential relationship, but the relationship of the five domains is more interactive and cyclical. The form of activity and destination of each domain are described in the following sections.

### 1. Domain Requirement Analysis Tutor (Teachers' Need Assessment Domain)

The purpose of the Tutor needs analysis is to identify the material and context as needed by the CLC Tutor, so that the performance of CLC Tutor will be better, then the implementation is done by CLC guides together with CLC Tutor, that is (1) identifying Various needs of CLC Tutor to support the learning process conducted by CLC Tutor, (2) to identify various learning problems often faced by CLC Tutor, (3) to find alternative solution from various learning problems that have been identified , (4) identify which knowledge and skills need to be developed to support the quality of learning, and (5) identify what conditions or contexts need to be created to improve the effectiveness of professional development of CLC Tutor.

### 2. Domain of In-Service Activity (Domain of In-Service Activity)

The preparatory work exercise aims to provide a broader and deeper understanding to the CLC Tutors on curriculum implementation; Development of teaching materials; learning model; And other supporting aspects of the learning process. Implementation is done by lecturers from high performance as experts in the field of learning and learning through the following steps, (1) provide feedback on learning problems often faced by CLC Tutor, (2) expand and improve the knowledge of CLC Tutor about material CLC and knowledge of learning methodology, (3) consult the Tutor on how to plan, implement, and evaluate the learning process, and (4) disseminate quality teaching practices through workshop and / or seminar activities.

### 3. Domain of On-service Activity (Domain of On-service Activity)

Exercise in the work aims to train the CLC Tutors to improve the quality of learning, so Tutor-Tutor able to reorient the learning process is active, creative, effective, and fun for learners. This domain is carried out following the philosophy of lesson study that requires the Tutor to work collaboratively in conducting a learning process. This activity is carried out by CLC Tutor collaboratively, by (1) doing learning planning, such as determining learning objectives to be achieved, (2) developing lesson plan, (3) selecting material or teaching materials; Preparing instructional media; Determining learning strategies; And choosing the procedure and the type of assessment, (4) carrying out the learning process whereby one of the Tutors acts as the Tutor model and the other as the observer, and (5) implements the learning process that has been done to identify the strengths and weaknesses of the learning process Has been done (after the lesson is over). Furthermore, lecturers from high performance as experts in the field of learning and learning together Tutor guides will (1) make observations on the learning process planned and carried out collaboratively by the CLC Tutor group, (2) provide feedback on the learning process that has been done by The CLC Tutor group, and (3) if necessary, assisting the CLC Tutor group in improving the lesson plan for the re-learning process. After reflecting on previous lessons, CLC's Collaborative Teachers will (1) make improvements to the lesson plan, if necessary, to define new learning strategies and approaches, to conduct the learning process, (b) to re-learn, (c) ) To re-reflect on the learning process that has been done collaboratively on the second occasion, and (d) to document the learning process that has been done.

### 4. Climate Domains and Working Conditions at the CLC (Domain of Climate and Working Condition at School)

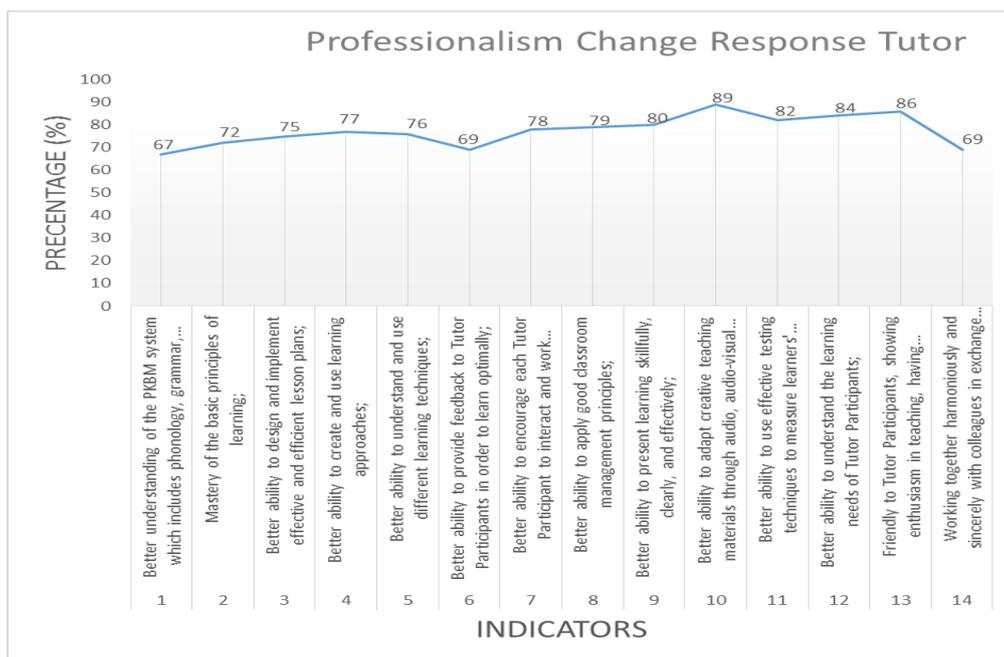
The purpose of analysing the climate and working conditions of the CLC is to create a context that can: (i) encourage participants to participate actively in professional development programs, and (ii) encourage participants to apply the knowledge, skills and attitudes gained during participation in Professional development program. In practice, the Head of the CLC will play a role by (i) providing support to the Tutor, (ii) identifying the urgent needs of the Tutor, then providing feedback on that need, (iii) influencing the perspective of the Tutor, (iv) initiate planning of the objectives to be achieved from a professional development activity, (v) fostering the Tutor's commitment to change after participating in a professional development activity; (vi) clarifying the various constraints faced by the Tutor to change, (vii) explaining the possible consequences of the action being taken By Tutor, and (viii) provide follow-up to the Tutor's performance after participating in a professional development activity.

The colleagues play a role in (a) assisting participants (other CLC Tutors) in planning the collaborative learning process, (b) observing the learning process, (c) providing suggestions and feedback on the learning process undertaken by the participants, and (d) Conduct formal evaluations intended to improve the implementation of the curriculum and instructional techniques in the classroom. The core tutor acts as a facilitator and resource

person to deliver or disseminate knowledge and skills to the participants of the CLC program, and (b) a motivator for the participants of the CLC program to discuss and express ideas in order to improve the learning process. And supervisors of the CLC (i) assist in the preparation and implementation of CLC programs, and (ii) encourage tutor to participate in CLC activities, and (iii) monitor Tutor in applying CLC activities results in Their classes.

### 5. Domain Enhancement Professionalism Tutor (Outcomes)

Domains outcomes refer to the level of CLC Tutor-Tutor professionalism as the impact of the implementation of the previous four domains after implementation learning Interactive Learning Simulation (ILS). This indicator of professionalism is seen from the change, as follows (Figure 1).



**Figure 2.** Implementation Model-Based Skills Guskey, Humanist, Mental (SHM) with Interactive Learning Simulation (ILS) in Teaching and Learning Centre (CLC)

### CONCLUSIONS

The result of the impact of the implementation of the Model-Based Skills Guskey, Humanist, Mental (SHM) with Interactive Learning Simulation (ILS) in Teaching and Learning Centre (CLC) included (1) increased knowledge of the subject matter better; (2) Tutor-Tutor is able to plan the learning process to encourage participants to be more active Tutor; (3) Tutor skill in conducting the learning process CLC changed for the better; (4) Tutor efficacy in performing the learning process increases CLC better. Guskey model that requires the inquiry process, joint study, observation, reflection, discussion and collaboration among CLC actors conducted following the philosophy of this lesson study has led to the increased professionalism of CLC Tutor.

Implementation of this Guskey model in the future can be utilized by the local government in order to improve the quality of education in the region. Implementation of this model requires a partnership between CLC Tutors, Tutor guides, and lecturers from high per post as a resource that many master the materials and learning methods. This partnership process of course requires adequate financial support. Thus, the support of local governments in providing financial assistance for the implementation of this model in the future is necessary. In accordance with the principle of regional autonomy, this support is one form of public service from local government in order to improve the performance of the organization of CLC through improving the quality and professionalism of the Tutor in line the result research Loughran, (2014). It is also in line with the spirit of

regional autonomy that local governments need to improve public services in all areas of life, including quality education services in educational units at the CLC.

One of the limitations of this Guskey model is that this model has not looked at the impact of the model on improving the learners' learning outcomes. The reason, to see the impact of the implementation of this model on improving learners' learning outcomes required observation in a relatively long time. Therefore, there needs to be further development of this model in the future. The development of this model needs to be done not only to examine the impact of model implementation on improving the professionalism of the Tutor, but furthermore it is also necessary to observe the impact of the model implementation on improving the learners' learning outcomes.

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# Development of Interactive Learning Project (ILP) Model for Unveil Creative Thinking Skills Concept

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## ABSTRACT

Research has been conducted on the development of interactive learning project (ILP) model to develop creative thinking skills on the concept of educational technology. The purpose of this study is to get an overview of the improvement of creative thinking skills as the impact of model development. The research method used experimentally with two group pretest-posttest design. The research subject used student of the second semester (two) in one of the University in Serang City, Banten, Indonesia. The research instrument consists of a test of creative thinking skills. The results showed that after the development of learning model some creative thinking skills are high. This is indicated by an average of normalized gain scores  $\langle g \rangle$  creative thinking skills in experiment group 1 increased by 0.84 and in experiment group 2 increased by 0.74. These results indicate that the ILP model is one of the learning models that can improve creative thinking skills.

## INTRODUCTION

Education is a fundamental need for every human being. It is education that will lead to the improvement of one's life or society. Education is defined as a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual, religious, self-control, personality, intelligence, noble and skill Which needed him, society, nation and state. The purpose of national education is to develop the intellectual life of the nation and develop the whole Indonesian people, that is, the man who is faithful and devoted to God Almighty and virtuous noble character, possessing knowledge and skills, physical and spiritual health, solid and independent personality and sense of community responsibility And nationality The concept is an abstraction professionals that represents a class of objects, events, activities, or relationships, which have the same attributes (Wibowo, 2017). The behavior to be acquired through the exercise or training to facilitate student learning and classroom management (Suherman, 2017).

Many methods, strategies and learning models developed by experts to build student conceptions either through scientific methods, demonstration, discussion or investigation. One of the methods developed to build conception is with Interactive Learning Project model. Interactive Learning Project model which is a student centered learning. The Interactive Learning Project model is suitable for large classes, and as a bridge from traditional models using lecture methods to innovative models using constructivism approach (Mazolini et al, 2011).

Interactive Learning Project model is a learning that presents a project in learning either in the form of real phenomena, experimental tools or visual aids. Project is done by the teacher in front of the class while the students are asked to predict the result of the project. In Interactive Learning Project, students are asked to predict the outcome of a project, observe the results, compare and discuss it (Crouch, 2016). The Interactive Learning Project model is developed so that students are able to understand the concept more deeply, reduce misconceptions and also change concepts that were previously mistaken for a scientific conception.

The process of education will not be separated in a learning process. As for science is a very important science that must be taught to students in the learning process. Science is a science that studies about nature and all life either about living things or inanimate objects. The educational technology as one branch of science of science that studies about the phenomena or natural phenomena that occur in the natural world or the universe. The purpose of learning century is as a means to develop the ability of analytical thinking inductive and deductive by using the concepts and principles of educational technology to explain various natural events and solve problems both qualitatively and quantitatively, to master the knowledge, concepts and principles of educational technology and have knowledge, scientific skills and attitudes. The universe as a whole must be studied because knowledge of human nature will increase the strength to resolve the problems (Wibowo, 2016).

Mastery of knowledge is the main goal of the education of a field of science including the field of educational technology. It is very important that after following the learning of educational technology students are expected to master the teaching materials well and fully understand. By having a full understanding of the concepts, principles, principles and laws of educational technology, students will be able to use and apply them in a real-life context and can master technology as applied to educational technology. In the study of educational technology, students are expected to not only be able to calculate the educational technology formula and memorize the existing educational technology theories but the students are expected to be able to understand it completely so as to be able to solve the problems related to the concept in everyday life. But the reality in the field shows less favorable circumstances, educational technology has long been considered a difficult lesson and hard to understand. Many students fail to understand educational technology as a whole and most of them only understand some or not even a few who experience misunderstandings. This happens because learning still tends to memorize verbalism and mathematical formulation of the laws of educational technology (Wibowo, 2013). The effects of such learning tend to rarely result in misconception. The result of Wibowo (2013) is shows that the number of students experiencing misconceptions on educational technology concepts is quite large. Misconceptions that occur in students will cause mistakes in drawing conclusions in each lesson. The results of preliminary research conducted by a researcher in one of the high schools in Serang related to the level of students' understanding shows that most students are in the category of "partial understanding" level of understanding, even amongst those who do not understand. Based on the background of the above problems, the authors are interested in conducting research entitled "Development of Interactive Learning Project (ILP) Model For Unveil Creative Thinking Skills Concept".

### THE STUDY

The research method used is pre experimental. Pre-experimental or called initial experiment and no controller treatment. While the research design using one group posttest only design. In this study, the group was given a final test after treatment Cresswell, (2014). Figure 1 shows a one group posttest only design chart.

Class	Pre- Test (Pre-Test)	Treatment (treatment)	Post-Test (Post-Test)
Experiment Group 1	-	X	O
Experiment Group 2	-	X	O

Figure 1. One group posttest only design

Information:

O: Comprehension material test

X : The treatment is an Interactive Lecture Project model

The population in this study used student of the second semester (two) in one of the University in Serang City, Banten, Indonesia where the sample was selected one class randomly from eight classes available through the draw on the grounds that the six academic characteristics of the class were almost the same. The research instrument consists of a test of creative thinking skills. Torrance (Wibowo, 2013) A creative thinking skill test involves asking skills, guessing skills for an event, the guessing skill of an event, and the skill of improving the output of the material. 4 Implementation of the ILP model in improving cognitive students' creative thinking skills, is determined on the basis of normalized average gain scores.

### FINDINGS

The study was conducted during three meetings in the experimental class treated (treatment) in the form of application of ILP model. Based on the analysis of data presented, the average gain score  $\langle g \rangle$  normalized creative thinking skills of 0.84 in the experimental group 1 and 0.74 in the experimental group 2 see Fig. 1 and Fig. 2. The average normalized gain score of this magnitude when confirmed with Category (g) of Hake (1999), included in the medium category. This increase is not in accordance with the expected increase of high categories. Some of the things that led to it; (1) there is no continuous practice by the students to master the four activities of creative thinking skills. (2) Time constraints so that there is no monitoring of the students' creative thinking skills activity, since the students when they have completed the project task have been considered mastering creative thinking skills. See Table 1 stages Interactive Learning Project (ILP).

**Table 1.** Interactive Learning Project (ILP) Stages

Learning Stages	Teacher Activity	Students Activity
1. Introduction	<ul style="list-style-type: none"> <li>✓ The teacher opens the lesson.</li> <li>✓ Teachers convey the scope of the discussion to be discussed as well as the learning</li> </ul>	Students answer questions asked by teachers.
	<ul style="list-style-type: none"> <li>objectives.</li> <li>✓ Teacher gives apperception for example by asking questions.</li> <li>✓ Teachers provide motivation early in the learning process</li> <li>✓ The teacher explores the student's initial conception of the material to be learned by asking students questions.</li> </ul>	
2. Core Activities 2.1. Predictions	<ul style="list-style-type: none"> <li>✓ Teacher shows a project of a phenomenon, event or event related to a real-world context relevant to the material to be learned and asks the student to make a prediction.</li> <li>✓ The teacher asks the students to discuss their predictions with their seek friends.</li> <li>✓ Teacher asks students to discuss their predictions in small groups with some of their nearest neighbor.</li> <li>✓ Teacher asks each group to express the prediction agreed by each small group</li> <li>✓ Teacher asks student to record class agreed prediction on sheets of prediction • Students pay attention to teacher project.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Students record class agreed predictions on prediction sheets</li> <li>✓ Students make individual predictions regarding projects that teachers show on a prediction sheet.</li> <li>✓ Students have discussions with their friends about the predictions model.</li> <li>✓ Students discuss in small groups with some of their closest neighbors about the prediction of the phenomenon that the teacher project until a group agreement is reached.</li> <li>✓ Each group of students expresses agreed predictions regarding the phenomenon that the teacher project.</li> </ul>
2.2. Experience	<ul style="list-style-type: none"> <li>✓ Teacher presents an advanced project of phenomena or physical events with an interesting display (e.g. slide projector).</li> <li>✓ Teacher asks students to expose their observations to the phenomenon or event that the teacher project and discuss it with a group of friends</li> </ul>	<ul style="list-style-type: none"> <li>✓ Students present their observations on the phenomenon or event that the teacher project and discuss it with a group of friends</li> <li>✓ Students observe projects presented by the teacher and fill in the requested items on the worksheets provided.</li> </ul>
2.3. Reflection	<ul style="list-style-type: none"> <li>✓ Teacher asks students to compare project results with their predictions.</li> <li>✓ The teacher displays a similar phenomenon or event based on the physical concept discussed</li> <li>✓ The teacher asks the students to discuss in their group to look for similar phenomena or events based on the concept discussed</li> <li>✓ Teacher directs students to make conclusions about learning materials.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Students make inferences about learning materials</li> <li>✓ Students identify the difference between what they predicted and the outcome of the project activity.</li> <li>✓ Students pay attention to the teacher's impressions of phenomena or similar events based on the physical concept discussed</li> <li>✓ students conduct discussions in their groups to look for similar phenomena or events based on the concepts discussed</li> </ul>
3. Closing	<ul style="list-style-type: none"> <li>✓ Teacher assigns a structured task to the students.</li> <li>✓ Teacher closes learning.</li> </ul>	

Creative thinking skills developed are creative thinking skills in everyday life. The indicator of creative thinking skills used consists of four activities namely (1) asking, (2) guessing for an event, (3) guessing the consequences of an event, (4) improving the output. Improving creative thinking skill on guess activity because an event is 0,76 and 0,73 with medium category. The improvement of creative thinking skills in this activity is low compared with other activities. This is because the questions on the activity of guessing because an event of the concept of Heat there are questions that rely on deep creative thinking skills. Problems in guessing activities because an event requires understanding the concept first before answering by determining the cause of an event.

For example, in the case of creative thinking skills number 2, 5, 7, and 10, students must understand the concept of the problems encountered, only the upper groups who can answer the problem description. The lower and the mean group responded incorrectly by determining the cause of an event but not related to the concept of Heat and not to the context of the problem.

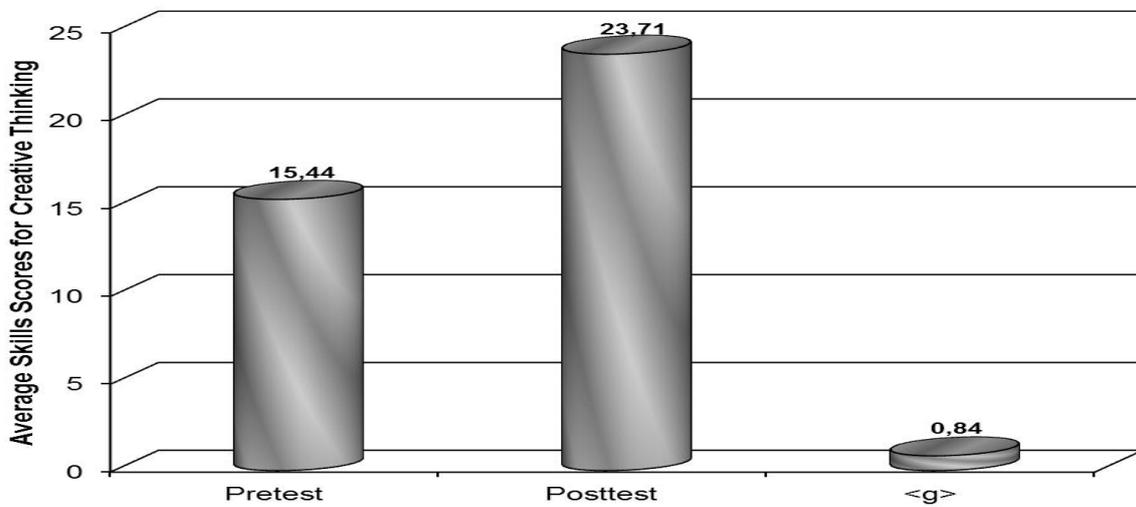


Figure 1. Average Skills of Creative Thinking Skills (Experimental Group 1)

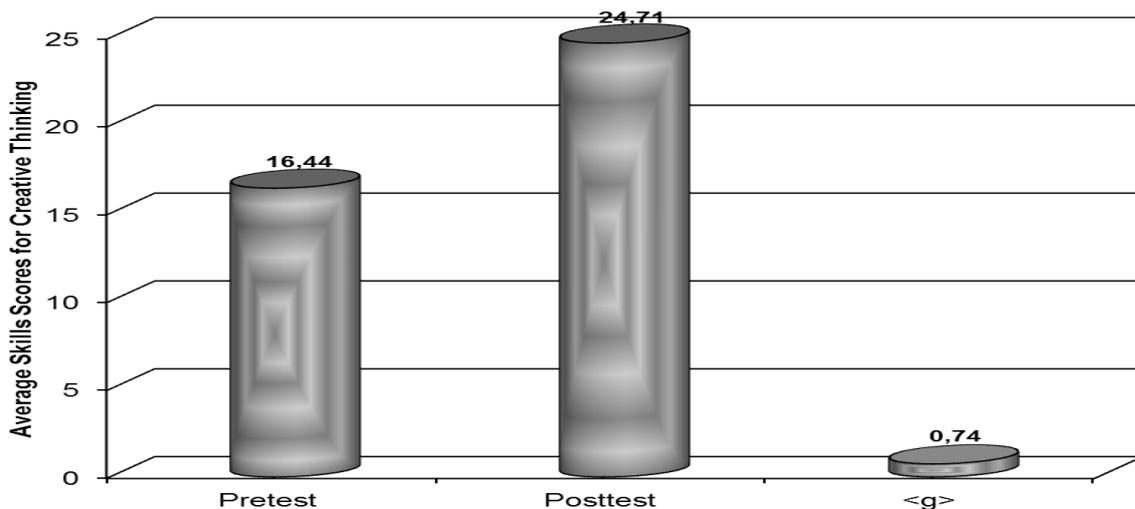


Figure 2. Average Skills of Creative Thinking Skills (Experimental Group 2)

Based on Fig. 1. Improvement of creative thinking skill in activity to improve output result and activity of asking magnitude of equal increase, that is 0,74 with medium category. This increase is due to the learning of project-based educational technology has several advantages such as goal-directed activities that will strengthen the relationship between activity and knowledge. In addition students are given the freedom to do project tasks done by emphasizing student autonomy (self-regulation) that will develop thinking skills.

The improvement of creative thinking skill in the guessing activity due to an occurrence of 0.84 and 0.74 in the high category. Improvement of creative thinking skills in this activity is high compared with other activities. This is due to increased motivation because students are challenged to work on project tasks and planting concepts conducted with experiments so that students find and understand the concept. This is in line with Renata's (2008) research results, project-based learning helps students develop thinking skills and improve understanding of science. This is also in accordance with Yalcin's (2009) research result that the effect of project based learning on the first year of science undergraduates' is attitudes towards educational technology, achievement, and development of scientific process skills.

## CONCLUSIONS

The result showed that after the development of learning model some creative thinking skills are high. This is indicated by an average of normalized gain scores  $\langle g \rangle$  creative thinking skills in experiment group 1 increased by 0.84 and in experiment group 2 increased by 0.74. These results indicate that the ILP model is one of the learning models that can improve creative thinking skills.

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## **Development of Research-Mindedness Scale of Undergraduate Students in Faculty of Education**

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### **ABSTRACT**

The aims of this research were: (1) to develop the research-mindedness scale of undergraduate students from the faculty of education at universities in the northeastern region of Thailand (2) to verify the quality of this research-mindedness scale. Research instrument was the research-mindedness scale which consisted of 2 sections including the Likert rating scale and the Multiple Choices Test with 3 multiple choice items. Data collection was conducted in 2 phases. The first phase focused on verifying the construct validity through the Exploratory Factor Analysis (EFA) based on the Orthogonal Rotation and Varimax Approach. Sample selected by Cluster Random Sampling Technique, was 780 third and fourth year undergraduate students of faculty of education from 9 universities. The findings of this phase revealed the three factors of research-mindedness scale which included: (1) curiosity and interest consisted of 4 sub-factors dividing into 18 items, (2) fairness and ethic consisted of 4 sub-factors dividing into 12 items, and (3) critical thinking consisted of 11 sub-factors dividing into 35 items. The second phase emphasized on verifying the quality of the scale towards the construct validity through the Confirmatory Factor Analysis (CFA) using the sample of 800 students. The Structural validity using second order confirmatory factor analysis showed the model fit well with the empirical data set (Chi-square = 232.273, df = 149, p-value = 0.00, TLI = 0.973, CFI = 0.977, RMSEA = 0.27, and SRMR = 0.30)

**Keywords:** Research-Mindedness, Confirmatory Factor Analysis, Exploratory Factor Analysis

### **INTRODUCTION**

KhonKaen University (2014) was announced and appointed as a national research university in 2010. Continuing our mission on conducting research is one of the key missions of KhonKaen University. This is to build ethical researchers and produce quality research, as well as erasing the bad images of research being “on the ivory tower”, and most importantly the benefits from each research must be able to truly respond to the needs of the society and provide a research-based learning environment for the staff. This is done through all the training sessions and follow-up sessions provided which are in accordance with the organization.

Social Care Institute for Excellence (2014) gives an importance on social science research, as the institute believes that the ability to perform an assessment and conduct research is the best way to facilitate the works of social work researchers and practitioners, which in this case, research-mindedness is a part that will reflect the way one searches for knowledge and leverages one’s abilities to be a professional. The institute also gives a definition for research mindedness that in order to have effective learning and working, practitioners and learners must understand well from key literature and related studies, and must consider how the said studies could be connected to their practices and research.

For social science workers, assessment and research skills have become their professional expectation, as the skills are determined as the basic professional skills required for social-science-related jobs. As a result, for many past years, there have been movements in order to cultivate research mindedness and research literacy onto those who work in the social science field, government studies, education and learning management.

Research Mindedness consists of the following:

- 1) An ability to reflect critically, which is derived from knowledge and studies
- 2) An ability to use studies as an argument against inequality, discrimination, racism, poverty, disadvantages and injustice -- which is in accordance with the virtues of social science research, and
- 3) An understanding of research system and the use of research in creating a theory and in practice, which is a qualification that should be promoted among learners who need to conduct research on social science issues (Social Care Institute For Excellence, 2014)

Apart from the above-mentioned, Harrison & Hympeys 1988 mentioned that practitioners define and give an importance on the attributes of research mindedness per below:

- 1) A qualification required for practitioners
- 2) An ability to reflect critically towards practice and to develop research questions
- 3) An ability to identify knowledge and conduct research related social values, and
- 4) An ability to understand how to design research and related research methodology in order to create a theory related to tasks performed at work.

Also, Austin & Other (2012) studied about research mindedness which consists of Curiosity & Interest, Critical Reflection and Critical Thinking.

## **LITERATURE REVIEW**

Research minded has become a key skill for social science learners and practitioners. The ability to assess and to use research results to provide advice and support ensures that the tasks performed are best selected. For social work learners and practitioners, research mindedness has become a key element that will prove and provide guidance for paths to knowledge and practice. It is a Professional Capabilities Framework or PCF and another way of professional assessment. As a result, there is an institute called Social Care Institute For Excellence that helps learners and practitioners in the field of social care and social work, thus a more effective use and covering academic research for practical usage. Also, the institute focuses on social science research, as it believes that having the ability to do an assessment and conduct research is the best way to facilitate the work of social work researchers and practitioners, which in this case research mindedness is a part that will reflect the ways one searches for knowledge and leverages one's ability into becoming a professional. Moreover, the institute has also provided a definition of the word "research mindedness" that, in order to effectively learn and work, practitioners and learners need to truly understand from the key literature and related studies, and then consider how the said studies are connected to how they practice or search for knowledge, which means that research mindedness is a thing that researchers have to create from the learning process and from their thoughtful considerations in selecting things that they would define as knowledge.

For those working in the social science field, these skills have become another of their professional expectations. The assessment and research skills have been determined as basic skills for social science related jobs. Therefore, these many past years, there have been movements to cultivate research mindedness and research literacy onto those working in social science field, government research, education and learning management (Social Care Institute For Excellence, 2014).

Research Mindedness consists of 3 elements:

- 1) An understanding of research system and the use of research in creating a new theory and in practice
- 2) An ability to use research to provide an argument against inequality and discrimination, without bias
- 3) An ability to reflect critically, which is derived from knowledge and research.

Should an educational academic try to give a definition of "research-mindedness", in general, it is focused on 1) being a research consumer or the use of those research with knowledge (sometimes it is referred to training assessment results) and on 2) starting to become a social science researcher. But for practitioners, it focuses on and gives an importance to the following attributes of research mindedness:

- 1) an essential practitioner attribute,
- 2) a capacity to critically reflect on practice to develop researchable questions
- 3) a capacity to be informed by knowledge and research related to social work values, and

- 4) capacity to understand research designs and related methodologies in order to theorize about practice (Harrison & Humphreys, 1998).

These three elements are the focus of the next section, and examined further especially in relationship to facilitating research-informed practice (see Figure 1).



Figure 1 Key elements of the research minded. (Austin, M.J., Santo, T.S. & Lee, C., 2012)

### Researcher's Code of Ethics

Ethics code of researchers refers to a code of practice for researchers designed to ensure that their research conduct is based on appropriate ethics and academic principles for the purpose of assuring quality and maintaining the dignity and integrity of researchers and research subjects (The National Research Council of Thailand, 1998).

Ethics Code of Researchers & Principles of Guidance:

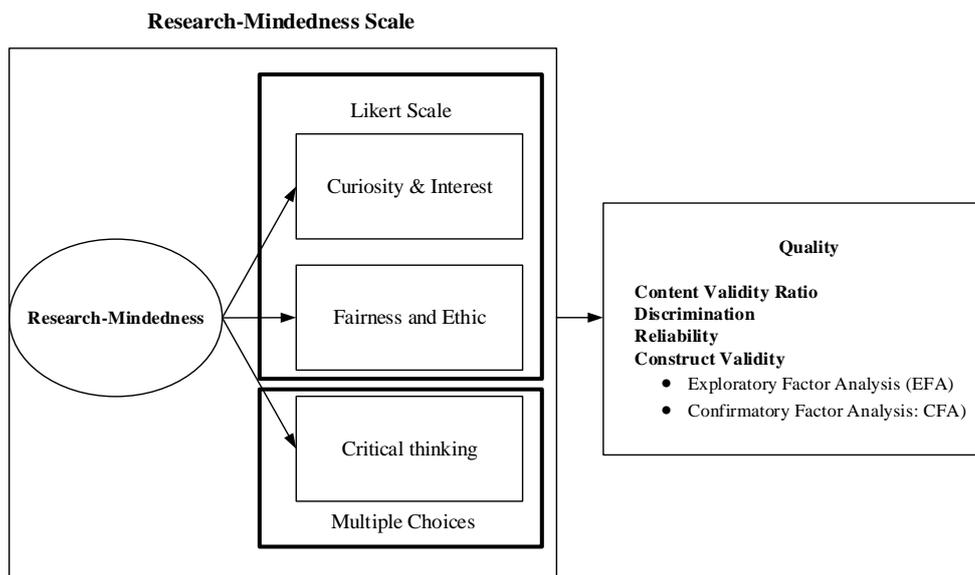
- 1) Researchers should be honest and fair-minded with regard to academics ambitions and management.
- 2) Researchers should abide by research obligation and agreements specified by and entered into with fellow researchers, funding agencies, and their affiliates.
- 3) Researchers should have impeccable training in the academic field related to their research.
- 4) Researchers should treat all research subjects, whether animate or inanimate, with appropriate respect and consideration and should take full responsibility for the impact and consequences of their research.
- 5) Researchers should have respect for their human subjects' dignity and right.
- 6) Researchers should enjoy freedom of the intellect and should be free from bias at very step of the research undertaking.
- 7) Researchers have a moral obligation to put their research findings to good use.
- 8) Researchers should respect peers' opinions.
- 9) Researchers should have a firm sense of commitment as regards all strata of society.

## RESEARCH AIM AND CONCEPTUAL FRAMEWORK

In this research, the main aims to develop a research-mindedness scale of undergraduate students in faculty of education, through identifying indications. In the first phase, it is an exploratory factor analysis, starting from using theories and concepts related to research mindedness, which consist of the following scales:

- 1) Curiosity & Interest and fairness and ethics in referring research in creating research methodology, using 5-level Likert Scale, and
- 2) Critical thinking that is developed into multiple choice tests.

Also, there will be a quality test for the discrimination index, the content validity ratio and the reliability. In the second phase, there will be a quality test for construct validity, through an analysis of confirmatory factor, which can be summarized into a framework for the development of the assessment in figure 2.



**Figure2** Conceptual Framework

## METHOD

The researchers employed the survey questionnaire as a method to collect quantitative data. The first phase focused on verifying the construct validity through the Exploratory Factor Analysis (EFA) based on the Orthogonal Rotation and Varimax Approach. Sample selected by Cluster Random Sampling Technique, was 780 undergraduate students of faculty of education from 7 universities. The second phase emphasized on verifying the quality of the scale towards the construct validity through the Confirmatory Factor Analysis (CFA) using the sample of 800 students from 7 universities. Sample selected by Cluster Random Sampling Technique. Research instrument was the research-mindedness scale which consisted of 2 types including the Likert rating scale and the Multiple Choices Test with 3 multiple choice items.

Cronbach's  $\alpha$  test was used to examine unidimensionality of the scale. Ideally, the  $\alpha$ -coefficient of a scale should be between 0.70 and 0.90 (Streiner and Norman, 2001). The correlation between each item and the total score (corrected item-total correlations) was calculated, as well as the impact on the alpha value of deleting the separate items from the pool (alpha if item deleted). The criterion of correlation 0.20 was used, as suggested by Streiner & Norman (2001). This analysis was used to help deciding whether some items should be excluded, and was done before performing the EFA. The suitability of the data for EFA was examined, by inspecting the correlation matrix for coefficients 0.3, and calculating the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) (Kaiser, 1974) and Bartlett's test of sphericity (Bartlett, 1954). The factor structure was then identified by using the method of varimax rotation of the factors, allowing for correlation (Kristopher, Preacher & MacCallum, 2003). Unidimensionality of the total scale and of eventual sub-scales was finally examined using

Confirmatory Factor Analysis (CFA) was applied to test the goodness of fit of the hypothetical model and empirical data. The goodness of fit statistics consisted of Chi-square statistic ( $\chi^2$ ), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR).

The Chi-Square value ( $\chi^2$ ) is the traditional measure used for evaluating overall model fit and, assesses the magnitude of discrepancy between the sample and fitted co-variances matrices' (Hu and Bentler, 1999: 2). According to Kenny and McCoach (2003), the Chi-Square statistic would lack of power when small samples are used. Thus Chi-square values may not discriminate between good and poor fitting models. Owing to the restrictiveness of the Model Chi-Square, Wheaton, Muthen, Alwin and Summers (1977) suggested the other alternative statistic that can minimizes the impact of sample size will be relative/normed chi-square ( $\chi^2/df$ )

Confirmatory Factor Analysis (CFA) is a powerful statistical tool to examine the nature and relations among latent construct (Brown, 2006; MacCallum& Austin, 2000).The RMSEA tells us how well the model, with unknown but optimally chosen parameter estimates would fit the population covariance matrix (Byrne, 1998). Recommendations for RMSEA cut-off points have been reduced considerably in the last fifteen years. Up until the early nineties, an RMSEA in the range of 0.05 to 0.10 was considered an indication of fair fit and values above 0.10 indicated poor fit (MacCallum, Browne, & Sugawara, 1996).

The Root Mean square Residual (RMR) and the Standardized root mean square residual (SRMR) are the square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model. The range of the RMR is calculated based upon the scales of each indicator. The standardized RMR (SRMR) resolves this problem and is therefore much more meaningful to interpret. Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than 0.05 (Diamantopoulos & Sigauw, 2000), however values as high as 0.08 are deemed acceptable (Hu & Bentler, 1999). The Comparative Fit Index (CFI) is introduced by Bentler (1992) and subsequently included as part of the fit indices in his EQS program (Kline, 2005). This statistic assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model. A cut-off criterion of  $CFI \geq 0.90$  was initially advanced however, recent studies have shown that a value greater than 0.90 is needed in order to ensure that miss-specified models are not accepted (Hu & Bentler, 1999). From this, a value of  $CFI \geq 0.95$  is presently recognized as indicative of good fit (Hu & Bentler, 1999).

## FINDINGS

The first phase focused on verifying the construct validity through the Exploratory Factor Analysis (EFA) based on the Orthogonal Rotation and Varimax Approach. Sample selected by Cluster Random Sampling Technique, was 780 undergraduate students of faculty of education from 7 universities.

**Table 1.** Comparison of eigenvalues from the Exploratory Factor Analysis (EFA) and the corresponding criterion values obtained from parallel analysis; the criterion value of the forth factor exceeded the eigenvalue. (Curiosity & Interest)

Component number	Eigenvalues	% of Variance	Cumulative %
1	7.433	37.165	37.165
2	1.873	9.366	46.531
3	1.578	7.888	54.420
4	1.231	6.157	60.577

Bartlett's Test of Sphericity = 6734.888 ( $p < .000$ ),  $df = 190$   
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .923

**Table 2** Comparison of eigenvalues from the Exploratory Factor Analysis (EFA) and the corresponding criterion values obtained from parallel analysis; the criterion value of the fourth factor exceeded the eigenvalue. (Fairness and Ethics)

Component number	Eigenvalues	% of Variance	Cumulative %
1	8.495	42.476	42.476
2	1.848	9.238	51.714
3	1.147	5.734	57.448
4	1.013	5.065	62.513

Bartlett's Test of Sphericity = 7451.899 ( $p < .000$ ),  $df = 190$   
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .940

**Table 3** Comparison of eigenvalues from the Exploratory Factor Analysis (EFA) and the corresponding criterion values obtained from parallel analysis; the criterion value of the 11<sup>th</sup> factor exceeded the eigenvalue. (Critical thinking)

Component number	Eigenvalues	% of Variance	Cumulative %
1	5.014	14.324	14.324
2	1.306	3.732	18.056
3	1.203	3.436	21.492
4	1.176	3.359	24.851
5	1.146	3.274	28.125
6	1.113	3.179	31.304
7	1.092	3.120	34.424
8	1.079	3.083	37.507
9	1.040	2.973	40.479
10	1.034	2.955	43.434
11	1.000	2.858	46.293

Bartlett's Test of Sphericity = 2645.754 ( $p < .000$ ),  $df = 595$   
Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .884

**Table 4** Factors of Research-Mindedness after the Orthogonal Rotation and Varimax Approach got the factor loading > 0.3

Factor of Research-Mindedness	items
Curiosity and interest (Likert rating scale)	
• Stimulate in formation acquisition	4
• Identify gabs in knowledge	4
• Learning in workplace and working potential can be affected by knowledge acquisition	6
• Information seeking can impact workplace learning	4
	TOTAL 18
Justice and virtue on conducting research (Likert rating scale)	3
• Respect for human dignity and related things	4
• Respect for others' academic opinion	3
• Aware of the research supporter's obligation	3
• Have the fundamental knowledge in field of research	
	TOTAL 13

Table 4 Factors of Research-Mindedness after the Orthogonal Rotation and Varimax Approach got the factor loading > 0.3 (continued)

Factor of Research-Mindedness	items
Critical thinking (Multiple Choices)	4
• Identify problem	4
• Collect information	2
• Consider information accuracy	3
• Evaluate information correctness	2
• Identify information	3
• Hypothesis	3
• Inductive	3
• Deductive	3
• Information judgment ability based on the correct criteria and various information.	2
• Predictive ability for the conclusive judgement's outcomes	2
TOTAL	31

The second phase emphasized on verifying the quality of the scale towards the construct validity through the Confirmatory Factor Analysis (CFA) using the sample of 800 students from 7 universities.

**Table 5** The First order Confirmatory Factor Analysis of Research-Mindedness Model

Factor	Factor Loadings				Factor score	R <sup>2</sup>
	b	SE	t	$\beta$		
<b>First Order</b>						
<b>Curiosity and interest</b>						
CC1	1.000**	0.000	-	0.68	0.156	0.462
CC2	1.027**	0.062	16.443	0.716	0.185	0.512
CC3	1.337**	0.081	16.520	0.719	0.145	0.516
CC4	0.959	0.063	15.313	0.673	0.157	0.453
<b>Fairness and Ethic</b>						
FF1	1.000**	0.000	-	0.658	0.119	0.432
FF2	0.968**	0.057	16.997	0.730	0.185	0.533
FF3	1.235**	0.070	17.636	0.798	0.222	0.637
FF4	1.201**	0.075	15.990	0.720	0.140	0.518
<b>Critical thinking</b>						
CV1	1.000**	0.000	-	0.636	0.139	0.405
CV2	0.905**	0.066	13.652	0.625	0.144	0.390
CV3	0.336**	0.035	9.606	0.406	0.120	0.165
CV4	0.549**	0.046	11.836	0.521	0.138	0.271
CV5	0.358**	0.033	10.709	0.467	0.159	0.218
CV6	0.485**	0.043	11.390	0.499	0.139	0.249
CV7	0.453**	0.042	10.699	0.463	0.123	0.215
CV8	0.318*	0.030	10.547	0.455	0.167	0.207
CV9	0.552**	0.048	11.427	0.503	0.125	0.253
CV10	0.454**	0.040	11.307	0.492	0.144	0.242
CV11	0.247	0.025	9.766	0.418	0.175	0.175

Table 6 The Second order Confirmatory Factor Analysis of Research-Mindedness Model

Factor	Factor Loadings				Factor score	R <sup>2</sup>					
	b	SE	t	β							
<b>Second order</b>											
Curiosity	1.000**	0.000	-	1.604	-	0.570					
Fairness and Ethic	0.283**	1.635	0.173	0.443	-	0.461					
Critical	-0.014*	0.124	-0.150	-0.014	-	0.000					
$\chi^2$	=	232.27	df	=	149	$\chi^2/df$	=	0.557	P-value	=	0.000
RMSEA	=	0.027	CFI	=	0.977	TLI	=	0.973	SRMR	=	0.030

\*  $p$ -value <.05 , \*\*  $p$ -value <.01

Result from Table 5 reveals that standard component score ( $\beta$ ) which indicated significantly high and positive correlations at 0.01. Besides, it was found that the measurement model of internal quality assurance operations has goodness fit with evident data, with  $\chi^2= 232.27$ ,  $df= 149$ ,  $p= 0.000$ ,  $\chi^2/df= 0.557$ ,  $RMSEA = 0.027$ ,  $SRMR = 0.030$ ,  $CFI = 0.977$  and  $TLI = 0.973$ . Result shows that Research- Mindedness Model was consistent with empirical data (Shama, et al., 2005; Steiger, 2007; Tabachnik&Fidell, 2007).

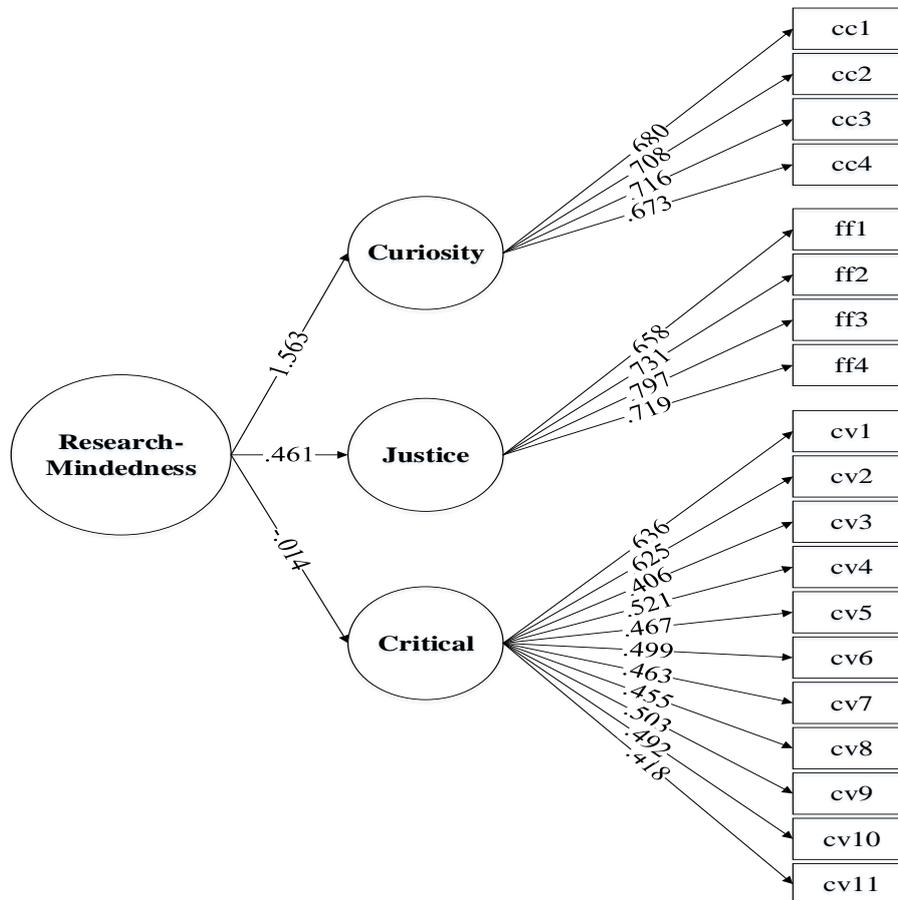


Figure 3 Research- Mindedness Model

## DISCUSSION

From the developments of the research-mindedness scale conducted by the undergrad students at the Faculty of Education, it was found that the Likert scale form and the 3-choice test were a high-quality type of test, especially the reliability level of the Likert scale that was at a very good level or at 0.946, while the multiple-choices test had the reliability level at 0.901, which was at a very good level, in accordance with what Devellis (1991) mentioned that the reliability level at 0.90 or higher is at a very good level, meaning that the assessment form created by the researchers was reliable.

Based on the analysis of the exploratory elements in the aspect of curiosity and interest, there were fewer elements. This was different from Austin & Other (2012). In the aspect of fairness and ethics there were fewer elements, different from what The National Research Council of Thailand (1998) had determined. However, the elements in the aspect of critical thinking, there were more elements. This was maybe due to the fact that it was within the coverage of the research conducted by the undergrad students of the Faculty of Education only. Anyway, in order to make the element analysis more reliable, there had to be another time of a confirmative element analysis or CFA.

For the secondary order confirmatory analysis of the research-mindedness scale model, when considering the model which consists of three sub elements, it was found that, the elements in the aspect of critical thinking had the standard component score ( $\beta$ ) at -0.140. This was due to the attributes of the test that provided situations in the test. They all were only experimental and scientific research situations. And for the data collection from the samples, there were many fields of subject for the tests, which might not be suitable for the undergrad students from other faculties of majors. The researcher analyzed the average score and found that in terms of the test scores in this part compared to the average scores between the groups of science-related majors and other groups of majors, the former had mean score at 25.74 and the S.D. was at 2.11, while the latter had mean score at 11.25 and the S.D. was at 5.63, which were different, resulting in all the average scores being low. This might lead to the critical thinking element shaving a negative standard grade weight. All in all, all the indexes of harmony were as follows: (Chi-Square; $\chi^2$ ) was at 232.27; df was at 149; p at 0.00; TLI was at 0.973; CFI was at 0.977; RMSEA was at 0.027; and SRMR was at 0.30. This indicated that the research mindedness scale model for the undergrad students at the Faculty of Education was consistent with empirical data

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# Development of Sustainable Leadership Indicators for Basic Educational School Principals in Thailand

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## ABSTRACT

The aims of this research were to investigate the key factors and indicators of sustainable leadership, followed by testing the goodness of fit of the identified sustainable leadership indicators from the developed model against its empirical evidence. A total of 500 high school principals were selected from a population of 9,521 utilizing a multi-stage random sampling. This study employed quantitative survey design using questionnaire as an instrument and analyzed by structural equation modeling. Initial data was collected through reviewing the related past literatures and in-depth interviewing with scholars. Results revealed that the identified components of sustainable leadership were comprised of seven main components and 89 indicators. These indicators were consistent with empirical data, with  $\chi^2 = 17.31$ ,  $df = 13$ ,  $p = .18$ ,  $RMSEA = .029$ . According to school principals' ratings in chronological order as follows: possessing in-depth knowledge, diversity in problem-solving and performance, resources management, justice, length (keeping good personnel), being conservationist, and distribution of leadership.

**Keywords:** High school principals; indicators; key factors; sustainable leadership

## INTRODUCTION

Sustainable leaders are individuals compelled to make a distinction by extending their attentiveness in relation to surrounding (The Sustainable Leadership Institute, 2011). Therefore, sustainable leaders assume new ways of seeing, thinking, and interacting that result in innovative and sustainable solutions. Hargreaves and Fink (2004) stated that educational leaders have to encourage others to join them in working towards those goals and leave a lasting legacy if they want to achieve those goals. Consequently, charismatic and sustainable leader turns around an underperforming school and enhances his or her institution's reputation by exerting a pull on top students across the nation. Hargreaves and Fink (2003: 3) defined sustainable leadership as a shared responsibility, which does not unduly deplete human or financial resources, and that cares for and avoids exerting negative damage on the surrounding educational and community environment. Sustainable leadership has an activist engagement with the forces that affect it, and builds an educational environment of organizational diversity that promotes cross-fertilization of good ideas and successful practices in communities of shared learning and development.

According to Hargreaves (2003), schools as a teaching and learning institution need to be reconfigured to prepare all their students to participate in transforming their countries into creative knowledge economics and to have opportunities to be employed at the highest levels of economics, in high skills with high wage societies. In the current rapidly transforming situations of Thailand which have created tremendous social problems are the results of the focus on economic development as the sole governmental policy. These in turn caused the imbalance to the developmental structures and personnel thereof (Office of the Educational Council Revised Edition, 2002). In order to reach the national balanced and sustainable development, one must put emphasis on the fortification of the available resources of the nation in order to move forward the developmental process, especially the

development of people or human resource in order to make them ready for coping with the changes of 21<sup>st</sup> century. This includes the promotion of requisite factors that would facilitate the development of quality manpower as well as structure so that they become immune to future changes (Educational Consultant, 2010).

In regard to organization and its development, it implies that school principals should find ways to change the organization from its current state to a better developed state (Avery & Bersteiner, 2011). Consequently to manage sustainability, the society has to formulate transparent and measurable sustainability goals that are to be regularly revised and specified. The conception of sustainable development obliges organizations to change their behavior with respect to the interested parties. Therefore, the sustainability of an organization is based on the economic, environmental protection, and social responsibility aspects (Hargreaves & Finks, 2004).

### **CONCLUDING THE CONCEPTS OF SUSTAINABLE LEADERSHIP**

Researchers conceptualized sustainable leadership in accordance to the seven principles of sustainable leadership proposed by Hargreaves and Finks (2003).

#### ***Possessing in-depth knowledge***

The possessing in-depth knowledge refers to the high school principals have to responsible to organize learning that engaging students intellectually, socially, and emotionally. According to Hargreaves and Finks (2003), sustainable leadership goes beyond temporary gains in achievement scores to create lasting meaningful improvement in learning. In other words, sustainable leadership preserves, protects and promotes in education what is itself sustaining as an enrichment of life: the fundamental moral purpose of deep, broad and lifelong learning (rather than superficially tested and narrowly defined literacy and numeracy achievement) for all in commitments to the relationships of abiding care for others. The key factor of sustainable leadership is leadership for learning and leadership for caring for and among others.

#### ***Diversity in problem-solving and performance***

Sustainable leadership encourages cohesive diversity. Strong ecosystems are bio-diverse ones. Strong organizations too, encourage diversity and evade the standardization that weakens learning, adoptability and flexibility in the face of unexpected changes and risks. Sustainable leadership, by contrast, fosters and learns from diversity in teaching and learning and moves things forward by creating consistency and networking among its richly varying components. Sustainable leadership recognizes and develops many kinds of excellence in learning, teaching, and leading, and it provides the networks for sharing these different kinds of excellence in cross-enriching processes of improvement (Louis and Kruse, 1995; McLaughlin and Talbert, 2001). Sustainable leadership does not execute standardized patterns on everyone.

#### ***Resources management***

Sustainable leadership develops and does not exhaust material and human resources. Sustainable leadership recognizes and rewards the organization's leadership talent in earlier rather than later career. It takes care of its leaders by getting them to take care of themselves. It renews staff's energy. It does not drain its leaders dry through innovation overload or unrealistic overload or unrealistic timelines for change. Sustainable leadership is practical and resourceful leadership that wastes neither its money nor its staff. Sustainable leadership systems provide intrinsic rewards and extrinsic incentives that draw and preserve the best and brightest of the leadership pool. Such systems provide time and opportunity for leaders to network, learn from and support one another, and trainer and mentor their successors. Sustainable leadership is economical without being cheap. It carefully distributes its resources in developing the talents of all its educators rather than loading rewards on a few proven stars. Sustainable leadership systems take care of their leaders and encourage leaders to take care of themselves.

#### ***Justice***

Sustainable leadership is not only about maintaining improvement in one's own school. Leaders who care about sustainability accept responsibility for the schools and students that their own actions affect in the wider environment. Sustainable leadership does not damage to and actively improves the surrounding environment. It does not attack the best resources of outstanding students and teachers from neighboring institutions. It does not prosper at other schools' expense. It does no harm to and actively finds ways to share knowledge and resources with neighboring schools and local community. Sustainable leadership is not self-centered; it is socially just. Sustainable leadership is alert of how lighthouse, magnet, and charter schools and their teachers can leave others in the shadows and is sensitive to how privileged communities can be tempted to scan the cream off the local leadership pool. Sustainable leadership recognizes and takes responsibility for the fact that schools affect one another in webs of mutual control.

### ***Length (Keeping good personnel)***

Sustainable leadership demands that leaders pay serious attention to leadership succession. Sustainable leaders can achieve this goal by preparing successors to continue important reforms, by keeping successful leaders in schools longer when they are making great strides in promoting learning, by resisting the attraction to search for irreplaceable charismatic heroes to be the saviors of the schools, by requiring all district and school improvement plans to include succession plans, and by slowing down the rate of repeated successions so teachers do not sarcastically decide to 'wait out' all their leaders. Sustainable leadership means planning and preparing for succession – not as an afterthought, but from the first day of a leader's appointment. Hargreaves and Fink offered rare hints of thoughtful and effective succession management. For example, there was one school built on its enthusiastic and positive principal's success in forging a democratically developed school improvement plan by grooming his assistant principal to replace him when he retired.

### ***Being a conservationist***

Standardized reform has embellished the problems of the traditional schools, turning these schools into less-motivated versions of their former selves. Meanwhile, the innovative schools have lost some of their edge. Sustainable leadership honors and learns from the best of the past to create an even better future. In the midst of the chaos of change, sustainable leadership is steadfast about preserving and renewing its long-standing purposes. Most change theory is change without a past or a memory. Sustainable leadership revisits and revives organizational memories and honors the insight of their holders as a way to learn from, preserve, then move beyond the best of the past.

### ***Distribution of leadership***

One method for leaders to leave a lasting inheritance is to ensure that others share and help develop their vision. Therefore, leadership succession means more than preparing the principal's successor. It means distributing leadership throughout the school's professional community so others can carry the torch after the principal has gone (Spillane, Halverson and Drummond, 2001). Sustainable leadership is not just the responsibility of the school administrator. In a highly complex world, no one leader, institution, or nation can control everything without help (Fullan, 2001). Sustainable leadership must be a shared responsibility. It sustains as well as depends on the leadership of others. In a complex world, no one leader, institution or nation can control everything without be of assistance. Sustainable leadership is distributed leadership – as an accurate description of how much leadership is already exercised, and also as an ambition for what leadership can, more deliberately, become.

## **LITERATURE REVIEWS**

Wayne and Polly (2011) had successfully created a clearer understanding of the nature of sustainable leadership and how it could contribute to a transformational change. They located sustainability within the leadership literature, defined the concept of sustainable leadership, and presented a sustainable leadership model in practice. In addition, they also tested the model with a sample of senior business leaders and refined the model in accordance with senior business leaders' feedback. Wayne and Polly's sustainable leadership model covered three major areas namely context, individual characteristics, and actions.

According to Simanskiene and Zuperkiene (2014), the major factors that affected by sustainable leadership are individual, team, organization, and society. They had examined the important factors to encourage managers to think broadly and be responsible sustainable leader. Simanskiene and Zuperkiene found that leaders should have self-awareness before they can start any changes in organization. Sustainable leaders have to face ever new challenges and need novel ideas in order to handle with them. Those external and internal pressures make leaders look for new methods which would assist both in retaining the quality of products and services and in fostering the morale of the employees, as well as assuring the stability in the organization. Sustainable leader should start with oneself such as to analyze one's own personal qualities and skills, and having identified insufficient abilities, to learn consistently and thus set an example for the employees, to use of innovations and creativity.

Somprach, Tang and Popoonsak (2016) explored the relationship of essential leadership styles of school principals in supporting teachers' participations in professional learning community practices in basic education schools in northeastern Thailand. They found that sustainable leadership is the second highest frequently leadership style practiced by school principals with mean score 4.41. Moreover, Somprach et al. found that sustainable leadership ( $r = 0.627$ ;  $p < 0.05$ ) with the strength of association being substantial to very strong and positive towards teachers' participation in professional learning community practices. However, their finding showed that sustainable leadership failed to be significant predictors out of the nine leadership styles that have an impact to teachers' participation in professional learning community practices.

Grooms and Reid-Martinez (2011) conducted a longitudinal cross-cultural case study to investigate the evolution of sustainable leadership in an orchestrated education programs. Grooms and Reid-Martinez found that leadership sustainability was an intricate weaving of multiple factors in three critical areas namely sustained communication in the ICT/Blended environment, sustained mentoring, and sustained curriculum and learning. They further emphasized about the synergy of sustained educational and communicational elements to the key factor together with immersed learners in a virtual or blended learning environment that focused on ethics, values, and transformation at the personal and organizational levels. Through modeling and mentoring, learners received intentional leadership support while learning to build leadership sustainability within themselves and their followers. Such learning creates a cycle of ongoing leadership development that continuously moves current and upcoming leaders from information to the formation of reservoirs of knowledge and wisdom, further expanding and sustaining leadership. This continuous leadership growth provides an important persistent in the development of sustainability, demonstrating that like sustainable development, sustainable leadership represents a process, not an end state.

## **RESEARCH OBJECTIVES**

The main aim of this study was to develop the sustainable leadership indicators for high school principals in Thailand. More specifically, the study sought to:

- a. Identify the key factors and indicators of sustainable leadership indicator for high school principals.
- b. Test the goodness of fit of the sustainable leadership indicators with empirical data.

## **METHOD**

A survey questionnaire was employ as a method to collect quantitative data. Sample size was determined based on Hair, Black, Anderson, and Tatham's (2006) rules of thumb. Hair et al. proposed that the ratio between the samplings and the parameters or variables in a factor analysis should be at a minimum of 50 but not less than 100 in proportion with the variables. Since the population consisted of 9,521 high school principals in year 2016, the ratio between population and parameters was 10 to 1 so the identified sample size was 500. Multi-stage random sampling technique was employed to select the samples.

Before researchers started to collect the quantitative data, researchers carried out the preliminary study to conceptualize the sustainable leadership indicators. This phase includes activities with a solid conceptual component to identify the indicators of sustainable leadership. According to Brink, Van Rensburg and Van der Walt (2012), conceptualization refers to the process of emerging and filtering non concrete ideas. During this preliminary stage, researchers categorized and developed sustainable leadership indicators to form a framework by analyzing documents and related previous research as well as interviewing some academic experts. Hence researchers had pleaded on the skills and capabilities of creativity, analysis and insight, as well as on the fixed grounded of existing research on sustainable leadership.

Survey questions in the form of a questionnaire were distributed to the 500 high school principals in order to collect information on their perceptions about validity of sustainable leadership construct. This method benefits the study in terms of obtaining data more efficiently as time, energy, and costs were minimized (Sekaran, 2006), and it provided an excellent means of measuring attitudes and orientations in a large population which can, therefore, be generalized to a larger population (Babbie, 2002).

The five-point Likert scale survey questionnaire instrument was administered in the Thai language to make sure that the respondents were clear about the statements. There were 94 items including five items of demographic and 89 items of sustainable leadership items at their workplace. The survey questionnaire consisted of two sections. Section A was intended to gather information regarding the demographic factors of the respondents while Section B was specifically designed based on the preliminary research findings as mentioned above to gauge the perceptions about the construct validity of the high school principals' sustainable leadership indicators.

In addition to the expert advice, a confirmatory factor analysis (CFA) was used to investigate the construct validity of the instrument. Several fit indices were selected in order to test which CFA model best represented the present dataset: root-mean-squared error of approximation (RMSEA) (Browne & Cudeck, 1993), comparative fit index (CFI) (Bentler, 1990), chi-square, and change in chi-square given the change in degrees of freedom between models. RMSEA is a measure of the average of the residual variance and covariance; good models have RMSEA values that are at or less than 0.08 (Hu & Bentler, 1999). CFI is an index that falls between 0 and 1, with values greater than 0.90 considered are to be indicators of good fitting models (Hu & Bentler, 1999). When comparing models, a lower chi-square value indicates a better fit, given an equal number of degrees of freedom. Since the RMSEA was 0.031 (<0.08) and CFI was 0.998 (falls between 0 and 1, with values greater than 0.90) these

verifications indicated that the model of the relationship between leadership styles and principals' competencies in managing high performance schools was consistent with the empirical data.

Structural Equation Modeling (SEM) was used in order to fit the model with empirical data. SEM is a mixture of factor analysis and regression or path analysis. SEM is a complete statistical modeling tool for analyzing multivariate data involving complex relationships between and among variables (Hoyle, 1995). In addition, SEM is a dominant method that can merge complex path models with latent variables (factors). Using SEM can identify the relationships between variables using two main sets of equations namely measurement equations and structural equations. Measurement equations are used to examine the accuracy of proposed measurement by considering relationships between latent variables and their respective indicators. The structural equations are used to drive the assessment of the hypothesized relationships between the latent variables, which permit testing the statistical hypotheses of the study (Byrne, 2010). In addition, SEM considers the modeling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms, and multiple latent independents each measured by multiple indicators. As a result, the interest in SEM is often on the theoretical constructs are represented by the latent factor.

## RESULTS

The results of this study are presented in accordance to the research objectives indicated above. The preliminary results were conceptualization of sustainable leadership to identify the key factors and indicators for high school principals. Results of the actual study are presented by analyzing the factor loading and validity of observable variables to test the goodness of fit of the sustainable leadership indicators with the empirical data.

### *Identification of sustainable leadership key factors*

Based on the investigation on the synthesis of concepts, theories, and previous research, the key factors of sustainable leadership were (i) possessing in-depth knowledge; (ii) diversity in problem-solving and performance; (iii) resource management; (iv) justice; (v) length (keeping good personnel); (vi) being a conservationist, and (vii) distribution of leadership.

### *Factor loading and validity of key factors*

After identifying sustainable leadership key factors, researchers aimed to estimate the parameter of the sustainable leadership model, the factor loading and validity of observable factors of sustainable leadership. As indicated in Table 1 below, factor loading values of all the sustainable leadership key factors ranged from 0.554 to 0.847 are statistically significant at 0.01. Factor loading is the importance of standard factors of each key factor in sustainable leadership model of the high school principals that have been taken into consideration. The co-variance with sustainable leadership was from 30.70 to 71.70 percent. The key factor with the highest factor loading was possessing in-depth knowledge. This is followed by diversity in problem-solving and performance, resources management, justice, length (keeping good personnel), and being a conservationist key factors respectively. The key factor that had the lowest factor loading was distribution of leadership. As a result, all the key factors were found to be important construct of sustainable leadership.

**Table 1. Factor loading and validity of observable variables in the measurement model**

Sustainable leadership factors	Matrix of Factor loading		
	$\beta$	t	R <sup>2</sup>
Possessing in-depth knowledge	0.847	0.000	0.717
Diversity in problem-solving and performance	0.828	0.000	0.685
Resources management	0.816	0.000	0.666
Justice	0.792	0.000	0.627
Length (keeping good personnel)	0.762	0.000	0.580
Being a conservationist	0.756	0.000	0.571
Distribution of leadership	0.554	0.000	0.307

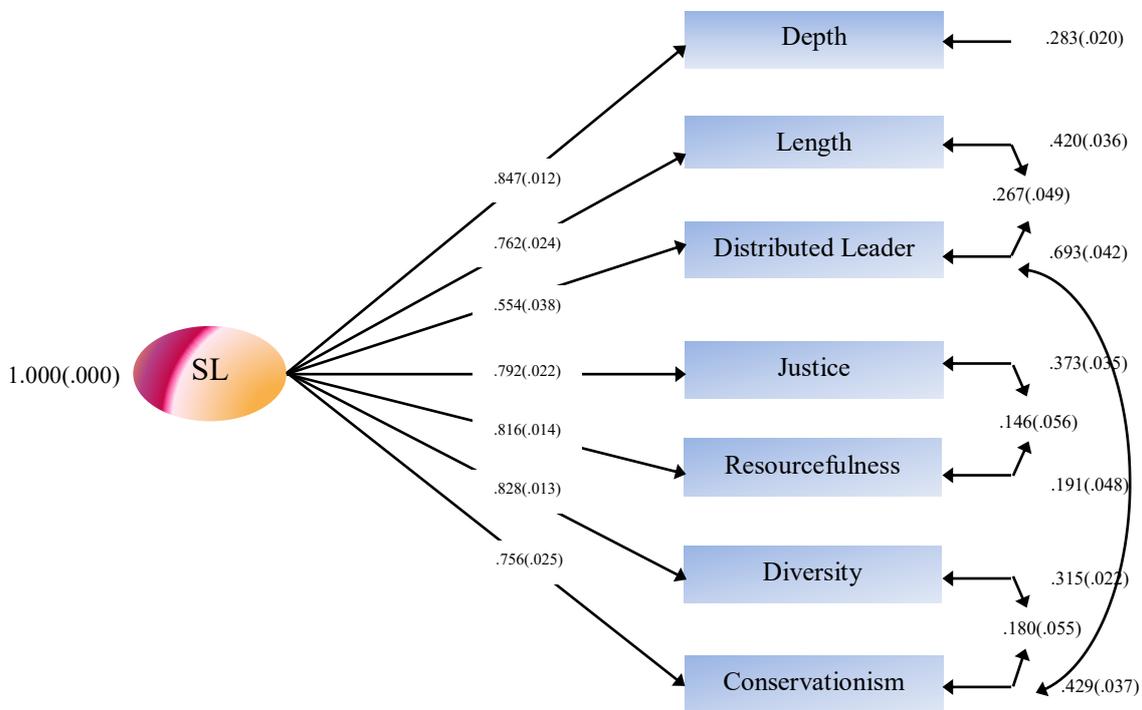
Result also indicated that there are 89 sustainable leadership indicators which derived from seven key factors as shown in Table 1 above. This is coupled with the experts' recommendations to fit the 89 indicators with seven key factors according to Thailand context. Majority of the experts suggested to use the mean score 3.00 or more as cut-off point and coefficient of dispersion as 20 percent or less to synthesize those key factors of existing research on sustainable leadership. The following Table 2 indicates the first three most weighted indicators of each sustainable learning key factors.

**Table 2. The first three most weighed indicators**

Sustainable leadership factors	Indicators
Possessing in-depth knowledge	1. Skill knowledge / competencies 2. Expertise 3. Experience
Diversity in problem-solving and performance	1. Best/good practices 2. Diversity culture 3. Integration
Resources management	1. Providing maintenance 2. Efficiency 3. Quality
Justice	1. Neutrality 2. Accuracy 3. Decision-making
Length (keeping good personnel)	1. Caring 2. Empowerment 3. Participation
Being a conservationist	1. Knowledge management strategies 2. Indigenuous knowledge 3. Future research
Distribution of leadership	1. Shared vision 2. A culture of team learning 3. Leadership practice

**Goodness of fit the sustainable leadership indicators with the empirical data**

Result of the study revealed that sustainable leadership model has goodness of fit with evident data, as  $\chi^2 = 17.31$ ,  $df = 12$ ,  $p\text{-value} = 0.18$ ,  $RMSEA = 0.029$  as illustrated in Figure 1 below. Finally, it was found that the sustainable leadership model agreed with empirical data.



**Figure 1. Sustainable Leadership Model**

**DISCUSSION**

The essential results of this research was on the importance of standard factor loading of each key factor in the sustainable leadership model revealed that all of the synthesized factors of sustainable leadership conformed well

with the empirical data with statistical significance (Tuksino, 2009). Hence all the seven key factors are vital factors and seem to be in line with theories and previous research studies. The results implied that an empirical definition was adopted from various scholars and literatures including local and international articles which were elaborately reviewed thus they enable to increase the possibility to define accurately the terms according to the objectives of the study. Furthermore, results indicate that the assigned indicators conformed very well with the empirical data. This reflects that the empirical definition is close to the theoretical definition and supported by theory, concept, academic documents, and previous studies (Wirachchai, 2002). Likewise, the created theoretical conceptual framework was found to be acceptable to assess the quality of developed indicators. Concepts were also identified through the interviews of educational experts in Thailand who possess sufficient knowledge and experiences at the preliminary stage would assist in developing the solid framework.

In addition, results illustrated that the Goodness of Fit index (GFI) of the sustainable leadership model followed by the designated criteria revealed that the structural relation analysis between sustainable leadership of high school principals and empirical data. The most significant key factor of sustainable leadership was possessing in-depth knowledge. This implies that high school principals have to responsible to organize learning in order to engage their students to learn intellectually, socially, and emotionally. Thus sustainable leadership practice was an intricate weaving of multiple factors as indicated by Grooms and Reid-Martinez (2011). The suggested approach to develop sustainable leadership skills will help the high school principals to develop in-depth knowledge, diversity in problem-solving and performance, resources management, justice, length (keeping good personnel), being a conservationist, and distribution of leadership as proposed by Hargreaves and Finks (2003).

The overall results of this study revealed the importance of sustainable leadership of high school principals. This testifies that Thailand Ministry of Education should recognize that high school principals play an important role in the organization of quality education hence project development to upgrade teachers and educational personnel is a necessity. The integration of knowledge and new existing experiences can lead to a creation of innovation. Moreover, application of different techniques during the problem-solving process can help schools to gain competitive power. On this line of reasoning, results are in accordance with the opinions of the experts at the preliminary stage that concerning about high school principals must take teachers and educational personnel to learn and realize that the educational world is in a constant state of changing.

Finally, researchers would like to suggest to the Thailand Ministry of Education to prepare an administrative leader preparation training including sustainable leadership skills development model. This is to ensure that school administrators at all levels must play their roles as a sustainable leader. The two highest key factors namely possessing in-depth knowledge and diversity in problem-solving and performance should be highlighted during the professional development process. As to the structural model of sustainable leadership, its main aim is the nature of current leadership and trends of leadership in the future and found that the current leadership style has changed and differs considerably from the leadership of the past. The school leaders now have to be able to create atmosphere of cooperation and free expression of ideas from their staff. They must be flexible and adaptable to changes, and to be able to cooperate and create connections in the non-boundary world (Simanskiene & Zuperkiene, 2014). They must also be able to create new innovations, to contribute to the maintenance of co-leadership and cordial relations among the staff of the organization. In addition, school leaders should be sympathetic about other people's feeling and to communicate with them effectively, to be creative and be able to manage changes to create personal relations as well as business networks in such a way that would lead to better management and flexibility with local organizations as well as external organizations (Gooms and Reid-Martinez, 2011).

In conclusion, researchers would like to suggest for future researchers to develop a comprehensive guidelines which will model the way of empowerment and development of teachers rather than deplete human resources as it encourages sustained leadership through sustained communities of learning. Such sustained learning creates a cycle of ongoing leadership development that continuously moves current and future school principals from information to the creation of reservoirs of knowledge and wisdom, further deepening and sustaining leadership.

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# Development of Usage of Smart Phones in Teaching-Learning Environments Scale

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## ABSTRACT

Smart phones are among the most prevalently used technological devices due to their various features including internet, sound recording, navigation, shooting as well as communication purpose. Areas of usage of the smartphones and the number of users are increasing more and more and they are getting more space in the daily life. The education on how to use smart phones effectively constitutes great importance in individuals' lives. When the literature is examined, there has not been any evaluation tool for smart phone education, for usage of smart phones in educational environments or for educators' skills of using smart phones with educational purposes. The current research aimed to develop "Usage of Smart Phones in Teaching-Learning Environments Scale" in order to determine whether university students use smart phones in educational environments with educational purposes. Accordingly, "Usage of Smart Phones in Teaching-Learning Environments Scale" was developed. Validity and reliability findings of the scale were demonstrated.

**Key Words:** Smart phone, teaching-learning environment

## INTRODUCTION

Individuals composing the modern society in our day possess and use more intense and advanced technology compared to what previous generations have had. People, especially children and teenagers, feel and live through technology more effectively in their daily lives (Yildirim, Yasar and Duru, 2016). A modern individual continuously alters and improves the technology, therefore the behaviours of the individuals are developed after being affected by the changes.

Technology and educational technology requires to provide functional educational service to broader masses, to uplift the human resources to a more productive function, to supply individual differences and social requests, to improve social justice, democracy and equality of opportunity, to decrease the costs and to make the best use of already existonf opportunities. These indispensable facilities that educational technology provides depend on the power of technology, quality of educational philosophy and reliability of the learning science. The success of educational technology improves as long as education is given necessary importance. Besides, educational technology determines the actual educational requirements on a scheduled basis and comes into existence as long as these aspects are provided (Alkan, 1997; Ministry of National Education, 2002).

Information technologies in education are defined as the subsidiary tools which enhances and increases the quality of education during the educational activities (Askar, Seferoglu, 2006). On the other hand, teaching technology is defined as the implementation of the systematic information obtained in scientific research on practical area (Yalin, 2003). Teaching technology applies the systematic strategies and techniques obtained from the contents of behavioral sciences and physics in solving the educational problems. Therefore, teaching technology deals with the ways to solve the problems that are encountered in education depending upon the scientific principles. When teaching is supported by technology and materials, it is concluded that it takes shorter time to determine the requirements of the students and to arrange the teaching accordingly. When the notions of technology and material are handled in educational aspects, it can be seen that they have a great deal of functions. The main functions are as follows: They are teaching and learning materials, they conver information, they provide the demonstration of reality, they can be regarded as objectified educational systems, they can work as symbolization tools (Kaya, 2006).

Research results on the place and importance of the materials in education demonstrate that teaching Technologies and materials should be implemented in order to reach the targeted purposes in each kind and level of educational activities. The more senses a teaching activity addresses to, the more permanent the learning item is. Forgetting levels decrease as the teaching activates more sense organs. Learning occurs via 83% seeing, 11% hearing, 3.5% smelling, 1.5% feeling and 1% tasting experiences. Teaching costs can be decreased to more

economic levels with the use of technology and materials (Yalin, 2003). At this point, smart phones provides teachers and students with various opportunities more quickly and they require less effort and resources. Many objects, occasions, personal information, photographs and situations used in teaching can be instantly obtained and used in educational environments.

Attitudes of teachers towards technology and material usage and their skills to use them affect students' learning levels. Some teachers may possess necessary knowledge about the utilization of the technology and materials while some may not be competent enough. Also some teachers may be reluctant to use new technology and materials. Some may think that it is hard to use technology and materials, therefore they may feel themselves under pressure and may stick to traditional strategies, technologies and materials with the sense that they are more beneficial. Besides these assumptions, it is indispensable that smart phones will be used in educational environments. Therefore, teachers need to be competent on utilizing the smart phones with educational purposes. In order to reduce the negativities in this issue, teachers should be provided with necessary training and information on how to make use of the educational technology products (Kaya, 2006).

Teaching technologies and material usage are consulted in educational applications in order to meet three main requirements: to provide educational services to broader masses, to improve the productivity of teaching-learning processes and to individualise the teaching-learning activities. Previously stated all other facilities that teaching Technologies and materials provide are implicitly or explicitly related to these three main requirements. To narrow it down, it can be said that teaching technology and materials mostly deal with developing systems to create capacity in education and to increase the productivity of education (Hizal, 1983).

Previously, teaching Technologies and materials had secondary importance in educational environments. In recent years, technology and material usage has become prominent with the development of teaching Technologies and materials. Usage of technology and materials in teaching is harder than the use of traditional lesson tools. They require more technical, complicated and combined information and skills. Thus, including technology and materials in managerial applications has not been easy in that advanced technology and materials may cause more obstacles, they are more complicated and they are more expensive. Also technology and materials attracts the attention more than traditional ways do and their use requires guidance and training (Kaya, 2006).

When the results stated above are examined, it can be seen that the importance of using teaching Technologies and materials cannot be ignored and that technology should be more utilized in order to obtain faster and more effective learning. Teaching tools provide various ways and environments through which the information is conveyed to the learner (Yalin, 2003). Therefore, technology in educational environments needs to be handled as a tool, not as a purpose. The existence reason of technology is to develop tools and methods in order to provide solutions to problems of people. These tools and methods can serve their purposes as long as they are used appropriately (Kaya, 2006).

In this current informational age, the information increases incrementally as a result of technology. Problems in today's world such as excessive increase in population, knowledge explosion, information generation, individualization can be solved only by using modern technologies. It is not possible that we can solve today's problems using old solutions. Therefore, we need to solve the problems of our day using today's opportunities. In our day, most of the work is carried out on free and mainstream information networks. According to Masrap (1999), innovations in science and technology, especially in information technologies, triggers modern-day organizations to search for more successful managerial applications (cited from Balay, 2013). One of the productions of this search is the smart phones which are among the mostly prevalently used technological tools.

Smart phones are popular technological devices which provides many features such as internet, camera, video, voice recorder, navigation, music player besides their communicative purposes. These features increase the areas and rates of their usage (Demirci, Orhan, Demirtas, Akpınar and Sert, 2014). Smartphones have a variety of features and these features can be used interactively. Therefore, they are getting more and more integrated in all areas of life that it is impossible to prevent it. Since the young generation is highly interested in mobile phones, teachers and academicians cannot prevent their usage during the lessons. In this case, it is necessary that these tools should be used in line with the educational purposes. In literature, there has not been any assessment instrument which determines the aims of mobile phone usage in educational environments and measures their usability during the lessons. The present research aims to develop "Usage of Smart Phones in Teaching-Learning Environments Scale" in order to determine whether university students use smart phones in educational environments with educational purposes.

## FINDINGS AND RESULTS

### Research Population and Sample

Research population consists of students from Science Teaching, Mathematics Teaching, Kindergarten Teaching, Music Teaching, Psychological Counselling and Guidance Teaching Departments in Aksaray University Faculty of Education. There are 996 students in these departments in total. Random sampling method was conducted in order to form the research sample out of the students in the research population and one section from each department was determined as representatives. Since Psychological Counselling and Guidance Teaching Department is divided into two as daytime and evening education, one section from each division is included in the research. There are 280 students in the research sample. Research forms were distributed to 253 of 280 students, however statistical applications were conducted on 226 of them. Demographical variables determined in the research are gender, branch and age. The distribution of the student teachers according to these variables are demonstrated in the tables below. Distribution of the student teachers according to gender is given in Table 1.

**Table 1.** Distribution of Participants According to Gender Variable

Gender	N	%
Female	163	72,1
Male	63	27,9
<b>Total</b>	<b>226</b>	<b>100</b>

According to Table 1, %71,1 of the student teachers are female; %27,9 of them are male. It can be seen that the rate of female participants is more than that of males in the research sample.

Distribution of the participants according to branch variable is given in Table 2.

**Table 2.** Distribution of Participants According to Branch Variable

Branch	N	%
Mathematics	41	18
PCG	102	45
Kindergarten	38	17
Science	23	10
Music	22	9

While most of the student teachers participated in the research are Psychological Counselling and Guidance Teaching students, the smallest number of participants is from music teaching department.

**Table 3.** Distribution of Participants According to Age Variable

Age	N	%
17-25	219	97
26 and above	7	3
<b>Total</b>	<b>226</b>	<b>100</b>

Most of the student teachers participated in the research is between the ages of 17-25.

### Development of Data Collection Tool

Quantitative methods were used in the research. "Smart Phones Usage Scale" was applied to all student teachers in research population in order to collect data. Also a personal information form prepared by the researchers was used in collecting personal data. The personal information form includes variables such as gender, age, branch.

## Literature Review

It was aimed to determine the items for the scale after national and international literature about smartphone usage had been reviewed. Although smartphones are widely used at the present time, not many resources are available related to its usage in education. After findings of the national and international resources were evaluated, the items to be used in the scale were determined.

## Formation of Item Pool (Suggested Items) and Expert Opinion

While determining the suggested items, opinions of the academicians who have conducted research on smartphone usage were consulted and their suggestions on how to form the item pool were taken into consideration. After related literature was reviewed and academicians who have research on the issue were consulted, items were suggested by the researchers. Since there is a lack of research on related scale in national and international resources, all items of the scale were created by the researchers. After the items were suggested, a semi-structured interview form which included open-ended questions was prepared and applied to student teachers in order to increase the content validity of the scale and to collect the opinions of the target population. The semi-structured interview form was implemented and data analysis was carried out by using content analysis method which is one of the qualitative research methods. New items that had been formed were added to the item pool. Thus, the number of items in the item pool increased to 24 with the new items from the interview forms. This item pool was decreased to the 19 suggested items according to reviewed literature and opinions of experts.

## Validity and Reliability

### Content Validity

The 19-item trial form was evaluated in terms of language and expression. Also the items that may be misinterpreted were decided to be omitted. Therefore an implementation was carried out with a group of 20 student teachers who did not attend the research sample. Face to face interviews were conducted with the group and they were asked to express the items which are not quite understandable. The clarity of the items were ensured with the feedback obtained from the student teachers.

The template sample developed was applied to 250 student teachers who are apart from the implementation area as a trial application. Item analysis was carried out on 226 scales that were collected. Tavsancil (2002) stated that the number of samples in factor analysis should be 5 or 10 times more than the item numbers (Yigit, Butuner and Dertlioglu, 2008). Accordingly, 10 times more than 19 items to apply in the research were targeted and 250 scales were distributed. However, 226 scales were obtained and factor analysis was carried out on them.

### Construct Validity

Among the validity operations, factor analysis was carried out first in order to determine the grouping among the items (factor). In the process of factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity values were determined; Principal Components Analysis was conducted and varimaxrotated operations were completed.

KMO value in Principal Components Analysis was found as ,875. KMO test evaluates whether the partial correlations are small and whether the distribution is sufficient for the factor analysis. Kaiser states that the value gets perfect as it gets closer to 1 and that it is non-acceptable if it is below 0.50 (0.90 is perfect, 0.80 very good, 0.70 and 0.60 are average, 0.50 is poor) (Tavsancil, 2010). KMO value was found to be very good in this research. Bartlett's test result was found as 1049,404 ( $p < .000$ ). The fact that Bartlett's Test of Sphericity values are meaningful supports the hypothesis that the data have multivariate normal distribution (Buyukozturk, 2005).

**Table 4.**KMO and Bartlett's Test Values Kaiser-Meyer-Olkin Sample Sufficiency

<b>Kaiser-Meyer-Olkin Sample Sufficiency</b>		,875
<b>Bartlett's Test of Sphericity</b>	X-square value	1049,404
	S.Level (df)	78
	P	,000

On the first factor analysis, distribution of the items to the factors were identified using the Varimax Technique and it was observed that some of the items had high values ( $<.45$ ) in multiple factors. Items which had higher values than 0.45 in multiple factors were observed in terms of the load and items that had less than %10 difference were eliminated (Buyukozturk, 2007). At this stage, 5th, 8th, 9th, 10th, 14th and 15th items were eliminated respectively and the analysis was conducted again. Factor analysis was carried out with 13 items. According to the results of the analysis, eigenvalues of the subdimensions of the scale and their variance percentages were demonstrated in Table 5.

**Table 5.** Eigenvalues of the Subdimensions of the Scale and Their Variance Percentages

Factor	Initial Eigenvalues			Total Factor Loads		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	5,081	39,087	39,087	2,930	22,541	22,541
2	1,476	11,356	50,444	2,710	20,918	43,459
3	1,018	7,829	58,273	1,926	14,814	58,273

In AFA results, it was determined that there were 3 subdimensions whose eigenvalues were bigger than 1 in the scale. The first subdimension explains the % 39,087 of total variance, the second subdimension explains the %11,356 of the total variance and the third subdimension refers to %7,829 of the total variance. These three subdimensions explains the % 58,273 of the total variance. Factor load values of the scale were demonstrated in Table 6.

**Table 6.** Factor Analysis Results of the Scale and Corrected Total Correlations of the Scale

Items of Smartphones Usage Scale	Factors			Corrected Total Correlations of the Items
	1	2	3	
S11	,766			,62
S12	,758			,66
S13	,744			,66
S16	,754			,51
S19	,482			,47
S6		,771		,68
S4		,744		,64
S3		,733		,69
S1		,661		,54
S7		,404		,30
				,52
S18			,792	,74
S17			,742	,73
S2			,547	,49

The fact that factor load value is .45 or more is a good criterion for the decision (Buyukozturk, 2007). On Table 6, it can be seen that factor load values of the scale ranks between ,404 and ,792.

The scale consists of three subdimensions. The first dimension of smartphone usage in education scale is “How smartphones will be used”, the second dimension of the scale is “The purpose of using smartphones” and the third dimension is “The design of using smartphones” as they can be seen in the texts of the items. Both first and second dimensions have 5 items and the third dimension has 3 items.

Baseline chart of the factor analysis is demonstrated in Figure 1.

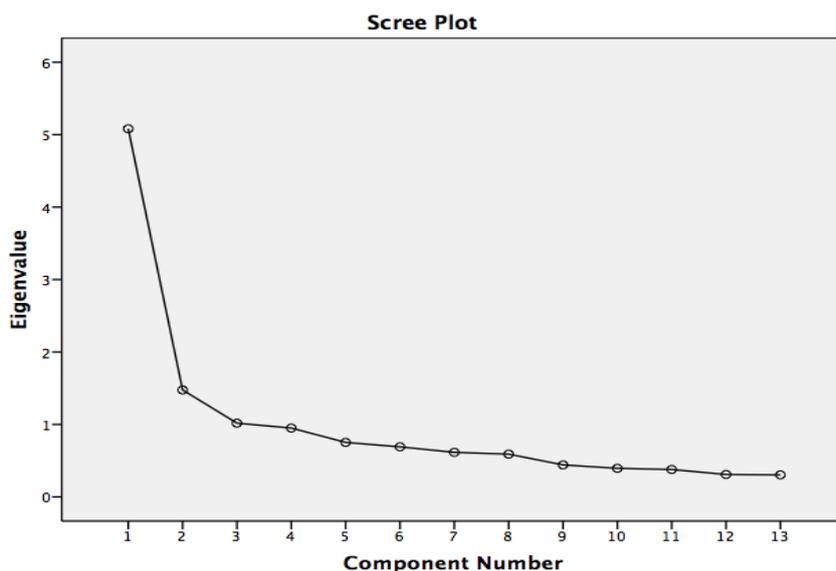


Figure 1. Line Chart of the Smartphone Usage in Education

When the line chart is analyzed, it is seen that the scale has three dimensions. Subdimensions determined in the factor analysis and the items of each subdimension are demonstrated in Table 7 below.

**Table 7.** Subdimensions Determined in the Factor Analysis and Items Loaded in the Dimensions

Factor	Number of Items	Numbers of the Items
The usage of smartphones	5	11,12,13,16,19
The purpose and necessity to use smartphones	5	1,3,4,6,7
Development of smartphone usage	3	2,17,18

Reliability operations of the smartphone usage in education scale developed were carried out by the researchers. Besides, Cronbach Alfa internal consistency coefficient was considered in order to determine the reliability of the scale. When there are 3 or more answers for the scale items, Cronbach  $\alpha$  coefficient is used. The fact that Cronbach  $\alpha$  reliability coefficient is .70 or more demonstrates that the reliability of the test points are sufficient (Buyukozturk, 2005). Some researchers indicated the criteria used in the evaluation of the Alpha coefficient as follows (Kalayci, 2008; Ozdamar, 2013);

If Cronbach Alpha value; is  $0.00 \leq \alpha < 0.40$ , the scale is not reliable.

If it is  $0.41 \leq \alpha < 0.60$  the scale has low reliability.

If it is  $0.61 \leq \alpha < 0.80$  the scale is considerably reliable.

If it is  $0.81 \leq \alpha < 1.00$  the scale is highly reliable.

Cronbach Alfa internal consistency coefficients obtained for the each dimension of the scale and for total points were demonstrated in Table 8.

**Table 8.** Reliability Coefficients Related to Subdimensions and Total of the Scale

Dimensions of the Scale	Cronbach Alpha( $\alpha$ )
The usage of smartphones	,811
The purpose and necessity to use smartphones	,765
Development of smartphone usage	,665
<b>Total</b>	<b>,864</b>

When the reliability levels of the subdimensions and total of the scale were examined, it can be seen that Smartphone Usage in Education Scale used in the research is reliable.

**Table 9.** Pearson Product-Moment Correlation Analysis Results

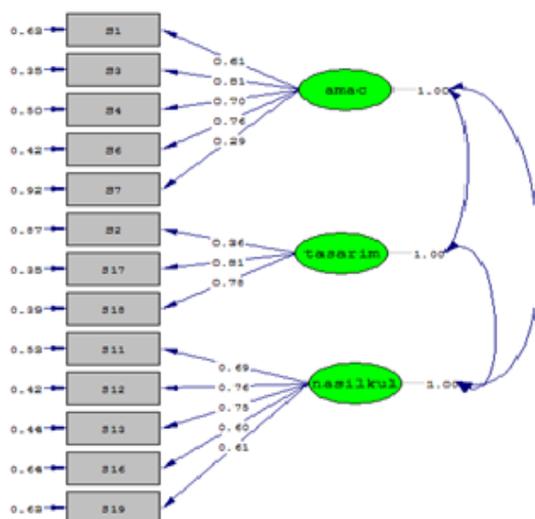
	1	2	3
<b>Akıllı telefonun nasıl kullanılacağı</b>	1,00	,464**	,522**
<b>Akıllı telefonun kullanım amaç ve gerekliliği</b>	,464**	1,00	,383**
<b>Akıllı telefonun kullanımının geliştirilmesi</b>	,522**	,383**	1,00

\*\*p<.001

Pearson Product-Moment Correlation Analysis was conducted in order to determine whether there were a meaningful relationship between the factors. If the correlation coefficient is between 0.71 – 1.00 as absolute value, it is defined as high. If the correlation coefficient is between 0.50 – 0.70, it is moderate; if it is between 0.30-0.50, it is defined as low level of relationship (Buyukozturk, 2005). Pearson Product-Moment Correlation analysis results demonstrate that there is a positive meaningful relationship among the factors. These results prove that the three factors are in the same structure.

### CONFIRMATORY FACTOR ANALYSIS RESULTS

Confirmatory Factor Analysis (CFA) of the scale which was applied to 226 student teachers was conducted. Confirmatory Factor Analysis (CFA) is based the measurement of the prediction that particular variables mainly take part in previously determined factors (Buyukozturk, 2009). Many fit indices have been used in order to reveal whether the model tested in Confirmatory Factor Analysis is sufficient or not (Simsek, 2007). In CFA, fit indicas of the smartphone usage scale to the three factorial model was examined in teaching-learning process. Confirmatory factor analysis operations were carried out with the help of Lisrel 8,71 packaged software. The results are demonstrated in Figure 2.



**Figure 2.** Confirmatory factor analysis of smartphone usage in teaching-learning process scale

When Figure 2 is examined, it can be seen that the fit indices are meaningful in the smartphone usage in teaching-learning process scale which consists of 13 items and 3 subfactors ( $\chi^2=109.02$  (P = 0.00021)). Correlations related to fit indices obtained from CFA results are demonstrated in Table 10.

**Table 10.** Fit indices obtained from CFA results

x-square	Sd	x-square	RMSA	NFI	CFI	GFI	AGFI	RFI	IFI
109.02	62	1.76	0.058	0.95	0.98	0.93	0.90	0.94	0.98

When Table 10 is examined, x-square/sd value is found as 1.76. The fact that this value is less than 5 proves that the model has high consistency. RMSA value was found slightly higher than 0.05, which is the maximum rate. NFI, GFI, CFI, RFI and IFI values are above 0.90 and this indicates that the model has quite high consistency (Simsek, 2007). When all of the consistency coefficients are examined, it is seen that CFA analysis results confirm the explanatory factor analysis results.

## RESULTS

The present research aimed to develop “Usage of Smart Phones in Teaching-Learning Environments Scale” in order to measure whether university students use smart phones in educational environments with educational purposes. First of all, an item pool which consists of 24 items was formed after interviews were conducted with the students related to the topic. Then expert opinions were consulted and the number of items was reduced to 19. The scale was applied to research sample and factor analysis was implemented. Criterion for the items to involve in the scale was based on 0,30 factor load values or more (Buyukozturk, 2002). Accordingly, the final state of the scale was determined as three factors and 13 items. Analysis results to measure the reliability and validity of the scale demonstrated that “Usage of Smart Phones in Teaching-Learning Environments Scale” was suitable for measurement. The final state of the scale was given in Appendix 1. This scale that has been developed can be utilized in order to determine the purposes with which the smartphones are used in educational environments and whether student teachers, teachers and academicians have necessary skills to use these tools according to educational purposes.

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## Ek-1

*Eğitim Ortamında Akıllı Telefonların Kullanım Ölçeği*

A	Kişisel Bilgiler
---	------------------

A1. Cinsiyetiniz? A (1) Kadın B (2) Erkek

A3. Yaşınız? A (1) 17-25 B (2) 26-35 C (3) 36+

A2. Branş /Alanınız .....

Mad.	Açıklama:	Her zaman	Çoğunlukla	Ara sıra	Nadiren	Hiçbir zaman
1	Akıllı telefonun derslerin hangi konularında nasıl kullanılacağını biliyorum.	5	4	3	2	1
2	Akıllı telefon içerisindeki eğitim amaçlı programların birbirinden farkını açıklayabilirim.	5	4	3	2	1
3	Akıllı telefonun derslerde kullanımının önemini açıklayabilirim.	5	4	3	2	1
4	Öğrenme öğretme süreci içerisinde zamana ve deneyime göre akıllı telefonun rolünü analiz edebilirim.	5	4	3	2	1
5	Öğrenme öğretme sürecinin değerlendirilmesinde akıllı telefonu kullanabilirim.	5	4	3	2	1
6	Akıllı telefonu eğitim öğretim ortamlarında (dersliklerde, amfide vs.) eğitim amaçlı kullanırım.	5	4	3	2	1
7	Akıllı telefonu eğitim öğretim ortamlarında kullanmak eğitim kalitemi olumlu etkiler.	5	4	3	2	1
8	Akıllı telefonun eğitim öğretim ortamlarında bulunmasına eğitimsel acıdan ihtiyaç vardır.	5	4	3	2	1
9	Akıllı telefonun eğitim öğretim ortamlarında kullanılmasının eğitim öğretim açısından faydalı olabileceğini düşünüyorum.	5	4	3	2	1
10	Öğretim üyeleri, akıllı telefonu eğitim öğretim ortamlarında eğitimin amaçlarına uygun kullanabilmek için gerekli bilgi ve teknolojiye sahipler.	5	4	3	2	1
11	Akıllı telefonu eğitim öğretim ortamlarında (dersliklerde, amfide vs.) olumsuzlukları belirlemek için kullanırım.	5	4	3	2	1
12	Öğrenme öğretme sürecindeki sorunlara çözüm getirecek özgün akıllı telefon kullanma modeli geliştirebilirim.	5	4	3	2	1
13	Öğrenen merkezli eğitimi için akıllı telefon kullanımı tasarlayabilirim.	5	4	3	2	1

Not: Faktör Analizi sonucunda belirlenen alt boyutlar ve boyutlardan yük alan maddeler; 1) **Akıllı telefonun nasıl kullanılacağı boyutu**, 1,2,3,4,5 2) **Akıllı telefonun kullanım amaç ve gerekliliği boyutu** 6,7,8,9,10 ve 3) **Akıllı telefonun kullanımını geliştirme boyutu maddeleri** 11,12,13. Olarak sıralanmıştır.

# **Differences Among Colleges from the Perspective of Labour Market Applicability in the Czech Republic**

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## **ABSTRACT**

The aim of this article is to evaluate unemployment of college (university) graduates in the Czech Republic from the perspective of labour market applicability. Data from years 2006-2015 from the Education Policy Centre were used for the purpose of this article. The data included information about graduates of public and private universities with focus on the field of study. Methods of descriptive and inductive statistics were used for data processing, namely the analysis of variance and test of relative frequencies. It resulted from the conducted analysis that the unemployment of university graduates is higher than the average unemployment rate in the Czech Republic. It was furthermore proven that private universities report lower percentage of unemployed graduates in the most of the monitored years. It is evident from the analysis that students studying in the capital city have better applicability in the labour market than students from other parts of the republic. The highest unemployment rate in the monitored period was proven in the fields of agriculture and forestry and in the arts, whereas other faculties from different fields of study report also a night ratio of unemployed, e.g. architecture, which belongs to the technical fields.

## **INTRODUCTION**

Unemployment belongs to the most monitored and discussed problem in society not only in the Czech Republic. Unemployment as a macro economic effect is a natural part of market oriented economy. Not finding a job in a short time after graduation can have a big impact mainly in the fact that people don't obtain work habits and also existence problems can appear. Many fields of study can be chosen while selecting the study and it is necessary to realize that it would be appropriate also to consider the field of study also in terms of applicability after graduation.

The goal of this article is an evaluation of Czech university graduates unemployment. From the perspective of applicability of graduates on the labour market it was necessary to analyse the field of study and also to distinguish between private and state universities. For the purpose of this article, the universities were divided according to the fields of study at schools - economic, humanitarian, pedagogical, medical, artistic, technical, law and agricultural. Several working hypotheses were created within the processing and the data were monitored between 2006 and 2015.

Main purpose of the paper Varshavskaya (2016) is to analyse school-to-work transition of Russian youth. It was proven in the article that the university education increases the success during the transition from the school to the work, thus it increases the employment rate of the graduates. The author proved that the graduates living in big cities have easier transition to the labour market thanks to the bigger jobs offer. It was also one of our sub-objectives to confirm, eventually disprove this statement that graduates living in the capital city of the Czech Republic have better applicability in the labour market than students from other regions. Assumption that

unemployment is the highest in agricultural fields and the lowest in medical fields was set as next sub-hypothesis. At the same time, we assume that there is a high demand for graduates from pedagogical schools and, as a result, even the unemployment of these graduates will be at a relatively low level as expected. Similar research can be found in a paper by Pellakuri and Rajeswara (2016) which deals with various data sets like number of graduates in various fields such as medical, agriculture, engineering, veterinary etc., to make a forecast on the number employments to be availed in the coming future to overcome the problem of unemployment, and Dohnalová (2016), where the author deals with unemployment of high schools graduates. Kuncová and Mulač (2016) compared trends in higher education in the Czech Republic, Slovakia and Austria. The situation at Czech universities and colleges study articles by Zámková, Prokop and Stolín (2016) and Zámková and Blašková (2014).

The overall unemployment in the Czech Republic has been decreasing for the last years; it reached the level of 4.1% in May 2017, while it was around 6% in the year 2015. We set an assumption as a next hypothesis that unemployment of graduates is bigger than the overall unemployment in the Czech Republic. It is worth noting that unemployment in EU countries in 2015 was 10% on average (the unemployment for young people up to age of 25 was even 22% in Germany) and 11.2% in Turkey in total (young Turkish had unemployment even around 20%), see (Economic newspaper, 2017), (Business Info, 2017). According to the article Akkoyunlu (2016) there was an increased number of university graduates in Turkey, but unemployment rate of young educated people rose at the same time. The German system of university education was analysed in the article for the purpose of gaining the guidance for an effective system of education. Similarly the aim of study from author Unay-Gailhard (2016) is to provide insight into the determinants of job access after leaving education in Germany among the young population aged 15-29 based on the Labour Force Survey of 2002-2009.

## MATERIALS AND METHODS

Primary data was taken from the database of the Education Policy Centre of Charles University (Education Policy Centre, 2017). Unemployed graduate is an applicant for a job registered in the Labour authority who graduated 2 years in the past at the latest. The data therefore concerns so called registered unemployment. The registered unemployment differs. It can be higher in some cases and sometimes it can be lower. In case of graduates it can be lower, because they are legally entitled to the support only in case that they provably worked for at least half a year during last 3 years. As the state pays the insurance for them, in case that they are registered in the Labour authority, they have motivation to be registered.

Associated Student Register provides information about total amount of university graduates and about students who continue in study after gaining the diploma (for example the most of bachelor students continue in follow-up master study (Czech statistical office, 2017). Data from the register are defined and processed in the way to fully correspond with the time when the Labour Authorities collect information about unemployed graduates. So they also relate to 30<sup>th</sup> April and 30<sup>th</sup> September. Only graduates, who graduated 2 years before the identification date at the latest, are analysed. For the purpose of this analysis, the term of unemployed graduate means such applicant registered in the Labour Authority, who successfully graduated 2 years ago.

Relative frequencies were used to test statistical hypotheses. The paper uses simple and multiple-sample testing of relative frequencies and ANOVA. The testing statistic for testing relative frequencies is:

$$U = \frac{p_1 - p_2}{\sqrt{\frac{(n_1 p_1 + n_2 p_2)(n - n_1 p_1 - n_2 p_2)}{n n_1 n_2}}} \quad (1)$$

If the value of this statistic calculated is greater than the critical quantile value ( $\alpha = 0.05$ ), the hypothesis  $H_0$  is rejected and the existence of different percentage of unemployment may well be assumed. For further details, see (Hindls, 2003). Gretl and Statistica software was used for primary data processing.

## FINDINGS

The number of university graduates has changed fundamentally in recent years in the Czech Republic (CR). An

overview of unemployment development in the Czech Republic is stated in the [Table 1] in total and also from the perspective of university (UNI) graduates. It is evident in the [Table 1] that the number of university graduates grew markedly till 2011. Then the number of university graduates has decreased gradually since 2011. We test the hypothesis, that the graduates unemployment rate is higher than the overall unemployment. This assumption was statistically proved only in years 2013-2015. We were not able to prove this assumption for the previous years. The percentage of unemployed graduates has ranged above 9% limit since the economic crisis which took place in 2009. The biggest change occurred in case of UNI graduates in comparison of rising unemployment between 2007 and 2013, namely an increase of almost 230%. A significant increase in the number of unemployed university graduates is largely caused by a steady increase in the number of graduates entering the labour market, but even so, these figures show that the consequences of the economic crisis avoided them no less than graduates with lower education. A significant increase in the number of new graduates applying for employment at Labour Authorities confirms the fact, that, graduates belong to the group of people who are the most vulnerable to unemployment in times of lack of vacancies. In years 2014 and 2015 there was a decrease and in 2015 there were almost 19% of unemployed graduates less than in 2013. However, the numbers of unemployed graduates are, of course, different in Prague than in the Ústecký or Moravskoslezský Region, regardless of which university they graduate. Graduates of particular schools enter regional labour markets, which are quite different in terms of job opportunities. Therefore, we will focus in our further processing on the last two years in view of the comparability of different schools, study fields and local jurisdiction of the university.

<b>Years</b>	<b>Labour force (in thousands)</b>	<b>Unemployment Total</b>	<b>No. of graduates (in thousands)</b>	<b>Unemployment of graduates</b>
2006	5 199.4	7.10%	50.302	10.3%
2007	5 198.3	5.30%	59.686	8.0%
2008	5 232.3	4.40%	68.555	7.5%
2009	5 286.5	6.70%	76.710	9.0%
2010	5 268.9	7.30%	82.307	10.1%
2011	5 223.0	6.70%	86.151	9.9%
2012	5 256.9	7.00%	85.116	9.1%
2013	5 306.0	7.00%	83.157	11.8%
2014	5 297.9	6.10%	80.406	11.3%
2015	5 309.9	5.00%	74.638	9.9%

**Table 1:** Overall unemployment and graduates unemployment.

If we look at the overall number of UNI graduates, it is evident that the number of graduates of the public universities has decreased regularly for the last three years, similarly the graduates number has decreased in the private universities, namely the 25% decrease. Private universities have contributed only about 13-15% to the total number of graduates in recent years, i.e. the unemployment rate of this group (if it was not extremely high) would not be a serious problem. The West Moravian University of Třebíč, o.p appears as the least successful private university, from the point of view of the unemployment of graduates, which underlines the consideration, that place of the founder is very important for the private universities. This university has about 25% unemployment. The school has around 150-200 graduates every year. Most of the private universities have the number of unemployed graduates of units, a few dozen at most. In [Table 2] there is an unemployment rate of graduates divided into private and state universities and both types according to the founder are further divided into schools having a place of study in the capital and elsewhere in the Czech Republic. Data on 49 private universities and 152 public university faculties were available.

Years	Private UNI – capital city	Private UNI – rest of CR	Public UNI – capital city	Public UNI – rest of CR
2006	2.34%	5.81%	3.20%	8.22%
2007	2.14%	3.65%	2.52%	5.88%
2008	2.27%	2.80%	2.48%	5.47%
2009	2.66%	3.54%	2.67%	6.39%
2010	2.89%	5.59%	3.24%	7.46%
2011	3.17%	5.78%	3.26%	7.40%
2012	2.78%	4.22%	3.25%	6.95%
2013	3.82%	7.79%	4.28%	8.81%
2014	4.36%	8.91%	3.95%	8.72%
2015	5.18%	7.23%	3.79%	7.39%

**Table 2:** Percentage of unemployed graduates according to the founder and place of study.

Graduates of private universities have reported better employment [Table 2] in comparison with graduates of public universities for several years. Their unemployment rate has been lower for 6 years, which is a significant change from the previous years. Their unemployment rate in 2012 was only 4.2%, while it was 5.8% for graduates of public universities. There are two main reasons for it. Many private universities are situated in the capital (Prague), and their graduates find the job much easier due to the low unemployment of university graduates in Prague and a much wider offer of appropriate jobs than in other regions. Perhaps the most significant cause is the fact that private universities are more often attended by older people who already have jobs and only supplement or increase their qualifications. We create two hypotheses to confirm this assumption:

1. percentage of unemployed graduates studying in the capital city is significantly lower than in the rest of the Czech Republic,
2. percentage of unemployed graduates of private universities is lower than for graduates of public universities.

[Table 3] lists the test criteria values complemented by significance. In most cases, zero hypotheses about the frequency match of the two monitored files were refuted. As a positive fact it can be claimed that in 2014 and 2015 there was no evidence of a significant difference between the unemployment of graduates for private and public universities.

Years	1st hypothesis	2nd hypothesis
2006	-2.56***	-2.99***
2007	-1.47	-3.74***
2008	-0.88	-5.88***
2009	-0.03	-6.37***
2010	-1.59	-4.37***
2011	-0.43	-3.85***
2012	-2.25**	-7.03***
2013	-1.86**	-2.06**
2014	1.61	0.39
2015	5.06***	-0.29

**Table 3:** Frequency match test (\*\*\*) p-value < 0.01, \*\* p-value < 0.05, \*p-value < 0.1).

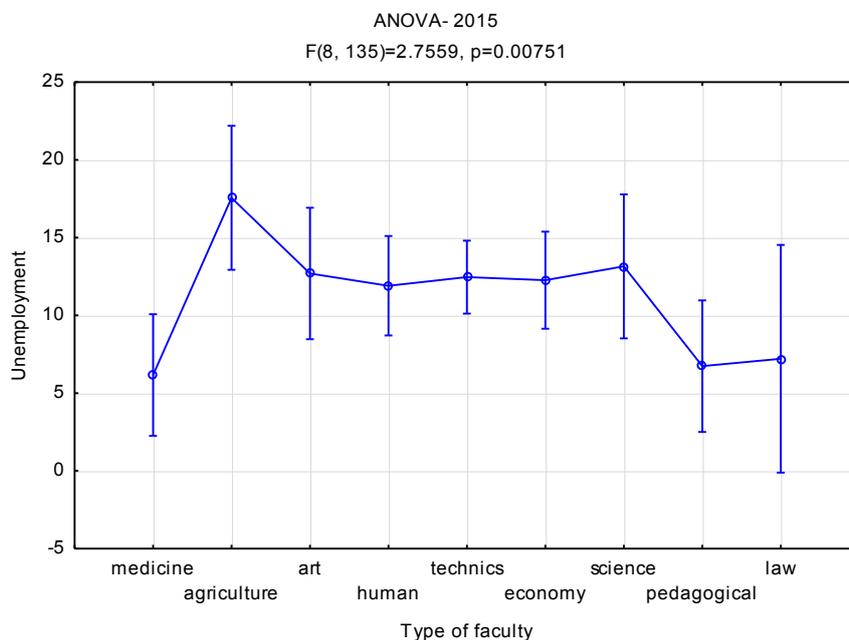
We will now focus on public universities students in detail. Number of graduates has been decreasing since 2011, so we will relate the comparison of years 2014 and 2015 to this year. Number of graduates decreased by 5% in 2014 (if we relate it to the previous year, it would be only 4.7%) The increase of the number of graduates can be observed in the fields of medicine, architecture and informatics. These increases are only about 2-3%. In 2015 there were 11% less graduates than in 2011. If we look at particular fields then the biggest decline of the number of graduates was in science and economics, where the decline was around 15%. It is however true, that these universities have the highest number of graduates from the long term perspective. Unlike these fields the number of graduates raised in architecture and arts. Percentage rate of university graduates unemployment

according to the type of faculty is shown in [Table 4]. Additionally an analysis by means of analysis of variance was conducted for the year 2015, see [Figure 1].

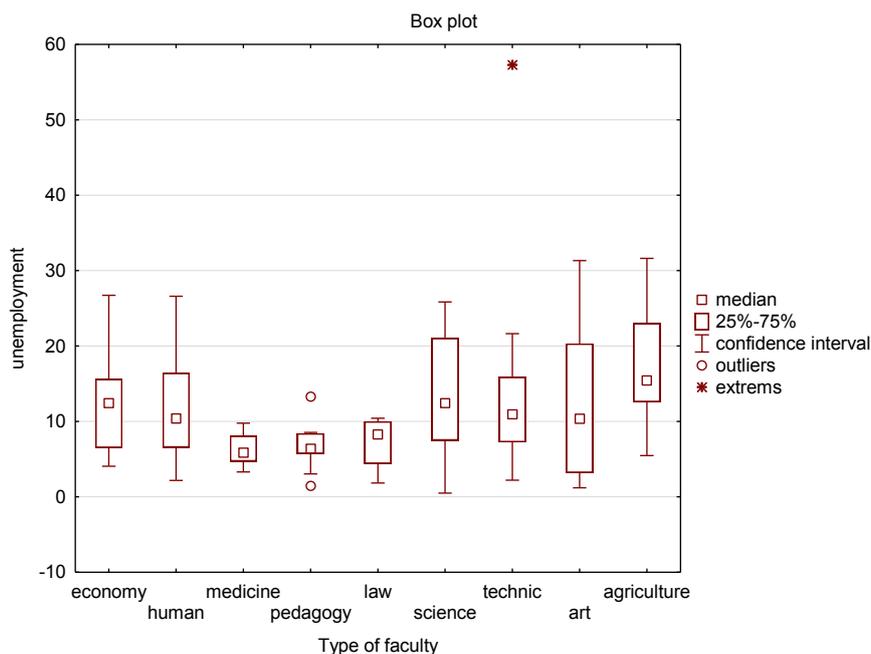
UNI faculty type	2015	2014	2011
Science	13.00%	15.11%	11.69%
Philosophy and Humanities	10.72 %	11.75%	9.64%
Medical fields	6.30%	6.79%	5.68%
Technical fields	11.61%	13.50%	12.96%
Law	6.24%	6.22%	7.73%
Pedagogy	6.36%	8.72%	6.85%
Agriculture and forestry	17.74%	20.74%	24.42%
Economy	11.92%	14.03%	13.27%
Arts	12.28%	15.40%	11.80%

**Table 4:** Unemployment according to the type of studied faculty.

It is evident from the [Figure 1] that there exists a statistically significant difference in the unemployment rate for agricultural and medical faculties as well as for agricultural and pedagogical. The year 2014 appears from the study's view like a year with significantly higher unemployment rate than the two remaining years in [Table 4]. Pedagogical, legal and medical fields appear like fields with the lowest unemployment rate and there is therefore better applicability than elsewhere. The results from [Table 4] are then supported graphically for the year 2015 in [Figure 2]. If we look at particular fields in details, it is apparent that within the technically oriented universities there is one faculty with significantly higher graduates' unemployment rate. Based on the tests this faculty was identified as extreme. The analysis is conducted in [Table 5] and [Table 6]. In these tables there are always 5 faculties with the lowest and the highest graduates' unemployment rate in 2014 and 2015.



**Figure 1:** ANOVA: Unemployment according to the type of studied faculty.



**Figure 2:** Box plot: Unemployment according to the type of studied faculty

The smallest percentage of unemployed graduates is in both years at the Faculty of Mathematics and Physics of Charles University, which has a long-term percentage of unemployed graduates less than 1%. This information should not be surprising, as there are a large percentage of students studying physics and informatics where there is a long-term demand for graduates. Only 5 faculties reported unemployment of graduates under 2% in 2015. On the contrary, unemployment over 30% occurred at 6 faculties in 2014 and at only 3 faculties in 2015. Field of architecture was evaluated as the most problematic field from the long term perspective - faculty of architecture BUT had almost 57.32% of unemployed graduates in 2015. This faculty is the extreme from [Figure 2] mentioned above.

Type of UNI faculty	2014	2015
Mathematics and Physics Faculty (CU)	0.905	0.498
Theatre faculty (AMU)	1.786	1.205
Faculty of Film and Television (AMU)	2.564	1.333
Pedagogical faculty (CU)	2.889	1.445
Faculty of Law (CU)	1.815	1.84
Catholic theological faculty (CU)	1.351	8.451
Evangelical Theological Faculty (CU)	1.471	9.589

**Table 5:** Faculties with the lowest graduates' unemployment rate [%].

Type of UNI faculty	2014	2015
Faculty of Architecture (BUT)	52.5	57.317
Faculty of Agronomy (MENDELU)	39.394	31.633
Ladislav Sutnar's Faculty of Design and Art (UWB)	35.484	31.325
Faculty of Veterinary Hygiene and EUNology (UVPSB)	23.148	29.008
Academy of Fine Arts in Prague (AFA)	23.81	27.273
Faculty of Fine Arts (BUT)	31.915	24.0
Faculty of Architecture (CTU)	34.682	21.649

**Table 6:** Faculties with the highest graduates' unemployment rate [%].

## DISCUSSION AND CONCLUSIONS

The aim of this article is to evaluate unemployment of university graduates from the perspective of labour market applicability in the Czech Republic. Data from years 2006-2015 from the Education Policy Centre were monitored. Analysis of contingency tables was used for processing of the data, hypotheses were tested by means and test of relative frequencies and also ANOVA was used. According to the processed evaluation it is evident that number of graduates in the Czech Republic grew significantly till the year 2011. Number of university graduates has been then decreasing gradually since 2012. The hypothesis, that unemployment of university graduates is higher than the overall unemployment in the Czech Republic, was tested. This assumption was statistically proven only for the years 2013-2015. The percentage of unemployed graduates has ranged above 9% limit since the economic crisis which took place in 2009. It is apparent that the consequences of the economic crisis avoided them no less than graduates with lower education.

The research shows that graduates of private universities report better employability compared to graduates of public universities. Their unemployment rate in the school year 2012 was only 4.2%, while it was 5.8% for graduates of public universities. It is evident, that many private universities are situated in the Czech capital city, where their graduates find the job much easier due to a much wider offer of appropriate jobs than in other regions. Another reason is the fact, that private universities are more often attended by older people who only supplement or increase their qualifications. A hypothesis, that percentage of unemployed graduates studying in the capital city is significantly lower than in the rest of the republic, was tested. It was proven that students studying in the capital city of Prague have really a better applicability in the labour market than students from other parts of the Czech Republic. Subsequently a hypothesis that percentage of unemployed graduates of private universities is lower than for graduates of public universities was tested. It was proven by the test that indeed the private universities report lower percentage of unemployed graduates in the most of the monitored years. The private universities have contributed only about 13-15% to the total number of graduates in recent years. The West Moravian University of Třebíč, o.p. was evaluated as the least successful private university, from the point of view of the unemployment of graduates.

The unemployment rate of graduates of public universities was monitored according to the type of faculty studied in a more detailed analysis. It was proven that there exists a statistically significant difference in the unemployment rate for agricultural and medical faculties as well as for agricultural and pedagogical faculties. According to the analysis, pedagogical and medical fields were stated as fields with the lowest percentage of graduates' unemployment. The highest unemployment rate in the monitored period was proven in the fields of agriculture and forestry and in the arts. The smallest percentage of unemployed graduates in the years 2014 and 2015 is at the Faculty of Mathematics and Physics of Charles University, which has a long-term percentage of unemployed graduates less than 1%. Field of architecture was evaluated as the most problematic field from the long term perspective - faculty of architecture BUT had almost 57.32% of unemployed graduates in 2015.

While it is evident from our analysis that the number of university graduates in the Czech Republic decreased in the monitored period, it was proven in the article Akkoyunlu (2016) that the number of graduates in Turkey is growing. Similarly to our article, it was proven by the author Akkoyunlu (2016), that the number of unemployed educated people is increasing. Likewise in our article, author Varshavskaya (2016) has proven that graduates living in big cities have easier transition to the labour market thanks to a wider job offer.

If we consider the selection of the university in terms of a chance to find a job easily, medicine appears as a long term prospective field. The law and pedagogical fields look also very positive from the overall overview. On the other hand, those with the worst applicability are all fields related to agriculture, forestry and agronomy, but also, for example, economics faculties. It points to the fact, that the labour market is saturated by graduates of these fields and therefore it is more difficult to find a job in this branch. If we look at particular faculties in details it is apparent that the study of architecture has very poor results. This field belongs to the technical fields and it increases the percentage of unemployed people in this direction of study. Further extended analysis of the fields of study will be certainly interesting and therefore following publications will be focused on this topic.

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# Digging Out the Debate: Types of Corrective Feedback and Their Effects on Grammatical Accuracy in Writing

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## ABSTRACT

The effect of written corrective feedback (WCF) has been a highly controversial issue in second language acquisition and writing research and various views have been put forward. Therefore, in order to support findings in the literature, this study aims to focus on the possible effects of various feedback types and revision process on EFL learners' writing performance by replicating the study of Shintani, Ellis and Suzuki (2014). The participants of the study are 146 EFL learners who study at the School of Foreign Languages at a state university in Turkey and have A2 level language proficiency according to CEFR descriptions. As the design of the study, the participants were divided into five feedback groups; namely direct corrective feedback (DCF), metalinguistic explanation (ME), direct corrective feedback and revision (DCF+R), metalinguistic explanation and revision (ME+R) and a control group. Following a treatment session consisting of three writing tasks including direct and indirect corrective feedback, the learners' performances were evaluated in terms of their accuracy in the use of past simple tense and indefinite articles in each task and they were interviewed considering their views about the effects of each feedback type. The findings suggest that there is no statistically significant difference in the effect of types of direct corrective feedback or revision process on grammatical accuracy in writing whereas indirect corrective feedback seems effective and learners preferred it for their written products.

**Key words:** direct corrective feedback, indirect corrective feedback, revision, accuracy, writing

## INTRODUCTION

In recent years, there has been an increasing interest in the research on the effect of written corrective feedback. While the studies have commonly focused on the effect of direct corrective feedback (DCF) on basic grammatical forms such as past simple or articles, alternative feedback types such as metalinguistic explanations or indirect corrective feedback such as using correction codes have been neglected. Likewise, as Sheen, Wright and Moldawa (2009) have indicated the number of the studies on focused CF (on a single form) is limited. Moreover, there are few studies on the effect of revision process on the accuracy in writing tasks as stated by Shintani et. al., (2014). Another issue which is needed to shed light on is how language learners regard these feedback types or which feedback type they find the most effective for their accuracy in the use of grammatical forms in writing as also proposed by Poulos and Mahony (2008) "... little known research has focused on students' perceptions of feedback and the contribution feedback makes to students' learning and teaching" (p. 143). To this end, Bitchener and Knoch (2015) have stated that "While a growing body of research has begun investigating these issues over the last 15–20 years, the field is in need of replication studies before firm conclusions can be reached." (p. 405) Thus, the current study addresses these issues and aims to support the research on the topic by replicating the study of Shintani et. al., (2014) with the permission of the researchers and investigating further the effect of revision and indirect corrective feedback.

## THEORITICAL BACKGROUND

### The notion of corrective feedback

Corrective feedback (CF), which can be defined as any attempts to focus on L2 learners' errors and provide correct linguistics forms, has been one of the controversial issues in second language writing and acquisition since views about its types, effects or benefits vary. For example, Kepner (1991) and Truscott (1996;1999;2007) have claimed that error correction in grammatical forms has nothing to do with writing skill, therefore, one-shot error correction by teachers proves no benefit for language learners to improve their writing skill. Conversely, Bitchener and Knoch (2008; 2009), Ferris (2003; 2004; 2006), and Sheen (2007) have proposed that corrective feedback is positively effective in the improvement of L2 writing skill.

As much as the effect of corrective feedback has been discussed, another highly discussed issue is the "correct form of corrective feedback". In other words, there is also no agreement on when or how to provide corrective

feedback to learners. With this regard, corrective feedback has been classified and named as direct (explicit) or indirect (implicit) corrective feedback (e.g., Ferris & Roberts, 2001) focused or unfocused corrective feedback (e.g., Bitchener, 2008; Ellis, Sheen, Murakami & Takashima, 2008; Sheen, 2007; Sheen et.al, 2009), written corrective feedback or metalinguistic explanations (e.g., Shintani et.al., 2014), coded or uncoded corrective feedback (e.g., Hartshorn, Evans, Merrill, Sudweeks, Strong-Krause & Anderson, 2010), and revised or unrevised corrective feedback (e.g., Chandler, 2003; Fathman & Whalley, 1990; Ferris, 2006; Ferris & Roberts, 2001). Lastly, another discussed issue in CF research is the availability of a control group in the study design. While a number of researchers have stated that it is not fair to provide feedback to a group of participants when control group is made deprived of it (e.g., Ferris, 2004;2006), other researchers have supported the idea of designing a control group (e.g., Bitchener, 2008). To this end, the current study combines these categories and focuses on direct (written corrective feedback and metalinguistic explanations) and indirect corrective feedback (coded) with revision process on focused forms (indefinite articles and past simple).

### **Direct or indirect corrective feedback**

Considering the evidence from the literature, it seems obvious that one of the ubiquitous types of CF for researchers has been direct and indirect CF for years. Direct CF including written corrective feedback and metalinguistic explanations provides learners with the correct language forms whereas indirect CF including underlying and coding the errors guides learners to correct the errors themselves. In the literature, there has been continuous interest in the effects of direct CF and indirect CF and studies have set forth various findings (e.g., Chandler, 2003; Ellis et. al., 2008; Ferris, 2006; Ferris & Roberts, 2001; Storch, 2009; Van Beuningen, De Jong, & Kuiken, 2008). For instance, the study of Chandler (2003) has revealed that direct CF was more effective than indirect CF while indirect CF emerged to be more effective in the long term. Similarly, Ferris and Helt (2000) have indicated a positive effect of indirect CF. Conversely, Van Beuningen et. al., (2008) have concluded that despite no obvious effect in short term; direct CF is more effective in long term than indirect CF. Yet, a number of studies have revealed no difference in the effects of these feedback types (eg., Ellis, et.al, 2008; Sheen, et. al., 2009; Storch, 2009). Consequently, considering this variety in the findings, Ellis et. al., (2008) have suggested that making a distinction between the effects of the two types makes no sense. Thus, more empirical data are essential to base the findings on the grounded theory.

### **The views of learners about CF**

While there is a lasting debate on the effects of CF types and how it is provided (e.g., focused vs unfocused, revision), one of the neglected issues in this research area is how the learners regard the effect of these types (e.g., Armhein & Nassaji, 2010; Ashwell, 2000; Poulos & Mahony, 2008; Schulz, 2001). To start with, the study of Poulos and Mahony (2008) on the effect of feedback as an umbrella term has revealed that learners have positive attitudes towards receiving feedback by their teachers. Lee (2005) has found out that learners preferred overt correction by their teachers, but they also benefitted from indirect CF in the form of coding. The study of Armhein and Nassaji (2010) that has investigated views of ESL teachers and learners about CF has revealed that teachers and learners agree on the importance of CF, but their views differ to a certain extent. In that study, similar to the findings of Lee's (2005) study, it has emerged that ESL learners also preferred overt correction and error correction with a comment by the teacher. Nevertheless, few studies have focused on learners' beliefs about the effect of feedback as also suggested by Poulos and Mahony (2008). Considering limited number of studies on learners' beliefs and the other theoretical issues mentioned above, this study addresses the research questions<sup>1</sup> below:

1. Is there any difference in the effect of variables (feedback type, revision and frequency of feedback) on EFL learners' grammatical accuracy in writing?
2. What are EFL learners' views about corrective feedback?

## **THE STUDY**

### **Setting and the participants**

The study was carried out at a state university in Turkey with 146 EFL learners who have A2 level language proficiency according to CEFR descriptions after having obtained the approval of Ethical Committee of the university and the Department of Basic English. The university provides higher education in various departments and also English language learning program for an academic year. The students who pass the English proficiency exam administrated at the beginning of each academic year by obtaining 60 points or above out of 100 carry on their education in their departments and a number of courses are presented in English to them. On the other hand, the students who fail the exam are required to launch at English language learning program which is appropriate for their language level. The program provides integrated courses for 30 hours a week and language use (grammatical accuracy) constitutes 40 % in the distribution of each language skill and knowledge area in the

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<sup>1</sup> Adapted from the study of Shintani et.al (2014)

curriculum. Language forms are taught in contexts implicitly and revised regularly. Furthermore, the skill of writing is highly significant and constitutes 15 % in the distribution. In this sense, learners are presented with various genres and styles and they keep track of their own progress in writing by keeping their products in portfolios. Following a writing task, students are provided with corrective feedback by their teachers by using correction codes that they were taught through norming sessions. Considering the meanings of the codes, students revise their products and write the second version and after teachers have checked these versions, students keep their products in their portfolios until they are evaluated by their teacher at the end of the academic year. Considering the importance of grammar and writing in this language program, it seems clear that it is eligible and convenient for the design of Shintani's et al (2014) study.

As for the participants, they are 146 A2 level learners who study at five different classes and who are selected on voluntary basis. Having been informed by the researchers about the aim and the process of the study, they became volunteers to involve in the study by signing a consent form and they were active participants in the study. However, since a small number of students did not show up for all three tasks, they were eliminated from the study. Thus, the total number of the participants was determined as 146. See Table 1 for the distribution of the participants

**Table 1.** The distribution of the participants

	Frequency	Percent	Valid Percent	Cumulative Percent
1 ME	34	5.3	23.3	23.3
2 DCF	25	3.9	17.1	40.4
3 ME+R	28	4.4	19.2	59.6
4 DCF+R	30	4.7	20.5	80.1
5 Comp.	29	4.5	19.9	100.0
Total	146	22.8	100.0	

### Research design

Both quantitative and qualitative research designs were employed in the current study in light of the study of Shintani et. al., (2014). In order to collect data, first, the learners were assigned groups as mentioned above and received treatment for 3 weeks on the target forms past simple and indefinite articles. The reason for selecting these structures as the target forms stems from what Storch (2010) has suggested (See below) and other researchers who have proposed that articles are particularly difficult to acquire for language learners whose native language does not have articles (e.g., Ellis et. al, 2008; Bitchener et al., 2005). Furthermore, Ellis et. al., (2008) have claimed that CF is likely to be more effective in language forms that language learners have partially acquired such as articles.

As the study was conducted in real classroom situation, no modification was made for the treatment. In other words, the same procedure for writing classes was also adopted for the study. Writing tasks which were involved in the syllabus were used as the material of the study and class teachers involved in the feedback process based on the suggestion of Storch (2010):

...Thus future research on WCF needs to be conducted in authentic classrooms so that the feedback is given within the context of an instructional program, with ecologically valid writing tasks, and where revision is meaningful for the students because it has a clear purpose (e.g. assessment). Such studies need to be longitudinal to allow for more than one treatment occasion... It also needs to reflect and reinforce what is taught and emphasized in the class. (Storch, 2010, p. 43)

In this sense, in the first week, the learners were assigned a writing task (See Appendix A for a sample task). Their class teachers who were trained and informed about the procedures and data collection process collected the papers of the participants and gave corrective feedback to the papers for the target structures (past simple and indefinite articles) appropriate for their treatment group. In the second week, the participants were allowed to look through their first assignment accordingly for five minutes and assigned the second task. In other words,

DCF= Students were provided with the correct forms of the target forms explicitly by the teacher.

ME= Students were provided explanations about the correct use of the target forms.

DCF+ R= Students were provided with the correct forms explicitly by the teacher and allowed to revise them in the second draft.

ME+R= Students were provided explanations about the correct use of the target forms and allowed to revise them in the second draft.

Control Group= Students had no feedback for their first task and were assigned the second task.

Similarly, having collected the second task, the class teachers gave corrective feedback to the students' papers. Yet, this time; they used a different feedback type and provided indirect corrective feedback by using correction codes to the students' papers. All groups except for the control group received indirect corrective feedback through correction codes and wrote the third and the last task.

**Table 2.** Research design

	ME (n=34)	DCF (n= 25)	ME+R (n=28)	DCF + R (n=30)	Control Group (29)
Week 1	Writing Task 1				
Week 2	ME (5 min)	DCF (5 min)	ME (5 min) Revision (20')	DCF (5 min) Revision (20')	No treatment
	Writing Task 2				
Week 3	Writing Task 3 (correction codes)				

In order to obtain quantitative data of the study and compare the effects of these feedback types, the scoring principle '*means of obligatory occasion analysis*' (Ellis & Barkhuizen, 2005) was adopted and used by the researchers to evaluate the accuracy of the target forms. Therefore, total score of students was compromised for the assigned task by dividing the total number of correct use of the target forms by the total number of obligatory occasions. SPSS version 20 was used to conduct analyses. Additionally, as the last step of the research design, randomly selected participants were interviewed to support the findings (See Appendix B for interview questions).

## FINDINGS AND DISCUSSION

In order to collect data, a three-week treatment was carried out with five groups of CF (WCF, ME, WCF+R, ME+R, control group). Following the treatment in the first two weeks, learners received coded indirect CF in the third week. Accuracy scores of the students for the use of simple past tense and indefinite articles were calculated and repeated measures ANOVAs and Post-Hoc Bonferroni analyses were conducted in order to compare the scores of the groups. With this regard, the findings related to the first research question which addressed whether there is any difference in the effect of type and frequency of feedback on EFL learners' grammatical accuracy in writing reported that there is no significant difference in the effect of types of feedback [ $F(4,141)=4.858, p=0.01$ ] for the use of past simple and [ $F(4,141)=2.131, p=.080$ ] for the use of indefinite articles. Similarly, there was no significant effect of revision process on grammatical accuracy in writing tasks. See tables 3 and 4 for the analyses of comparisons.

**Table 3.** Pairwise comparison for the use of past simple  
Measure: time effect (past simple)

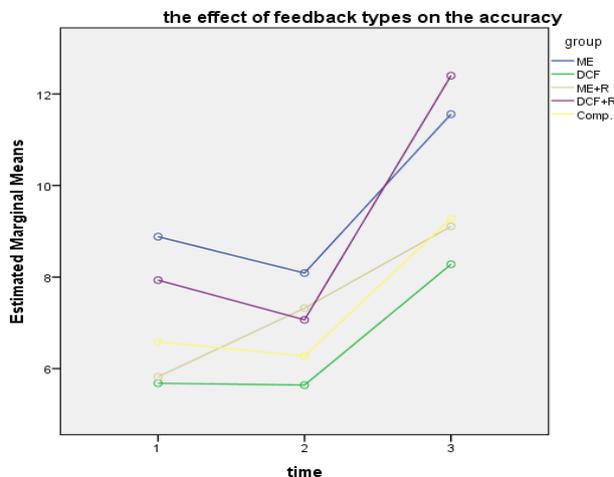
group	time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1 ME	1	8.882	.532	7.830	9.935
	2	8.088	.607	6.888	9.289
	3	11.559	.860	9.859	13.258
2 DCF	1	5.680	.621	4.453	6.907
	2	5.640	.708	4.240	7.040
	3	8.280	1.003	6.298	10.262
3 ME+R	1	5.821	.586	4.662	6.981
	2	7.321	.669	5.998	8.644
	3	9.107	.947	7.234	10.980
4 DCF+R	1	7.933	.567	6.813	9.053
	2	7.067	.647	5.788	8.345
	3	12.400	.915	10.591	14.209
5 Comp.	1	6.586	.576	5.447	7.725
	2	6.276	.658	4.976	7.576
	3	9.276	.931	7.436	11.116

**Table 4.** .Pairwise comparison for the use of indefinite articles  
Measure: time effect (articles)

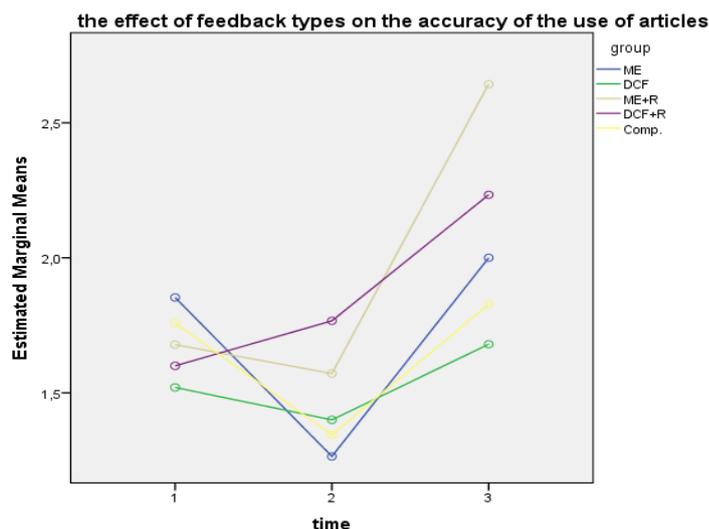
Group	time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1 ME	1	1.853	.158	1.541	2.165
	2	1.265	.127	1.014	1.516
	3	2.000	.213	1.579	2.421
2 DCF	1	1.520	.184	1.157	1.883
	2	1.400	.148	1.107	1.693
	3	1.680	.248	1.189	2.171
3 ME+R	1	1.679	.174	1.335	2.022
	2	1.571	.140	1.295	1.848
	3	2.643	.235	2.179	3.107
4 DCF+R	1	1.600	.168	1.268	1.932
	2	1.767	.135	1.499	2.034
	3	2.233	.227	1.785	2.681
5 Comp.	1	1.759	.171	1.421	2.096
	2	1.345	.138	1.073	1.617
	3	1.828	.231	1.372	2.283

As could be seen in the tables concerning the use of simple past and indefinite articles, there was no significant difference between the mean scores in any groups related to feedback types. Likewise, the mean scores in revision groups of ME and DCF were not statistically different from each other. These findings support the previous ones that have revealed no significant difference among types of CF (eg., Ellis, et.al, 2008; Sheen, et. al., 2009; Storch, 2009).

With respect to frequency of feedback, the study aimed to explore whether one-shot corrective feedback influences grammatical accuracy as stated in the literature (eg., e.g., Bitchener et al., 2005; Hartshorn et al., 2010). Therefore, the participants received various types of corrective feedback for the second task in treatment groups and all participants in treatment and control groups received coded corrective feedback that had been used as part of the practices of the program for a long time for the third task. Thus, a comparison was made between the effects of one-shot CF and long term CF. To this end, the output of the analyses suggested that one-shot CF did not have a positive effect on grammatical accuracy as compared to receiving the same type of feedback for long, which is illustrated in Figures 1 and 2.



**Figure 1.** Comparison of the treatment groups for the use of past simple



**Figure 2.** Comparison of the treatment groups for the use of indefinite articles

It is seen in the Figures 1 and 2 that the scores of the participants dropped at Time 2 when they received various types of CF that were different from what they had already been familiar with for their grammatical errors. Their scores rose at Time 3 when they received coded CF which they had been familiar with for relatively longer time compared to receiving one-shot CF. Therefore, these findings are in line with Truscott and Hsu (2008) who have asserted that giving feedback only once does not benefit to learners. On the other hand, the findings are contrary with what has been commonly suggested in the literature considering that they revealed a positive impact of receiving on-shot CF for treatment (e.g., Bitchener et al., 2005; Hartshorn et al., 2010; Sheen, 2007). Conversely, it could be assumed that the findings are in line with the research considering receiving long term CF (Chandler, 2003; Van Beuningen et. al., 2008) as beneficial.

As for learners' views about CF which is suggested to be neglected as a research concern, the content analysis of the study sets forth varied findings that support quantitative findings. In other words, while there was no statistically significant difference in the effect of feedback types, interviews also revealed no significant difference in the effect of particular feedback type reported by the participants. Ten out of twenty participants stated that the feedback type used in their treatment group enabled them to focus on their errors more whereas the other ten indicated that the coded CF that they are used to proves more beneficial to them since it encouraged critical thinking and awareness. Moreover, while eleven participants reported that they focused their errors on the use of indefinite articles, nine reflected that they focused on their errors on the use of simple past tense. Lastly, the participants who were in the treatment groups of revision pointed out a positive effect of revision process as it helped them notice the errors and avoid repeating them. As a reason for their being attentive to their errors, they stated that it was because they did not want to write the draft again (See Appendix C for a sample of interviews). As a whole, supporting statistical data with learners' voices was one of the purposes of the current study that could be thought to be important considering the highlighted lack of research in the literature on learners' views about CF (e.g., Armhein & Nassaji, 2010; Poulos & Mahony, 2008)

## CONCLUSION

The aim of this study was to investigate probable effects of CF on the accuracy in writing by supporting findings with learners' views through a three-week treatment session. The effect of potential variables (type and frequency of feedback) was considered while searching for evidence corresponding with findings of the previous research. Thus, research questions addressed the factors (type and frequency of CF) that might have an impact on EFL learners' grammatical accuracy in writing and their views about the effect of different types of CF. The data emerged as a result of experimental designed suggested that there was no significant difference in association with feedback type, but there was a considerable difference in the tasks related to frequency of treatment. As addressed in the second research question, participants' views supported the variety in the effects of type and frequency of CF, thus proposing use of various feedback types in writing classes. Furthermore, it could be suggested that an agreed type of feedback might be determined by negotiating with students. As for the limitations of the study, it could be stated that the sample may not reflect the population or time constraint of the treatment could be a concern. For further research, it is suggested that the study be conducted in various setting and with more participants and long term effect of each feedback type could be investigated to obtain more reliable findings to support existing research.

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## APPENDICES

### *Appendix A: A sample task used in the treatment*

Write a paragraph about a memorable night by answering the questions below:

- When was it?      - Where were you?      - Who were you with?
- What did you do?      - How did you feel?      - Why was it a memorable night?

### *Appendix B. Interview questions* (Adapted from Shintani et.al, 2014)

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#### **For ME treatment**

1. You were given the grammar explanation sheet with your original writing. Did you understand the explanation well?
2. When you analyzed your own writing based on the grammar explanations did you identify your errors?
3. Then you worked on another writing task. What did you pay attention to while you were writing?

[If the participant did not mention the target structure or mentioned only one of the two target structure, the interviewer further asked whether he/she paid any attention to any of the target structure].

4. Did you think about the grammar points explained in the sheet?
5. What about \_\_\_\_ (the target structure that the participant did not mention)?
6. Did you focus more on your errors related to the use of simple past or indefinite articles (a/an)?<sup>2</sup>

#### **For DCF treatment**

1. You read your original writing with some correction on it. Did you try to analyse the corrections to work out why you had made the errors?
2. Then you worked on another writing task. What did you pay attention to while you were writing?

[If the participant did not mention the target structure or mentioned only one of the two target structure, the interviewer further asked whether he/she paid any attention to any of the target structure].

3. Did you think about the correction that you received on your original writing?
  4. What about this correction (pointing the CF on the error that the participant did not mention)?
  5. Did you focus more on your errors related to the use of simple past or indefinite articles (a/an)?<sup>3</sup>
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<sup>2</sup> included in the questions by the researchers

### *Appendix C. Transcript of a sample interview*

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*(This interview was conducted by Researcher 1)*

1. You read your original writing with some correction on it. Did you try to analyze the corrections to work out why you had made the errors?

*S27: Yes, I did.*

2. Then you worked on another writing task. What did you pay attention to while you were writing?

*S27: Yes, first of all, grammar was simple past, so I had to use 'was' not 'is'. I focused on this on my first draft, but I made an error. You wrote me directly the correct form. I would prefer discovering the error myself, though. I did not make any errors on my second draft. To me, encouraging us to find our own errors is more useful than this feedback type.*

R1: You mean, you would like to receive feedback by using correction codes, right?

*S27: I think we need to work hard to find our errors. You try to find your errors. If you can't, you look up reference books. I believe it is better.*

R1: So, you don't think that receiving direct corrective feedback is helpful.

*S27: No, I don't.*

3. Did you focus more on your errors related to the use of simple past or indefinite articles (a/an)?

*S27: I have problems with the use of a/ an, so a/ an*

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<sup>3</sup> included in the questions by the researchers

# Digital Stories to Teach English to Young Learners: Prospective ELT Teachers' Beliefs, Attitudes and Experiences

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## ABSTRACT

Equipping prospective teachers (PTs) of young English learners with a variety of child-appropriate materials and techniques is very prominent. Digital Stories (DSs) with their multimodal features enable teachers to meet the needs of 21<sup>st</sup> century digital native students when learning a foreign language. Thus, the study aims to investigate the beliefs, attitudes and experiences of 75 prospective English teachers of Uludağ University ELT department about the creation and using child-appropriate digital stories to teach English to young learners (YLS). The data were collected through a 5-point Likert scale questionnaire with 26 items and the Cronbach alpha of the items was .87. In addition, a semi-structured interview was conducted with 10 participants to delve into the results obtained from the questionnaire. The descriptive analysis of the questionnaire revealed that nearly all of the participants agreed that digital stories should be used to take children's attention easily, better learn a foreign language, increase YLS' motivation, change the dynamics of the traditional classrooms, and keep YLS' attention throughout the lesson. However, based on their own experience in creating a child-appropriate digital story, nearly half of them reported that it was not easy to create an effective DS without being educated.

**Key Words:** ELT prospective teachers, a child-appropriate digital story, teaching English to children, beliefs and experiences.

## INTRODUCTION

Children have fantasy world and like meaning-based imaginative play. Through stories, children's interests, attention, and imagination are engaged meaningfully (Read, 2007; Robin, 2008). In addition, stories with familiar cross-curricular topics can bring the world into the classroom to enable learners compensate the distance between learners' world and the language (Skouge & Rao, 2009; Yılmaz & Karatepe, 2013). Because children have great capacity to pick up ready phrases, in other words, chunks (Moon, 2000) both digital and print-based stories with repetitive and predictable formulas and patterns help learners develop cognitive and language skills (Porrás González, 2010). Furthermore, they foster learners' social/ emotional skills and attitudes as they listen, provide a response of laughter, sadness, excitement, and anticipation, collaborate, take turns, show respect for others (Brewster, Ellis & Girard, 1992; Çubukçu, 2012; Haznedar, 2010; Read, 2007). Thus, it is very prominent for teachers to have the repertoire of various stories as teaching resources (Skouge & Rao, 2009).

Human cognition and learning could be facilitated through the growing use of intelligent software agents (Natriello, 2007). Hence, in addition to print-based stories, the digital storytelling should be used as one of the innovative pedagogical tools as it is considered as "a modern incarnation of the traditional art of oral storytelling" to provide deeper and more meaningful learning (Smeda, Dakich & Sharda, 2014, p.2),

## DIGITAL STORIES AS INNOVATIVE PEDAGOGICAL TOOLS

DSs are defined as; "3-5 minute long computer-based and user-generated short video clips that enable learners to utilize and combine various skills" (Köse & Küçüköğlü, 2012, p. 396). They help learners build communication and information-creation skills (Abdul-Ameer, 2014; Köse & Küçüköğlü, 2012; McGeoch, 2012; Salkhord, Gorjian & Pazhakh, 2013). DSs with multimodal features such as visual and audio component through the integration of text, images can motivate and engage learners easily, develop the ability to solve problems, facilitate their meaning making, and enable learners to work with both text and multimedia to gain multiple skills (Keşli Dollar & Tekiner Tollu, 2015; Ohler, 2013; Oskoz & Elola, 2016; Salkhord et al., 2013; Tiba, Condy, Chigona & Tunjera, 2015; Timuçin & Irgin, 2015; Xie, 2016).

Among a great deal of research related to digital storytelling, the following studies are the most related ones to provide a basis for the present study. For instance, Xie (2016) conducted a one-year teaching project in which 54 Chinese university-level students were created digital stories in small groups in a content-based course after being introduced how to do it to explore how and to what extent students' motivation and efficiency in EFL learning were influenced through digital storytelling. The results indicated the following positive points regarding digital story telling; project-based group learning was considered as an efficient way to feel stronger sense of competition and achievement; students' passion and motivation were enhanced, the ability to integrate

various materials was developed, students' sense of achievement were increased through having product outcomes, target content was learned more efficiently besides having deep learning due to the students' reflection on what they were learning critically and creatively. However, the following challenges were reported regarding making a digital storytelling such as the necessity of being trained about how to use the required software to make videos, limited time to create their own videos, and their worries with regards to the use digital storytelling efficiently in crowded classrooms.

Furthermore, the study by Lei (2009) which was conducted with 2007 intake freshmen in teacher education programs at a large northeastern university revealed that most of the participants had moderate confidence in using classroom technologies despite having strong positive beliefs in technology. The study indicated that being digital native students might not guarantee being digital native teachers. Hence, teacher education programs are responsible for helping them become digital-native teachers who can use classroom technologies in critical, wise and meaningful ways by considering that not all pre-service teachers were exposed to the digital technologies equally despite growing up in digital age. The following suggestions were given in the study:

(a) expose preservice teachers to a variety of technologies that can be used to support different teaching and learning activities, (2) emphasize subject-specific technology, (3) include assistive technology as an important component of teacher technology preparation programs, (4) help preservice teachers understand the enabling conditions for technology use, (5) help preservice teachers make meaningful connections between technology and teaching" (Lei, 2009, p. 92-93).

Tiba et al. (2015) conducted a qualitative study with 50 South African pre-service teachers via five focused group interviews to explore their perceptions of the potential benefits of Digital Story Telling (DST) and perceived barriers to DST uptake during in-service practice. The results of the transcribed data revealed that most of the participants valued the importance of DST in today's classroom as it has potential to motivate and engage learners easily, to promote collaboration and self-expression besides developing multiple skills including critical thinking, communication and language skills, particularly writing skills. However, they also remarked the following perceived barriers to DST uptake during in-service practice such as a lack of resources, self-confidence and time due to restrictive curricula in addition to their lack of technological knowledge of how to teach with DST.

Timuçin & Irgin (2015) examined how 16 Turkish EFL university students studying at the Preparatory School of a state university in Turkey construct knowledge with digital storytelling. The participants were provided the digital environment for digital stories is Kerpoof Studio website operated by Walt Disney Company. The overall results indicated that digital environment increased the students' motivation to learn and increased the creativity of learners. In addition, this experience helped the participants become aware of both media and visual literacy, transform the curricular content into the digital storytelling, take up multidimensional roles, and develop their writing skills.

The fact that students who were taught via DSs online by computer outperformed the students who were taught through the stories based on only the teacher not the technology was reported in the following studies such as Abdul-Ameer (2014) for comprehending new vocabulary items and gaining four basic language skills particularly listening comprehension, Salkhord, Gorjian & Pazhakh (2013) for reading skills, Verdugo & Belmonte (2007) for listening skills, and Hwang, Shadiey, Hsu, Huang, Hsu, & Lin (2016) for oral skills. Being aware of the emerged positive experimental research results in favor of the use of DSs in EFL learning, EFL teachers and PTs should be trained about how to create and integrate DSs.

In addition, constructivism has been adopted by the Turkish Ministry of National Education as an educational philosophical viewpoint since 2005 (Özar, 2012). However, as reported by Kırkgöz (2009) constructivist approach has not been adequately implemented in the realms of Turkish classrooms. Thus, EFL teachers should seek for innovative pedagogical tools which foster constructivist thinking. As suggested by Smeda et al. (2014), digital storytelling is one of the most suitable ways to follow a constructive approach to learning as students who were given basic instructions construct and reflect their own understanding via interactions and experiences to be able to create their own digital story.

Therefore, as also mentioned by Tiba et al. (2015), it is very prominent for PTs to be equipped with not only content and pedagogy knowledge but also with technological knowledge to enable them to integrate technology into their curriculum. For instance, ELT prospective teachers can learn how to digitalize a story as a tool for language learning and teaching material for YLs by using some of the most common free-of-charge digital story telling programs such as Windows Movie Maker, Microsoft Photo Story 3 (for Windows based PCs), and iMovie for Macintosh computers (Köse & Küçüköglü, 2012). However, the challenges of integrating technology

into classrooms should be considered to get benefit from technology more effectively. Groff and Mouza (2008, p. 42) reported many challenges some of which were as follows: “lack of teacher input on the development of innovations for instructional use; teacher beliefs, attitudes, and concerns about classroom technology use— inexperience with technology, the shift of pedagogical practices, management issues, and the possibility of new roles and teaching style...”. Believing that teachers’ experiences are affected by their beliefs and attitudes, the researcher aimed to answer the following research questions:

- RQ1: What are the beliefs and attitudes of the 3rd year ELT prospective teachers with regard to the use of digital stories to Teach English to Young Learners (TEYLs)?
- RQ2: What are the experiences of the 3rd year ELT prospective teachers in creating child-appropriate digital stories to TEYLs?
- RQ3. Is there a statistically significant difference between digital native and digital immigrant participants regarding the creation of child-appropriate DSs and integrating them into YLs’ classrooms?
- RQ4: Is Microsoft Photo Story 3 (for Windows based PCs) an effective program to digitalize a child-appropriate DS?

## **METHOD**

A mixed method research design with both quantitative and qualitative methods was used to answer the aforementioned research questions.

### **Context and Participants of the Study**

The study was conducted with 75 third year ELT students of Uludag University enrolled in TEYL course I which is a part of the National Curriculum ELTP by Turkish MoNE. The participants who were trained about some knowledge about children’s characteristic and how they learn a language were expected to be equipped with how to teach YLs. The participants, as a group of 5 or 6 members, were demanded to prepare ten different tasks such as preparing child-appropriate materials, activities, and lesson plans to be performed in the practice part of the course throughout the term after being lectured in the theoretical lesson. As a final task, they were asked to create a child-appropriate DS based on one of the units of the Turkish primary state school curriculum in two-weeks. In the first week, they wrote their script. After getting feedback from the instructor about the title, content, context, characters, length and language aspect of the story, they digitalized their stories in the following week to be watched as a class and evaluated by the instructor in the practice part of the course. In addition to watching previously created DSs to discuss their weaknesses and strengths, the participants were informed about DSs, particularly how to digitalize an effective child-appropriate DSs through Microsoft Photo Story 3 (for Windows based PCs) in the theoretical course to support the participants to complete the task. Although Microsoft Photo Story 3 was suggested and explained step by step (for further see Köse & Küçüköğlü, 2012) in the course, the participants were free to use another programs to digitalize their stories.

### **Data Collection Instruments**

The data collection instruments were a 26-item 5-point Likert scale questionnaire, an open-ended questionnaire, and a semi-structured questionnaire. First part of the closed questionnaire aimed to find out their beliefs about the use of DSs in the YLs’ classrooms whereas the second part aimed at investigating their experiences when creating their DSs. Simultaneously, an open-ended questionnaire was administered to the participants to enable them to share their views and experiences with regard to the program they used to create their DSs. Finally, a semi-structured interview was conducted with 10 participants (5 digital native & 2 half digital half immigrant & 3 digital immigrants) to delve into the results obtained from the questionnaires. The interview questions were as follows:

1. What do you think of the use of child-appropriate DSs in YLs’ classrooms?
2. How was your experience in creating your DS as a two-week group task?
3. How do you define yourself? Digital Native or Digital Immigrant? Do you feel yourself competent in using DSs? Why?

### **Data Analysis Procedure**

The quantitative data were analysed firstly through descriptive statistics including mean, standard deviations and frequencies of the items secondly through independent sample t-test to compare the results based on the groups (digital native & digital immigrant). The Cronbach’s Alfa coefficient was found 0.87 which is acceptable. Therefore, the structured questionnaire could be said to have acceptable internal consistency. Moreover, the opinions of the three experts in instructional technologies and material design were taken to validate the content of the questionnaire. 4 items were modified based on their comments. On the other hand, the qualitative data obtained from the open-ended questionnaire and the extracts of the interviews were analysed through content analysis of the participants’ manuscripts.

## RESULTS

### RQ1: What are the beliefs and attitudes of the 3rd year ELT prospective teachers with regard to the use of digital stories to TEYLs?

The results of the closed questionnaire were presented in two different tables: table 1 displays the participants' beliefs about the benefits of using DSs into YLs' classrooms and table 2 shows their beliefs about the integration of DS into YLs' classrooms and the necessity for effective teacher training.

**Table 1 Results of the Descriptive Statistics Regarding Beliefs about the advantages of using DSs into YLs' classrooms**

Items	N	$\bar{X}$	SD	Strongly Disagree/ Disagree (%)	Neutral (%)	Strongly Agree/ Agree (%)
12. It becomes easier for teachers to take children' attention through DSs due to its multimodal components	73	4,45	,76	2.7	8.12	89
4. DSs help YLs better learn a foreign language due to its multimodal components.	74	4,35	,81	1.4	13.5	85.1
8. I believe that teachers can increase YLs' motivation through the use of DSs.	72	4,34	,69	0	12.5	87.5
7. I believe that teachers can change the dynamics of the traditional classrooms through the use of DSs	74	4,24	,79	2.7	13.5	83.7
13. It becomes easier for teachers to keep YLs' attention throughout the lesson via DS-based activities	72	4,23	,84	2.8	18.1	79.1

The results revealed that nearly all of the participants whether they were digital native or immigrant were (93.2%) agreed that DSs should be integrated into YLs' classrooms in this 21st-century. It was clear that most of the participants believed the advantages of using DSs with their multimodal components as follows; taking children' attention easily, better learning a foreign language, increasing YLs' motivation, changing the dynamics of the traditional classrooms, and keeping YLs' attention easily throughout the lesson. The following interview extracts can shed light on the participants' aforementioned high level positive beliefs about the use of DSs into YLs' classrooms referring to some advantages of them.

*I3: «Children love looking at the screen. They tend to watch TV or play with tablet or mobile phone. They are familiar with technology. We can say that today's children are digital native. Thus, we cannot ignore the use of technology in our classrooms».*

*I2: «I think we should certainly use DSs when teaching English because children learn by doing. When I observe them in real classrooms, I realized that they continuously repeated the chunks in the video. They didn't want us to close the video. Even after closing the video they went on repeating by themselves. In a sense, they made their own videos. Thus, their learning became easy and permanent».*

*I01: «I think DSs help children understand the target language as we have opportunity to visualize the target chunks. If the chunks are repeated several times they keep on saying them. In addition, they tend to imitate what they are watching».*

Table 2 indicates the results of the descriptive statistics regarding the participants' beliefs about the integration of DS into regular classroom teaching and necessity for effective training to be able to achieve this appropriately.

**Table 2 Results of the Descriptive Statistics Regarding Beliefs about the use of DSs into YLs' classrooms.**

Items	N	$\bar{X}$	SD	Strongly Disagree/ Disagree (%)	Neutral (%)	Strongly Agree/ Agree (%)
2. DSs should be integrated into YLs' classrooms in this 21st-century.	73	4,54	,70	2.7	4.1	93.2
1. I believe that teachers need effective training to use DSs appropriately in their classrooms.	73	4,27	,76	1.4	13.5	83.6
10. Integrating DSs into regular classroom teaching might be challenging for teachers.	74	3,74	,90	8.2	28.4	63.5
18. I believe that teachers can easily integrate DSs into their English lessons.	74	3,72	,94	10.9	24.3	64.9

As seen in the above table, there appeared contradictory results concerning the integration of DSs into the participants' classroom teaching despite their high level of positive beliefs about the necessity for the use of DSs into YLs' classrooms (93.2%). More than half of the participants (63.5%) thought that it would be neither challenging nor easy (64.9%) for teachers to use DSs into language classrooms. This result was supported by their positive beliefs about the importance of teacher training as most of them (83.6%) believed that they needed to be trained effectively to use DSs in their classrooms appropriately. The following interview extract might support the aforementioned results.

*I7: " I do not think that I am good at something done with the computer. Actually, we learnt many things concerning the use of technology during the course entitled "Instructional Technologies and Material Design" at the university. However, I hold off from using the technological devices in the classroom".*

It is understood that some of the participants had hesitation in integrating technology into their classrooms due to lack of technology competence and self-confidence. Therefore, most of them believed (83%) the necessity for teachers to be trained to use DSs appropriately in their classrooms.

### **RQ2. What are the experiences of the 3rd year ELT prospective teachers in creating child-appropriate digital stories to TEYLs?**

The results of the second part of the questionnaire regarding the experiences of the participants were presented in three different tables indicating the skills developed through creating DSs, the process through which they were instructed about child-appropriate DSs, shown previously created DSs, and given opportunities to discuss about their quality based on the criteria given by the instructor, and the participants' affective states respectively. Table 3 demonstrates to what extent creating a child-appropriate DS contributed their development from various aspects.

**Table 3 Results of the Descriptive Statistics Regarding the advantages of creating a DS for ELT Prospective Teachers**

Items	N	$\bar{x}$	SD	Strongly Disagree/ Disagree (%)	Neutral (%)	Strongly Agree/ Agree (%)
3. Putting the pictures into logical order when creating our DS increased my organisation skills.	74	4,32	,77	2.7	10.8	86.4
6. Vocalizing our DS helped me understand how I use English including pronunciation, intonation etc.	74	4,28	,80	2.8	9.5	87.8
25. Creating a DS helped us use our information creation skills.	74	4,05	,80	2.8	17.6	79.7
5. Writing the script increased my creativity	74	4,08	,79	2.7	19.2	78.1
14. Creating a DS as a group helped us develop our social skills.	72	3,75	1,08	11.1	27.8	61.1
24. Creating a DS helped us develop our language skills.	74	3,71	1,02	9.5	29.7	60.8
21. Creating a DS helped me understand the world of the child better.	74	3,83	1,02	9.5	28.4	62.1

Based on the mean scores, it is clear that creating a child-appropriate DS made a significant contribution to the participants' organisation skills via putting the pictures into logical order ( $M= 4.32$ ) and phonological development through vocalizing ( $M= 4.28$ ) at the very most. In addition, most of them remarked that they used their information creation skills when creating their DSs (79.7%) and writing the script increased their creativity (78.1%). Finally, more than half of them reported that they developed their social skills (61.1%), language skills (60.8%), and understanding the world of the child better. The interview results support some of the aforementioned points as follows:

*I3: "Children follow the process very carefully and give too much importance to visuality. Although we were able to write the script in a very short time, we allocated much of our time to find and form our pictures. The subject was daily routine; thus, it was very important to find night pictures with our character. We discussed what to do as a group. We could not exclude the night part of the story. Finally, we decided to blacken the*

background colour. It was very time-consuming and difficult to organize pictures to have meaningful and coherent story...”.

I7: “Knowing the programs is not enough to be able to create a child-appropriate DS. It required us to be aware of the children’s interests. They do not watch Buggs Bunny as we did. Thus, we asked many 4<sup>th</sup> graders to get information about their favourite cartoons to be able choose our story characters. We believed that once we found their favourite characters, it would be easier to take their attention and sustain their interests throughout the lesson...”.

Table 4 displays the results concerning both theoretical and practical process to create a DS.

**Table 4 Results of the Descriptive Statistics Regarding the Process of Creating a DS for ELT Prospective Teachers**

Items	N	$\bar{x}$	SD	Strongly Disagree/ Disagree (%)	Neutral (%)	Strongly Agree/ Agree (%)
20. The elements of an effective DS explained by the instructor helped us to create the DS of better quality.	74	4,25	,75	1.4	14.9	83.7
22. Discussing the elements of an effective DS in the lesson helped us to create the DSs of better quality.	73	4,21	,73	2.7	9.6	87.7
19. Watching the final version of our DSs in the classroom helped us to reflect on our own learning.	74	4,18	,80	4.1	12.2	83.8
16. I can individually prepare a DS-based lesson plan with child appropriate activities.	74	4,01	,86	6.8	16.2	77
11. Creating a DS required us to possess high computer skills.	74	3.13	1,12	32.4	21.6	45.9
26. I could have easily created a DS without watching and discussing on the samples.	74	2.64	1,23	48.7	27	24.4

As presented in table 4, to be able to create a DS of better quality the participants got benefit from the explanation of the instructor about the elements of an effective DS ( $M= 4.25$ ) and the discussion part immediate after the lecturing ( $M= 4.21$ ). This can be supported by the following interview extract:

I3: “Creating an effective DS is not an easy job such as writing on Microsoft Word. I think creating a DS is not something done with computer easily. It is a complex task which required us to vocalize, combine many pictures together to have a meaningful story. Thus, what you said about creating an effective child-appropriate DS helped us understand your expectations besides the discussion we had after watching the sample DSs which enabled us to have an idea about the qualified DS...”

Moreover, majority of them (83.8%) asserted that they did reflection on their own learning after watching their DSs. The following two extracts might show how they did reflection.

I7: «Watching the sample DSs prepared by the former PTs helped us to understand your expectations from us when preparing child appropriate DSs. You (referring the instructor) explained the reasons why the samples were bad or good. When watching our own DSs we said that our group’s DS was not bad at all but could have been better».

The results also revealed that although most of the participants (77%) felt confident in planning a DS-based lesson with child appropriate activities, half of them reported lack of confidence in creating a DS alone without watching and discussing on the samples (48.7%). Similarly, nearly half of them considered that creating a DS required them to possess high computer skills (45.9). The extract below might explain why they found difficult to create a DS alone.

I10: «I could plan a lesson based on a DS but I cannot prepare a DS alone. I think I am not a digital native, so it is too difficult for me to prepare alone. Preparing as a group is better because there are lots of things to be considered, for instance, their ages. Our story was for 2nd graders. It was also 3rd unit. It means that it was a starting point. Because they do not know anything in English creating a meaningful and child appropriate context became very difficult for us. I can say that we forced ourselves to be creative. Keeping the story at  $i+1$  level was really trouble for us. Choosing the characters was also very difficult. We thought our childhood firstly

(Cedric) but we noticed that we did not know currently popular characters (Niloya). Thus, we searched on YouTube...».

Table 5 indicates the descriptive statistics of the participants' affective states with regard to creating a child-appropriate DS.

**Table 5 Results of the Descriptive Statistics Regarding Affective Aspects of Creating a DS for ELT Prospective Teachers**

Items	N	$\bar{X}$	SD	Strongly Disagree/ Disagree (%)	Neutral (%)	Strongly Agree/ Agree (%)
23. Creating a DS helped us build self-confidence in using technology for educational purposes.	73	4,10	,90	6.8	10.8	82.4
17. I was happy to learn how to create a DS.	74	4,22	,88	2.8	17.6	79.7
9. I was motivated to learn how to create a DS.	72	3,69	,97	12.5	25	62.5

As revealed in table 5, while more than half of the participants (62.5%) were motivated to learn how to create a DS it is notable that some of them (25%) were not motivated before involving the process. However, after the process, most of them (79.7%) fostered positive attitudes towards learning how to create a DS. In the wake of this experience, it is pleasing that creating a DS helped most of them (82.4%) build self-confidence in using technology for educational purposes. In the following extract, one of the interviewees mentioned about her feelings after watching their product outcome.

*I5: «When watching our own DS I firstly said «Yeess! We did a good job. Later, I thought that we could have found better pictures... Because I know that I can prepare lots of materials even DSs I feel happy as a PT...»*

### **RQ3. Is there a statistically significant difference between digital native and digital immigrant participants regarding the creation of child-appropriate DSs and integrating them into YLs' classrooms?**

Depending on whether the participants were digital native or immigrant, the T-test results indicated a significant difference pertaining to only one item, which is displayed in table 6.

**Table 6 Independent Sample T-test Results Regarding the Integrating Child-appropriate DSs**

Item 10	Groups	N	$\bar{X}$	SD	df	t	p
Incorporating DSs into regular classroom teaching might be challenging for teachers.	Digital Native	39	<b>3.46</b>	,94	67	-2,897	<b>.005</b>
	Digital Immigrant	30	<b>4.06</b>	,73			

As seen in table 6, the results of the independent sample T-test revealed a significant difference between two groups regarding only one item. Based on the mean scores, it is clear that ELT prospective teachers who were digital immigrant believed more than the digital native participants that incorporating DSs into regular classroom teaching might be challenging for teachers. The extracts below indicated how creating a DS was considered differently by the participants depending whether they were digital native or immigrant:

*I9: «The process was easy for me because I know the required programs. I think I am a digital native but not at advanced level. The most difficult aspect for lots of my friends was to find out the most appropriate pictures for the script. However, I know the programs to design pictures... »*

*I4: «It was very challenging for me to understand the required programs. Therefore, I contributed to the other tasks. For instance, I am good at drama and I vocalized different characters».*

### **RQ4: Is Microsoft Photo Story 3 (for Windows based PCs) an effective program to digitalize a child-appropriate DS?**

The results of the open-ended questionnaire revealed the frequency of the programs used by the participants as displayed in the following table. Table 7 indicates the frequency of the programs used by the participants to create their DSs.

Table 7 The Frequency of the Programs Used by the Participants to create a child-appropriate DS

The Programs used to create DSs	Microsoft Photo Story 3	Movie Maker	Microsoft Photo Story 3 & Cantasia	Story Bird	Microsoft Photo Story 3 & Toondo	Paint & PowerPoint
Number and Frequency of the of the Participants	36 (%48)	18 (%24)	5 (% 6.6)	6 (% 8)	4 (% 5.3)	6 (% 8)

As indicated in table 7, more than half of the participants (60 %) reported that they used Microsoft Photo Story 3 to create their DSs and it was an effective program with technical facilities to create DSs whereas 40 % of them used another programs considering that the program was very old and not effective. Content analysis of the students' extracts revealed that most of the participants who used Microsoft Photo Story 3 stated that the program was very useful, free, and easy to be used even by those who were digital immigrant or those who had never used any applications before. They also reported that they could add images, narrate their voices, and add texts at the same time easily besides setting the time to customize motions as they wanted. As a drawback of the program, they mentioned that the effects of the program were not of high quality as it was old software.

The analysis indicated that those who were digital native preferred to use different programs from Microsoft Photo Story 3. They mentioned about why they tended to use additional or another programs as follows: for Camtasia, they believed that they could insert background sound of better quality and also narrate their voices more than once; for Toondo, they explained that they wanted to create their stories as cartoon style believing that it was advantage to create new images freely; for PowerPoint, they emphasized that it was alone a good program to create a DS. If it was used with some programs which allow designing pictures such as Paint, Pixlr, Photoshop etc. it would be better and more attractive; for Moviemaker, it was reported that it easier via this program to adjust the sound and pictures. Customizing notion was smoother and of high quality; for Storybird, they stated that they could not only set subtitles and photos but also break down the videos into parts as they wished.

## DISCUSSION AND CONCLUSION

The study aimed to reveal ELT prospective teachers' beliefs, attitudes and experiences regarding the use of and creation of child-appropriate DSs. As mentioned by some researchers such as Porras González (2010), Read (2007), Robin (2008), Tiba et al. (2015), and Timuçin & Irgin (2015), the overall result of the study indicated that nearly all of the participants agreed that DSs should be integrated in YLs' classrooms believing the power of it to take the pupils' attention easily, help them better learn a foreign language, increase YLs' motivation, change the dynamics of the traditional classrooms, and to keep YLs' attention easily throughout the lesson. This result may be attributed to the fact that ELT prospective teachers are aware of how the use of technology becomes unavoidable in today's world through having an impact on variety of fields, and education is no exception. Their high motivation and their positive attitudes towards learning how to create and integrate DSs in their future classrooms to teach a foreign language to YLs corroborates the fact that the teachers of 21<sup>st</sup> century should not be digital immigrant when teaching to the learners who are mostly technology savvy (Tiba et al., 2015).

As suggested by Tiba et al. (2015), this study revealed that creating a child appropriate DS enabled ELT prospective teachers blend technological, content, and pedagogy knowledge as they were required not only to write a script including the chunk/s compatible with the target unit of the curriculum, choose the most appropriate characters by taking the target group's age and interests into account, upload well-matched pictures with the text, vocalize the story by giving importance to the supra-segmental features. In other words, due to having multidimensional roles, they used not only their technology competence by using the programs to create their DSs but also their knowledge about how children learn and how to teach them accordingly. Therefore, in line with the study by Xie (2016), the participants of this study suggested that creating a child-appropriate DS as a group-work task rather than an individual task was better to prepare a more effective and of high quality DS. Furthermore, as also mentioned by Robin (2006), when working as a group for digital storytelling, they develop their social skills as they brainstorm and discuss their ideas collaboratively in addition to work sharing depending on their individual strengths such as having content knowledge, pedagogy knowledge and technological knowledge.

In line with Smeda et al. (2014) who asserted that DST is one of the most innovative pedagogical tools to foster constructivist thinking, the ELT prospective teachers in this study constructed their own understanding and reflected on their own learning via creating a child-appropriate DS, which is the essence of constructivism.

Because constructivism has been suggested by MoNE as an educational philosophical viewpoint since 2005, the PTs should be given more tasks such as creating DS to develop various skills including organization skills, information creation skills, social skills, and language skills in addition to developing autonomy through constructing their own learning.

In addition, similar to the findings of the study by Lei (2009), most of the participants of this study fostered positive attitudes towards learning how to create a DS, which increased their self-confidence in using technology for instructional purposes. Before being involving in preparing a DS as an instructional technology, motivating students particularly those who are digital immigrant might be difficult as experienced in this study. However, providing support such as informing the elements of an effective DS, enabling students to discuss about strengths and weaknesses of sample child-appropriate DSs, and allowing them to work as a group might facilitate the process of creating a DS.

Another point to consider based on the interview results is that, the experiences of the participants varied depending on whether they were digital native and digital immigrants. It is clear that digital native participants contributed technological aspects such as the use of story-telling programs more to the completion of the task. On the other hand, those who were digital immigrants considered the process of creating a DS challenging and thought that it required them to have high computer skills. However, performing the task collaboratively enabled them to contribute to the achievement of the task through writing the script through finding an interesting and child appropriate context, finding the most matched pictures, vocalizing the story as dramatic as they could. Agreeing with Lei (2009) who claimed that being a digital native student cannot guarantee being a digital native teacher, the study suggest that teacher educators who expect their PTs to perform tasks that require the use or creation of instructional technologies should provide support without considering whether they are digital native or immigrant. The participants of the study created their DSs via using different programs reporting their pros and cons. Thus, it would be better for teacher educators to keep up with the technological innovations to be able to suggest the newest and the most qualified apps for digital storytelling.

To sum up, it is clear that we are living in the digital age and technology is moving too fast. Hence, it was not easy for some PTs to create a DS without being educated and supported due to lack of knowledge about the required software to create DSs and lack of confidence in using them in the realms of classrooms as also noted by Xie (2016) and Tiba et al. (2015). Thus, as revealed by Timuçin & Irgin (2015), this study support that the more students are exposed to digital environment and the more they are given tasks including the use of technological devices the more they become aware of both media and visual literacy and they foster positive attitudes towards creating and using technological tools for instructional purposes.

## IMPLICATION AND SUGGESTIONS

Today's children are born into digital environment and grow up with technology in different aspects of their lives. Because learners of new generations are mostly digital native, teachers, PTs, and teacher educators should ask themselves whether they are digital native or immigrant. They should seek for opportunities for integrating technology into regular teaching to better teach a foreign language. We, teacher educators, evaluate our syllabus to decide whether we prepare PTs for teaching to new digital native learners. If not, we should revise our lessons to better prepare future teachers. Furthermore, teachers should know how to embrace and integrate technology in their classrooms which should be technologically well-equipped.

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# Document Screening of The Studies on Leadership and Effective Leadership Made Between 2009 and 2017

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## ABSTRACT

The purpose of this study is to assess the work conducted on effective leadership. The research was carried out using the “document screening method”. The data were obtained through various journals, theses and the Internet. In the study; 17 articles and 7 master's theses covering the years 2009 and 2017 were evaluated. When the findings of the research were examined, it was found that 16 were quantitative and 8 were qualitative. In the field of educational administration, the body of literature conducted on effective leadership has been examined. A good leader must influence and motivate the employees, create solutions and also pioneer changes in order to achieve certain goals because leadership is a group function. Group members with different roles form integrity by interacting with each other to achieve common goals. In this study, the concept and purpose of leadership, characteristics of a leader, leadership behaviours and leader types, leadership theories, effective leadership and studies on effective leadership are explained. In conclusion, the transformational leader is more prominent in leadership and makes the process stronger. In this process, in addition to internal factors such as hope, optimism and energy, principals like responsibility, fairness and commitment have a more positive influence on the educational administration system since they are in the foreground.

**Keywords:** Leadership, effective leadership, research method.

## INTRODUCTION

### 1. THE CONCEPT OF LEADERSHIP

The process of driving someone to act under certain conditions in order to achieve an aim is one of the definitions of leadership. Leadership in principle is to direct people to a particular goal (Kılınç, 2009) While leadership can be developed by education, it generally bears traits of those with positive characters. Those having a negative character cannot maintain leadership traits. Leadership education does not end with the certification obtained and the leader maintains the life-long education process (Sertoğlu, 2010). If the subordinates of a leader are contented, then the leader is successful. If they are not, then one cannot speak of successful leadership (Alıcı, 2004). Any individual who implements the strategic vision successfully, resolves critical problems and does the strategic planning bears leadership traits (Cascio, 2010). The leader is the person who convinces members of the organization and inspires his employees (Lunenburg, 2011). Having the power, charisma and different personality traits slightly contributes to leadership. Understanding the employees, being a good listener and resolving problems are also important in terms of leadership. These make people meet to reach a common goal (Akyar, 2014). Motivating employees, encouraging them for the works to be carried out, governing them for shared goals and promoting creativity are of common features of leadership (Gürel and Yılmaz, 2014).

### 2. LEADERSHIP BEHAVIOURS AND LEADER TYPES

There are different types of leadership behaviour.

**Autocratic Leadership:** The autocratic leader has the absolute power. He sets the group policy and does the planning himself. He determines the relationships between group members. He is the one who rewards and also punishes (Serinkan, 2008). The creativity of groups members diminishes in the case of such leadership. The leader's being self-centred or his ignorance of the ideas and beliefs of group members disrupts the motivation of the members and creates psychological dissatisfaction in employees. Thus, employees start to have a strong dislike of the leader and internal conflicts and disagreements increase

(Eren, 2005)

In such leadership, the leader is highly motivated. The decision-making process is fast as he merely takes decisions himself. In this type of leadership, there is decreased motivation due to the extremely strict nature of the leader. The followers may display psychological dissatisfaction, decrease in morale and conflict (Kılınç, 2009). The excessive self-centeredness of the leader results in a decrease in creativity within the group (İlgar, 2005)

**Democratic Leadership:** The leader includes all the employees in the process of formulation and implementation of decisions. This results in sound communication between the leader and the subordinates. Thus, the willingness of the staff to serve increases (Serinkan, 2008).

In democratic leadership, the whole team acts as a social group due to the presence of a central authority. The employees are informed, their ideas are asked and they are encouraged by the leader (Doğan, 2007.)

**Cosmopolitan Leadership:** The cosmopolitan leader who is focused on learning is the one who pushes the limits in a disciplined manner. These leaders learn the answers to the questions largely from their followers (Memişoğlu, 2003).

Such a leader immediately responds to the wishes and needs of his followers. Thus, he elevates their sense of subordination. He also influences the employees by means of his cosmopolitan skills. (Uğurluoğlu and Çelik, 2009)

**Visionary Leadership:** In visionary leadership, individuals are those who can see the future better under a shared vision. The leader facilitates individuals' innovations and trials and takes risks (Günlü, 2012). The visionary leaders who are always open to innovations are aware that new ideas bring about new initiatives and new horizons. They keep making trials and they are insistent. They do not easily give up what they plan to do and are highly skilled on convincing (Gedikoğlu, 2015).

The leadership style which is oriented towards seeing the future in the real sense is visionary leadership. Such leaders analyse uncertain situations with success. They put forth ideas which will resolve problems and increase opportunities (Doğan, 2007).

**The Learning Leader:** They come to the foreground with their freethinking, convincing skills and their willingness to learn. Such leaders also encourage their teams to learn (V. Çelik, 2011).

**Transformational Leadership:** Transformational leaders provide their employees with motivation and reveal the synergy. They encourage individuals to use their skills and talents effectively. Group members champion group interests rather than their own (Kurtuluş and Kutanis, 2015).

Transformational leadership assist in the development of skills and potentials of employees. Their performance is far superior than that of the employees (Gedikoğlu, 2015)

**Transactional Leadership:** The transactional leader who exerts extraordinary efforts in the resolution of problems devises programs and enables communication. Such leaders have a guiding role in decision-making, negotiation and the development of employees (V. Çelik, 2011). Administrators demonstrating transactional leadership make use of money and status for empowerment. They reward employees for their achievements and encourage them to consolidate their success (Şimşek and Fidan, 2005).

This leadership style is characterized by dimensions of conditioned reward, management by exception and laissez-faire leadership (Buluç, 2009). Management by exception is divided into two as active and passive implementation. In active implementation, the leader corrects the employees' mistakes and deviations from the standard. In passive management, the leader does not do anything for such mistakes and deviations. He remains passive in problem-solving (Buluç, 2009). In laissez-faire leadership, on the other hand, the leader keeps his distance in the face of incidents and his presence is not felt on the ground. It is the slowest leadership style and symbolizes lack of transaction. The leader is ineffective and insensitive. He avoids decision-making and assuming responsibility. Such leaders disappear when they wish to do so (Buluç, 2009).

**Charismatic Leadership:** Charisma is the quality of the leader. Such leaders feel well psychologically. They convey the enthusiasm they feel to their followers (Sertoğlu, 2010). They are masterful in influencing the employees and making them follow their lead. They have a say in decisions. They keep their distance with the employees and ask the tasks given to be fulfilled. These leaders are influential on individuals and societies. They are nowhere near democracy and appear occasionally (Werner, 1993).

**Ethical Leadership:** Corruption, bribery and favouritism is eliminated owing to ethical leaders.

Exploitation taking place in countries comes to an end (Gedikoğlu, 2015). Ethical leaders are those with a good personality. They have a strong character and possess the right values. Such leaders help to shape the interactions as well as decisions taken in the workplace. The ethical leader is aware of the ethical system and ethical decision-making (Bakan and Doğan, 2013).

**Educational Leadership:** Educational leadership has been the most popular type of leadership in the field of education in the last three decades. This leadership pioneers the effective employees in the school. It aims to increase the professionalism of the teachers and the academic achievements of students (Gedikoğlu, 2015).

Educational leadership is the one associated with students, teachers, educational plans and elements of teaching-learning. It is presently one of the indispensable types of leadership (Bakan and Doğan, 2013).

### 3. LEADERSHIP THEORIES

Leadership theories which include Traits Theories, Behavioural Theories and Contingency Theories are as follows:

**Traits Theories:** These theories which deal with inherent or subsequently acquired traits form the basis of leadership theories as from 1940's. To be a leader, an individual should have physiological and personal traits different than the others (Bakan and Doğan, 2013).

Subsequent to the failure of existing theories in determining the effective leader, scientists have explored and devised different leadership theories (Gedikoğlu, 2015).

**Behavioural Theories:** The behavioural approach focuses on the behaviour of the leader towards the employees during the conduct of the work rather than his personal traits. Relations with the subordinates, decision-making style and conflict management are indispensable elements in that regard (Bakan and Doğan, 2013)

What makes a leader successful and effective is his behaviours during leadership rather than his traits. Behaviours like communication with subordinates, whether or not the authority is delegated, planning and control are factors which determine effectiveness (Sertoğlu, 2010).

According to Rensis Likert, there are two behavioural dimensions of leadership. The first one is leadership which takes into account individuals and the second one is leadership with a spirit of entrepreneurship. Leadership which takes into account individuals inspects performance based on the legal system of reward and punishment. Leadership with a spirit of entrepreneurship, on the other hand, attaches importance to happiness and pursues the satisfaction of employees (Erel and Yalçın, 2014).

**Contingency Theories:** The Contingency theory has been devised where other approaches were not found satisfactory in terms of leadership. The behavioural approach is preferred more in terms of leadership traits (Sertoğlu, 2010). As a result of globalization, studies oriented towards distinguishing successful leaders from unsuccessful ones have been made. The traits theory has emerged following the determination of these personal traits. Thus, studies aimed at understanding leadership have been needed to discover what a successful leader does and how he behaves (Bakan and Doğan, 2013)

Researches have been made under the contingency approaches in cases where the behavioural leadership theory fell short. Studies have aimed to determine the effectiveness of a leader based on contingency factors like the type of work, group norms, time limit and organizational culture (Bakan and Büyükbeşe). The activities and behaviours of a leader are determined by his personality and behavioural traits. The members forming the team and following the leader are elements of the environment one is in. The leadership concept on the other hand may be formulated as follows (Erel and Yalçın, 2014).

### 4. EFFECTIVE LEADERSHIP

Studies on leadership behaviours have initially been made in 1950's. In one research made by Ohio State University on leadership behaviours, studies were focused on attaching importance to the individual and mobilizing the structure.

In another study carried out in Michigan University on leadership behaviours, relationships between the leaders were defined and evaluations were made in relation to group projects and group performances. Likert analysed the differences and similarities of effective and unsuccessful leaders and defined three types of leadership behaviours between the years 1961 and 1967 (Yukl, 2002).

**1. Task-oriented Behaviour:** Effective administrators are resourceful. They focus on task-oriented functions and coordinate the tasks of employees.

- 2. Relationship-oriented Behaviour:** It is put forth that sound personal relationships, supporting the subordinates and being philanthropic is influential in effective leadership.
- 3. Participative leadership:** Effective administrators ensure that the subordinates participate in decision-making, enhance communication, increase solidarity and facilitate the resolution of complicated problems.

## 5. STUDIES ON EFFECTIVE LEADERSHIP

In the subject of effective leadership, theoretical deduction and judgment classification was employed to define previous studies and classifications (Kim and Yukl, 1995).

- 1. Planning and organization:** The leader determines long-term goals and strategies. He also looks for ways of developing coordination, productivity and organizational efficiency.
- 2. Problem-solving:** He defines the problems related to the work. It analyses such problems and seeks for reasons and ways to solve the problems.
- 3. Explaining roles and objectives:** He explains the responsibilities related to the work and the targets of the tasks.
- 4. Briefing:** He explains the information necessary for the continuation of the work by using written documents, verifies technical data and ensures that they reach the right individuals.
- 5. Oversight:** He determines the information related to the work as well as the external factors influential on the work. He also inspects the work and its development.
- 6. Motivation and Inspiration:** He employs influential techniques for emotional or rational support, assistance or resources.
- 7. Consultation:** He supports proposals for development.
- 8. Assignment:** While leaders assign their subordinates, they should clearly indicate what should be done or when the work should be completed.
- 9. Support:** The leader acts sincerely and considerately. He is patient and helpful.
- 10. Development and consultation:** He makes suggestions with respect to careers.
- 11. Conflict management and team-building:** He finds constructive solutions to conflicts.
- 12. Networking:** He develops communication with individuals who are sources of information and support and facilitates socialization.
- 13. Recognition:** He commends effective performance and significant achievements.
- 14. Rewarding:** Kim and Yukl who explained managerial applications under headings formed an integrated structure under the scope of behaviour classification. They conceptualized this under three independent dimensions as task efficiency, human relations and adaptive change.
  - a. Task-oriented: It is related with the successful performance of the task.
  - b. Relationship-oriented: It is related with the development of multiple relationships, increasing job satisfaction of subordinates and individuals' identifying themselves with the organization.
  - c. Change-oriented: It is related with developing strategic decisions, making significant changes in products and services and ensuring commitment to changes. Effective leaders should be flexible and adaptive (Yukl, 2002). They decide when and how a work needs to be done.

## METHODOLOGY

The present research has been conducted by using the literature review method. According to Büyüköztürk et al (2013), literature review is made by systematic definition and classification of information and documents related to the relevant research and subsequently the data obtained through the review are analysed (Büyüköztürk, Çakmak, Akgün, Karadeniz, Demirel, 2013).

### Data Collection Tool

Data pertaining to this research have been analysed after having been compiled from the references contained in several books, articles and theses included in the literature following the screening work conducted in Ulakbilim, Scopus, Ebscohost, Google Scholar and YÖK (Council of Higher Education) databases.

### Study Group

This study analyses 17 articles and 7 postgraduate theses written between 2009-2017 with a view to find about studies on leadership and effective leadership.

## FINDINGS

The findings section include the titles, sources, years of publication, authors and methodology of the theses and articles under the research. The findings are explained through a table.

Studies made between 2009 and 2017 on leadership and effective leadership are given in Table 1. An analysis of the studies reveals that the sources of the articles are the journals on education.

**Table 1. Articles and Theses Written Between 2009 and 2017 on Leadership and Effective Leadership**

Title	Source	Year of Publication	Number of Authors	Methodology
An Analysis of the Kindergarten Headmasters' Possession Levels In Respect of Effective Leadership in Terms of Certain Variables	YÖK Thesis Postgraduate Thesis	2011	1	Quantitative
An Analysis of the Kindergarten Headmasters' Effective Leadership Traits and Possession Levels in Terms of Certain Variables	YÖK Thesis Postgraduate Thesis	2015	1	Quantitative
An Analysis of the Postgraduate Theses on Educational Administration and Supervision in Terms of Leadership Theme	YÖK Thesis Postgraduate Thesis	2016	1	Quantitative
Controlled Autonomy: Novice Principals' Schema for District Control and School Autonomy	Scopus Journal of Educational Administration	2016	2	Qualitative
Cultures of Learning in Effective High Schools	Google Scholar Educational Administration Quarterly	2016	3	Qualitative
The Effect of Transformational and Transactional Leadership and Leader-Member Interaction on Organizational Citizenship Behaviour	Google Scholar Educational Administration: Theory and Practice	2012	3	Quantitative
Educational Leadership for Social Justice in Costa Rica, Mexico, and Spain	Scopus Journal of Educational Administration	2016	7	Qualitative

		2012		Qualitative
Servant-Leadership	Google Scholar Dergipark.ulakbim.gov.tr		2	
		2009		Quantitative
The Relationship between Bureaucratic School Structure and Leadership Styles of School Principals in Primary Schools	Google Scholar Education and Science	2010	1	Quantitative
			2	
Primary School Administrator's Transformational Leadership Traits (The Example of Malatya Province)	Google Scholar Pamukkale University Journal of Education Faculty	2012	1	Quantitative
Researching the Effective Leadership Traits of Administrators in Girls' Technical and Vocational High Schools. "The Example of Kocaeli Province"	YÖK Thesis Postgraduate Thesis	2016	1	Quantitative
			1	
Learning and growing: trust, leadership, and response to crisis	Scopus Journal of Educational Administration	2016	1	Quantitative
		2016	3	Qualitative
Effects of Leader Cultural Intelligence on Subordinates Organizational Citizenship Behavior and Job Satisfaction	Google Scholar Journal of Defence Sciences		1	Quantitative
		2012		Quantitative
The Effect of Leadership Levels of High School Principals on the Motivation of Teachers (The Example of Konya Province)	YÖK Thesis Postgraduate Thesis	2015	2	Quantitative
	Scopus Journal of Educational Administration	2014		Quantitative
New principals, accountability, and commitment in low-performing schools	Google Scholar Journal of Theoretical Educational Science		1	Quantitative

An Investigation of the Effective Leadership Behaviors of School Principals	YÖK Thesis Postgraduate Thesis	2017	2	Quantitative
An Analysis of the Relationship Between the Effective Leadership Traits of School Administrators and Subjective Well-Being	YÖK Thesis Postgraduate Thesis	2009	1	Quantitative
An Analysis of the Relationship Between the Contingency Leadership Styles of Secondary School Principals Perceived by Teachers and Their Educational Leadership Roles (The Example of Kartal District)	Scopus Journal of Educational Administration	2016		Quantitative
Principal's perceptions of Effective Professional Development in Schools	Google Scholar Educational Administration	2017		Quantitative
The Relationships between Organizational Commitment and Leadership Styles of Principals Based on Elementary School Teacher's Perceptions	Scopus Journal of Educational Administration Routledge	2017		Qualitative
Sustaining School Improvement in a High-need School Longitudinal Analysis of Robbins Elementary School (USA) from 1993 to 2015	Scopus Journal of Educational Administration			
The Language of Performativity? A Content Analysis Concerning Differing Constructions of Leadership for Secondary School PE Departments	Scopus Management & Administration Society			

As seen in Table 1, 17 articles and 7 postgraduate theses written between 2009 and 2017 have been analysed. Of the works analysed, 8 was written through qualitative and 16 by quantitative methods. The examination of the findings reveals that foreign researchers mostly use the qualitative method. When the works are examined, it was also found out that articles were largely published in educational journals and that the majority of the works involved researches where leadership issues were explained.

#### **DISCUSSION AND CONCLUSION**

This research has been made to analyse works conducted in relation to leadership and effective leadership. A total of 24 works conducted between 2009 and 2017 have thus been analysed. It has been seen that 8 of the works were conducted by using the qualitative method whereas 16 were conducted by using the quantitative method. Overall, it has been ascertained that the qualitative researches contained the definitions and explanations of the subject matter. In the quantitative researches, on the other hand, the data have generally been collected through a survey. The majority of the references were reached through Scopus database. Since Scopus is the largest database of the literature which contains scientific journals, books and conference reports, it allows retrieving researches all over the world. It is used by more than three thousand institutions globally ([www.elsevier.com](http://www.elsevier.com)). When the number of authors of the works conducted was examined, it has been found out that they were largely written by more than one author.

Leadership has come existed everywhere and at all times since the existence of mankind (Bakan, 2008). A strong leadership enables superiority and equality in education as well as the continuity of the vision. It supports people, programs and services in order to realize the vision of the school (Karsh, 2006). Leaders know how to attain their goals and they are generally self-confident individuals who act less personally, generate ideas quickly in case of need for action and subsequently take action (Tahaoğlu and Gedikoğlu, 2009).

Contrary to the active transformational leader who bears effective leadership traits and helps his employees to perform well, the laissez-faire leader is an administrator who stays in his office, meets with few students and employees, ignores teachers' needs and student development and lets everything go on as it is (Hoy and Miskel, 2010). According to Korkmaz (2008), school principals displaying transformational leadership behaviours are more influential in the emergence and development of features like risk-taking and taking initiatives, occupational development, shared and observed mission and collaborative climate, which are described as the features of a learning organization. In terms of the future of organizations, the way leaders are selected is of importance (Kasımoğlu and Küçükaslan, 2005). The non-objectivity of the criteria by which school administrators are designated; failing to attach due importance to educators having a postgraduate degree in the field of educational administration and supervision; the non-ethical nature of the process by which administrators are designated as well as training, electing, assigning and promoting school administrators may cause administrators to attach more importance to the dimension of leadership within the management process (Argon, 2004).

The effective leader should be visionary, democratic and also tolerant. Furthermore, he should be excited about his job and be exemplary. He should be trustful and reliable in nature, give positive energy to those around and have the ability to mobilise and convince them. Effective leaders should have traits like being able to establish communication easily. Therefore, the atmosphere of the school is really important due to

its effect on the education of students. For, it is easier to attain goals by encouraging the behaviour and loyalty of a staff in a school with a positive atmosphere (Öznacar and Osma, 2016).

In conclusion, in a modern society, changes in the structure and management of a school also bring about a change in the roles of school administrators. The school administrator assumes new roles in terms of innovations like globalization, information technology and total quality management. Thus, administrators contribute to training in the field of educational administration. Otherwise, the pursuit of becoming an information society cannot be successful. The transformational leadership is becoming prominent in the field of educational administration as it contains elements of innovation, reform and future. For, the collective action generated through transformational leadership renders the participants of the process stronger. As principles like responsibility, fairness and commitment are in the foreground more in this process in addition to internal factors like hope, optimism and energy, the educational administration system is affected more positively.

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# Drug Use Characteristics of Elderly Women Living in a Rural Area

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## ABSTRACT

**Purpose:** The study was conducted to determine the drug use characteristics of women aged 65 years and older living in a rural area in the Eastern Black Sea Region.

**Methods:** The universe of the descriptive research was composed of 273 women over 65 years of age registered in the Family Medicine Unit in a rural area in the Eastern Black Sea Region; while the sample consisted of 256 women. Data were collected from March to June 2014 using the "Patient Information Form" using face-to-face interview technique. Number and percentage test were used to evaluate the data.

**Findings:** Of the elderly women surveyed, 53.9% were in the age range of 65-74, 51.6% were retired, 58.2% were in 'income less than the expense' group and 46.1% benefited from social security. It was found that 92.2% of elderly women used prescribed drugs, 73.0% used drugs regularly, 52.7% knew about the side effects of the drugs they used, 48.4% used 3-4 drugs daily, 41.4% experienced side effects related to drugs and 23.8% of those side effects were gastrointestinal complaints.

**Results:** Most elderly women use prescribed drugs, and most of them take their drugs regularly. Monitoring the use of drugs is especially important for women living in rural areas.

**Keywords:** Nursing, Drug, Drug Use, Elderly Women

## INTRODUCTION

The share of the elderly population, as determined by the World Health Organization (WHO) "65 years and over", is increasing day by day in many countries around the world. The elderly population constitutes 8.5% of the world's population according to 2015 data, and this rate is increasing rapidly [TÜİK], (2016). The elderly population in Turkey, which is in the process of global aging, is 6.495.239 according to 2015 data and constitutes 8.2% of the whole population. 43.8% of the elderly population is male and 56.2% is female. The Turkish Statistical Institute (TUIK) reports that the life expectancy at birth in Turkey is 80.7 years for women and 75.3 years for men in 2015; and that this ratio will increase by 10.2% for men and women in 2023 [TÜRKSTAT], (2014), [WHO], (2015)

Aging is all the non-reversal, structural and functional changes that occur as the organism progresses at the level of molecules, cells, tissues, organs and systems [Ulker, Göksel S,2010]. Aging is the process of aging, in which successive changes occur throughout life (Kurt, & Çiçek, 2014). Old age can not be considered independent of social, physical characteristics, conditions and problems. Factors such as education, occupation, income situation, living place (rural-urban), environment can affect the social characteristics and harmony of the elderly (Kurt, 2008). Furthermore, the fact that the life span of men in Turkey and in the world is shorter than that of women, causes the number of widowed women to increase among women over 75 years old; and this situation is referred as "womenalization of older age" (Arun, 2014 & Arun, 2013).

Womens' relatively longer life expectancy causes elderly women to be more susceptible to chronic illnesses than men, and to refer to health institutions more frequently. This increases the use of drugs by older women.(Gökçe ,2006; TÜİK,2016).

While all organs and systems are affected by aging, some situations also vary according to sex. (Efe, & Aydemir, 2015; Tufan, 2007; TUIK, 2016). Elderly women have fewer lung tissue complications, less calcification in the cartilage, and lower thoracic degeneration, and these processes take longer to form. Following menopause in women, ovaries terminate estrogen and progesterone synthesis, and thyroid hormone synthesis and destruction is reduced. In addition to age-related bone loss, there is also a rapid bone loss due to estrogen deficiency in the perimenopausal period. 40% and 25% bone loss occur at advanced senescence period in women and in men, respectively. Elderly women are increasingly susceptible to urinary infection because of short urethra, sphincter muscle loosening, decreased bladder capacity, loss of urine concentration and acidification, and the presence of glycosuria and non-compliance with hygiene requirements. In 2015, the proportion of illiterate elderly women (32.6%) is four times higher than that of elderly men (8.2%). Along with the advancing age, decreasing the productivity of elderly women causes them to lose some physical abilities and change their social position to be exposed to loneliness and neglect. The lack of regular and well-equipped examination facilities for elderly women living in rural areas leads to difficulties in reaching the center to benefit from health services and the control of given drugs leads to the inability for adequate follow-up. These physical and psychosocial differences in older women alter the pharmacodynamics and pharmacokinetics of drugs, making the treatment process more difficult by increasing the risk of drug effects, side effects and interactions between drugs. This research was conducted to determine the drug use characteristics of 65-year-old and older women living in a rural area in the Eastern Black Sea Region.

## **MATERIALS AND METHODS**

This descriptive study was conducted between March and June 2014. The universe of the research was composed of 273 women aged 65 years and over, registered in the Family Medicine Unit (FMU), number 10 in the Eastern Black Sea Region of Rize, Ardesen. In order to reach the whole universe, sample selection was not conducted in the study. However, the study was completed with 256 elderly women for reasons that older women enrolled in FMU should be excluded from the province during the collection of research data and refused to participate in the survey. Thereby, elderly people aged 65 years and over who were able to communicate verbally, good orientatied and agreed to participate in the research were enrolled in the study.

Data were collected with the "Patient Information Form" created by the researcher by searching the literature. The Patient Information Form was composed of two parts. In the first chapter; 10 questions to determine the personal characteristics (age, gender, education level, marital status, etc.) of 65 years old and older women; a total of 22 questions were included to determine the characteristics related to drugs (prescribed/non-prescribed drugs, where the drugs were prescribed, daily amount of drugs, which way drugs were taken etc.). The patient information form was filled by the researcher at the AHB using face-to-face interview techniques with older women aged 65 years and older. The questions on the form were asked to the elderly women by the researcher and the responses were recorded. It took about 30 minutes to complete the form. The survey is limited to the search for women aged 65 years and older who are registered with the FMU in the Ardesen district of Rize, eastern Black Sea region only. For this reason, the research results are limited to women aged 65 and over who are registered with the FMU, number 10 in Ardesen, Rize. Required permission was granted from the Rize Public Health Directorate for the research to be carried out.

## **FINDINGS**

Table 1 shows sociodemographic characteristics of older women. Of the elderly women, 53.9% were in the age group of 65-74, 48.0% were in spouse died group, 40.6% of them were primary school graduates, 51.6% were retired, 58.2% were the income fewer than outcome group, 46.1% were in retired group, 44.1% were living with other family members, 100% were non-alcoholic and 83.6% were non-smokers (Table 1).

**Table 1. Socio-demographic characteristics of elderly women (n = 256)**

Socio-Demographic Characteristics	n	%	
Age	65 - 74 years	138	53.9
	75 - 84 years	101	39.5
	85 years and over	17	6.6
Marital Status	Married	117	45.7
	Widowed	123	48.0
	Divorced	16	6.3
Educational Status	Non-literacy	43	16.8
	Literacy	93	36.3
	Elementary School	104	40.6
	High School	14	5.5
	Univercity	2	0.8
Profession	Housewife	124	48.4
	Retired	132	51.6
Monthly Income	Income greater than outcome	13	5.1
	Income equal to outcome	94	36.7
	Income fewer than outcome	149	58.2
Social Security	Pension Fund	118	46.1
	Bag-Kur	72	28.1
	Social Security Organisation	52	20.3
	Special Fund	14	5.5
Household	Alone	29	11.3
	Husband/Wife	48	18.8
	Husband/Wife and children	66	25.8
	Other family members	113	44.1
Alcohol Use	Yes	-	-
	No	256	100.0
Smoking Status	Yes	42	16.4
	No	214	83.6

It was determined that 98.4% of elderly women have their drugs prescribed at primary health care institutions. Antihypertensive (70.3%), urinary system (48.0%) and endocrine system drugs (45.7%) were the most common prescribed drugs. Only 7.8% of the elderly women use non-prescribed drugs (Table 2).

**Table 2. Prescribed Drug Use Characteristics of Elderly Women (n = 256)**

<b>Prescribed Drug Use Characteristics</b>		<b>n*</b>	<b>%</b>
<b>Health Institutions ibing The Drugs</b>	Primary Health Care Facility	252	98.4
	State Hospital	51	19.9
	Private Hospital	5	2.0
	Univercity Hospital	8	3.1
		<b>n*</b>	<b>%</b>
<b>Drugs Used by Prescription</b>	Antihypertensive Drugs	180	70.3
	Urinary System Drugs	123	48.0
	Endocrine System Drugs	117	45.7
	Analgesic And Anti-inflammatory Drugs	212	44.0
	Psychotropic Drugs	83	32.4
	Vitamins	74	28.9
	Cardiovascular System Drugs	122	25.3
	Respiratory System Drugs	116	24.1
	Digestive System Drugs	110	22.8
	Haematological drugs	57	22.3
	Antirheumatic Drugs	42	16.4
	Antihistamine Drugs	39	15.2
	Eye-Related Drugs	35	13.7
	Oncological Drugs	20	7.8
<b>Unprescribed Drug Use</b>	Yes	20	7.8
	No	236	92.2

\*(More than one reply, value of "n" is folded).

It was determined that 89.8% of the elderly women were informed about the drugs they used, and that 64.5% of the information was provided by the physician (Table 3).

**Table 3. Characteristics of Information on Drugs Used by Elderly Women**

<b>Characteristics of Information on Drugs</b>		<b>n(256)</b>	<b>%</b>
Gathering Information About Drugs	Yes	230	89.8
	No	26	10.2
		<b>n*(230)</b>	<b>%</b>
Information Gathered By	Physician	165	64.5
	Pharmacist	108	42.2
	Nurse	24	9.4

\*(More than one reply, value of "n" is folded).

It was determined that 71.9% of elderly women did not read the drug prospectus that they used, 41.4% did not understand the first line of statement and 18.8% had visual disability (Table 4).

**Table 4. Elderly Women's Ratio of Reading Drug's Prospectus and the Reasons for not Reading**

<b>Ratio of Reading Drug's Prospectus and Reasons for not Reading</b>		n(256)	%
Reading Drug's Prospectus	Yes	72	28.1
	No	184	71.9
		<b>n*(184)</b>	<b>%</b>
Reasons For Not Reading	Misunderstanding The Statement	106	41.4
	Visual Disability	48	18.8
	Not needing to read	42	16.4
	Non-literacy	26	10.2

\*(More than one reply, value of "n" is folded).

It was found that 48.4% of the elderly women used 3-4 drugs per day, and that 99.2% of those were taken orally (Table 5).

**Table 5. The Amount Of Daily Drugs Used by Older Women And Drugs' Delivery Routes**

<b>The Amount Of Daily Drugs, Drugs' Delivery Routes</b>			
		n(256)	%
The Amount Of Daily Drugs	3-4 pieces	124	48.4
	5-6 pieces	78	30.5
	1-2 pieces	40	15.6
	>7 pieces	14	5.5
			<b>n(256)*</b>
Drugs' Delivery Routes	Oral	254	99.2
	Epidermal	44	17.2
	Subcutaneous	41	16.0
	Intraocular	34	13.3
	Inhaler	34	13.3
	Intramuscular	25	9.8

\*(More than one reply, value of "n" is folded).

It was determined that 52.7% of elderly women are aware of the side effects of the drugs they use, 41.4% have side effects related to drugs they use and 23.8% of these side effects are gastrointestinal complaints. (Table 6).

**Table 6. Adverse Effects Related to Drugs Used by Elderly Women**

<b>Adverse Effects Related to Drugs</b>		<b>n(256)</b>	<b>%</b>
Aware Of Side Effects	No	135	52.7
	Yes	121	47.3
		<b>n(256)</b>	<b>%</b>
Experiencing The Side Effects	No	150	58.6
	Yes	106	41.4
		<b>n(106) *</b>	<b>%</b>
Complaints Related To Drugs	Gastrointestinal Complaints	61	23.8
	Cerebrovascular Complaints	23	9.0
	Dermal Complaints	17	6.6
	Muscle-Skeletal Complaints	15	5.9
	Endocrinal Complaints	13	5.1
	Other (Cardiovascular, Respiratoral, Psychiatric) Complaints	4	1.6

\*(More than one reply, value of "n" is folded).

It was determined that 73.0% of older women use their drugs regularly. 23.0% of the elderly who do not use their drugs regularly can not keep up with the drug hours and 22.3% forget to take their drugs (Table 7).

**Table 7. The Rate of Regular Use of Drugs by Older Women and the Reasons for Not Using**

<b>The Rate of Regular Use of Drugs and the Reasons for Not Using</b>		<b>n(256)</b>	<b>%</b>
Regular Use of Drugs	Yes	187	73.0
	No	69	27.0
		<b>n(69)*</b>	<b>%</b>
Reasons for Not Using	Not keeping up with drug taking hours	59	23.0
	Forgetting to take drugs	57	22.3
	Not feeling well and reducing the dose	39	15.2
	Drug tablets being large and hard to swallow	18	7.0
	Felling well and reducing the dose	17	6.6
	Not benefiting from drugs	13	5.1
	Not being able to provide drugs	10	3.9
	Drugs tasting awful	9	3.5
Disclaiming treatment	2	0.8	

\*(More than one reply, value of "n" is folded).

It was determined that 99.6% of elderly women are careful to take their drugs on the right pathway and 46.1% have difficulty to use drugs due to dementia. (Table 8).

**Table 8. Points Of Consideration By Elderly Women In Their Drug Use And They Experience (n=256)**

<b>Points Of Consideration In Drug Use And The Difficulties They Experience</b>	<b>n*</b>	<b>%</b>
Taking drugs in the right pathway	255	99.6
Taking drugs as explained in prospectus	239	93.4
Taking drugs on right time	193	75.4
Taking drugs on right dose	192	75.0
Storing drugs properly	180	70.3
Taking drugs by obeying hygiene rules	178	69.5
Consuming enough water with orally taken drugs	144	56.3
Being aware of drugs expiration date	73	28.5
Reading drugs prospectus	71	27.7
Following drug related side effects	66	25.8
Taking information about drug related side effects	64	25.0
<b>The Difficulties in Drug Use</b>		
Forgetting to take drugs	118	46.1
Having to use equivalent (non-original) drug	104	40.6
Having difficulties to use drugs (injection, inhaler etc.)	95	37.1
Confusing which drug to use	77	30.1
Drug not available in pharmacy	68	26.6
Not taking drugs on right time	64	25.0
Experience more side effects using more than one drug	58	22.7
Difficulties to swallow	48	18.8
Difficulties in prescription	36	14.1
Difficulties in dosing	31	12.1

\*(More than one reply, value of "n" is folded).

## DISCUSSION

Elderly people often refer to health institutions related to chronic diseases and drug use (Ünsal ,Demir, Ozkan and Arslan (2011). In our study, nearly all of the elderly women (98.4%) have their drugs prescribed in primary health care institutions. In a study, 55.2% of which consisted elderly women, it was determined that 44.2% of the elderly were referring to primary health care facilities for prescription (Demirbağ & Timur, 2012). The antihypertensive drugs (70.5%), the urinary system drugs (48.0%) and the endocrine system drugs (45.7%) were among the drugs mostly used by the elderly women in our study group.

Akkus and Karatay (2011) found that older women mostly used antihypertensive drugs (68.4%), analgesics (50.0%) and antidiabetic drugs (26.3%); while Demirbağ and Timur (2012) found they used antihypertensive (67.8%), antirheumatic (62.4%) and diuretic drugs (46.0%) . In our study, 92.2% of elderly women use prescribed drugs whereas only 7.8% use non-prescribed drugs. In the study of Unsal and his colleagues (2011), in which elderly women constitute 40.5% of total women population, it was found that 75.4% of the elderly were using prescribed drugs; while 7.9% used non- prescribed drugs and 5.6% used both prescribed and non-prescribed drugs.

It was determined that 89.8% of the elderly women in our study group were informed by physician (64.5%), pharmacists (42.2%) and nurses (9.4%) about the drug they use. In their study consisting %55.2 of elderly women, Demirbağ and Timur (2012) reported that elderly women were informed by physician (22.1%), pharmacist (9.7%) and nurse (7.1%) about the drugs they used; while Dolu and Bilgili (2010) determined that elderly people refer to physician (88.7%), pharmacist (23.8%) and nurse (2.2%) for information, both were in line with our findings.

In our study, 71.9% of elderly women stated that they did not read the drug prospectus; the reasons were not understanding the transcripts (41.4%), having visual disability (18.8%), not needing to read (16.4%) and being

illiterate (10.2%). In parallel with our findings, Solmaz and Akin (2009) stated that in their research, which consisted 49.4% of elderly women, 80.8% of the elderly individuals did not read the drug prospectus. In the same study, the reasons for not reading drug prescriptions for elderly people were misunderstanding (77.7%), visual disability (13.0%) and not needing to read (9.3%). Demirbağ and Timur (2012) also stated that in their study, which consisted 55.2% of elderly women, 67.8% of the elderly did not read the prospectus of drugs and that visual disability (42.8%) was the reason for not-reading.

It is reported that in line with the increase of chronic diseases, elderly people have to use more drugs (Feng and friends.2014). In our study, 48.4% of elderly women were using 3-4 drugs per day; while 30.5% used 5-6 drugs daily. In line with our study, Yaylıcı et al. (2016) found that 67.7% of the elderly used at least one drug, while 13.4% used five or more drugs; and Solmaz and Akin (2009) found that 46.5% of the elderly were using three or more drugs daily, whereas Çatak and colleagues (2011) found that 26.5% used five or more drugs daily. In our study, it was determined that the elderly women used the most oral pathway (99.2%) for drug intake. It is thought that orally drug is preferred by both the patient and the physician because of the reason that the elderly can easily reach and apply this form.

Drug related side effects are more common in the elderly (Unsal and friends. (2011). 52.7% of the elderly in our study are aware of the side effects of the drugs they use, and 39.8% of them experience side effects related to the drugs. Gastrointestinal system (23.8%), cerebrovascular system (9.0%) and skin (6.6%) related complaints were among the common complaints experienced by those who had side effects. Solmaz and Akin (2009) reported that 35.6% of the elderly are aware of the side effects related to the drugs they use. Akkuş and Karatay (2011) determined that 47.4% of the elderly had side effects related to the drug they used, and that 21.1% of those who had side effects experienced constipation, 18.4% had fever and fatigue and 9.2% had gastric complaints.

Regular use of drugs is important for the effectiveness of treatment in chronic diseases. Increasing number of chronic diseases in line with age can also increase the amount of drugs and create problems about regular use of drugs (Akkuş & Karatay (2011). While 73.0% of elderly women who participated in our research did regularly used their drugs, 27.0% did not use their drugs regularly. Most common reasons for not taking drugs regularly are forgetting to take drugs (23.0%) and not keeping up with drug taking hours (22.3%). In line with our study results, Dudak et al. (2006) reported that 71.2% of the elderly used their drugs regularly. In the same study, the frequency of regular drug use was found to be higher in women (77.8%) than in men (62.5%).

As a result; most elderly women use prescribed drugs, most of them are informed about the drugs they use, very few read the drug prospectus, almost half of them use about 3-4 drugs per day, almost half of them experience side effects related to the drugs they use and almost half of them forget to take drugs. Periodic monitoring of drug use in older women is recommended.

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## Ear Training Approach in the Context Of “Do To Do” Scale in Music Education

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### Abstract

Ear Training Is One Of The Most Important Elements In Music Education. The Purpose Of This Study Is To Discuss The Approach Used As A “Do To Do” Scale In Ear Training Education By Presenting Unique Charts And Examine The Advantages In Music Education. Charts Prepared In Major And Minor Tonalities And Scales Written In All Major And Minor (Including Natural, Harmonic And Melodic- Chromatically) Scales, Are Prepared As A Guideline To Those Related With The Subject. “Do To Do” Scale, Also Known As The Dalcroze Scale, Is One Of The Methods Used In Solfeggio And Dictation Training Which Brings A Different Perspective To Tonality.

**Key Words:** Ear Training, Music Education, “Do To Do” Scale, Solfeggio And Dictation Training.

### Introduction

Ear Training Is Training In The Power To Perceive The Tonal Elements In Musical Beauty. It Always Involves Setting Up The Right Kind Of Responses To Music (Jackson, 1963, P. 133). Although The Ear Training Models Used In Music Education Methods Differ, Almost Every Method Aims At Not Only Better Hearing, Dictation And Solfeggio But Also Development Of Music Literacy; According To Günay And Özdemir (2006, P.73) Ear Training Is Also Referred To As “Training Of Music Capability”. The Development Of This Ability Will Undoubtedly Be The Result Of Desire And Effort, And Qualified Education. According To Egemen (2003) Quoted From Yıldırım (2012, P. 4) That The Main Aims Of The Solfeggio Training Program Is To Improve The Students' Musical Abilities And Various Musical Hearing And Reading Skills. Widely Known Approaches Are Set In Accordance With These Thoughts Are Designed And Developed By Carl Orff, Zoltan Kodaly, Shinichi Suzuki And Emile Jaques Dalcroze. Among These Approaches, Ear Training Has Been Dealt With In Different Ways. There Are Many Ear Training Methods Used Nowadays And Some Of Those Are Fixed Do, Moveable Do, Numbers And With One Syllable.

In The Fixed Do System, C, D, E, F, G, A And B Are Called Do, Re, Mi, Fa, Sol, La And Ti. In Singing A Melody, The Name For Each Note Is Sung Without Regard To Any Accidentals (Berkowitz, Fontrier, Kraft, 1997, P.1). Fixed-Do Implies That A Given Syllable Denotes A Fixed Pitch (More, 1985, P.14). In The Movable Do System, C Always Represent The Tonic Or First Degree Of The Scale, Regardless Of Key Used. Accidentals Are Accounted For By Changing The Syllables. The Ascending Chromatic Scale Reads As Follows: Do, Di, Re, Ri, Mi, Fa, Fi, Sol, Si, La, Li, Ti, Do. The Descending Chromatic Scale Reads As Follows: Do, Ti, Te, La, Le, Sol, Se, Fa, Mi, Me, Re, Ra, Do. The Purpose Of This System Is To Emphasize The Relationship Between The Degrees Of Scale, And To Develop A Feeling For Tonality Even When The Tonal Center Shifts (Berkowitz, Fontrier, Kraft, 1997, P. 1). So, It Would Appear That The Differences Between The Fixed And Movable Approaches Are So Far Largely A Matter Of Degree. The Fixed-Do Class Would Seem To Have Advanced Much Less Than The Movable-Do Group (Multer, 1978, P. 34). In Addition, Many Years Ago, Taylor (1897, P.1) Used To Define "Tonal Relation" For Movable Do And He Mentioned That Beyond Which Music Neither Does Nor Can Extend. Numbers (1, 2, 3 Etc.) May Be Used Instead Of Syllables (Do, Re, Mi, Etc.). The Application Is The Same In The Movable System (Berkowitz, Fontrier, Kraft, 1997, P. 1-2).

Aside From What Has Been Presented Above, This Paper Focuses On “Do To Do” Scale Which Is Also Known As Dalcroze Scale. Emile Jaques Dalcroze (1865-1950) Was A Swiss Educator Who Built Up And Improved The Method Known As Eurhythmics. According To Abramson (1996, P.1), One Of The Early Pioneers In Eurhythmics, The Processes Of Eurhythmics, In Addition To Their Value For Musical Learning, Can Aid General Development In Such Areas As Attention, Concentration, Memory, Coordination, Self-Control And Sensitivity. He Is Best Known For A Chapter In Lois Choksy's Book, “Teaching Music In The Twentieth-Century.” In This Chapter, Abramson (1986) Said That All The Pedagogical Principles And Techniques He Discovered In Eurhythmics, Jaques Dalcroze Reapplied To The Study Of Sight-Singing And Ear Training. Abramson Also Indicated That Special Exercises For The Development Of Perfect Pitch, Accurate Hearing And Refined Intonations Were Combined With Exercises In Mental And Musical Alertness, Concentrations And Memory (Choksy, 1986, P. 52).

### “Do To Do” Scale

The Simplest Expression For “Do To Do” Scale Is Singing All Scales From Tonic To Tonic. The Most Important Goal Of This Approach Is To Broaden The Sense Of Functioning Of The Scales. Solfeggio, On The Other Hand, Aims At The Development Of Inner Hearing, Which Means Hearing Written Notations Mentally Before Actually Singing Or Performing. Inner Hearing Is Concerned With The Control Of Sensitivity In Musical Perception Which Is Related To The Sensitivity Of Our Hearing.

According To Choksy Quoted From Abramson (1986), Dalcroze Noticed That When Major Scales Were Taught From Tonic To Tonic, Students Experienced Only As Transpositions Of The Same Simple Melody. Moreover, Some Scales Could Not Be Experienced Through Singing Because Students Extended Beyond Their Vocal Range. He Proposed A Solution To Resolve The Difficulties Of Experiencing, Comparing And Measuring All The Major Scales, While Keeping All Of Them Within A Comfortable Singing Range (Choksy, 1986, P. 55-56). Thomsen (2011, P. 74) Also Agreed With The Proposition That “Do To Do” Scale Is In Everyone's Vocal Range. Stevenson (2016) Analyzed “Do To Do” Scale As Based In A Series Of Pitch Sets, Which Are Groups Of Consecutive Tones Taken From The Diatonic Scale. The Dyad Contains Two Pitches, The Trichord Has Three, The Tetrachord Has Four, The Pentachord Contains Five, The Hexachord Has Six, And The Heptachord Holds Seven Pitches. The First Three Pitch Sets Are Used In The Study Of The Dalcroze Scales, While The Pentachord, Hexachord, And Heptachord Are Used In The Study Of Triads And Seventh Chords. From The Study Of The Scales Tonicization And Modulation To Nearly Related And Distant Key Centers Are Experienced And Studied. (Stevenson, 2016, P. 18).

His Method Of Fixed Do Scales Used The C Major Scale Melody As The Norm To Which All Other Scales Were Compared; The C Major Scale (From Middle C To The C Above) Became The Frame Which Contained The C Major, As Well As All The Other Scales (Choksy, 1986, P. 56). The Accidentals Of The Tonality Is Also Singing Within The Scale And Finishing The Tonic Of The Tonality. In Figure 1, We Saw E Flat Major Scale We Use Now, Figure 2 Shows Us How To Read The E Flat Major Scale As A “Do To Do” Scale With Degrees. Figure 3 And Figure 4 Are Some Samples For Minor Scales. The Importance Of The “Do To Do” Scale Is Finishing The Tonic Of The Tonality For Closure.

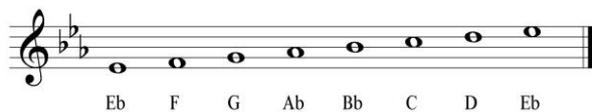


Figure 1: E Flat Major Scale.

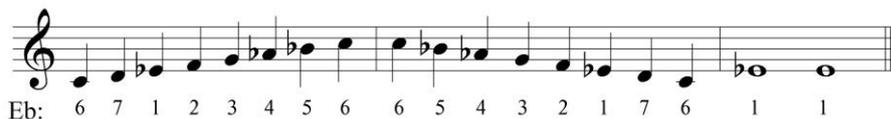


Figure 2: E Flat Major Scale In Terms Of “Do To Do” Scale With Degrees.

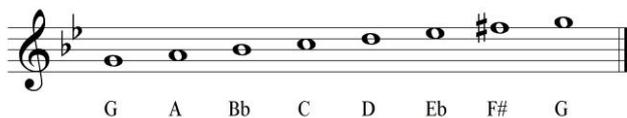


Figure 3: G Harmonic Minor Scale.



Figure 4: G Minor Scale (Harmonic Minor) In Terms Of “Do To Do” Scale With Degrees.

Much Of What We Know Of Today As Dalcroze Solfège Pedagogy Comes From Other Teachers Who Have Added Their Own Ideas To The Method (Ristow, 2017, P. 8). In Figure 5, We See An Example Of Anne Farber's Lessons Who Is The Director Of The Dalcroze Music School In New York. Farber Wanted To Help Her Students Find Their Bearings Tonally In The Scales, And To Encourage Them Away From Feeling The Scales As Modes, She Suggests Adding Words And Rhythms To A Scale (Ristow, 2017, P. 8). We Can Also Apply Farber's Exercise In A Different Tonality (Figure 6). Example In Figure 5 Is In A Flat Major, And Example In Figure 6 Is In

A Major. Once The Accidentals Of The Tonality Are Analyzed, Differences Of The Examples Arise. Accidentals Provide Better Understanding Of The Tonality Of These Examples.



Figure 5: Example In A Flat Major Using Anne Farber's Lessons.



Figure 6: Example Of The Melody At Figure 5 In A Major.

Table 1 And Table 2 Present Two Charts For Major And Minor Scales For Those Who Would Like To Use The "Do To Do" Scale. With These Tables Prepared For All Major And Minor Tonalties, All The Notes Of "Do To Do" Scales Can Be Seen. Tonic And Also Ending Notes Of All Tonalties Are Shown At The Last Columns Of The Tables. At Table 3, All Major And Minor Scales (Including Natural, Harmonic And Melodic) Are Clearly Written One By One With The Degrees. Scales Are Written In Chromatic Way Starting With C To B In Table 3.

Table 1: Chart For "Do To Do" Major Scales.

<b>C MAJOR</b>	C	D	E	F	G	A	B	C	C
<b>D<math>\flat</math> MAJOR</b>	C	D $\flat$	E $\flat$	F	G $\flat$	A $\flat$	B $\flat$	C	D $\flat$
<b>D MAJOR</b>	C $\sharp$	D	E	F $\sharp$	G	A	B	C $\sharp$	D
<b>E<math>\flat</math> MAJOR</b>	C	D	E $\flat$	F	G	A $\flat$	B $\flat$	C	E $\flat$
<b>E MAJOR</b>	C $\sharp$	D $\sharp$	E	F $\sharp$	G $\sharp$	A	B	C $\sharp$	E
<b>F MAJOR</b>	C	D	E	F	G	A	B $\flat$	C	F
<b>G<math>\flat</math> MAJOR</b>	C $\flat$	D $\flat$	E $\flat$	F	G $\flat$	A $\flat$	B $\flat$	C $\flat$	G $\flat$
<b>G MAJOR</b>	C	D	E	F $\sharp$	G	A	B	C	G
<b>A<math>\flat</math> MAJOR</b>	C	D $\flat$	E $\flat$	F	G	A $\flat$	B $\flat$	C	A $\flat$
<b>A MAJOR</b>	C $\sharp$	D	E	F $\sharp$	G $\sharp$	A	B	C $\sharp$	A
<b>B<math>\flat</math> MAJOR</b>	C	D	E $\flat$	F	G	A	B $\flat$	C	B $\flat$
<b>B MAJOR</b>	C $\sharp$	D $\sharp$	E	F $\sharp$	G $\sharp$	A $\sharp$	B	C $\sharp$	B

Table 2: Chart For "Do To Do" Minor Scales (Harmonic).

<b>C MINOR</b>	C	D	E $\flat$	F	G	A $\flat$	B	C	C
<b>C<math>\sharp</math> MINOR</b>	C $\sharp$	D $\sharp$	E	F $\sharp$	G $\sharp$	A	B $\sharp$	C $\sharp$	C $\sharp$
<b>D MINOR</b>	C $\sharp$	D	E	F	G	A	B $\flat$	C $\sharp$	D
<b>E<math>\flat</math> MINOR</b>	C $\flat$	D	E $\flat$	F	G $\flat$	A $\flat$	B $\flat$	C $\flat$	E $\flat$
<b>E MINOR</b>	C	D $\sharp$	E	F $\sharp$	G	A	B	C	E
<b>F MINOR</b>	C	D $\flat$	E	F	G	A $\flat$	B $\flat$	C	F
<b>F<math>\sharp</math> MINOR</b>	C $\sharp$	D	E $\sharp$	F $\sharp$	G $\sharp$	A	B	C $\sharp$	F $\sharp$
<b>G MINOR</b>	C	D	E $\flat$	F $\sharp$	G	A	B $\flat$	C	G
<b>G<math>\sharp</math> MINOR</b>	C $\sharp$	D $\sharp$	E	F $\times$	G $\sharp$	A $\sharp$	B	C $\sharp$	G $\sharp$
<b>A MINOR</b>	C	D	E	F	G $\sharp$	A	B	C	A
<b>B<math>\flat</math> MINOR</b>	C	D $\flat$	E $\flat$	F	G $\flat$	A	B $\flat$	C	B $\flat$
<b>B MINOR</b>	C $\sharp$	D	E	F $\sharp$	G	A $\sharp$	B	C $\sharp$	B

**Table 3.** All Major And Minor (Natural, Harmonic, Melodic) “Do To Do” Scales With Degrees.

**MAJOR AND MINOR “DO TO DO” SCALES WITH DEGREES**



Degree: 1 2 3 4 5 6 7  $\bar{1}$  7 6 5 4 3 2 1 1  
**Figure 1: C major scale**



Degree: 1 2  $\flat 3$  4 5  $\flat 6$   $\flat 7$   $\bar{1}$   $\flat 7$   $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 2: C natural minor scale**



Degree: 1 2  $\flat 3$  4 5  $\flat 6$  7  $\bar{1}$  7  $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 3: C harmonic minor scale**



Degree: 1 2  $\flat 3$  4 5 6 7  $\bar{1}$   $\flat 7$   $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 4: C melodic minor scale**



Degree: 7 1 2 3 4 5 6 7  $\bar{1}$  7 6 5 4 3 2 1 7 1  
**Figure 5: D flat major scale**



Degree: 1 2 3 4 5 6 7  $\bar{1}$  7 6 5 4 3 2 1 1  
**Figure 6: C sharp major scale**



Degree: 1 2  $\flat 3$  4 5  $\flat 6$   $\flat 7$   $\bar{1}$   $\flat 7$   $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 7: C sharp natural minor scale**



Degree: 1 2  $\flat 3$  4 5  $\flat 6$  7  $\bar{1}$  7  $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 8: C sharp harmonic minor scale**



Degree: 1 2  $\flat 3$  4 5 6 7  $\bar{1}$   $\flat 7$   $\flat 6$  5 4  $\flat 3$  2 1 1  
**Figure 9: C sharp melodic minor scale**



Degree: 1 2 3 4 5 6 7  $\bar{1}$  7 6 5 4 3 2 1 1  
**Figure 10: D major scale**



Degree:  $\flat 7$  1 2  $\flat 3$  4 5  $\flat 6$   $\flat 7$   $\flat 6$  5 4  $\flat 3$  2 1  $\flat 7$  1  
**Figure 11: D natural minor scale**



Degree: 7 1 2  $\flat 3$  4 5  $\flat 6$  7  $\flat 6$  5 4  $\flat 3$  2 1 7 1  
**Figure 12: D harmonic minor scale**



Degree: 7 1 2  $\flat 3$  4 5 6 7  $\flat 6$  5 4  $\flat 3$  2 1  $\flat 7$  1  
**Figure 13: D melodic minor scale**



Degree: 6 7 1 2 3 4 5 6 5 4 3 2 1 7 6 1  
**Figure 14: E flat major scale**



Degree:  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4 5  $\flat 6$  5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  1  
 Figure 15: E flat natural minor scale



Degree:  $\flat 6$  7 1 2  $\flat 3$  4 5  $\flat 6$  5 4  $\flat 3$  2 1 7  $\flat 6$  1  
 Figure 16: E flat harmonic minor scale



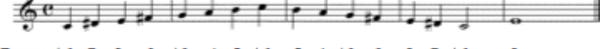
Degree: 6 7 1 2  $\flat 3$  4 5 6 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  1  
 Figure 17: E flat melodic minor scale



Degree: 6 7 1 2 3 4 5 6 5 4 3 2 1 7 6 1  
 Figure 18: E major scale



Degree:  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4 5  $\flat 6$  5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  1  
 Figure 19: E natural minor scale



Degree:  $\flat 6$  7 1 2  $\flat 3$  4 5  $\flat 6$  5 4  $\flat 3$  2 1 7  $\flat 6$  1  
 Figure 20: E harmonic minor scale



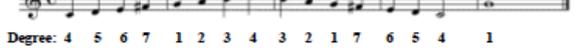
Degree: 6 7 1 2  $\flat 3$  4 5 6 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  1  
 Figure 21: E melodic minor scale



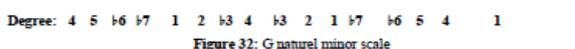
Degree: 5  $\flat 6$  7 1 2  $\flat 3$  4 5 4  $\flat 3$  2 1 7  $\flat 6$  5 1  
 Figure 29: F sharp harmonic minor scale



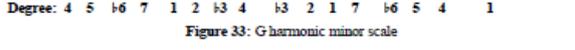
Degree: 5 6 7 1 2  $\flat 3$  4 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 1  
 Figure 30: F sharp melodic minor scale



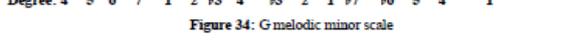
Degree: 4 5 6 7 1 2 3 4 3 2 1 7 6 5 4 1  
 Figure 31: G major scale



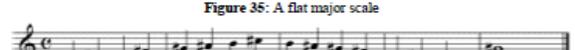
Degree: 4 5  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4 1  
 Figure 32: G natural minor scale



Degree: 4 5  $\flat 6$  7 1 2  $\flat 3$  4  $\flat 3$  2 1 7  $\flat 6$  5 4 1  
 Figure 33: G harmonic minor scale



Degree: 4 5 6 7 1 2  $\flat 3$  4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4 1  
 Figure 34: G melodic minor scale



Degree: 3 4 5 6 7 1 2 3 2 1 7 6 5 4 3 1  
 Figure 35: A flat major scale



Degree: 4 5  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4 1  
 Figure 36: G sharp natural minor scale



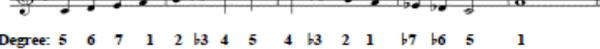
Degree: 6 7 1 2 3 4 5 6 5 4 3 2 1 7 6 1  
 Figure 22: F major scale



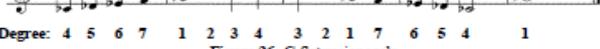
Degree: 5  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 1  
 Figure 23: F natural minor scale



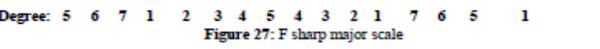
Degree: 5  $\flat 6$  7 1 2  $\flat 3$  4 5 4  $\flat 3$  2 1 7  $\flat 6$  5 1  
 Figure 24: F harmonic minor scale



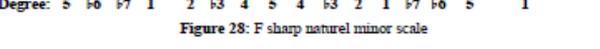
Degree: 5 6 7 1 2  $\flat 3$  4 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 1  
 Figure 25: F melodic minor scale



Degree: 4 5 6 7 1 2 3 4 3 2 1 7 6 5 4 1  
 Figure 26: G flat major scale



Degree: 5 6 7 1 2 3 4 5 4 3 2 1 7 6 5 1  
 Figure 27: F sharp major scale



Degree: 5  $\flat 6$   $\flat 7$  1 2  $\flat 3$  4 5 4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 1  
 Figure 28: F sharp natural minor scale



Degree: 4 5  $\flat 6$  7 1 2  $\flat 3$  4  $\flat 3$  2 1 7  $\flat 6$  5 4 1  
 Figure 37: G sharp harmonic minor scale



Degree: 4 5 6 7 1 2  $\flat 3$  4  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4 1  
 Figure 38: G sharp melodic minor scale



Degree: 3 4 5 6 7 1 2 3 2 1 7 6 5 4 3 1  
 Figure 39: A major scale



Degree:  $\flat 3$  4 5  $\flat 6$   $\flat 7$  1 2  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4  $\flat 3$  1  
 Figure 40: A natural minor scale



Degree:  $\flat 3$  4 5  $\flat 6$  7 1 2  $\flat 3$  2 1 7  $\flat 6$  5 4  $\flat 3$  1  
 Figure 41: A harmonic minor scale



Degree:  $\flat 3$  4 5 6 7 1 2  $\flat 3$  2 1  $\flat 7$   $\flat 6$  5 4  $\flat 3$  1  
 Figure 42: A melodic minor scale



Degree: 2 3 4 5 6 7 1 2 1 7 6 5 4 3 2 1  
 Figure 43: B flat major scale



Degree: 2 b3 4 5 b6 b7 1 2 1 b7 b6 5 4 b3 2 1

Figure 44: B flat naturel minor scale



Degree: 2 b3 4 5 b6 7 1 2 1 7 b6 5 4 b3 2 1

Figure 45: B flat harmonic minor scale



Degree: 2 b3 4 5 6 7 1 2 1 b7 b6 5 4 b3 2 1

Figure 46: B flat melodic minor scale



Degree: 2 3 4 5 6 7 1 2 1 7 6 5 4 3 2 1

Figure 47: B major scale



Degree: 2 b3 4 5 b6 b7 1 2 1 b7 b6 5 4 b3 2 1

Figure 48: B naturel minor scale



Degree: 2 b3 4 5 b6 7 1 2 1 7 b6 5 4 b3 2 1

Figure 49: B harmonic minor scale



Degree: 2 b3 4 5 6 7 1 2 1 b7 b6 5 4 b3 2 1

Figure 50: B melodic minor scale

Once The Advantages Of Using This Scale Considered, Few Subjects Should Be Taken Into Account. “Do To Do” Scale Is Always Sung In C Range, So It Fits With Everyone’s Vocal Range. This Helps Students Be More Comfortable With Scales In Solfeggio And Mostly In Sight Reading. It Allows Students To Sight Read The Pieces Without Thinking About Their Vocal Range. For Example, To Sight Read A Piece Which Is In G Minor And Also The Highest Pitch Is Bb6, One Should Transpose The Note To Her Own Range To Make It Sound Right. However, Using The “Do To Do” Scale Allows Students To Indicate Specific Pitch Within A Scale. Another Advantage Of “Do To Do” Scale Is To Teach Students To Sing In Tune. Students Are Always Ready For C, Because C Sound Is Always In Their Memory. As It Was Mentioned In Ristow’s (2007, P. 2) Translation Of Jaques Dalcroze’s *Les Gammes Et Les Tonalitiés, Le Phrasé Et Les Nuances*, This Advantage Is Invaluable, Certainly, In Musical Hearing. Students Trained In Our Method Will Have No Trouble Discerning The Key Of Any Excerpt, Thanks To The Perception Of Alterations Which The Scale Of C Is Submitted To, And, Experienced In The Singing Of Various Intervals In Different Settings (Meaning Different Keys), They Will Recognize Easily All Of The Notes, Regardless Of Instrumentation (Ristow, 2007, P.2). Another Benefit Of Using “Do To Do” Scale Is To Provide The Teachers In Dictation Training. All Notes Can Be Dictated To Tonic To Tonic In C Firstly, And Then Accidentals Can Be Written Depending On Tonality.

**Conclusion**

Ristow's Translation (2007) Of Dalcroze’s Phrase, Every Good Musical Method Must Be Based On The “Hearing” Of Sounds As Much As On Their Performance. “Do To Do” Scale Known As Dalcroze Scale Provides An Opportunity To Those Who Aim To Improve Their Hearing Abilities, As Well As Solfeggio And Dictation Skills. “Do To Do” Scale Also Presents Numerous Advantages In Ear Training Education; It Is In Everyone’s Vocal Range, All Keep Their Own Tune When Singing Solfeggio, Sight Reading And Are More Comfortable With Dictation Due To Tonic To Tonic. In Addition, Charts And Tables Given With This Paper Are Unique And Will Be Essentially Beneficial For Those Who Aims To Use “Do To Do” Scale For Ear Training.

**Acknowledgements**

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# Education And Social Engineering: A Study of Human Behavior

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## ABSTRACT

Human behavior is not randomly attempted. Rather it is done according to specific rules. In addition, individuals have to adopt a physical and social behavior to fulfill these roles. Besides, behavior is closely related to society. Therefore, it is necessary to realize the role of education in its mutual relation to social engineering to understand and change individuals' behavior. Social engineering is a social change for individuals. It is done by changing their basic negative intellectual structures and replacing them with more socially compatible ones. The processes of social engineering begins with studying the nature of the relation between the individual and the society to determine the negative conducts of some members of the society. Rather, they are related to social needs in order to establish a mutual relation between individuals and the resources and potentials of society in its production institutions in order to help organize and fulfill its goals.

**Key words:** Education ,Social, Engineering ,Human,Behavior

## INTRODUCTION

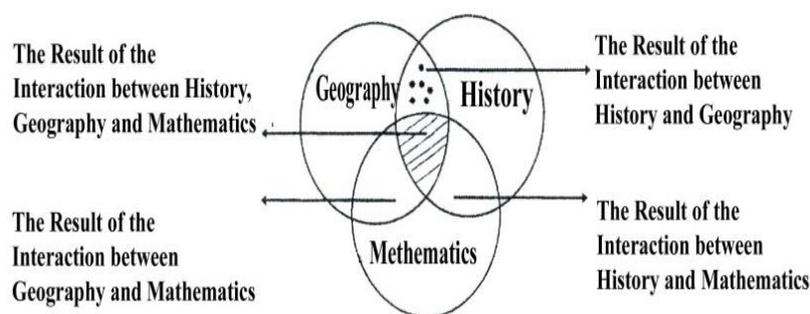
It is important to identify the bases of the individual's behavior in order to have a balanced character. Human behavior is not randomly acquired. Rather, it is based on specific rules, because people can no longer communicate with or understand each other.

Once seen by the eye, behavior is sent to the neurotic net that is connected with the brain. It gives specific meanings of that behavior that are associated with the individual. In other words, the significance of a certain behavior varies from one person to another according to the epistemological store of that behavior which is also different from that of another person. Cognitive storing generally refers to the relation of behavior to the variables which affected it, particularly the first time it happened to someone and upon which it was stored. The fact that there is another person at the same time and in the same place does not necessarily mean that his epistemological cognitive system will store the same significance which the first person did (Stanylaf, 2005).

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### The Formation of Cognitive Behavior Web

The individuals' behavior is affected by what is called "cognitive behavior web" which consists of two compounds: cognitive and behavioral. The cognitive compound is the outcome of the individuals' knowledge and information. It includes several areas of knowledge such as logic, mathematics, physics, history, etc. The final form of that web is the outcome of the reactions of those areas with each other as is shown in the following figure:

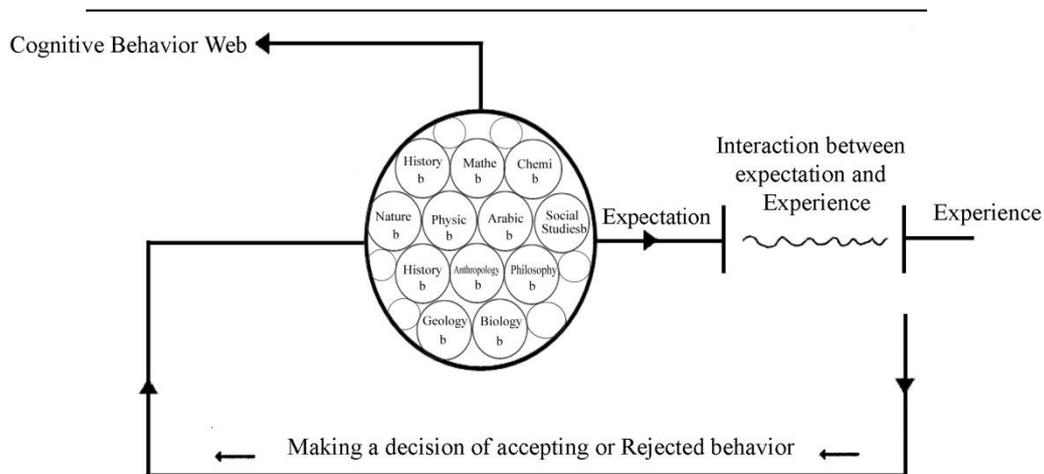


**Figure (1) explains the interactions of knowledge areas to form the cognitive web.**

The final form of that web is the outcome of the interactions of those areas with each other. Thus, each of the epistemological items has a lower effect on forming the cognitive web. The sum of those items gives the web its final shape. Moreover, the final web determines the individual's cognitive potentials. Therefore, the more the individual can affect the interaction among the various cognitive areas and their results as well as the result of the interaction among the areas themselves, the more powerful his /her cognitive status (Peat, 1987).

## THE INDIVIDUAL'S BEHAVIORAL WEB

Behavioral knowledge is different from knowledge in natural sciences as it is always associated with specific behavior that is determined by the environment of an individual. In the same way, the behavioral web of a person is strongly affected by the environment in which he acquired it. It is also different from the cognitive one which is not related to a specific environment. Moreover, it acquires a new shape which varies according to the individual's modifications of his behavioral experience. Consequently, people may have similar, but not identical behavior. This is due to the fact that a person gains behavioral knowledge which interacts with his /her conduct or pre-behavior ideas. Since ideas vary from one person to another, the final result of conduct may be similar, but not identical. Behavior, in addition, is divided into two kinds. The first kind is external behavior that complies with others. The second one is internal behavior that is unique for every individual (Simon, 1990). The following figure shows how an individual's behavior is formed.



**Figure (2) : The Formation of Human Behavior**

The previous figure helps formulate an idea of how behavior is accepted or rejected by the individual. As explained before, the behavioral and scientific areas interact with each other (figure 1) to produce new cognitive behavior areas that help the individual to acquire a certain conduct. The expectation interacts with the individual's personal experience, which is also a cognitive behavior area. The result of the interaction between expectation and experience is manifest in the individual's decision to accept or reject behavior. Next, behavior goes from the inner space of the mind – which cannot be seen – to the outer one which is seen by others. The decision is then made to accept or reject behavior after identifying it with the reactions of those around the person and his own behavioral cognitive web (Johnson, 1983).

It is important to notice that practicing any behavior can be implicit. Its real significance can be implied within the cognitive web of the individual. This is confirmed by the fact that if we try to explain some one's behavior, we have to provide our own interpretation of it which may be completely different from his / her own viewpoint. That is why it is referred to as implied behavior. More importantly is the fact that the person may himself fail to justify his / her own behavior. This is perfectly clear when we ask a friend to explain why he did something; his answer may be "I do not know why I did it". This is simply because the friend's behavior is the outcome of a large number of interactive variables which are received by the mind and stored in the intermediate areas that may be called the unconscious memory. That is why he could not identify or even control it. The only thing he could perceive or live is his own conduct. In practical life we depend on an individual's experience. We know he can make a decision in a certain situation because of his own experience or what may be called the unconscious memory. Consequently, the more experience man has of any field, the more his unconscious memories. His judgment on things is unusually right to a great extent because of his increasing unconscious memory. The question that may be raised here is; how can we create this experience? Or what makes an individual's behavioral practices active? We should also determine what do we mean by the word "active" and for whom: the individual or the society? Adopting the idea of social engineering or behavior engineering can solve such problem (Chaiklin,1993).

## **SOCIAL ENGINEERING AND HUMAN BEHAVIOR**

It has been previously explained that human behavior is not randomly attempted. Rather it is done according to specific rules. In addition, individuals have to adopt a physical and social behavior to fulfill these roles. Besides, behavior is closely related to society. Therefore, it is necessary to realize the role of education in its mutual relation to social engineering to understand and change individuals' behavior.

Indeed, social engineering is a social change for individuals. It is done by changing their basic negative intellectual structures and replacing them with more socially compatible ones. The process of social engineering begins with studying the nature of the relation between the individual and the society to determine the negative conducts of some members of the society. Furthermore, it is necessary to identify the facts that lead to their rise and make people practice them in a negative way. A perception of how to deal with variables affecting people's behavior which lead to the emergences of negative conduct is attempted to change them. Major ideas of social and political systems that use social engineering are discussed. Such viewpoints are not limited to the methods of dealing with individual conducts in isolation from society. Rather, they are related to social needs in order to establish a mutual relation between individuals and the resources and potentials of society in its production institutions in order to help organize and fulfill its goals. (Hands, 1973).

### **STEPS OF MAKING SOCIAL ENGINEERING**

To establish a mutual relation between the individual and the society by using the technique of social engineering, the following steps should be adopted:

- 1- Identifying a specific formulation of social engineering concept.
- 2- Determining the organizing form of society.
- 3- Determining the goals of the society and transmitting them to desired conduct stereotypes.
- 4- Identifying negative behavior types prevalent among members of the society.
- 5- Suggesting a perspective of the variables affecting negative conducts.
- 6- Suggesting a perspective of the variables affecting positive conducts which should replace the negative ones.
- 7- The beginning of forming an unconscious memory for the required conducts.
- 8- Determining the prototype affecting the individual /individuals and the suggested one before the beginning of the formulation process to generalize the required type.

### **THE ROLE OF SOCIAL ENGINEERING AND HUMAN BEHAVIOR**

Social engineering forms the behavioral patterns of society to maintain compatibility between the society and its members. By so doing, the society becomes one web reflecting the dominant culture. Education is used here to determine the patterns of relationships and the values needed in a society. Furthermore, it contributes to socialization which supports positive values and eliminates negative ones. Means of social control represent the guiding tool that promotes individuals to form positive relations and give up negative ones.

The process of social engineering begins by gathering facts and information on the reality of social relations and the factors affecting them. It also studies the effects of those factors on the social structure. In addition, the process of social engineering is fulfilled gradually, beginning with the acknowledged facts identified by the members of society. These facts are then related to the values which society aims to find and acquire direct social relations to certain aspects which fulfill the purposes of the society and enable it to attain its intended goals (Stacey, 1978).

Furthermore, social engineering transforms social behavior from undesired patterns to desired ones by using what is known as the techniques of changing behavioral patterns. The process goes through the following steps:

- 1- Identifying the behavior which needs support and the values that promote it.
- 2- Identifying undesired behavior.
- 3- Determining the means that can be used to transform behavior from one pattern to another.
- 4- Making a plan for the society to be implemented through its different institutions.

### **MODELS OF BEHAVIOR ENGINEERING**

Let's agree that what we are suggesting in this paper is not simple. Rather, it is a complex process that needs regular work. Co-ordination among all institutions of society is required. Moreover, it should be under specific supervision. What the paper explains is a very simple example which aims to show the main idea of social engineering. Based on what was said about the way the human mind in stereotyping behavior, we may presume that the main goal of the social engineering process is to eliminate undesired behavior and use a desired one instead. This process is done through a group of mental models which can be illustrated as follows:

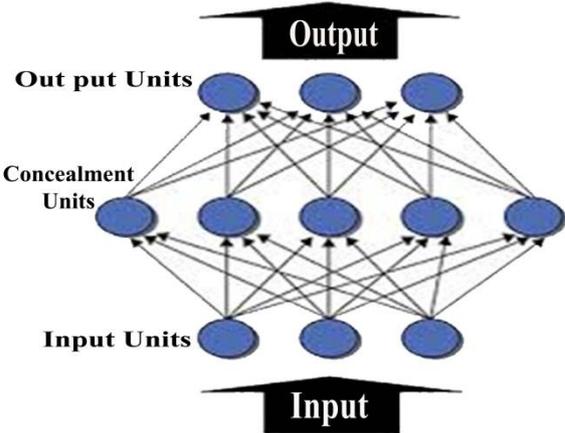
The learner receives information by means of what is known as "Input unit" (UNIT LAYER 1) , storing them in the concealment units (UNIT LAYER 2) and taking them out through the production units (UNIT LAYER 3) (Howard, 2003).

Layer 3 units { ••• }  
 Layer 2 units { ••••• }  
 Layer 1 units { ••• }

**Figure (3) represents the neurological unit as one of the units that show how behavior is stored.**

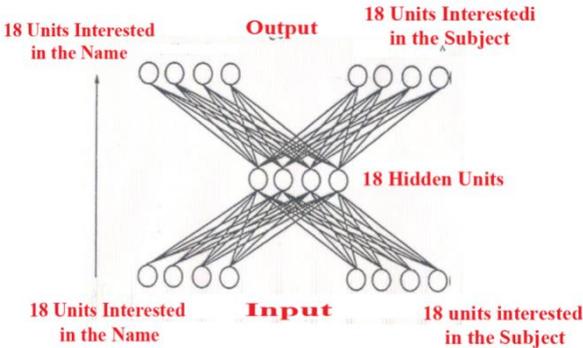
This model shows two kinds of connection. The first kind is the "Input connection" through which the individual receives information (inputs). Inputs are the units that receives information and external stimuli. The second type is the "Output connection" through which information is sent (Output). Output is the units that send and take out the information they receive from input. This model is used for learning and direct experience that depends on memorization and indoctrination.

Information or behavior is inserted and taken out as it is, without any interference attempted by the creativity and personality of the individual in this production. For example when you teach a child to keep away from fire least he should be burnt, the child is afraid of coming closer to it without even exploring it (Gary, 2010).



**Figure (4): The Units of Input, Concealment and Output**

The previous figure shows that every unit is connected to the units found in the higher layer. The result is a web of units that are related to several connections among them. Information goes forward through these units from input to concealment and then products units. This model is an example of indirect learning .Information is received in the input units .It is stored in the concealment units which send it to the production ones. The concealment units keep and store the information received by the individual from the input. Next the individual sends the information to the outputs when it is needed. This model enables the individual to innovate rather than memorize and indoctrinate ideas. For example, when a child comes closer to fire, he puts his hand in it. When his hand is burnt he learns that he should not do this. Such information is stored in the concealment area as an experience he gains throughout his life .The model also should be adapted to transform behavior .In other words, it is the active model that may be used in social engineering (Michael, 2004).



**Figure (5) explains the multiplicity of concealment units and the frequency of mental activity.**

The previous figure shows many of the concealment units and the frequency of mental activity which trains webs and repeats learning. They are also used in learning language. Webs are trained according to the procedures of two phases.

1-The phrase of language exposure:

The learner or the child is exposed to language in order to learn it.

2-The experimental phase:

The child is examined to test what he learned. Through this model it is clear that the mind is in a state of permanent activity which results in more mental output and several behaviors and reactions. This means that the more experience and learning a learners has, the more his mind activity and work becomes. The result is sound ideas and actions. This model is different from the previous one which represents few experiences and consequently little mental activity and output.

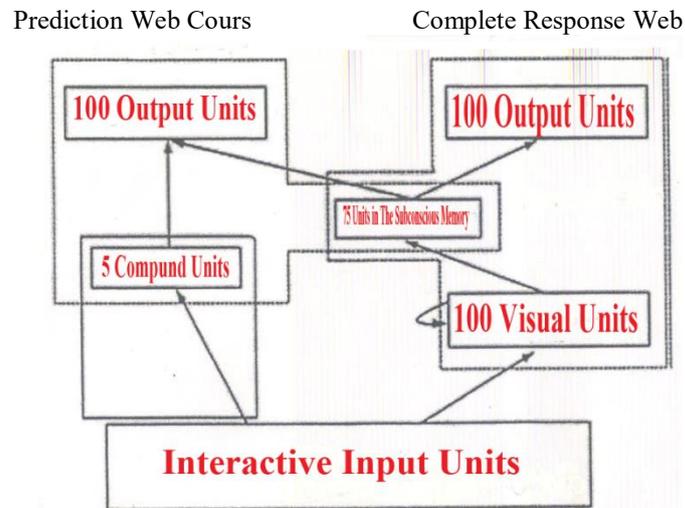


Figure (6) shows the relation between the subconscious memory and other cognitive gains.

The previous model is a schematic summary of the relation between stored subconscious memory in the middle (the hidden)area. In this model, units are divided through two of the participating units. For example, the integration that happens between the concealment units (75units) and the prediction web course is considered agate of input information. It is possible that the stored information may not necessarily be compatible with the internal representation and the new information coming from the outside world. Surprise in this phase is caused by the fact that there is a contradiction between the emergence of the unexpected and the real. In other words, there is a contradiction between the stored representation and the new one which provides a new behavior image. For example, when someone is exposed to a new situation, he may be surprised because he does not know how to act. It is probable that his action may be wrong or right. Yet he will learn anyway. He will take the right action. For example, though we may be warned against a certain behavior, we will not be convinced unless we practice it ourselves. If someone is accustomed to driving his car quickly, he will not listen to any one asking him to drive slowly unless he is subject to a traffic accident because of high speed. He realizes that he should have listened to others' advice. Both the young and old are equal (Philip,2003).

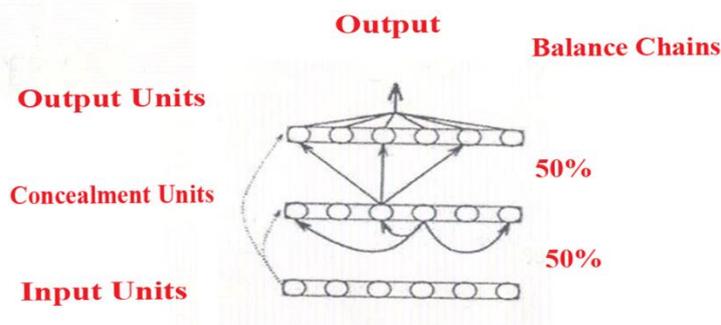


Figure (7) shows how behavior can be modified through learning

The previous model explains how behavior can be modified through learning. Response caused by stimuli which varies from one to another. It may be expected or unexpected by others surrounding the individual. It may be

also unexpected of the same person. The daily behavior of people depends on the flexibility of response to stimuli. This means that the same stimuli may cause a different response even without man's knowledge. It depends on his present condition and previous experiences. For example, revenge may be considered necessary by some and a symbol of ignorance and backwardness by others according to the previous experiences of the avenger which were acquired from his environment. All the former models have one thing in common, i.e., the mind that receives knowledge (information/behavior) through the input units. Information is activated through social interaction in which the hidden units are also activated before outputs are produced (Michael,2004).

Unlike previous models, there are many others that are identified. As mentioned before, education can be used to construct behavior or reform these models in order to make the required social balance, particularly in the transitional phases of any society. This can be done through the following steps:

1. Identifying the negative behavioral patterns that will be eliminated from the daily practices of the members of society.
2. Identifying the positive behavioral patterns which may replace the negative ones that will be eliminated.
3. Choosing the suitable model for engineering society.
4. Selecting educational methods and means to fulfill the determined model.

The previous four phases are not easy. Fulfilling every phase necessitates conducting a collective research to carry out orders precisely. Such precision is important because we are dealing with reconstructing social engineering. Unintentional mistake may destroy it. Precautionary outlook may hinder approaching that new domain in the world of education.

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## **Education In The Key Area Of Prevention Of Nosocomial Infections**

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### **ABSTRACT**

The focus of this post is the issue of education in the key area of prevention of nosocomial infections. Evidence-based practice in the relation of education to the prevention of nosocomial infections is the simplest and best practice of increasing the quality of provided care, leading to the desirable result. The aim of the study was to educate and detect the compliance of hand hygiene among healthcare professionals in prevention of nosocomial infections in comparison with the latest scientific evidences. 164 healthcare professionals from the Department of Anaesthesiology and Intensive Medicine in Slovakia participated in the study. The results of exploratory studies have shown that despite the participation in education and observance of the recommended clinical practices, the hygiene of the healthcare professionals' hands in these workplaces is one of the most well-established and most important strategies leading to the disruption of the transmission and spread of nosocomial infections.

**Keywords:** Education. Hand Hygiene. Nosocomial infection. Evidence based practice. Prevention.

### **INTRODUCTION**

The presence of multi-resistant organisms and a weakened immunity of intensive care patients at anesthesiology and intensive care medicine wards represent an irrevocable risk of developing an infection with a high morbidity and mortality rate. Hands are both a means of communication and a working tool; they heal, yet can, at the same time, pose a threat. The transmission of infection at these wards most frequently occurs as a result of the microorganism-contaminated hands of the staff. A key area of the prevention of nosocomial infections are, first and foremost, hygiene and hand disinfection. It is precisely the education of medical care professionals in the field in question that represents an inseparable part of health care provision. This paper analyzes the issue of education in the area of the prevention of nosocomial infections in clinical practice as a significant presupposition of good-quality health care provision.

### **EDUCATIONAL PROCESS**

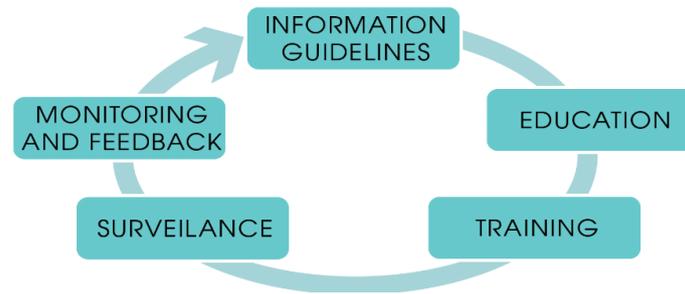
Being a decisive part of both nursing and clinical practice, education has a very long history. According to the legislation, each health care professional is obliged to pursue continuous education throughout his or her career (Regulation of the Government of the Slovak Republic no. 296/2010).

The educational process in clinical practice:

- represents a certain form of the "passing on" of specific information that takes place in a specially arranged environment within the framework of the mutual interaction between an educator and an educatee;
- is intentionally designed to enable someone to learn something;
- is a dynamic relationship between an educator and an educatee;
- is a pedagogic-educational process;
- is part of the nursing process in clinical practice (Nemcová et al., 2010).

The education of health care professionals in clinical practice on the issue of the prevention of nosocomial infections is of utmost importance with respect to the implementation of evidence-based changes (Jarošová,

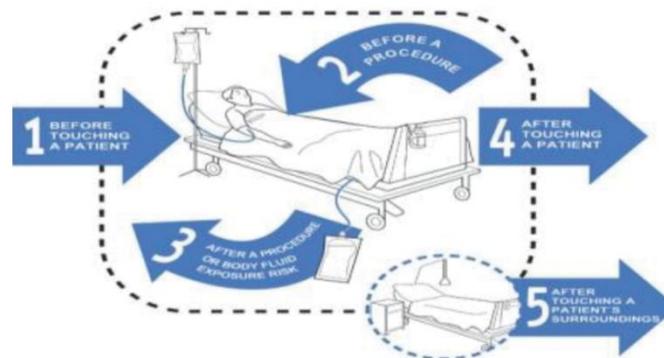
Zeleníková, 2014). There are strategies and methods enabling to increase the awareness of health care professionals in the field of hand hygiene according to the evidence-based practice principles. Most commonly used is a multimodal strategy that consists of five sequential steps (Chart 1).



**Chart 1:** A multimodal strategy in the prevention of nosocomial infections

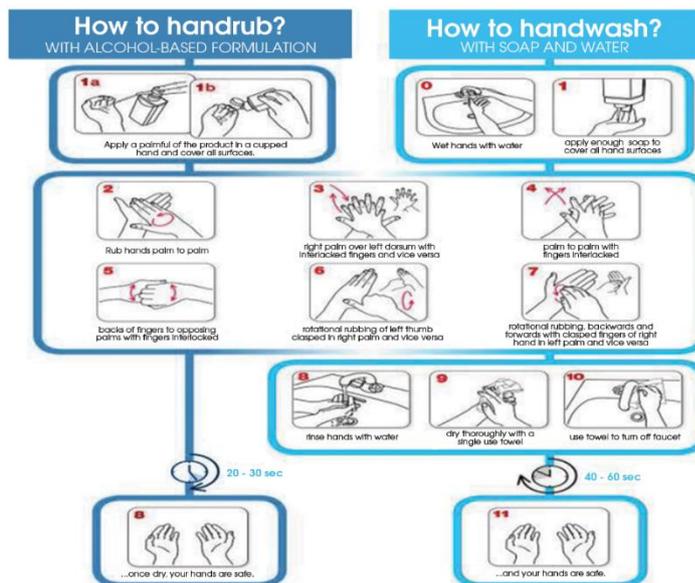
As the chart shows, working tools contribute to elementary and homogenous education and the implementation of programs for the prevention of nosocomial infections in clinical practice. This includes information tools (an overview of recommendations, WHO recommendations, global patient safety guidelines), educational tools and training (observations, presentations, educational films, flyers, brochures, and posters on the techniques in the field of hand hygiene), observational and monitoring tools (a state-of-play analysis at the health care professional/health care facility level, an opinion survey on the implementation of the change as perceived by health care professionals and managers in clinical practice, a survey and an evaluation of the knowledge of health care professionals in the area of hand hygiene compliance) (WHO Guidelines on Hand Hygiene in Health Care, 2009).

Launched in 2009, the WHO campaign "Save Lives: Clean Your Hands" is a behavioral strategy that focuses on the education of health care professionals. It concentrates on "5 key moments for hand hygiene" that include the hand cleaning and disinfection before patient contact, before aseptic task, after body fluid exposure risk, after patient contact, and after contact with patient surroundings (Chart 2). It visually interprets the representation of patient zones and health care facility zones, respectively. Based on this, it describes the indications that necessarily require hand hygiene. The model is practical, easy-to-remember, compatible, and easy-to-do (Kelčíková, 2013).



**Chart 2:** „5 moments for hand hygiene“ (Source: WHO Guidelines on Hand Hygiene in Health Care, 2009)

The compliance of health care professionals and the significance and effectivity of hand hygiene in clinical practice are also very robustly encouraged by the visual demonstration of hand cleaning and disinfection technique. This method is also recommended when hand hygiene techniques are practiced as part of the professional training and workshops of health care professionals, but also in clinical practice (Chart 3).



**Chart 3:** Proper hand hygiene technique (Source: WHO Guidelines on Hand Hygiene in Health Care, 2009)

The strategic goal of the EU member states is to decrease the risk of nosocomial infections by implementing the evidence-based techniques recommended for clinical practice (ECDC, 2015). In Slovakia, these techniques are rooted in the Regulation of the Ministry of Health of the Slovak Republic from 28 June 2015 no. 192/2015 that amends and supplements the Regulation of the Ministry of Health of the Slovak Republic no. 553/2007 Coll. and establishes the details of the requirements for the operation of health care facilities from the perspective of health protection. Clinically recommended techniques confirm that it is necessary to clean and disinfect hands according to evidence-based practice guidelines, while it is first and foremost education that plays a key role in the process. The points of departure for the education regarding hand hygiene issues ought to include scientific information about the positive influence of the increased quality of hand hygiene on the reduced occurrence of nosocomial infections and on the transmission of resistant microorganisms; an interpretation of hand hygiene guidelines; the supplementation of missing knowledge regarding the indications of hand cleaning and disinfection for daily patient care; information on non-compliance with the guidelines and the reasons thereof; and information on solutions for hand hygiene and skin protection (ECDC, 2015).

The education in the prevention of nosocomial infections according to the evidence-based practice principles is the simplest and well-established technique for increasing the quality of provided health care that leads to a desirable result.

### THE STUDY

The aim of the research study was to explore hand hygiene compliance in the key area of the prevention of nosocomial infections at anesthesiology and intensive care medicine wards in comparison with the most up-to-date scientific evidence, both before and after the educational process has been accomplished.

164 health care professionals ("nurses") in Slovakia participated in the research study. The basic criteria for making selection files included the affiliation of one's official position in the branches of anesthesiology and/or intensive care medicine; age; years in professional practice; highest achieved education; and participation in a specialized study program. The most numerous group of the selection file consisted of 30.5% of the respondents with completed high school education, while 19.5% of the respondents had some form of advanced vocational training. 22.0% of the respondents had a bachelor degree, while 21.3% of them were awarded a master's degree. 5.5% of the respondents had a first professional degree (PhDr.) and 1.2% of the respondents were awarded a Ph.D. 35.4% of the respondents of the total research sample have accomplished a specialized study program in the field of anesthesiology and/or intensive care medicine. The average age of the respondents was 36.4 years. The average years of professional experience was 12.7 years.

The research study was done in the first line by way of extrospective direct, hidden and structured observation under natural conditions through a pre-prepared standardized research protocol. In the second line, it was done by

way of an educational process that took into consideration the valid legislation and information available in academic literature.

The results acquired in the analytical phase were mathematically evaluated and analyzed through the lens of descriptive statistical techniques and through an analysis of dispersion with the significance level set to the acceptable value of 5%.

## **FINDINGS**

In the field of anesthesiology and intensive care medicine today, one of the goals of nursing practice is to provide a good-quality and scientifically-approved care based on the education of health care professionals ("nurses") in the area of the prevention of nosocomial infections. The most important methods of the prevention of nosocomial infections include the hand hygiene, cleaning and disinfection of health care professionals ("nurses").

Based on a statistical data analysis of individual features of the issue we can identify certain connections and make some conclusions. All in all, we can conclude that there is a statistically significant connection between hand hygiene compliance before and after the educational process has been accomplished because the statistical significance level did not exceed the defined statistical value of 5%. According to the Regulation of the Ministry of Health of the Slovak Republic from 28 June 2015 no. 192/2015 that amends and supplements the Regulation of the Ministry of Health of the Slovak Republic no. 553/2007 Coll. that establishes the details of the requirements for the operation of health care facilities from the perspective of health protection, the indications of hand cleaning include the arrival to the working place; visible hand contamination by dirt, blood or other body fluids; part of personal hygiene before meals and after using the toilet; and cases of possible or documented hand contamination by spore-producing microorganisms with the aim of mechanical removal of visible hand contamination, including organic and inorganic impurities. The "my 5 moments for hand hygiene" strategy includes the indications of consistent hand disinfection. It is also supported by the fact that the strategy in question was only applied correctly by 37.8% of the respondents before the education, while the number went up to 62.8% of the respondents after the educational process was accomplished. The described strategy represented a significant tool in both our observation and the process of education. It describes five clearly defined techniques for easy-to-do monitoring of errors and deficits related to hand hygiene. The concept of the new strategy also established itself as important and successful in the educational process (WHO Guidelines on Hand Hygiene in Health Care, 2009).

The World Health Organization (2009) recommends cleaning hands with regular soap and water no longer than one minute. We also focused on the area of the compliance with the optimal length for hand cleaning. The measuring of the time length for hand cleaning was done by recording a time interval using a stop watch. During our observation, the optimal time for hand cleaning was complied with by 18.5% of the respondents. After the educational process had been accomplished, the optimal length for hand cleaning only increased by 2.7%.

The aim of hand disinfection is a speedy reduction of the transient hand skin microflora as a way of prevention of the transmission of microorganisms (Regulation of the Ministry of Health of the Slovak Republic from 28 June 2015 no. 192/2015 that amends and supplements the Regulation of the Ministry of Health of the Slovak Republic no. 553/2007 Coll.). It is evident from the research studies that only 25% of the health care professionals at anesthesiology and intensive care medicine wards disinfect their hands before coming to contact with a patient during a high working load. In contrast, during a regular working load this percentage goes up to 70%, provided that there is adequate work-force (Hugonnet, 2007). The research study also monitored the compliance with the optimal time for hand disinfection. Today, alcohol-based disinfection solutions are predominantly used in ordinary clinical practice at anesthesiology and intensive care medicine wards. A fluid alcohol-based disinfection solution must comply with certain requirements given by the valid legislation. To enable good-quality and effective hand disinfection it is necessary to use 3 ml of a disinfection solution. According to our tests, it represents one push of the dispenser with a disinfection solution. An important phenomenon in hand disinfection is the rubbing of the disinfection solution onto hands during the whole exposure time. According to clinically recommended techniques, the exposure time for hand disinfection is 30 seconds. Our research has shown that the optimal time for hand disinfection was only complied with by 29.4% of the respondents before the education. In contrast, the value increased significantly after the education of the nurses (Table 1).

The hand cleaning that aims at removing the impurities and reducing the volume of transient microflora on the hand skin is more effective than mechanical hand cleaning, but less effective than hygienic hand disinfection. At the end of our research, we also focused on the proper technique of hygienic hand cleaning and disinfection. Our research has shown that the proper technique of hygienic hand cleaning was complied with by 25.8% and 43.5%

of the respondents, respectively, before and after the educational process was accomplished. The educational process regarding the issue in question was also important in the compliance with the proper technique for hygienic disinfection because the monitored value increased by no less than 26.3% (Table 1).

N		164
Variables	Before education (%)	After education (%)
5 moments for hand hygiene	37,8	62,8
Optimal time for hand cleaning	18,5	21,2
Optimal time for hand disinfection	29,4	50,6
Hand washing technique	25,8	43,5
Hand disinfection technique	31,8	58,1

**Table 1:** Hand hygiene compliance according to evidence based practice

The findings of the research study have shown that the hand hygiene of health care professionals at wards in question remains to be one of the most fundamental and important strategies to disconnect the transmission and spread of nosocomial infections, despite the participation in education and the compliance with clinically recommended techniques. This fact is related to the accessibility of evidence-based information and the ability of nurses to implement the recommendations acquired in the educational process into their nursing practice, as clearly evident from the findings of research studies (Von, et al., 2004; Kampf, et. al., 2009; Borges, et. al., 2012; Kelčíková, 2013; Marimuthu, et al., 2014).

## CONCLUSIONS

The compliance with educational strategies in the educational process, together with the implementation of clinically recommended techniques according to up-to-date scientific knowledge into clinical practice at anesthesiology and intensive care medicine wards represent a way of integrating the best practice known also from traditional nursing. To enable the continuous development of nursing care in the area of education for the sake of the prevention of nosocomial infections at anesthesiology and intensive care medicine wards, it is necessary to make sure that the nurses have up-to-date knowledge and put scientific knowledge into practice by way of creating and complying with unified recommendations, standards, and guidelines.

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# Education of Security Management Students Aimed on the Managing of Psychosocial Risks

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## ABSTRACT

People working in the area of security management have to be professionally, physically and mentally capable to perform their working activities. Psychosocial risks are one of the significant factors that have influence on the work performance. The following psychosocial risks have been identified by the EU-OSHA agency within the ESENER researches: stress in the workplace, time stress, necessity to cooperate with problematic customers. In order to deal with these psychosocial risks, one needs to have abilities and skills that can be developed and improved by university education, as well as by life-long learning. Faculty of Security Engineering is specialized into training of new professionals in the following areas: Protection of People and Property, Civil Security and Rescue Services. The education also focuses on improving of mental abilities of safety management students within subjects such as psychology, manager communication, ethics and sociology. The aim of this work is to define the possibilities of education (theory and practice) that focuses on identification of psychosocial risks, coping with these risks and their possible prevention.

**Keywords:** education, safety/security management, psychosocial risks, stress, prevention.

## INTRODUCTION

Requirements for professional qualification of employees of security services are given by legal norms (law 473/2005 Collection of Laws. Law about providing services in the private safety sphere as amended; ministerial Decree of MV SR 634/2005 Collection of Laws., by which some regulations of law 473/2005 Collection of Laws., about providing services in the private safety sphere as amended). Secondary schools on which future employees can be trained within security services are grammar schools (continuation at university) or secondary technical schools focused on branch of study security services (anti-riot police, traffic, judicial and criminal police). After that universities which train specialists (commanding and executive) in the field of security are categorised to the group of branches of study 8.3 Security services (people and property protection, safety publicly services, theory of police sciences, criminology and criminalistics, occupational health and safety, emergency services and civil safety). There can be also categorised universities which train specialists within the group of branches of study 8.4 Civil defence and soldiery (management of military systems, economics and management of defence lines, arsenal and technique of armed forces, national and international safety, operational and combat usage of armed forces, military connection and information systems, military logistics).

Faculty of security engineering of University of Žilina develops educational and science and research activities aimed on providing complex security of society and individual citizens. Faculty provides academic bachelor, engineer and doctoral studies and many various forms of lifelong learning in accredited study programs (tab. 1). Department of security management from Faculty of security engineering provides education in study program Security management in bachelor, engineer and doctoral degree. Absolvents acquire knowledge in the field of theory and practice of people and property protection, they are able to analyse external and internal secured environment and identify, analyse, evaluate and solve risks. Absolvents have the opportunity to be employed as

security workers (Dlhodobý, 2014; Výročná, 2017):

- Specialists in state and non-state security services and organizations which realise specialised security actions in the people and property protection sector;
- Managerial staff in the system of police and security services.

Solution of security issues and crisis is influenced by many factors. The most significant common features of crisis are lack of time and information which place high demands on employees (command and executive). Level of competences required from employees of security services is raising proportionally to difficulty of their working activity (Loveček, Ristvej, 2016).

**Table 1:** Overview of accredited study programs of faculty

Field of study	Study program	Degree	Study form	Degree of study
8.3.1 People and Property Protection	Security Management	I.	Part-time Full-time	Bc.
8.3.7 Civil Security	Crisis Management			
	Security and Protection of Critical Infrastructure			
8.3.6 Rescue Services	Rescue Services			
8.3.1 People and Property Protection	Security Management	II.	Part-time Full-time	Ing.
8.3.7 Civil Security	Crisis Management			
	Security and Protection of Critical Infrastructure			
8.3.6 Rescue Services	Rescue Services			
8.3.1 People and Property Protection	Security Management	III.	Part-time Full-time	PhD.
8.3.7 Civil Security	Crisis Management			
8.3.6 Rescue Services	Rescue Services			

Educating has a form of lectures, seminars, measurements and working in laboratories of faculty of security management. Students participate in educational excursions (e.g.: Grand Power & Apis), educational study exchanges and internships in abroad (e.g.: Mark2 Corporation Czech a.s., Occupational Safety Research Institute)

Outputs of science and research activity of department of security management are used by many various organisations such as: JABLOTRON Slovakia s.r.o., JABLOTRON, s.r.o. Jablonec nad Nisou, EUROSAT CS, Quadriq a.s. Current research outputs gained in the sphere of people and property protection are systematically used in the activity of corporations providing services for private security within a membership in the Slovak Chamber of Private Security.

For the purpose of raising education quality the faculty employees make surveys between their absolvents. Faculty made **The Survey of Absolvents Finding Employment from 21<sup>st</sup> March 2016 to 20<sup>th</sup> May 2016**. Questionnaire was distributed electronically and the questions were given to absolvents of second degree of studies in all study programs of faculty in years 2013, 2014 and 2015 (study programs: Security Management, Transport in crisis situations, Crisis Management and Rescue services). Totally 499 absolvents were asked and returnability of questionnaire survey was 50,1% (250 questionnaires/respondents). **Within study program Security Management 218 absolvents were asked and filled in questionnaires was a number of 101 (returnability 46,3%)** (Vyhodnotenie, 2016).

Main parts of survey:

- Absolvents finding employment in their branch of study;
- Time horizon of absolvents employment;
- Application of knowledge from the studies in the practice;
- Evaluation of studies;
- Activity of absolvents in practice;
- Extending of knowledge (sphere);
- Contact with faculty.

From the survey, it is obvious that from the number of 101 respondents, absolvents of study program Security Management:

- 64,3 % is working in studied or similar field of study;
- 27,7 % has been employed during the studies and 40,6 of them till three months since finished studies;
- 32,6 % uses in praxis 41-80 % of knowledge acquired during studies (less than 40 % knowledge is used by 64,4 % of absolvents);
- 78,2 % is satisfied with knowledge, skills and experience acquired during studies;
- 39,2 % is working in the safety and protection sphere, 7,2 % is working in public administration and 4,1 % is working in transport and logistics sphere;

Within the survey there were also identified spheres, in which absolvents needed to be improved, especially language skills (foreign language) and communication skills (Vyhodnotenie, 2016).

Security management students within the first-year studies of engineer degree pass the subject Psychology, which consists of lectures and seminars. The subject is focused on topics: personality of worker, working place, worker's performance, their motivation, mental strain and stress, their management and precautions.

### **INFLUENCE OF PSYCHOSOCIAL RISKS FOR HUMAN PERFORMANCE**

Psychosocial risks are emerged as a result of bad planning, negative working conditions, relationships and work organization. Factors which can lead to emerging of psychosocial risks are for example: excessive working load (psychical and physical), ambiguous tasks, insufficient involvement of workers to making decisions, uncertainty of employees, ineffective or poor communication, bad working organisation, violence or abuse (Psychosociálne, 2016).

The issue of psychosocial risks is being concerned by many researches. Between the most significant ones belong Europe-wide surveys ESENER 1 and 2, which took place in 2009 and 2014. Surveys were done by agency EU-OSHA in European enterprises and they were focused on (Európsky, 2016):

- General risks in the field of occupational health and safety (OHS, Slovak BOZP) and the way of its managing;
- Psychosocial risks such as: stress, bullying and abuse;
- Incentives and barriers connected with measures in leading of OHS;
- Participation of employees on OHS.

As **the most important psychosocial risks by work in organizations** were in surveys ESENER 1 and 2 identified:

- Stress-related work;
- Time stress;
- Be pressed for time;
- Necessity of coming into contact with problematic customers, patients and pupils.

As other psychosocial risks were identified for instance: bad communication between the management and employees, uncertainty of the post, bad cooperation between colleagues, long or irregular working hours, indefinite policy of human resources, injuries risk caused by machines or hand tools, discrimination (e.g.: according to the sex, age or ethnicity), noise and vibrations.

**Stress** is a result and expression of workload, it represents its border case which is caused by extreme requirements of the surrounding. Stress is a result of psychic and physiological reaction on stressor (stressing event is understood as anything which person considers as threatening) (Bratská, 1992).

People are daily in situations which are subjectively experienced as load. Each individual is unique and distinct from each other and that is why their eking of the same events is in the case of many people absolutely different. Load situations can have positive or negative impact on people. Someone cannot bear up the pressure of load situations, he is beaten by its strain and the other one perceives load situations as an inevitable part of private or working life, which can motivate him for better results. Stress influences eking and behaviour of individuals in an important way. Possible **sources of mental strain (stress)**:

- New, too strong and fast changing stimuluses;
- Interrupting and constant changing of concentration, information overflow;
- Asynchronous orders, tasks, instructions from management at working place;
- Lack of information when worker is forced to take a stand on something, decide, delegate and plan;
- New and sudden requirements for change of every-day used, stereotypical ways of behaviour and others.

Between the sources of load situation is inevitable to classify events from personal life, load life situation (e.g.: the death of close relatives, disease, loss of employment), which can influence work, performance of individuals but on the other hand, various work problems can influence personal life of people.

**Stress manifestation** is decreasing working performance and motivation, decreased concentration, insufficient coordination, tenseness, duplicate work, irritation, missing flexibility, failure to meet obligations, loss of sense for every-day work, changes in eking and others. Between the signs of stress it is possible to classify (Kačáni, 1999):

- Physiological symptoms (turning red, breathing changes, sweating, vertigo, vomitus);
- Cognitive symptoms (reducing of range and accuracy of perception, thinking, perception, memory, speech disorders, negative changes in social perception, disturbed balance of decision-making and evaluating processes);
- Emotional symptoms (fast changes of mood, strong emotional expressions in mimics, gestures, informal language, emerging negative states in eking – fear, anxiety, insecurity, sense of guilt, apathy, depressions, loss of emotional control);
- Behavioural symptoms (motor activity disorders, decreased cooperation, accuracy and check of movements, motor restlessness is occurred – trembling and torticollis).

Result of the influence of load situations is gradual decreasing of working performance, raising emerge of errors and failures which creates human failure, increases the possibility of injuries and changes in eking and behaviour concerned on gaining the aim which is changing to behaviour concerned on self-defence. States of psychical load and stress are basically emerged and shown in the spheres (eking, motor abilities signs, cognitive and physiological signs), they interfere in volition, they disrupt individual's integrity, cause mobilisation of self-regulation system (Činovský, 2002; Zánická Hollá, 2011). Between **disorders caused by long-term affecting load factors** we can classify: pathological lassitude, acute reaction on stress, dissociative amnesia, permanent personality change after catastrophic experience, mutism, posttraumatic stress disorder, chronic fatigue syndrome and burn out syndrome (Brečka, 2009).

By excessive activation, which is caused by load situations, the disruption of individual functions working is being held and there is emerged incompetence of purposeful and adequate actions but also disorganisation of general behaviour of an individual.

## **METHODS AND TECHNIQUES AIMED FOR COPING THE STRESS**

Coping load situations is possible to be understood as a form of behaviour by the help of which individual can resist or overcome load situations. It is a process of controlling, overcoming with external and internal requirements which are experienced as load, so they are currently surpassing the abilities of individual. This coping is on conscious and unconscious level of eking. It is necessary to give reasons why to cope with load situations and which results on people their long-term usage can have. With coping the load situation, terms adaptation and coping are connected.

**Adaptation** for subjectively eked reality (load situation) is often provided by defence mechanisms. For the base of defence of self-conception, safety feeling is possible to consider involuntary pushing out and deliberate

suppression. Pushing out is based on elimination of unpleasant and inadmissible psychic experience from the individuals' consciousness. Although the individual does not realise them, they can influence his eking and behaviour. Pushing out is about abandonment of some certain attractive activity or its postponing (Paulík, 2010). Between defence mechanisms we can classify regression, projection, trivialisation, rationalisation, social isolation, compensation and aggression. **Coping** is understood as "defence" of person with inadequate and extreme load which he cannot cope by casual way of behaviour. In comparison, adaptation is understood as coping with load which person can relatively easily control and in some limits, he can defeat it.

Between techniques used in working process for eliminating the occurrence of negative psychical states (tiredness, monotony, limiting or extreme psychical load and others) belong: models of sleeping regime and rest during working time, using of free time and forms of relax (work breaks, tempo a working rhythmizing – optimal working tempo, time management, sleep, relaxation, breathing exercises, movement). Bedrnová (2007) states that, prevention concerns especially the sphere of regime and appropriate working and rest activities. The significant importance has the causes, expressions and results analysis of increased neuropsychological load. Leading worker should pay attention at looking for his effective life way. Then it is looking for such a life program which would provide him as best psychological and physiological development of his potential. There are listed strategies of coping stress which Vymětal divides into: short-term (coping current stress situation) and long-term (preventive) in table 2.

**Table 2:** Strategies for coping the stress (Vymětal, 2009)

<b>Short-term:</b>	<b>Long-term:</b>
Work with breathing, long breathing; Drink, cool carotid artery; Movement (go for a walk); Internal monologue; Intentional distracting of attention; Positive imagination.	Right regime; Regular physical activity; Relaxing exercises; Analysis of problems and possibilities of its solving; Care of interpersonal relations; Open communication; Self-education.

There are listed principles which are possible to use within coping stress and also its prevention in table 3.

**Table 3:** Rules aimed for prevention of psychical load and stress (Bartůňková, 2010)

<b>General:</b>	<b>Specific:</b>
Knowing ourselves and our own possibilities; Learning how to cope my emotions; Determine real and attainable aims; Recognise various stressors and estimate stress situation which could occur; Distinguish important from less important and suggestible from not suggestible on time; Accept problems and do not get discouraged by it; Change lifestyle, relax appropriately; Use anti-stress techniques, make assertive behaviour; Movement activity, spend time doing your hobbies.	In crises to name the general problem; Determine priorities and hierarchy of importance; Look for compromises if optimal solutions are not possible; Control emotions (as leading worker or worker); Delegate authority if it is needed; Refuse risky and out of control tasks; Correctly manage time and keep the timetable, Learn to relax.

Very interesting is **prevention and raising of psychic resistance of individuals** with the interest in coping load situations. For prevention has a big impact also self-knowing and self-control which are inevitable for identification of sources of individuals load as their solving and coping. Between preconditions of coping load situations and increasing resistance towards them is possible to classify: interest for own health, well-balanced

diet, positive thinking, relaxation, using tools of time management (e.g.: Paret's principle, Eisenhower's principle and Method ABC), assertive behaviour, rest, movement activity, education aimed on load situations issue and others. In the case of need it is inevitable to find an expert who will suggest possible solution according to some analysis of stated problem.

Appropriate way how to cope psychical load and stress are breathing exercises. **Breathing exercises** are part of body exercises, relaxation techniques and common movement activities and they have an effect on the whole organism. Rhythm of breathing involves muscular and psychic pressure. Inhalation supports active movement, mobilisation of energy, concentration on a certain object and exhalation is connected with release, relaxation by which there is an effort for distracting of attention from undesirable thoughts, visions, disturbing events or stimuluses. In order to be effective and to be able to use them by relaxation or by coping psychic load, such as during solving the crisis phenomena, breathing exercises are needed to be studied – the technique of breathing from professional literature or to learn it by the help of specialist. By the help of conscious breathing it is possible to decrease the influence of stress for individuals' performance, concentration, attention and it helps to cope fits of anxiety (Paulík, 2010; Jones, 2010).

Within the campaign healthy workplaces without stress (SLIC 2012, EU-OSHA) those tools aimed for evaluation and reducing stress were recommended (Zdravé, 2013):

- Handbook of International Employment Office with the name „Stress Prevention at Work Checkpoints“;
- Legal norms for leading the work stress published by Health and Safety Executive in United Kingdom;
- Tool „Faire le Point“ of French National Institute for Research and Safety;
- Belgian strategy SOBANE, strategy for evaluation and prevention of psychosocial risks;
- Other internal tools for coping stress and psychosocial risks are provided by national contact places – agencies EU-OSHA.

## CONCLUSION

In present times, psychosocial risks seem to be one of the most alerting problems within working places. Their negative impacts influence workers health and economic terms of organization. Consideration of those risks is not time-consuming but also content demanding, because human factor differs between workers each other. Important psychosocial risks are e.g.: bad communication and cooperation between management and employees and also between colleagues, clients, there is an uncertainty for working place, stress connected with working and time stress. Concerns for handling and especially for prevention of situations, which could lead to stress or other psychosocial risks on the individuals level (self-realisation) and on the employers' level (corporation) which should provide adequate working conditions, are very important.

As mentioned in the article there are many methods, techniques and principles how to cope load situations. Each person should choose the type of coping psychic load and stress which fits him the best. After the appropriate choice and successfully done ways how to cope psychic load and stress there is a precondition that worker will be looking at situations which he can experience subjectively as loading. He can easily concentrate, perform better at work, master his reactions, perceive and solve problems and raise above it and to react better on emerged situations.

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## Educational Software for the Sprego Method

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### ABSTRACT

It has been found that traditional spreadsheet-teaching has a technocentric and decontextualized focus and is aimed mainly at demonstrating the technical features of the computer application. This approach does not help students and end-users in developing their computational thinking, nor with schema-construction, reliable fast thinking, storing knowledge in long term memory, and ultimately, working effectively and efficiently with spreadsheets. However, among several recently published methods, Sprego – Spreadsheet Lego – is free of these misconceptions, and as such, is a high mathability, computer-supported real world problem solving approach for both spreadsheet management and end-user programming, which has been proved to be more effective than the traditional spreadsheet approaches.

Our current work is based on Sprego programming. We developed an educational application to support the students' understanding of the execution processes of algorithms, the building of composite functions, and the process of discussing/debugging problems. The application consists of the animated visual representations of real world problems and a formula evaluator – similar to the one that can be found in spreadsheet applications – for displaying the problem-solving process step-by-step. Our software – available in English and Hungarian languages – currently supports a counting and a searching algorithm with the `{=SUM(IF())}` array formula and the `=INDEX(MATCH())` lookup formula, respectively.

In our classes we conducted experiments using the software, and the responses were positive and encouraging. The students found the graphical design engaging, followed the presentations on how these algorithms and formulas work, and it also helped them solve similar problems, which support schema-construction. From the teachers' perspective, the learning process was more effective after presentation, since the formulas required less explanation and reiteration. Similar results were found in testing high-school and university students, which proved that the method and the application is not restricted to specific age and interest groups.

### INTRODUCTION

Teaching spreadsheet management provides knowledge of handling data and structured information that students will use in their everyday life. This topic also lays the foundation for future topics in ICT, such as database management and programming (Hubwieser, 2004, Schneider, 2004, 2005; Zsakó, 2006; Wakeling, 2007; Sestoft, 2011, Csernoch, 2014; Csernoch & Biró, 2015b, Csernoch & Biró, 2017). Moreover, it has the potential to develop computational thinking (Wing, 2006) and algorithmic skills if the appropriate method is used (Csernoch, 2014). The Sprego programming – Spreadsheet Lego – provides an efficient and high-mathability (Baranyi & Gilanyi, 2013; Biró & Csernoch, 2015a, 2015b) approach to teaching spreadsheet management and to facilitate computer-problem solving skills. We provide a more detailed introduction for the method in the following section: “SPREGO”. We developed an educational software for the Sprego method (Csapó & Sebestyén, 2017) to introduce visual representations for the most common spreadsheet-problems to support the educational processes. In this paper, we present the currently prevailing situation and problems as regards end-user spreadsheet-management education, and the Sprego method as a possible solution to these issues. We demonstrate our educational software designed for the Sprego method in detail, as well as the underlying technical details and methods used to develop the application. We also share the experiences and feedback we gathered while teaching student groups using the software.

#### *Computer problem-solving*

The ability to build up algorithms and computational thinking is essential in our everyday life. Therefore, developing these skills in students is an important task for computer-science education and is mainly carried out within the programming topic. Research shows that students completing their school leaving exams at high schools lack the required level of computer problem solving abilities that they and tertiary education can build upon (Biró & Csernoch, 2013; Biró et al., 2015). This situation poses problems in higher education, such as the

need for reiteration courses for first-year university students, and the divergent and unreliable nature of previously acquired knowledge. In our vision, topics such as end-user computing should focus on developing computational thinking from the beginning in order to support knowledge transfer so as to develop the long-lasting knowledge and algorithmic skills the subsequent topics can rely on. However, the currently applied approaches mainly consist of navigating on the applications' interfaces instead of focusing on the logic behind creating and structuring information. "Traditionally, the teaching of spreadsheets ... has had a technocentric and decontextualized focus, and aimed at mainly demonstrating the technical features of the computer application..." (Angeli, 2013). While these traditional approaches prepare the students for passing the final exams, they do not build up lasting knowledge and invoke a state of sunk-cost fallacy when confronted with alternative methods (Kahneman, 2011). This problem is relevant to students and teachers alike. In our experience while working with Sprego, we found teachers who were open minded towards new educational methodologies, but there is a considerable group of educators who prefer to stick with the traditional approaches with a "belief in the fixed nature of science", and who have neither the time nor the inclination to explore and experiment with alternatively developed areas of the topic (Chen et al., 2015).

#### *Birotical software*

Some of the most commonly used applications in every line of work are 'bureautique' software, birotical for short. Nowadays, end-user knowledge of such programs is a requirement for almost every job and can prove to be invaluable for personal use as well. Students are taught birotical software programs from their first ICT years in schools and are constantly using them as they progress in their studies (NAT, 2012; Kerettanterv, 2013). The software used varies according to the individual, but the most commonly chosen packages are Microsoft Office (Microsoft, 2017) and Open/LibreOffice (The Document Foundation, 2017). Google Documents (Google, 2017) is also a valid option for cloud-based and potentially collaborative work.

Since students learn to use birotical software throughout ICT education, it is not uncommon that they develop a certain point of view that they can and are using these applications correctly, and that they create error-free documents. The fact that the newest versions of office software come with built in, user-friendly wizards, commands, and functions designed for specific purposes rather than general usage, means that most students use these software packages in a trial and error, wizard-based way (Csernoch & Biró, 2015a, Csernoch, 2017), navigating and searching for tools that are closest to their needs on the interface without logical structuring or building. This practice results in bricolage (Ben-Ari, 1999; Csernoch, 2009, 2017), documents which carry the potential to cause damage to the individual or the company. For example: bricolage text documents require more effort and resources to update, and present a non-professional image of their creator, while "bricolage spreadsheets" may cause financial losses due to the misuse of spreadsheet functions and calculations ([Horror Stories], 2017). Another problem with teaching birotical software effectively is that it creates the sunk-cost fallacy. Students who have previously learned to use birotical software using a specific methodology tend to insist on continuing to use this approach, even if it is proved to be less-efficient (Kahneman, 2011). Therefore, teaching students who have experience with such software using alternative methodologies requires constant reiteration of the curriculum to make the new information more dominant than the less-efficient previously learned knowledge. Users who have learned end-user text management using traditional methods tend to make several errors (for example formatting, layout, and typographical errors) while creating text documents (Csernoch, 2009, Csernoch et al., 2015). The ERM (Error-Recognition Model) (Csernoch, 2009) methodology focuses on error-detection and correction from the beginning. With the ERM, the students learn how to create well-formatted documents instead of using the previously mentioned trial and error wizard based approach.

Throughout their studies of spreadsheet-management, students learn specific spreadsheet-functions for solving special problems (Csernoch et al., 2014). This results in a large number of functions that the students have to master, remembering the purpose of each of them. Furthermore, each of these functions has different arguments, which further complicates the subject and usually confuses the learners (Csernoch, 2014). Since writing spreadsheet formulas is a functional language (Sestoft, 2011) it can also serve as an introductory programming language for students (Booth, 1992). Using spreadsheet environments to teach programming provides students with a familiar interface and syntax to work with, while also focusing on deepening the spreadsheet management subject area.

#### *Educational software*

Nowadays, educational software programs are regarded as popular and useful tools. There are approaches which claim that these applications are more effective than teachers; however, both practice and research confute that assumption. Using only computers instead of teachers in classrooms is not yet possible, since today's educational software can only be efficient with guided instructions (Kecskés, 1987; Wilson et al., 1996; Iacob, 2009). Therefore, it is more accurate to refer to these pieces of software as computer-assisted learning or learning process assisting tools. While every program created with an educational usage in mind is different, they have the same goal: to support the learning processes (Kecskés, 1987) and to make understanding the topic easier through

interactive representations. Using computers to support the learning of schema-construction based on the Cognitive Load Theory (Merriënboer & Sweller, 2005; Skemp, 1971) is a well-founded practice and was one of the ideas behind the development of our Sprego Application. Our goal was to represent the purpose and essence of the Sprego method using a computer-assisted interactive interface: creating and building algorithms, developing long-lasting knowledge, and transforming algorithms into schemas. Since in the spreadsheet management subject area these goals require a deep understanding of the artificial language of the spreadsheet management software, a visually engaging and interactive interface offers the possibility of making the learning process more effective.

## SPREGO

The Sprego – Spreadsheet Lego – methodology provides an alternative approach to spreadsheet management teaching. Regarding the results of the TAaAS (Testing Algorithmic and Application Skills) research (Biró & Csernoch, 2013; Biró et al., 2015), students who studied with traditional approaches in high-schools listed 99 different spreadsheet functions when asked to define the most important 15 functions in the subject (Csernoch et al., 2014). This leads to the realization that the learning processes and educational materials used in practice are very different, since every teacher has a preferred function base to work with. This method does not provide effective results, as students applying for computer-science courses in tertiary education lack fundamental knowledge in spreadsheet management (Csernoch & Biró, 2014).

The IEEE ACM report lays down three levels of knowledge (IEEE&ACM, 2013):

- Familiarity: Basic awareness of the concept and its meaning.
- Usage: The application of the concept using a technique.
- Assessment: Examination and consideration of the concept and the selection of the appropriate approach.

The levels above are consistent with the logic of the problem-solving techniques defined by Pólya (1954):

- Understand the problem
- Devise a plan
- Carry out the plan
- Look back

ICT education usually uses an interface based approach which correlates with “Usage” in the IEEE&ACM levels of knowledge and does not reach the Assessment level.

In Sprego the students work with general purpose functions, creating composite spreadsheet formulas (more details are provided in the “Sprego functions” subsection). As a symbol of this approach and of how composite functions work, the method uses Matryoshka dolls (Figure 1) for representation. This approach is based on real-life problem-solving and data, while motivating and facilitating algorithm building for the students. Using this method we focus on developing computational thinking and long-lasting knowledge supported with high-mathability problem solving approaches (Baranyi & Gilanyi, 2013; Biró & Csernoch, 2015a) that means slow thinking for novice and fast thinking for familiar problems (Kahneman, 2011, Csernoch, 2017).



**Figure 1:** Matryoshka doll designed by Zsuzsanna Biró.

Sprego reaches the third level of the IEEE&ACM levels of knowledge, developing from the first one. Using alternative methodologies sometimes requires a specific environment or software to work with. Therefore, we would like to point out that Sprego is both spreadsheet management software and version independent and is suitable for all age groups. In contrast to other functional programming languages, Sprego does not focus on the language, syntax, and/or tools, but highlights algorithmic thinking and structuring. Consequently this methodology

can also be used when teaching programming to develop students' computational thinking. Sprego programming can prove an effective choice for this topic, especially in educational institutions where the number of lessons is limited, since the students do not have to learn a new interface and language in order to progress forward.

### *Sprego functions*

Instead of using a large number of specialized spreadsheet-functions, the Sprego method defines a low number of general purpose functions (Sprego1&2: N = 12, that can be further extended with Sprego3, Table 1), which, when applied in composite formulas are suitable for solving spreadsheet problems. The functions are separated into three categories according to complexity and instance of use (Table 1). In practice, not all of the 24 functions included are used, since in most of the cases the functions listed in the first two categories can cover the requirements stated by the curriculum (Kerettanterv, 2012).

The widely used problem specific merged functions (for example =SUMIF() and =AVERAGEIF()) can be replaced with composite array formulas using the corresponding general purpose functions (for example {=SUM(IF())} and {=AVERAGE(IF())}). Following on from this principle the required number and various forms of arguments the students have to learn are reduced to a smaller, more manageable group.

	Sprego1	Sprego2	Sprego3
1.	SUM()	INDEX()	SMALL()
2.	AVERAGE()	MATCH()	LARGE()
3.	MIN()	ISERROR()	ROW()
4.	MAX()		COLUMN()
5.	LEFT()		AND()
6.	RIGHT()		OR()
7.	LEN()		NOT()
8.	SEARCH()		OFFSET()
9.	IF()		TRANSPOSE()
10.			ROUND()
11.			RAND()
12.			INT()

**Table 1:** The Sprego functions listed in 3 categories.

Research proves that students who have learned spreadsheet management using Sprego can solve spreadsheet problems with 40–50% success rates several years after their classes, while for students who have used traditional methods with problem specific functions the rate of successfully solved problems is 5–10% (Csernoch & Biró, 2015a). Therefore, teaching Sprego programming is a more effective approach than traditional methods, providing guidelines which the students can later build upon and a unified framework to develop algorithmic thinking.

### *Unplugged tools*

Using unplugged tools in computer science education stimulates the thinking process even when the students are not in front of a computer. These tools offer the possibility to improve group problem solving abilities and efficiency, and support social activities. Most beginner programmers focus on solving problems by language and syntax instead of thinking about the problem itself (Bell & Newton, 2013).

In Sprego we used 3D printed Matryoshka dolls (Figure 2) to show how composite formulas work. In our experience, this form of unplugged tool can be used regardless of age and educational level. We used the following methodology to help students understand the basic principles of algorithms and build up composite formulas. The students wrote the steps of the discussed algorithm (based on the educator's instruction) on painter's tape. After each step, they stuck the appropriate tape onto a doll and embedded it into a bigger one. At the same time, the students completed the appropriate step on their computer. This process was repeated until all the steps of the algorithm were written down. After we had solved the spreadsheet problem using the algorithm, the students disassembled the dolls, from which they removed the tapes and stuck them into their notebooks (Figure 2) to provide a unified and reliable source of student notes. We found that using unplugged tools throughout the teaching process increased the students' motivation, as well as improving class efficiency, and made the understanding of the algorithms easier (Biró & Csernoch, 2017), especially in the early stage of the topic.



**Figure 2:** The 3D printed Matryoshka dolls and the pieces of painter's tape stuck into one of our student's notebook with the steps of the discussed algorithm written on them.

## VISUAL PROGRAMMING

An alternative programming method which is becoming more and more popular by the day is visual programming (Pro, 2009; Fincher et al., 2010; Papadakis et al., 2014). With this approach the developers build up their projects and their logic by using graphical interfaces to visually construct every aspect of the software under development. Creating the code for a program using visual programming means that the user works with some form of graphical interpretation of a programming language (usually a specifically constructed version of a programming language) to build up the algorithms. The development environment then translates the visual code into a traditional programming language, usually by code-generators. This programming method is designed to focus on the logic and algorithms in a project by eliminating factors that beginner programmers find distracting and troublesome (for example the syntax of the programming language).

Developing with visual programming provides an easier and more understandable form of programming compared to the traditional text-based languages (Fesakis & Serafeim, 2009; Kim et al., 2012). We found that using visual programming environments speeds up the development process and even seasoned developers choose to work with this approach because of its advantages. These languages have usually been designed with educational usage in mind. This means that learners are provided with several resources and help tools to make the necessary learning curve for the specified language smoother. Note that this may vary depending on the chosen environment. However, we would like to point out that visual programming, since it is based on and is a specifically constructed version of a traditional programming language, has limitations. It varies by development environment, but usually the pre-constructed visual building blocks for the code are more limiting in terms of usage than writing text-based program code. Another problem is that the environments built for such programming are diverse and therefore each uses a special form of visual language, making transition between environments troublesome. However, despite the various forms of visual programming languages, after investigating several environments we found four categories that any visual language we have so far encountered can be fitted into:

- Behavior based: This form uses pre-programmed scripts (called behaviors) to provide the developer with the easiest and most rapid development process in which the user assigns the behaviors to objects. These types of visual languages guarantee results instantly. However, it can be very limiting and usually only minimal configuration is available for the pre-constructed behaviors. For this reason, this method is best used for prototype purposes. An ideal visual programming development environment includes the option to use behavior based methods, but also includes a less-limiting form of visual coding, for example Construct 2 (Scirra, 2017a) and Construct 3 (Scirra, 2017b).
- Block based: This approach can be considered the most popular choice in education based on observing the commonly used learning programming environments. It builds on the structure and logic of traditional text-based languages, but instead of typing commands, it incorporates them into blocks that can be embedded into each other. Therefore, this method is one of the least limited forms of visual programming and the knowledge it develops can be easily translated to traditional programming methods later on. However, due to the fact that it symbolizes the structure of text-based code, some students may find it harder to master than other visual programming forms. The popular Scratch (Lifelong Kindergarten Group, 2017) learning programming environment and the Stencyl (Stencyl, 2017) development software are based on this approach.
- Event-action based: This method uses pre-constructed conditions (included in events) and commands (actions) to provide the building blocks for the project's code. The user creates their custom event blocks

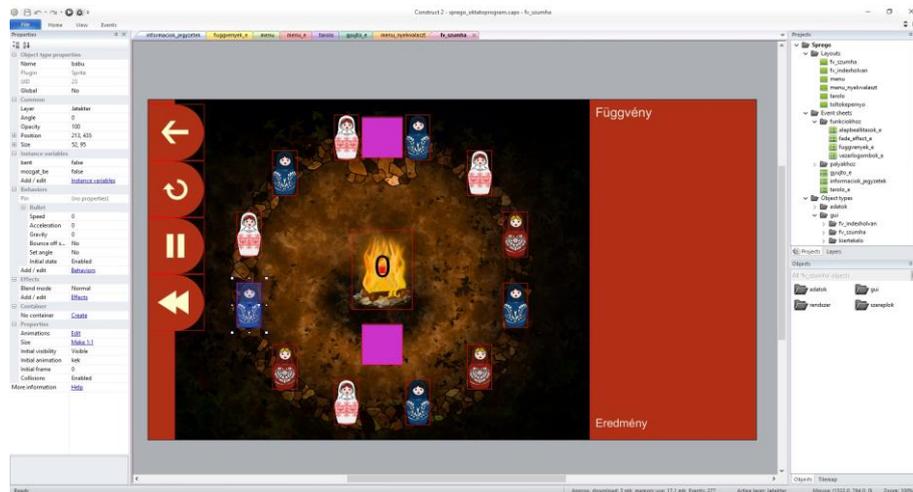
using the conditions provided (note that some environments only let the user include one condition per event) to create situations where the actions will run that they have defined to this block. This form of visual programming results in an easy-to-read code, and at the same time (depending on the environment's condition and action base) does not limit the project in terms of functionality. It is important to note that despite the advantages of event-action based visual programming, we found that it is not a popular choice for education and software development, and only a few development environments can be found using this method, such as Construct 2 (Scirra, 2017a), Construct 3 (Scirra, 2017b), GDevelop (Rival, 2017), and Kodu (Microsoft Research, 2017).

- Node-based: With this form of visual languages, the developers create flowcharts using pre-constructed nodes. Each node defines a purpose in the code and has points for connection (for example input and output). The user builds up the logic of the project by adding nodes to the flowchart and connecting them using the points provided. By observing popular, industry leader development environments, node-based visual programming can be considered the most popular among the categories listed above. It provides a great visual representation of the application's code; however, it can be difficult to see through once the project reaches a higher complexity level. The popular Unreal Engine 4 (Epic Games, 2017), Godot Engine (Linietzky & Manzur, 2017), and GameMaker: Studio (YoYo Games, 2017) all include forms of node-based programming.

Different forms of visual programming have been taught in educational institutes for years, with varying results (Seiter & Foreman, 2013; Kalelioglu & Gülbahar, 2014). Simple forms of learning programming environments can be seen at major events (Code.org, 2017) popularizing programming in order to help students understand and develop a positive image towards the basic principles of programming. For our work, we chose the event-action based visual programming method because of its advantages and future possible integration into the educational processes. Our goal was to use a method and environment that students can also master while providing an example for possible educational software development using visual programming.

### Construct 2 & 3

To develop the Sprego Application (Csapó & Sebestyén, 2017) we chose the Construct 2 (Scirra, 2017a) visual programming environment (Figure 3). It uses an event-action and behavior based approach to build up algorithms. The underlying engine of the software is based on HTML5 and the environment is currently available for Windows operating systems. After examining several options for visual programming languages, we decided to use Construct 2 because of its efficiency and general design. The software was designed to support a wide range of applications for development, without locking the user into a pre-defined type of project.



**Figure 3:** Sprego Application: the layout of the counting problem representation inside Construct 2.

When working with this environment, the developer has to be aware of the three most important aspects of the development process specific to this software: layouts, event-sheets, and objects (Scirra, 2017c). Construct 2 uses layouts to display content on the screen. Every project contains at least one layout that serves as the canvas of the application. The visual code (events and actions) are defined on the event-sheets. These sheets either need to be referenced by one of the layouts or called by another event-sheet in order to run the visual code. The software defines objects as elements that perform most of the useful work in a project. These elements are also important when considering the event-sheets. Every condition and action references an object, therefore the group of available options for the visual code is defined by the objects added to the project. It is important to mention that

the System object is always present in every project by default to manage system-related tasks, for example variables and loops. The software separates the objects into two categories:

- Non-global objects: These elements usually have a visual appearance and can be placed on the layouts. The user has to add these objects to each layout she wants to use them on. This category consists of objects such as images, text boxes, and buttons.
- Global objects: The specialty of global objects is that they only have to be added once to the project and they will be available for the entire development process. Generally, they perform system-related tasks (similarly to the System object) that do not require visual representation on the screen, such as audio, keyboard, mouse, and touch screen input.

Construct 2 is considered a well-supported and documented environment. There is a complete manual available (Scirra, 2017c) covering all features and unique aspects of the software. The community working with this environment is also productive. User-written tutorials (Scirra, 2017d) help the learners to better understand and extend the possibilities of the software. The official forums are active and the inquiries posted there usually receive responses within a day. Further advantages of the community are that the Construct developers also actively respond and help out users, and that there is a dedicated section for the educational usage of the environment (Scirra, 2017e).

While the environment supports text-based programming in a limited form, it also allows the community to create add-ons based on JavaScript and the official SDK (Software Development Kit) for those who find the default behaviors, conditions and actions limiting. The community has already developed and uploaded various add-ons to the official forums in order to extend the capabilities of the software.

Construct 2 is free to use with limitations (educational usage of the free version is permitted). For developers who need extended functions, one-time payment licenses are available for personal and business use. Educational institutes have the option to subscribe to educational licenses to unlock all capabilities of Construct 2, and they also have the opportunity to buy licenses for students to work on their projects at home for a lower price than personal-use licenses.

Since the start of the development of our Sprego Application a new major version of Construct has become available: Construct 3 (Scirra, 2017b). The engine behind the software has remained the same (in the currently available version), while the editor has been rebuilt from the ground up to target web-browsers and to rule out platform restrictions. Construct 3 as a PWA (Progressive Web App) brings new possibilities for educational usage which require further examination. The latest version of the software is currently in a publicly available beta stage. After a stable version of Construct 3 releases, we plan on porting our application's source code to the new environment.

## **SPREGO APPLICATION**

We developed an educational software program for the Sprego method to support its usage in educational processes by providing a visual representation of the most common spreadsheet problems. We focused on creating software that is easy to use and accessible for students. We optimized the interface of our software in a minimalist design, while reflecting on feedback received from in-service teachers during the development to provide an appropriate structuring of the information included. Additionally, our goal was to create a spectacular and aesthetic look to motivate students without compromising on quality and readability.

As we described in the “SPREGO” section, the methodology uses composite formulas in spreadsheet environments. Understanding the algorithm of the problem and the functional language of the software can sometimes pose problems for the students. Therefore, using unplugged and semi-unplugged tools, such as 3D printed dolls and our software, respectively, can help the students grasp the concept and logic behind the Sprego functions.

Based on the frequency of the spreadsheet problems, we implemented a step-by-step visual representation of the following problems:

- `{=SUM(IF())}` counting array formula
- `=INDEX(MATCH())` composite lookup formula

We also included a formula evaluator similar to the Formula Evaluator of spreadsheet applications to list the steps one-by-one in a form that would symbolize how the spreadsheet applications execute the formulas. We used Matryoshka dolls in our design to provide a consistent look with the symbols of the Sprego method. The original dolls we used were designed by Zsuzsanna Biró (Figure 1), which we recolored to create our own set of dolls. It was an important aspect of our work to present these dolls in real-life contexts, similar to that aspect of the Sprego methodology where the students work with real-life data and problems. The software uses sound effects for the presentations with the aim of capturing students' attention through different senses.

Our application currently supports English and Hungarian languages and is available on Google Play (Csapó & Sebestyén, 2017) to download for free.

#### How it works

After the application starts, the menu appears, where users have the option to choose one of the problems included (Figure 4). The right side of the screen contains the options for the selected problem. Since the available options differ for each problem, they are hidden until the user chooses a problem listed on the left side of the screen. In the current version, the difference between the settings of the two problems is the number of available colored dolls. After the problem has been selected and configured an animated “Start” button is displayed to start the presentation. The menu also contains options for turning sound effects on or off and changing language.



**Figure 4:** The menu of the Sprego Application with the “How many dolls have the same colour?” problem selected and configured.

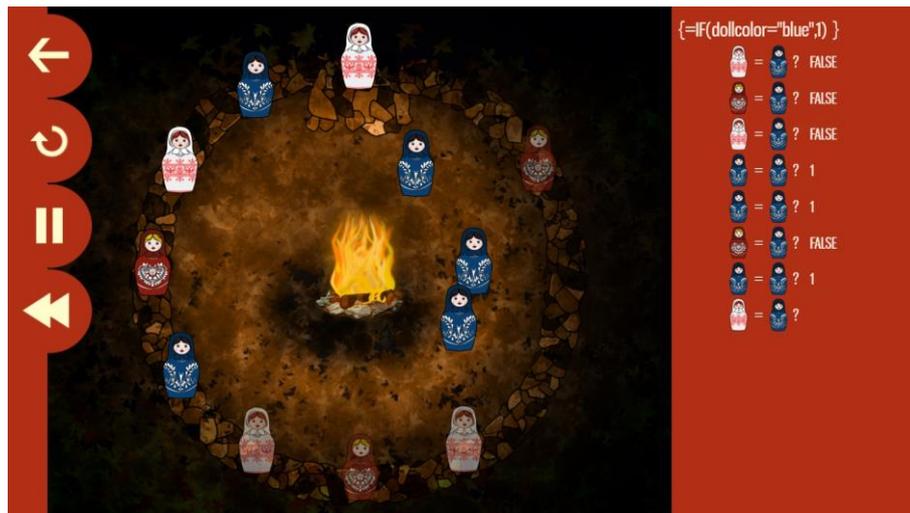
The screens presenting the implemented problems (Figures 5 and 6) consist of three major parts (from left to right):

- Buttons for controlling the presentation
- Presentation space
- Formula evaluator

The buttons for controlling the presentation provide options for the user to go back to the menu, restart the presentation, pause or continue it, and slow down the movement of the dolls. Navigating back to the menu allows users to select a new problem, or define different inputs for the currently selected one. Restarting the actual presentation does not change the user’s settings, while generating a different – random – placement for the dolls. The pause and slow-down features are implemented in order to allow the students to examine the content seen on the screen at a slower pace. This can prove essential when going through the displayed content of the formula evaluator.

#### Counting: $\{=SUM(IF())\}$

The first problem included is based on the following question: “How many dolls have the same color?” In Sprego, to solve this problem (provided we have selected a color beforehand) first we have to apply selection to the vector of the dolls by asking yes/no questions and then making decisions based on the answers by using the  $\{=IF()\}$  array formula. The yes/no question outputs TRUE or FALSE logical values for each doll. Before moving to the next step, the learners need to set the arguments of the  $\{=IF()\}$  array formula to return 1 (as a number) at the TRUE branch for each doll, while the FALSE branch is ignored. The last step is to summarize the items of the output vector to get the number of the dolls which have the same color as we selected. Following on from the above, this problem is based on the  $\{=SUM(IF())\}$  array formula, which serves as a basic calculation method in Sprego, and students learn to work with it when they start the ‘counting formulas’ topic (Csernoch, 2014). We designed a visual representation (Figure 5) for this formula to aid the learning process and to symbolize the steps the spreadsheet management software takes when it executes it.



**Figure 5:** The representation of the  $\{=SUM(IF())\}$  array formula inside the Sprego Application.

The dolls ( $N = 12$ ) whose colors are randomly selected (blue, red, and white) are standing in a circle around a campfire. As the presentation starts, the dolls start to move (“dance”) along the circle. Each doll who reaches the top of the circle (indicated by stones at the top of the screen) has its color compared to the color selected in the menu, and makes the circle stop for a few seconds. This symbolizes that a comparison is happening before the movement begins again. If the doll has the same color as we are looking for it moves (“walks”) closer to the campfire and continues its movement along a smaller circle. If the comparison has returned a FALSE, the doll becomes transparent, indicating that it will be disregarded in the following calculation. This process continues until all dolls are evaluated. After the last doll’s color has been compared with the condition, the dance around the campfire stops permanently and the software counts the number of the dolls inside the smaller circle one-by-one while displaying the result inside the fire.

At the beginning of the presentation, the formula evaluator on the right side displays only the first step of the algorithm, the  $\{=IF(dollcolor=selected\_color,1)\}$  array formula with the selected color’s name. As each comparison is made, the evaluator lists the compared doll with the selected color next to the result, one after the other. After the evaluation of the colors is completed, the formula of the following step is written below the list of the comparisons:  $\{=SUM(results)\}$ , surrounding the output of the previous formula. Meanwhile, the array formula at the top is extended to display the complete array formula required to solve the problem:  $\{=SUM(IF(dollcolor=selected\_color,1))\}$ .

*Searching in vector with unique items: =INDEX(MATCH())*

The problem “In which house does the doll live?” is based on lookup formulas. The first step of the algorithm behind solving this problem in Sprego is to find the index of the doll which has the same color as we selected. In the comparison of the dolls’ color-vector to the color we are looking for the  $=MATCH()$  spreadsheet function is used (with the “match\_type” argument set to “0” for an exact match). The whole number which this function returns will be the index of the colored doll required. The next step is to find the house in which this numbered doll lives by using the previous result in an  $=INDEX()$  function. The students will then find the appropriate house based on the doll’s index with this function. A composite formula comprising these two functions is the universal lookup formula for vectors in the Sprego method:  $=INDEX(MATCH())$ . Our representation of this problem works with this composite formula (Figure 6).



**Figure 6:** The representation of the =INDEX(MATCH()) composite formula in the Sprego Application.

After the user has selected a color from the menu and started the presentation, all the dolls with different colors ( $N = 9$ ) are distributed randomly on the screen in front of their houses. Note, that the vector of the houses is constant (no change will occur to them on restarting the presentation), and each colored doll only appears once. The context is that the dolls are standing in front of their houses, waiting for the postwoman to check whether they have mail or not. In this situation only the previously selected colored doll has mail and the postwoman will look for her to deliver it. The postwoman starts from the top-left part of the street and moves (“walks”) in front of the dolls, stopping at each one for a few moments and comparing them to the condition (the selected color). If the currently compared doll has the same color as we are looking for, the postwoman turns to her and walks closer to deliver the mail. If the comparison has returned a FALSE, the postwoman continues to move until the appropriate doll has been found. While the design of this presentation splits the dolls into two lines (Figure 6) this has no meaning and effect in the context of the specified composite spreadsheet formula.

The formula evaluator displays only the first step of the algorithm at the beginning of the presentation:  $\{=MATCH(doll,dolls\_vector,0)\}$  and the vector of the dolls the formula is working with. As the postwoman inspects each doll, the vector of the dolls is extended one-by-one with the comparison at hand, displaying the selected colored doll along with the result (the index of the doll). When the doll in demand is found, its comparing line will be highlighted in the evaluator to mark it as the answer for this step. The software waits for the postwoman to complete her movement (delivering the mail) before continuing to display the formula for the next step at the bottom of the column:  $\{=INDEX(houses\_vector,doll\_index)\}$ . Since the presentation with the postwoman has ended, the formula evaluator plays a vital role in displaying the steps the spreadsheet software takes with this formula. The vector of the houses appear next to the dolls at the comparison lines, while the formula at the top is extended to contain the complete solution for this problem:  $\{=INDEX(house,MATCH(doll,street,0))\}$ . As a last step the answer to the problem (the house in which the selected doll lives) appears at the bottom of the evaluator, next to the  $\{=INDEX(house,doll\_number)\}$  formula.

## TECHNICAL BACKGROUND

After examining the available visual programming environments on the market, we decided to develop the Sprego Application using Construct 2 (Scirra, 2017a). Construct 2 is built on a lightweight HTML5 engine to run the applications developed with it as efficiently as possible and to provide the widest platform support via web-browsers. While developing the Sprego Application we built up the algorithms with a structured, organized, and clean code result in mind. The well-structured form of our visual code allows straightforward error correction and an accessible form to extend the capabilities of the software (for example with newly supported spreadsheet formulas, languages, and platforms).

The software has been optimized for slower devices in terms of its processing power requirements, memory usage, and GPU (Graphics Processing Unit) fillrate. We wanted our application to provide a responsive experience, even on older or cheaper computers, smartphones, and tablets. The graphics included use resolutions and formats to adhere to this purpose while providing detailed visuals on high-resolution displays. We designed our application from the ground up with multiplatform support in mind. While the application is currently only available for download on Google Play (Csapó & Sebestyén, 2017) we built and tested versions for web-browsers and Windows operating systems (32- and 64bit versions) as well. The input types of the most popular devices (mouse and touch) are supported simultaneously and we use cross-platform solutions (for example webfonts and platform-specific functions) to display the included texts correctly. We tested the HTML5 and Android versions of our application prior to release in all major browser software and on the following devices: Asus Zenfone 2, Lenovo IdeaPad 3, LG

G Pad 8.0 and Samsung Galaxy Grand Prime.

The HTML5 technology creates the possibility to support multiple platforms from one codebase through web-browsers or natively by using wrappers. In this process, the code of the application is wrapped together with a modified browser software into a package. When the user starts the application, first the browser software included executes, which then runs the HTML5 application. Our educational software for the Sprego methodology uses the Cordova (The Apache Software Foundation, 2017) wrapper for supporting Android devices natively. It is worth mentioning that due to the availability and technical background of this wrapper, we target Android 5.0 and above versions of the operating system. We decided on releasing the application on Google Play first to provide an easily accessible way for students to download it onto their devices. Based on our observations during the computer science classes, most students have Android smartphones.

The underlying engine of our software supports modern web-technologies, therefore the planned HTML5 release of the Sprego Application will depend on the Service Worker (Gaunt, 2017) solution to provide offline access and running in web-browsers once the students have opened and downloaded the application at the first run.

## USING THE APPLICATION IN EDUCATION

We use the Sprego method to teach spreadsheet management in our classes. Therefore, introducing and using the Sprego Application with our groups was an obvious choice. During the counting and lookup formulas sub-topic we presented our software and used it to support the educational processes for two year-9 groups at a local high-school and for pre-service computer science teachers at the University of Debrecen, Faculty of Informatics. The students responded with interest and focused attention when we presented the implemented formulas. They followed the presentations and the instructors' explanations and asked several questions regarding the topic.

The graphical interface caught the students' attention from the beginning and they found the dolls and their environment interesting and motivating. The built-in formula evaluator also proved to be an effective part of the software. Stopping or slowing down the presentations gave the students and the teacher time to inspect the elements displayed inside it and go through the steps the algorithm takes one-by-one. In the affected classes, the learners were more active, responded more frequently, in a more motivated way to the teacher's inquiries. From the educators' perspective, the increased activity the software produced resulted in more dynamic lessons and required less explanation and reiteration of the problems. Using the Sprego Application made the integration of more complex tasks into the topic feasible and provided a better progression through the classes.

The Sprego Application used together with the unplugged tools developed for the Sprego method enhances the learning process and makes it easier for students to grasp the concept of composite formulas and use them to build algorithms. The pre-service teachers accepted the software as a possible educational tool to integrate into their classes, and it also helped them master the Sprego methodology. Using the software as students, the pre-service teachers also found it helpful and motivating, making the understanding of the computational-logic behind the composite formulas easier.

We would like to emphasize that the results stated above were based on teacher and student feedback and experiences during the educational usage of our Sprego Application. To scientifically measure the efficiency and supporting potential of the application for the Sprego method, future research and measurements are required.

## CONCLUSIONS

ICT education primarily focuses on teaching the interfaces of the birotical programs and therefore it is limited to the second level of the IEEE&ACM levels of knowledge (IEEE&ACM, 2013). The differentiation observed and measured in spreadsheet management education teaches students various spreadsheet functions specialized for specific problems (Bíró & Csernoch, 2013; Bíró et al., 2015). The Sprego (Csernoch, 2014) methodology provides an alternative approach for teaching spreadsheet management by working with a smaller, general-purpose function base to develop computational thinking and algorithmic skills. We developed an educational software program for the Sprego method to help and foster the students' understanding of programming algorithms. Our application, used together with the already tested (Bíró & Csernoch, 2017) unplugged tools, resulted in higher student attention and motivation and therefore more efficient classes. While our initial experiences and feedback were positive regarding the educational usage of the Sprego Application, exact measurements are needed in the future.

In the current version, the Sprego Application contains the visual representation of two problems and is available on Google Play (Csapó & Sebestyén, 2017) for free. We plan to improve and further develop our application in the following areas:

- Implementing more spreadsheet problems
- Supporting more languages
- Including narration to aid visual explanation
- Supporting multiple platforms
- Testing its efficiency in education contexts

Currently only a few teachers have mastered the Sprego approach and we aim to increase their numbers by providing ready to use tools that make spreadsheet management teaching more effective. The official Sprego textbook (Csernoch, 2014), the unplugged tools, and our application are already available to achieve this goal. We hope to see increased attention given to modern visual programming methods as a viable option to develop educational material with, and towards, unplugged and semi-unplugged tools in general, which can help students understand computer science problems from a different viewpoint.

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# Educational Value From the Perspective of Bilingual and Multilingual Pupils From a Different Cultural Environment

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## **ABSTRACT**

The aim of this contribution is to define the importance of educational value of pupils from bilingual, anglophone backgrounds. The survey is based on assumptions. Firstly, the cultural background of pupils is an important socialising determinant and the fact that school education is perceived as the key to the success of an individual in society. The importance that individuals ascribe to the educational value is later reflected in their individual educational and future career trajectories. In the research, we did not only concentrate on capturing the position of the educational value in the value system of the pupil enrolled in the secondary education level, but also on mapping the main aspects that determine the process of constructing it within the individual's value system and the importance of education from a transgenerational perspective. The result of the research was the comparison of the total data obtained from monolingual and bilingual environments.

**Keywords:** Educational value, anglophone pupils, value orientation, value preferences, students from different cultural backgrounds

## **INTRODUCTION**

Man has asked questions about values, about what is meaningful, significant, essentially important and determinant since the twilight of humankind. Such questions have been the focus of philosophers, theologians, scientists or teachers; however, in the broad sense they concern the meaning of everyone's lives and the functioning of society as a whole. Cakirpaloglu (2004) defines them as a specific mental category, which forms a relatively stable and permanent structural element of a personality, important for the individual, social and historical realization of man. Durzoi a Roussel (1994), whose contemplations are based on the philosophical perspective, maintain that such issues are moral categories that determine ethical standards. A value is always connected with a human being and only a human being is capable of attributing a meaning to objects by creating a relationship to the objects (Pruner, 2002). Rokeach (1973) defines a value within the framework of three components:

- a cognitive component connected with learning
- an affective component connected with emotional relationship to an object
- a behavior component acting as an intervening variable.

Rokeach's value components are close to the evaluating relationship, which is often interpreted by social psychology as an attitude comprising three components whose nature resembles those of Rokeach's. He further distinguishes instrumental values and terminal values. In each individual, they are formed through experience, taught and acquired rules, family and school education and self-cultivation of each person. The specifically arranged system of values, regulating our behavior, interests, needs and affecting our attitudes and views, is referred to as value orientation in literature.

The level of education is certainly a prerequisite for a successful and quality life of an individual in society, with the importance of education and education for societal growth (Sak, 2006). In the value system, education is the key value for pedagogy. The educational process itself has a significant impact on this value. The importance and significance of the values that children have as they step into the educational system shows that their backgrounds have a significant influence on their understanding of the educational role in society (Katrňák, 2003). Values are in the center of attention of many scientific disciplines. It is understandable that the concept of values lies at the heart of all contemplations about upbringing and school and extracurricular education. In the field of pedagogy, we concentrate in particular on the value systems of youth, education in itself as a social value, and values as part of aims and contents of schooling, defined in educational programs (Průcha, Walterová, Mareš, 2008). The influence of the value system of an individual upon the process of his upbringing and education is particularly important. The value of education is crucial within the system of values. A person's attitude to education differs in the case of high preference of the educational value and in the case of low

preference. Likewise, individual value specifics are reflected in each educational action (Sak, 2000). In our research, we have chosen the value directly relating to upbringing and cultivation from the broad range of values – the value of education. Our assumption is that the importance that is attributed to the educational value by an individual significantly determines the process of his upbringing and education. The environment from which the individual originates has a fundamental influence upon the process of forming this value and upon understanding the role of education in the society. Strictly applying the principle of cultural relativism, we have found out that the concept of educational value may be perceived differently in different cultures. Education may be attributed a different significance on the scale of value preferences of individuals as carriers of a specific culture; the value of education may be placed on a different position and either favored or disfavored. Such different attitude toward education as a value does not mean that there is a better and a worse way of such perception in various cultures.

In Czech schools, pupils coming from another cultural background are in the position of socially disadvantaged or special educational needs students according to the Framework Educational Program for Elementary Education and the School Act (Act No. 561/2004 Coll.). Socially disadvantaged pupils are considered those coming from an environment that is socially, culturally or linguistically different than the environment of pupils in the majority population, pupils who are part of minority ethnic groups living in this country or students coming as immigrants. The number of such children in Czech schools has been steadily rising. Some of them are able to become integrated without any serious problems, others encounter various difficulties due to a different language or due to deeply embedded influence of their families and cultural patterns manifesting themselves in the behavior, conduct, scale of values, lifestyle, conception of raising children, attitude to education etc.

According to Hladík (2016), multicultural learning is a process transferrable from one culture to another. More precisely, multicultural learning and strategy applied during instruction can be applied in other cultures, too. Central European countries (Czech Republic, Slovakia, Poland, and Hungary) do not encounter such cultural variety as the countries of western Europe. Nevertheless, experts in multicultural learning have been increasingly sought also in the Czech Republic (Hladík, 2016). This research project focuses closely on the educational value and aims to specify its importance and position in the value preferences of pupils from a different cultural background (anglophone pupils), while the perceived role of educational value by this group may be different from the perception of pupils from the majority of society. Anglophone pupil is a child whose proficiency in English is on the level of a native speaker. In our sample, they have equal knowledge of at least another language. From international authors specialized in bilingual (or multilingual) Anglophone students we can name Threhub (1976) a Clark (2009). Corresponding research has not been conducted in the Czech Republic, and it is a relatively new research topic. However, previous research has focused on raising children and how to teach them or simply by comparing them to different groups around the world (Du Plessis, 2006, Gogolin, 2002). Application of this research in the Czech Republic is very limited. The English-speaking community here is relatively young as most of this group of foreigners came to the Czech Republic after the Velvet Revolution in 1989.

## METHODS

The main aim of this project is to determine the importance of educational values among pupils from a different cultural background, compared to the majority of pupils. Haburajová (2010) defines a minority as a *group of people defined by social and demographic characteristics and the number of members, significantly differing from another group that has an utter majority in the society concerned*. Additionally, factors are identified that have a significant impact on their perception of educational values and the relationship between these determinants and the educational value in the individual value system is explored.

The issues of values, value orientation and preferences are frequently dealt with in specialized literature; however, research in this area has been rather scarce (Prudký, 2009). The reasons are difficulties in finding the right approach to the theme as well as in search for the way to measure values. Although a number of studies have been conducted, experts still seek models and inspiration suggesting the method of approaching the research topic of values (Prudký, 2009).

The present research project specifically aims at the value of education, and its goal is to concretize the significance of the educational value and its position in value preferences of students coming from another cultural background. It is the perception of the role of the educational value by this group that may differ from the perception by students who are part of the majority population. This is the reason why, although we use the above models and approaches, we intend to examine the value of education through a prism of a selected sample of students in detail and use several viewpoints. Thus, we shall combine the established research tools with our own research strategy, aiming at concrete results.

Partial goals:

- Identify the position of education in value preferences of pupils from a different cultural background.
- Capture the educational aspirations of pupils from a different cultural background.
- Identify the reasons and motivations behind education in this group.
- Analyse the opinions and attitudes towards education among pupils from different cultural backgrounds.
- Describe the concepts of education from the point of view of the pupils.
- Find the dominant factors that have an influence on individual conception of educational values.
- Understand the concept of education in the process of intergenerational transfer.
- From the perspective of the importance of education, identify the confrontation of cultural systems in the family versus schools as the main determinants of the value system in the individual concept of the pupil.

## RESULTS

### Description of the 1<sup>st</sup> part of "Education as a Value" research

In the first part of our research, we focused on the quantitative perspective on the status of the educational value in the value preferences of pupils from a different cultural background, on their educational aspirations and on the reasons behind their education. A questionnaire survey from second grade pupils at elementary schools in selected locations in the Czech Republic gave us insight into how education is perceived as a value. We then compared the resulting data with the results of pupils from the majority population to obtain valuable data.

### Research sample

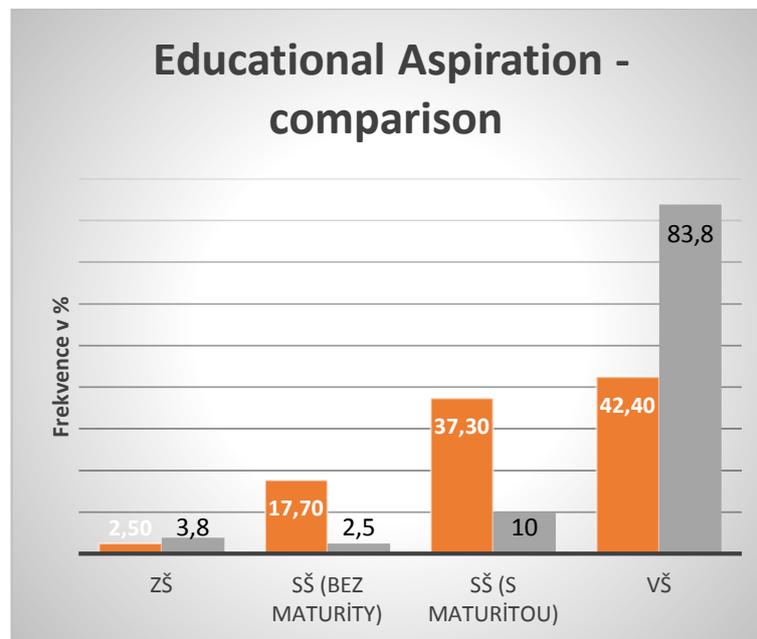
The research was carried out among a selected set of youth (pupils from sixth to ninth grade) and the research sample was subject to predetermined criteria:

First sample group:

- Anglophone pupils (pupils with knowledge of Czech and English at a native level)

Second sample group:

- A comparative sample from the majority population



**Figure 1:** Graph of Educational Aspiration – Comparison

- - majority pupils in the Czech Republic
- - anglophone pupils in the Czech Republic

ZŠ – primary school, SŠ (bez maturity) – practical school, SŠ (s maturitou) – high school, VOŠ – college, VŠ - University

[Figure 1] describes educational aspirations of Anglophone pupils classified by the type of achieved education. The resulting data show that 84% of the children wish to obtain university or college education, and confirm the

fact apparent from the table of comparison of value preferences, where this specific group of students prefers education and personal development and places them to the first two positions. This may be influenced by the fact that such pupils often attend international schools or bilingual classes in “ordinary” elementary schools, where the value of education is stressed since the beginning of study as a very important feature. The survey suggests that the parents of such children have a university or college degree in most cases. Only 10% of respondents aspire to achieve high school education with the school-leaving examination (baccalaureate). Only 2.5% of children wish to obtain secondary education in the form of apprenticeship.

Value	Sequence	Sequence
	Anglofone pupils	Majority pupils
Education	1	6
Development of my own personality	2	13
Freedom	3	7
Health	4	1
Friendship	5	4
To have enough money	6	8
Interesting job	7	11
Truth	8	9
Happy family and children	9	3
Life partner	10	5
Life in peace	11	10
Environment	12	15
Love	13	2
Usefulness to others	14	14
God (faith)	15	12

**Table 1:** Comparison of Value Preference and Anglophone Pupils and Majority Pupils.

[Table 1] shows comparison of the importance attributed to education by the two monitored groups of pupils. Their task was to make an order of preference of fifteen values and to assign a position to each value, whereas 1 = the most important, to 15 = the least important. The results show that for the group of Anglophone pupils, the values of education and personal development clearly occupy the first two positions unlike the results of the majority population students. If we make a comprehensive comparison of value preferences, we can see that the majority children have a different system of value preferences than Anglophone pupils, who hold education and development of their own personality in high esteem, followed by freedom, health and interesting job. On the other hand, the values connected with love, life partner, family and children are given very low preference.

## CONCLUSION

The aim of this contribution was to outline the individual steps of the project which monitors the perception of the educational value through the prism of pupils from another cultural environment. The first published data show that the value of education occupies a different position in the value systems of pupils who come from another cultural background. Thus, our assumption of the importance of socio-cultural influences in the process of formation of the personal value system has been confirmed. In our further work, we shall examine these determining factors in more detail and we shall try to capture the reasons and motivation to learn and educate oneself in these selected groups of pupils we shall analyze their views and attitudes toward education as well as describe the perception of education by children and their parents.

## ACKNOWLEDGMENTS

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# Effect of Collaborative Concept Mapping on University Students' Learning Achievement

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## ABSTRACT

In recent years collaborative concept mapping (CCM) has become a very useful didactic teaching tool for teaching and learning about different topics. It engages the student in active learning and helps him to organize his ideas. The main objective of this study was to investigate the effect of using CCM on university students' learning achievement in two subjects: ethical principles and deontology in university (EPDU) and Physics. 64 students from faculty of sciences participated in this research. All students in our sample took courses in EPDU and physics, at formal situation. Students were randomly divided into two groups; experimental and control groups. The students in the experimental groups constructed CCM at the end of each lesson. Meanwhile, the control groups were taught by just traditional teaching strategies. All groups took multiple choice learning achievement tests. No significant difference was found between groups which took courses on EPDU. While, a significant difference in favour of the experimental group, where CCM after conventional teaching methods was applied to learn physics, has been observed.

The results support that when students are constructed CCM in a scientific subject like physics, they achieve the best scores.

**Keywords:** Collaborative learning, concept mapping, achievement.

## INTRODUCTION

Concept mapping (CM) has been suggested to be an effective learning tool through the process of map construction which has been developed by David Novak and colleagues. This technique, which based on the cognitive theories of assimilation of David Ausubel and the constructivism, shows how the student's conceptions are structured (Novak, 1990). The cartographic representation of students' concepts with links and labels is very gainful for conceptual change: "The most important single factor influencing learning is what the learner already knows" (Ausubel, 1968, p. 18).

That is why; CM has been used at almost all levels of education in a variety of ways. In science education, CM has not only been found useful in promoting students' understanding of science concepts (Cheema & Mirza, 2013), it also facilitates pupils' abilities to solve problems (Zimmerman et. al, 2011). It has been used to observe change in students' understanding of concepts over time and to help them to build and organize their knowledge base in a given discipline or on a given topic (Ling & Boo, 2007). Concept mapping has helped pupils elaborate the conceptual understanding theory they already possess, and especially to recognize and modify those knowledge structures that contains misconceptions, alternative conceptions or framework (Novak & Gowin, 1984).

The importance of collaborative learning has been raised by several researchers (Vygotsky, 1978; Anderson et al., 1995; Roschelle & Teasley, 1995; Hwang et al., 2011). Roschelle and Teasley (1995) define collaboration learning as a process of construction and maintaining a shared concept of the problem. According to Vygotsky (1978), students' knowledge can be constructed through interactions with their peers. This allows them to build knowledge and to develop reflective thinking (Hwang et al., 2011). In this theory of knowledge-building, elaborated by Bereiter (2002), the discussions between pairs around conceptual artefacts (ideas, methods, models) includes questioning, proposition, justification, criticism, clarification, negotiation, challenge.... The interactions between peer in collaborative learning, promotes the externalization of learner's prior knowledge and the emergence of sociocognitive conflicts, thus stimulating the elaboration of new cognitive structures and facilitating their integration into existing structures (Anderson et al.,1995).

If the individual building of concept maps makes it possible to develop a meaningful learning in particular by clarifies, schematics and hierarchies in knowledge, developed in a group, a CM (CCM) conducting effective

discussions on concepts, and thus enhances significant learning. Students who have developed CCM gained better knowledge than students working individually (Okebukola, et al., 1994).

The issue of the possible use of CCM strategy in enhancing achievement at university level in two topics (physics and EPDU), was addressed in the present study. Therefore, this study aimed at testing the effect as used the effect of CCM on students' achievement in Physics) (Technical and applied sciences) and ethics and deontology (Humanities and Social Sciences).

## RESEARCH QUESTIONS

Our research questions, in this study, are:

- Will the use of CCM with university students have significantly different effects on students with physics achievement test (Physic-AT) than students who taught just traditional courses?
- Will the use of CCM with university students have significantly different effects on students with EPDU achievement test (EPDU-AT) than students who taught just traditional courses?
- Will the use of CCM with university students have significantly different effects on students with different achievement levels in physics and EPDU?

## METHOD

### SAMPLE

Purposive sampling technique was used for the present investigation. Department of physics in the faculty of sciences in Boumerdes University was selected for this purpose. 64 students from faculty of sciences participated in this research. 53% of them were female. The average age of the students was 22.45 years with a standard deviation of 2.63 years.

### DESIGN AND PROCEDURE

All students in our sample took courses of 3 hours a week in physics (biophysics courses) in the first semester of 2016/2017 University year. In the second semester of the same university year, they were taught one hour and 30 minutes per week of EPDU courses, at formal situation.

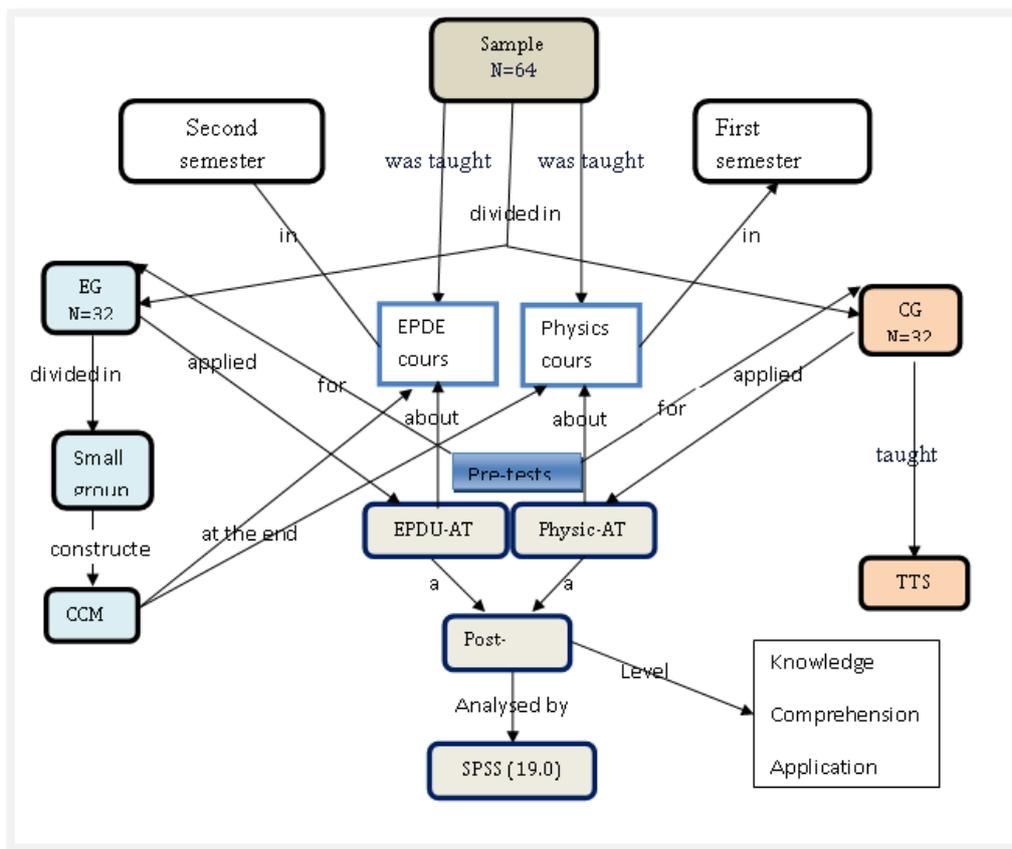


Figure 1. Concept map representing the design of the study

[Figure 1. Concept map representing the design of the study.png](#)

At the beginning of each semester, before beginning the courses, the students were tested, in order to know their knowledge and their misconceptions in physics and EPDU. These official tests were considered in our study as pre-test. The sample was randomly divided into one experimental group (EG) and one control group (CG) having 32 students in each group. All students, in both groups, were taught in formal classes under the same conditions. However, EG students are divided into small groups (SG) of three members. At the end of each course, the teacher asked students in each SG to construct a CCM, while control groups were taught only by traditional teaching strategies (TTS). All students had academic achievement tests as post-test. The design of this study is given by concept maps showed in figure 1.

Figure 2 shows two examples of concept mapping given by students in SG concerning physics and EPDU.

The physics achievement test (Physic-AT) and the ethical principles and deontology in university (EPDU-AT) was developed as data collection scales and the items were at three levels of Blooms taxonomy (knowledge, comprehension and application). Both tests were prepared by the contribution of three teachers in the faculty of sciences at Boumerdes University and author. The maximum score in both tests is 20. in Physic-AT and EPDU-AT is 20 points (Table 1).

To determine the internal consistency reliability of Physic-AT and EPDU-AT, Cronbach alpha coefficient was calculated. We have found  $\alpha=0.72$  for Physic-AT and found  $\alpha=0.69$  for EPDU-AT. Both values of found  $\alpha$  are considered to be acceptable.

Physic-AT was administered under standard conditions as post test to the CG and EG at the end of first semester. However, EPDU-AT was administered to both groups at the end of second semester. The achievement tests were done in the language of instruction (French).

All data were compiled and analysed using SPSS 20 statistical analysis programs for Windows computer software. The results of the analysis were used to answer the research questions, by using average and t-test. The significance level was taken as 0.05.

**Table 1: Scores in Physic and EPDU achievement tests**

Bloom level	Physic-AT		EPDU-AT	
	Number of items	maximum score	Number of items	maximum score
knowledge	8	7	8	8
comprehension	6	5	6	6
Application	4	8	6	6
Total		20		20

## FINDINGS

At the beginning of the first semester we compared the averages of the students to the pre-test in physics. A t-test for independent samples showed that there were no significant differences between EG and CG ( $t = 2.88, p > 0.05$ ). At the second semester, before starting teaching, a t-test was carried out on the pre test data for EPDU. It was shows that there were no significant differences between EG and CG ( $t = 1.28, p > 0.05$ ).

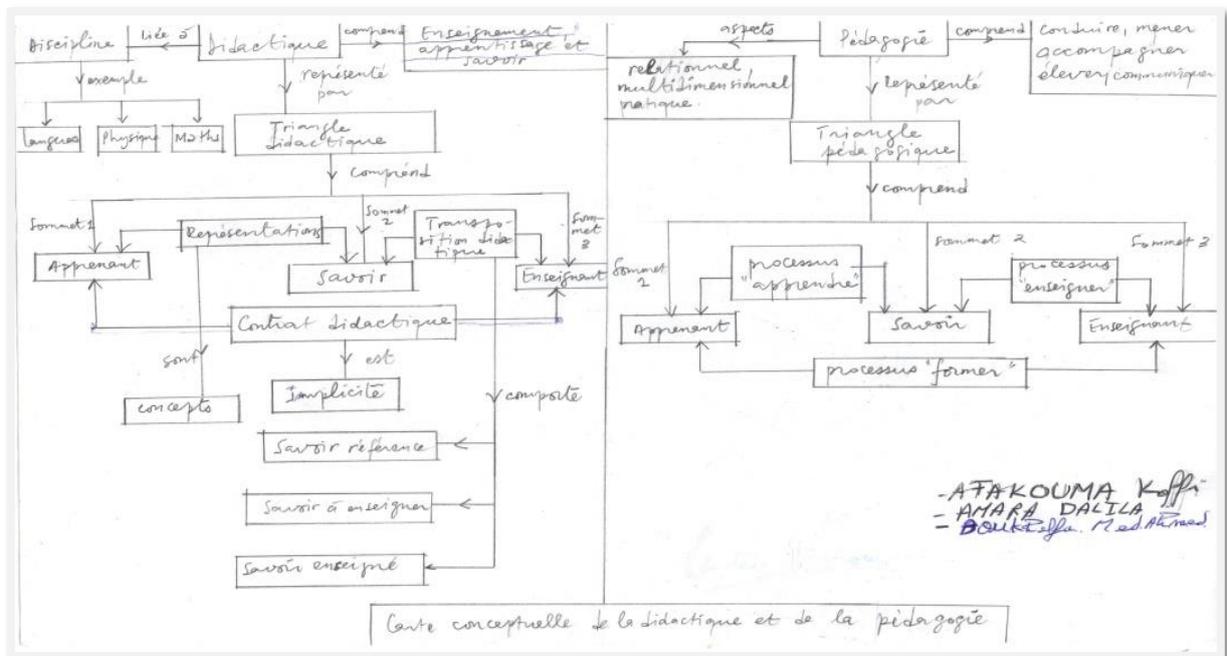


Figure 2a: Example of CCM about EPDU done by Students in EG

[Figure2 a. Example of CCM about EPDU done by Students in EG.jpg](#)

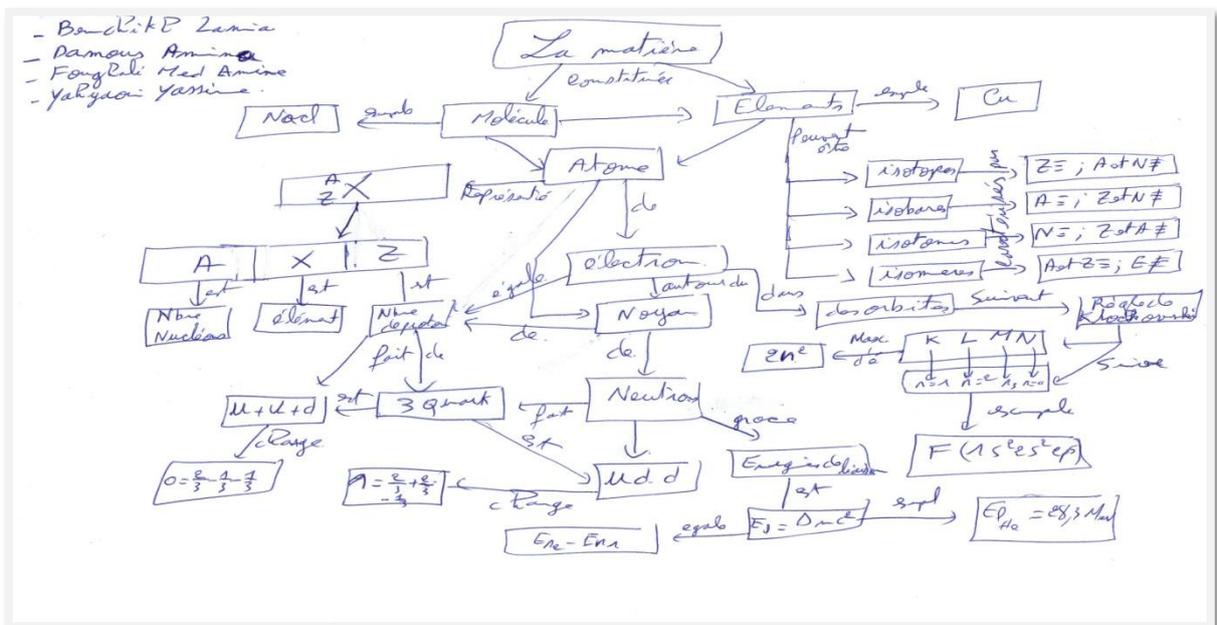


Figure 2b: Example of CCM about physics done by Students in EG

[Figure 2b. Example of CCM about Physics done by Students in EG.jpg](#)

The effect of CCM that were done by the GE students (see Figure 2) was tested by the application of a post test. This test was used to answer the research questions related to the in Physic achievement test main purpose of the research.

A post test means scores of the students in EG and CG in terms of students' achievement of physic were used. The results were shown in Table 2.

**Tableau 2 : Scores in Physic achievement test**

Group	EG			CG			Samples t-test		
	N	Mean	SD	N	Mean	SD	t	DF	P
<b>Knowl- Physic-AT</b>	32	4,5000	1,19137	32	4,0000	1,41421	1,530	62	,131
<b>Comp-Physic-AT</b>	32	3,3750	1,31370	32	2,6250	1,09985	2,476	62	,016
<b>Appl-Physic-AT</b>	32	3,4688	1,50235	32	2,2813	1,48616	3,179	62	,002
<b>Physic-AT (total)</b>	32	11,3438	3,32740	32	8,9063	3,21648	2,979	62	,004

The post physics-AT total means scores were compared using independent samples t test to found whether there was a statistically significant mean difference between EG and CG in the case of physics. As shown in table 2, there was a statistically significant mean difference between the EG (M =11.34, Sd=3.33) and CG (M = 8.91, Sd =3.22) totals scores in favour of the experimental group [t (62)=2.98, p <0.05].

Also, the effectiveness of CCM tools was explored with respect to mean differences in post physics-AT for both the groups at different cognitive abilities of knowledge, comprehension and application. The value of independent sample “t” is 2.48 and 3.18 for comprehension and application levels respectively; which were found to be significant at 0.05 level for the degree of freedom 62 in favour of EG. However, t-test result (see Table 2.) showed that there were no significant differences between the two groups in knowledge level (t = 1.53, p > 0.05).

Regarding the research questions to be answered related to the main purpose of the research, a post test mean scores of the students in EG and CG in terms of students’ achievement of ethical principles and deontology in university (EPDU) were used. The results were shown in Table 3. In post EPDU-AT, the EG total mean score (M=12.61, Sd=06.79) was slightly higher, comprehension and application than CG [M=12.62, Sd=3.03; t (62) =1.77, p=0.08], with no significant difference (see table 3).

**Tableau 3 : Scores in EPDU achievement test**

Group	EG			CG			Samples t-test		
	N	Mean	SD	N	Mean	SD	t	DF	P
<b>Knowl-EPDU-AT</b>	32	5,2500	1,52400	32	4,9688	1,63597	,712	62	,479
<b>Comp-EPDU-AT</b>	32	3,8125	,99798	32	3,5626	,80071	1,105	62	,273
<b>Appl-EPDU-AT</b>	32	3,5625	1,16224	32	2,9688	1,03127	2,162	62	,035
<b>EPDU-AT (total)</b>	32	12,6250	3,03475	32	11,3125	2,88978	1,772	62	,081

The effect of CCM tools on different cognitive abilities of knowledge, comprehension and application levels related to EPDU was also explored. The value of independent sample “t” is 0.71 and 1.10 for knowledge and comprehension levels respectively; which were found to be no significant at 0.05 level for the degree of freedom 62. However, t-test result showed that there was a significant difference between the two groups in application level (t = 1.53, p > 0.05) in favor of EG.

## DISCUSSION OF RESULTS

The study sets out to investigate the effect of the use of CCM to the university students’ achievement towards learning physics and ethical principles and deontology. The results showed that the students who learned with CCM (EG) performed better than students who leaned only with traditional instruction in the case of physics.

This confirms the results obtained by many studies in science education, concerning the non effectiveness of the use of traditional teaching strategies alone (Elcin and Sezer 2014).and the efficiency of the use of the CCM for meaningful learning. The results of the study of Czerniak and Haney (1998), conducted with preserves teachers, indicate that CCM could increase physical achievement. In chemistry the positive effect of concept mapping on achievement has been confirmed by Özmen, and al. (2009). Even in Economics, The score achievement of the group exposed to CMM was significantly higher than to group taught by conventional method (Sharma, M., & Singh, G., 2016).

From the meta-analysis of many studies using concept mapping as an instructional strategy, Horton and al. (1993) confirm that concept mapping had positive effects on students' overall achievement in sciences.

Also, we noted that students in EG have a high cognitive abilities in learning physics compared to the students taught by traditional teaching method only. The active involvement of the students during the discussion and the sharing of concepts among themselves, favored by CCM, helps them to correct their misconceptions. The confrontation of students' ideas could facilitate conceptual change and having an impact on comprehension and application levels. This finding is in agreement with Afamasaga-Fuata'i (2007). study, which found that concept maps help raise the level of comprehension.

Consequently, CCM learning improves the academic performance of students in sciences. It helps to exploit the abilities of the students of a single group, integrating them into one outcome that benefits all members of the group, and the desire of everyone in the group to manage the discussion, to ask questions and answer the questions of their peers actively in a cooperative atmosphere within one group and competitive with the other groups. When students are in traditional education, they are more dependent on the teacher and explain, and this is a factor in the superiority of the experimental group members in total achievement.

In the case of EPDU, the use of CCM has no effect on achievement. No significant differences between experiment group and control group on the post EPDU achievement test for comprehension and knowledge levels were found. However, the finding indicates a significant difference in mean scores of application level in favor of the experimental group. Despite that a very high number of studies have shown the efficiency of the concept mapping, some research results have shown that in some topics such financial accounting, the CCM has no effect (Leauby et al., 2010).

## CONCLUSION

As a conclusion of this research paper, the following items summarize the findings after comparing the results of the experimental groups and the control groups at Physic-AT and EPDU-AT

- The students in experimental group that was exposed to concept mapping method, performed significantly better than the control group on physic achievement test.
- The experimental group involved in concept mapping was found to have significantly high cognitive abilities than control group in physics
- The CCM has no significant effect on students' achievement learning in the case of EPDU.

From our findings, it can be concluded that that CCM strategies is more effective than traditional methods of teaching in increasing student's achievement in Physic. We think that in general, CCM learning is better for science education than social science education. For the reason that many science concepts are very difficult to understand, CCM as learning tools can facilitate the conceptual change and the understanding concepts. Finally, CCM learning has a significant impact on increasing the level of achievement of students in the university because of the mechanism of learning from peers in the groups, and what it allows students to share and interact with each other to gain knowledge and understand concepts.

Following this research, several perspectives are possible to develop teaching strategies integrating the CCM in order to improve student cognitive abilities and conceptual change.

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# Effectiveness of Visual Multimedia Supported Conceptual Change Texts on Overcoming Students' Misconception About Boiling Concept

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## ABSTRACT

In this study, the effectiveness of visual multimedia supported conceptual change texts (VMMSCTexts) on overcoming senior high school students' misconception about boiling concept has been studied. Two students' misconception about boiling concept addressing in this study, that is: 1) Boiling is identic with high temperatures, and 2) At the time of boiling, the fastest rate of water convection. VMMSCText was designed based on students' misconceptions by following six-phase Conceptual Change Model (CCM) synthesized by Stepan. Visual multimedia used in these texts included image (photo), virtual simulation and Video. These texts were tried out on senior high school students at one high school in Bandung district. A quasi-experiment method with design one control group (n=36) and one experimental group (n=36) were used. Experiment group were given the VMMSCText, whereas the control group were given CCText. Data were collected by two item conceptual test in the three tier test format concerning boiling concept. When the results of the study were examined as to the quantity of student whose misconceptions are remediated and who have consistency of scientific conceptions in the two groups, it was found that the number of students whose misconceptions are remediated and who have consistency of scientific conceptions in the VMMSCText group was higher than that of the CCText group. It is believed that these visual multimedia used in these texts can be concretize concepts that represent abstract phenomena enable to show many processes to students which are imposible to show; thus, it becomes possible to remove students' misconceptions and prevent any possible misconceptions.

**Keywords:** VMMSCText, Remedial teaching, Misconception, Boiling Concept.

## 1. INTRODUCTION

During the past few years, much effort has been put on studies of student's misconceptions in various physical subject matters. students may find that some physical concepts such as electricity, magnetism and heat are abstract, difficult, confusing and complicated. Some research were based on misconceptions of some physical concepts: the concept of simple electric circuit (Kucukozer and Kocakulah, 2007), force and motion concept (Fadaei and Mora, 2015), heat and temperature concept (Kartal et al., 2011), heat transfer mechanisms and elementary kinetic theory

concept (Pathare & Pradhan, 2010), refraction concept (Kaewkhong et al., 2010), gas concept (Aslan and Demircioglu, 2014), and electricity and magnetism (Demircioglu and Cirkinoglu, 2004).

Two students' misconception about boiling concept found in the phase transition of matter that are: 1) Boiling is synonymous with high temperatures, and 2) At the time of boiling, the rate of water convection is highest. The occurrence of these misconceptions is caused by at least two things; First, their experience in daily life, where almost every day they observe that water boils at a high temperature, almost 100°C; Second, the teacher's classroom learning is not so clear explaining that the boiling point of water is influenced by environmental stresses, the greater the environmental pressure the higher the boiling point of water. The teacher never asserts that if the environmental stresses can be lowered to a very small value then the water can boil at a low temperature, for example at room temperature (27°C).

Misconceptions are resistant to change with scientific ones and students may reject accepting new ideas (Hynd et al., 2015) and they are obstacles for students in learning and to make meaningful understanding of some concepts in science. So the state of misconception that occurs in students should not be left and must be remediated so as not to resist students in achieving a sound understanding of physical concepts.

Researches including various activities based on conceptual change approach have been regulated to provide conceptual change. Commonly used conceptual change technique based on activities are; analogies (Choi & Chang, 2004; Cosgrove, 1995), Conceptual Change Text (CCText) (Chambers & Andre, 1997; Çakir, Uzuntiryaki & Geban, 2002; Alparslan, Tekkaya & Geban, 2003), Computer Supported Instruction Material (CSIM) (Windschitl, 2001; Talib, Matthews & Secombe, 2005); Dual Situated learning model (She, 2004; She, 2005, Samsudin et al., 2016).

Conceptual change texts (CCText) were firstly developed by Wang and Andre (1991). After that, many researchers developed and continued to use these methods, primarily (Chambers and Andre, 1997). With CCText it is aimed to remove students' misconceptions or to rearrange their pre-knowledge. CCText is prepared to provide students to feel that their existing knowledge is insufficient in explanation of some topics. In conceptual change texts, firstly students are ensured to be aware of their misconceptions. After that, the reasons of these misconceptions are explained through examples and reasons. Students feel that their knowledge is insufficient in explaining new situations that they meet and conceptual change is ensured by showing them the concepts that are scientifically correct (Guzzetti et al., 1993).

Until today, there have been different researches on the effect of conceptual change texts on removing misconceptions. In some researches, effects of conceptual change texts and traditional texts on teaching concepts and removing misconceptions were compared (Mikkila, 2001). At the end of these researches, it was determined that conceptual change texts are more effective than traditional texts in teaching concept and removing misconceptions. On the other hand, in their study, Diakidoy, Kendeou and Ioannides compared the effects of conceptual change texts and traditional method on conceptual learning (Diakidoy et al., 2003). As a result of their study, conceptual change texts were more effective than traditional methods in terms of conceptual success. Yılmaz made a similar study and found out that conceptual change texts were more effective than traditional method in removing misconceptions (Yılmaz, 2010).

To give student understanding on the physical contents that contain microscopic or abstract phenomena phenomena required a teaching media that can visualize the phenomenon. One of the media that can be used is a virtual simulation of microscopic physics phenomena (Wibowo, et al., 2017). Because of the virtual simulation media microscopic phenomenon can only run on the computer, then CCText and virtual media must be integratedly packaged in computer format. CCText supported by visual multimedia is then given the term Visual Multimedia Supported Conceptual Change Text (VMMSCCText). In the VMMSCCText can also be enriched with other visual impressions such as video phenomena. Hua & Hong (2012) state that "Application of multimedia courseware in teaching physics to make up traditional teaching not only saves the time, meeting teaching requirements, but makes abstract physical content more visual and intuitive via combination of video and audio means. In addition to shorter teaching time and higher teaching density, the teaching efficiency and quality is greatly improved, so as to accommodate and promote combination of university students with their ability".

One of the physical content that contains microscopic objects is the phase transition content. One of the concepts covered in phase transition content is the concept of boiling. Boiling is the process of loosening the bonds of H<sub>2</sub>O molecules from the entire volume of water when the water reaches a certain temperature called boiling point. Water molecules (H<sub>2</sub>O) are microscopic objects that misconceptions to students.

In this study, development and test of VMMSCCText related to boiling concept has been done. VMMSCCText was designed based on students' misconceptions by following six-steps Conceptual Change Model (CCM) synthesized by Stepan, consisting of: The first step aims at helping learners become aware of their own thinking in order to help them commit to a problem or challenge and make predictions to an outcome before starting any activity. The second step aims at helping learners expose their beliefs and share ideas with classmates before testing these ideas. The

third step aims at helping learners confront their existing ideas by testing them in small groups. The fourth step aims at helping learners benefit from class discussions to accommodate the new concept and resolve any existing conflicts. The fifth step aims at helping learners extend the concept by making connections between the concept they have learned in class and other related concepts and ideas. Finally, the sixth step aims at helping learners go beyond the concept through pursuing new ideas related to the concept they have learned in class (Stepans, 2011). To control the effect of presence of visual multimedia usage on VMMSCCText, then in the implementation test of VMMSCCText used control treatment in the form of CCText without supported by visual multimedia. This article describes the results of VMMSCCText development related to the boiling concept and its implementation in the remedial teaching of phase transition content in senior high school students.

## 2. EXPERIMENTAL METHOD

The method used in this research is the quasi-experiment method with design one control group (n=36) and one experimental group (n=36). Experimental group were given the VMMSCCText, whereas the control group were given CCText as shown in Figure 1.

Class	Pretest (Integrated in 1st part of VMMSCCText /CCText)	Treatment	Posttest (Integrated in 4nd part of VMMSCCText /CCText)	Delayed posttest
Experiment	O	X <sub>1</sub>	O	O
Control	O	X <sub>2</sub>	O	O

Fig. 1. The research design used in this study

Here, O is a conception test of the boiling concept, X<sub>1</sub> is a remedial teaching treatment using VMMSCCText and X<sub>2</sub> is a remedial teaching treatment using CCText. This experimental research was conducted at one senior high school in Bandung district. The sample was chosen purposely. Because of the VMMSCCText and CCText is used in remedial teaching, then as a sample selected students who have followed the phase transition content learning regularly in their class. Duration of the one VMMSCCText and CCText activity in the remedial teaching was 45-min periods. To assess students' conceptual change as effect of CSCCText activity, a Boiling Conceptual Test (BCT) consisting of two items, was developed based on the alternative conceptions in three-tier multiple choice test format. To identify the state of student conception before and after following VMMSCCText and CCText activity based on conception test results used guidelines as proposed by Kaltacki and Didis has been used (Kaltacki and Didis, 2007).

The decrease in the number of students who have misconception as the effect of using VMMSCCText and CCText in the remedial teaching about phase transition content is calculated from the difference between the number of high school students who have misconceptions in 4nd part of VMMSCCText or CCText with the number of students who have misconception in 1st part of VMMSCCText or CCText. While the number of students who have a consistency of scientific conception as a results of conception accommodation in VMMSCCText or CCText activities is calculated from the difference in the number of students who have a scientific conception on the 4nd VMMSCCText or CCText with the number of students who have a scientific conception at the delayed test.

In the first parth of VVMSCCText, students' pre-conception was diagnosed. In this section presented a picture of phenomena associated with the concept of boiling. Then the students are asked to express their conception about that presented phenomena. In addition, students are also asked to provide an explanation for their conceptions and the level of confidence in their concepts. At the 2nd parth of VMMSCCText, a confrontation of conception takes place, students are asked to observe video about the boiling presented in VMMSCCText. The student is asked to compare the conceptions he has had with the actual phenomenon that he has seen on the video, allowing for the occurrence of cognitive conflicts in their minds. At the 3rd parth of VMMSCCText presented scientific explanation about boiling with explanation down to the microscopic level using various visual media such as virtual simulation, ficture of object and video. Interactively students asked to study the scientific explanation presented at VMMSCCText until there is an accomodation process of new scientific conception to replace the old false conception. And at the 4rd parth of VMMSCCText are presented reinforcement and enrichment of conception, students are required to observe and study other physical phenomena related to the boiling concepts shown in the video. After that they are faced

with conception tests related to the boiling concept to check the conception that students have after following VMMSCCText activity (see Appendix).

### 3. RESULTS AND DISCUSSION

Table 1 and Table 2 shows a comparison of the percentage of high school students whose misconceptions are remediated between the VMMSCCText class and the CCText class. In both classes the decrease in the number of students who have misconception is in the high category, indicating that the confrontation stage of conception beliefs presented in the 2nd part of VMMSCCText and CCText has succeeded in causing a cognitive conflict situation in the students minds that causes dissatisfaction with their pre-conceptions so that their level of confidence to their pre-conception it has gradually decreased. A decrease in the number of students who have misconceptions also indicates the success of the scientific explanations stage presented in the 3rd part of VMMSCCText and CCText in constructing a scientific conception about boiling concept in the minds of students. The new conceptions presented in this section are presented clearly, plausibly and fruitfulness, so that students can accommodate them to replace the old mistaken conception.

Table 1. Percentage of students whose misconceptions are remediated in the VMMSCCText class

Concept Labels	Number of students who have misconception on 1st part of VMMSCCText	Number of students who have misconception on 4nd part of VMMSCCText	Percentage of Students whose misconceptions are remediated (%)	Category of decrease of the quantity of students who have misconception
CL1	19	0	100,0	High
CL2	22	2	90,9	High

Table 2. Percentage of students whose misconceptions are remediated in the CCText class

Concept Labels	Number of students who have misconception on 1 <sup>st</sup> part of CCText	Number of students who have misconception on 4nd part of CCText	Percentage of Students whose misconceptions are remediated (%)	Category of decrease of the quantity of students who have misconception
CL1	20	5	75,0	High
CL2	21	6	71,4	High

Based on the data in Table 1 and Table 2 the percentage of students whose misconceptions are remediated in the VMMSCCText class is higher than the percentage of students whose misconceptions are mediated in the CCText class on both reviewed concept labels. This data shows that the use of VMMSCCText in remedial teaching of phase transition content can further decrease the quantity of students who have misconception compared to the use of CCText. Its indicates that the use of VMMSCCText in remedial teaching about phase transition content is more effective in reducing the number of students who have misconception than the use of CCText.

The effectiveness of VMMSCCText in the remediation of misconceptions that occurred in the concept of boiling that are classified as an abstract concept can not be separated from the role of visualization media used in concretizing abstract phenomena to be real. Concretizing concepts that represent abstract issues is very important in order to understand them correctly. Computer assisted materials that are used to concretize concepts enable to show many processes to students which are impossible to show; thus, it becomes possible to remove students' misconceptions and prevent any possible misconceptions (Yumusak et al., 2015).

Table 3 and Table 4 show a comparison of the percentage of students who have consistency of scientific conception as a results of conceptions accommodation between the VMMSCCText class and the CCText class.

Table 3. Percentage of students who have consistency of scientific conception as a results of conceptions accommodation in VMMSCCText class

Concept Labels	The number of students who are in the category of scientific conception in 4nd part of VMMSCCText	The number of students who are in the category of scientific conception on the delayed test	Percentage of students who have consistency of scientific conception (%)
CL1	20	19	95,0
CL2	21	19	90,5

Table 4. Percentage of students who have consistency of scientific conception as a results of conceptions accommodation in CCText class

Concept Labels	The number of students who are in the category of scientific conception in 4nd part of CCText	The number of students who are in the category of scientific conception on the delayed test	Percentage of students who have consistency of scientific conception (%)
CL1	15	10	66,7
CL2	16	12	75,0

Based on the data in Table 3 and Table 4 the percentage of students who have consistency of scientific conception as a result of conception accommodation in VMMSCCText class is higher than the percentage of students who have consistency of scientific conception in CCText class on both concept labels. This data indicates that the use of VMMSCCText in remedial teaching about phase transition content can further maintain the consistency of scientific conception in students' minds rather than the use of CCText. Its indicates that the use of VMMSCCText in remedial teaching is more effective in maintaining the consistency of scientific conception than the use of CCText.

The presence of a variety of visual media at the stage of scientific explanations and the strengthening/enrichment stage of VMMSCCText can assist students in achieving a sound understanding of physical concepts, so that the scientific conception that has been embedded in the minds of students of conception accommodation will not be easily reverted back to the old conceptions. According to Alrsa'i & Aldhamit (2014) the use of computer simulations can help understand students about physical concept. Meanwhile, Mirana (2016) states that the use of computer simulations in a constructivist approach can improve students' understanding of physics. In line with that Esquembre (2001) states that the use of computers in learning physics has a good potential in improving physics achievement.

#### 4. COCLUSION

The VMMSCCText related to boiling concept has been developed. The use of VMMSCCText in remedial teaching about phase transition content can further reduce the number of students who have misconception and can further maintain consistency of students' scientific conceptions related to boiling concept compared to the use of CCText. It shows that the application of VMMSCCText in remedial teaching about the phase transition content are more effective in remediate misconceptions and maintains the consistency of scientific conceptions about boiling concept that occur in senior high school students than the use of CCText.

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Appendix

VMMSCText

1st part: Conception Disclosure	
<p>In daily life you must have the experience of seeing even feel splashed by the water being boiling. What do you see when the water is boiling? What do you feel when your body parts are splashed by boiling water?</p> <p>Now please You observe the images below showing the water that is boiling and the state of</p>	
<p>Air sedang mendidih</p>	<p>Kulit melepuh tersiram air panas</p>
<p>Questions:</p> <ol style="list-style-type: none"> <li>1. If someone now challenges you by asking a question, do you dare to soak in boiling water? What answer would you give to the person asking?</li> <li>2. Do you answer "do not dare"? Why do you answer like that? Is the answer based on the idea that the boiling water temperature is so high so that when there are people soaking in it then surely the skin of his body will blister and it must feel very hot? Why do you have such thoughts?</li> <li>3. Are you sure of the truth of your thinking?</li> <li>4. If you do not have such thoughts then what kind of thoughts do you have about</li> </ol>	
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p>(Please answer all questions on the provided worksheets, according to the thoughts you have!)</p> </div>	



## 2nd part : Conceptions Confidence Confrontation

Click the images below, and then you observe phenomena that displayed and please you to answer the questions asked!



Video view shows it appears that the water in a glass that is inserted into the vacuum desiccator appears to boil when the desiccator space is exposed.

In the above process is there a water heating process?

What is the temperature of the water in a glass stored on the vacuum desiccator?

Is it close to 100°C?

Is the temperature near the room temperature (27°C)?

So boiling water occurs at what temperature?

Do you observe on video, same or different with the conception or thoughts you have so far about the temperature of boiling water?

If different, do you still believe in the truth of your conception or thought that you have so far?

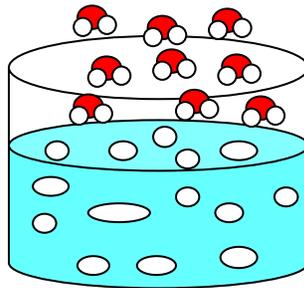
Will you retain the conception you have or want to replace with a new conception that matches with phenomenon you observe?

(Please answer all questions on the provided worksheets, according to the thoughts you have!)

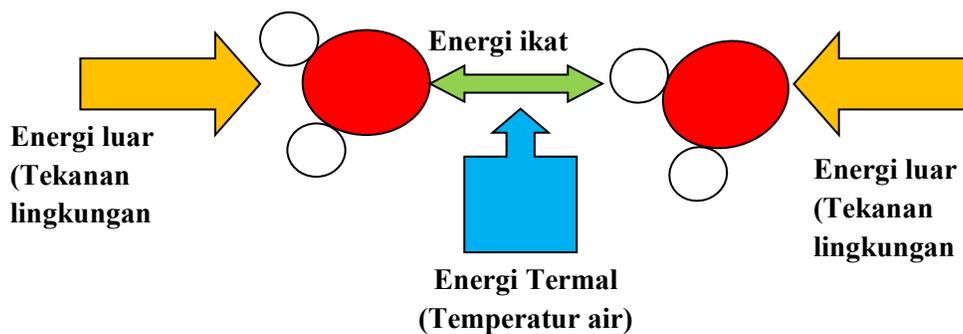
### 3rd part: Scientific Exploration

Please learn about the following exposure carefully!

As has been known before, that boiling is the evaporation process that occurs in all parts of the liquid (water). Microscopically boiling is the breaking process of bonding of H<sub>2</sub>O molecules from the entire volume of water.

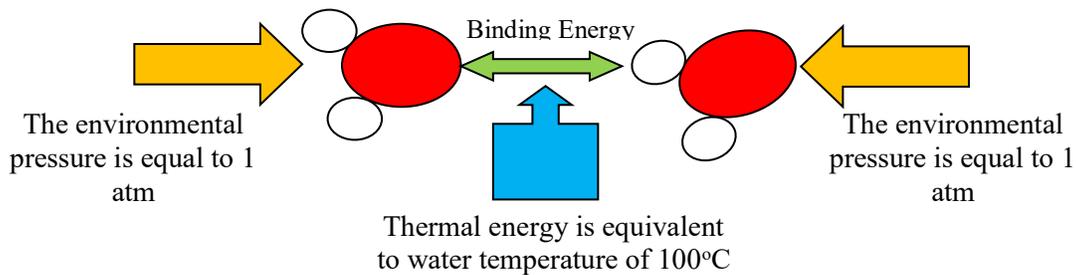


To break the bonds of H<sub>2</sub>O molecules is certainly needed energy, one of which is in the form of thermal energy. The amount of energy required to break the bonds of the H<sub>2</sub>O molecules depends on the bonding energy between the H<sub>2</sub>O molecules and the external energy that holds the H<sub>2</sub>O molecules together. This external energy is environmental pressure, it can be atmospheric pressure. The binding energy between H<sub>2</sub>O molecules is of a certain size, whereas the amount of external energy can vary. So the given thermal energy must be able to overcome the binding energy of the H<sub>2</sub>O molecule and this external energy so that the H<sub>2</sub>O molecules can escape from the bonds that mark the boiling water. If external energy (environmental pressure) is large, it would require large thermal energy, but if the environmental pressure is small then the required thermal energy is not too large. The amount of thermal energy is usually represented by the water temperature.

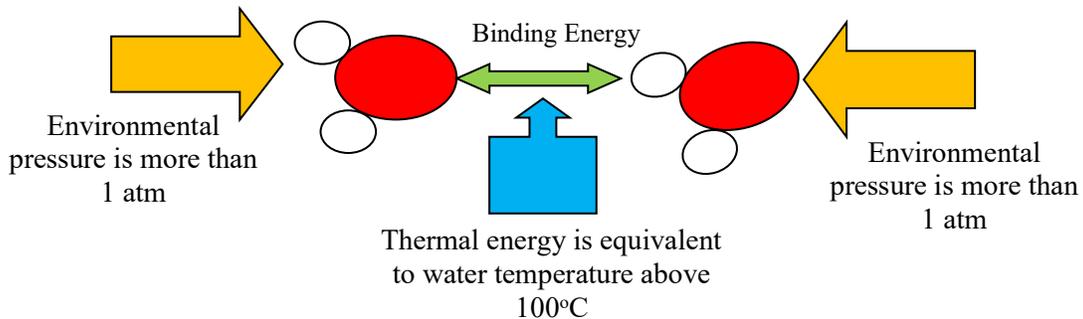


### 3rd part: Scientific Explanations

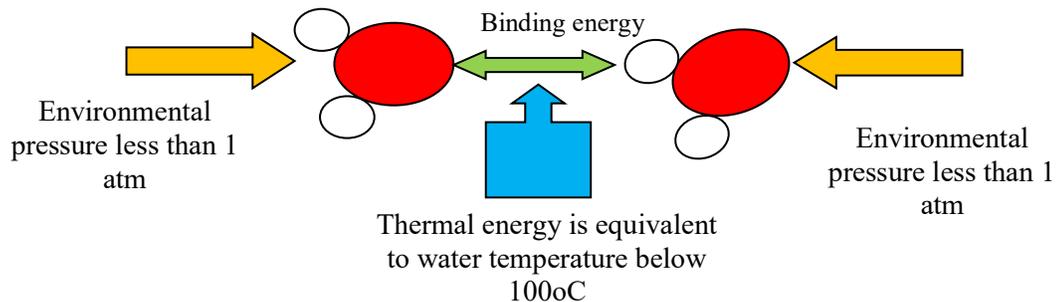
If the environmental pressure is at least 1 atm (average air pressure at sea level) then it needs considerable thermal energy that is equal to the temperature of 100°C water.



If the environmental pressure is greater than 1 atm (eg air pressure in the pressure cooker) then greater thermal energy is required that is equal to the water temperature above 100°C.



If the environmental stresses are less than 1 atm (eg air pressure in the vacuum desiccator) there is a smaller thermal energy equivalent to the water temperature below 100°C.



From the above explanation, what can you conclude about the temperature of boiling water? Can water boil at room temperature? When can it happen?

(Please answer all questions on the provided worksheets, according to the thoughts you have!)

#### 4nd part: Reinforcement, Enrichment and Conceptions Disclosure

To reinforce your understanding of the boiling concept, now you click the image below and you observe and study the video presented!



What can you tell about the video show above?

(Please answer all questions on the provided worksheets, according to the thoughts you have!)

After reviewing the above explanation, Are you now going to change your conception that boiling water is identical to high water temperature (close to 100°C)?

(Please answer all questions on the provided worksheets, according to the thoughts you have!)

Now you answer the following questions!

If water is cooked in the mountains (highlands), at what temperature the water will boil?

- a. 100°C
- b. above 100°C
- c. below 100°C

Provide an explanation of the choice of answers you choose!

Are you sure of the truth of the answer you chose and the explanation you provided?

(Please answer all questions on the provided worksheets, according to the thoughts you have!)

# Effects of the Story-Based Number Program on The Development of The Number Concept of 60-72 Month Old Children

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## ABSTRACT

The purpose of this study was to investigate the effect of the Story Based Number Program on the development of the concept of numbers of 60-72 month old preschoolers from low socioeconomic level. A total of 28 children, 14 experimental groups and 14 control groups, participated in the study using quasi-experimental design with pretest posttest control group. The Bracken Basic Concept Scale-III: Numbers / Counting subtest of the Receptive Form developed by Bracken (2006) and adapted by Angın, Arı, Deniz and Hamarta (2016) and "Counting Development Evaluation Tool" developed by Olgun, Fidan ve Babacan Özer (2013) were used to collect data. Mann Whitney U test and the Wilcoxon Signed Rank test were used to analyze the data. According to the results of the study, it was determined that there was a significant difference in favor of the experimental group between the posttest mean scores of Numbers / Counting subtest and Counting Development Assessment Tool. It was also found that there was no significant difference between and posttest and follow-up test measurements of the experiment group. According to these results, it can be said that the Story Based Number Program is effective on the development of the concept of number of 60-72 month old children.

**Keywords:** children's books, number development, low socioeconomic level, pre-school education

## INTRODUCTION

Studies focusing on the use of storybooks to support children's learning have increased in recent years, mainly focusing on language development, vocabulary, and early literacy skills, as well as efforts to combine short storybooks with mathematics teaching, especially since the early 1990s (Blok, 1999; Hellwig, Monroe & Jacobs, 2000; Hauray, 2001; Van den Heuvel-Panhuizen, Van den Boogaard & Doig, 2009; Binali, 2013; Flevares & Schiff, 2014). Linking storybooks with mathematical content helps to make mathematics more interesting, to develop a mathematical concept or skill, and to revise a mathematical concept or skills acquired (Welchman-Tischler, 1992; Whitin, 1992). According to Whitin and Wilde (1992), the integration of children's books with mathematics provides a way for children to understand how mathematics relates to daily life. Mathematical concepts can be presented visually through storybooks, so concepts become meaningful for children as they become concrete (Murphy, 1999, Callan, 2004, Goldstein 2007; Wilburne & Napoli, 2008; Marston, 2010). In addition, integrating mathematics into storybooks has also led to a reduction in anxiety towards mathematics and creates positive attitude towards mathematics (Jennings, Jennings, Richey & Dixon-Krauss, 1992; Hong, 1996; Keat & Wilburne 2009; Flevares & Schiff, 2014). According to Van den Heuvel-Panhuizen and Van den Boogard (2008), the use of storybooks in teaching mathematics supports the use of three theoretical learning approaches, namely constructivist approach, context-based approach and interactive learning. That is to say, the value of using picture books in the teaching of mathematics is supported by three theoretical perspectives for learning: a constructivist approach to learning, the position of contextualized learning and the importance of learning by interaction which

is incorporated in the first two perspectives. All these three theoretical perspectives are important for the teaching and learning of mathematics (Elia, Van den Heuvel- Panhuizen & Georgiou, 2010). The National Association for the Education of Young Children and the National Council of Teachers of Mathematics (2002) supports the use of storybooks in mathematics teaching and notes that mathematics-related learning experiences should include sessions combined with various preschool activities. The integration of storybooks and mathematics facilitates teaching children how to interact with mathematical content (Van den Heuvel-Panhuizen et al., 2009), demonstrating how to relate mathematics, literature and critical thinking skills (Smith, 2013) and to personalize learning while filling gaps in the mathematical understanding of children (Goldstein 2007; Siebert & Draper, 2008). According to Caprora & Caprora (2006), teachers using storybooks in mathematics teaching have a more interactive learning environment.

When research that demonstrates the importance of the use of storybooks in mathematics education examined, it is seen that there is a lot of international research in relation with the standards of mathematics content and process designated by National Council of Teachers of Mathematics (2000) (Anderson, Anderson ,Shapiro, 2004; Anderson, Anderson, Shapiro, 2005; Casey, Erkut, Ceder, & Young, 2008; Van den Heuvel-Panhuizen & Van den Boogaard, 2008; Van den Heuvel-Panhuizen et al., 2009, Skoumpourdi & Mpakopoulou, 2011, Minetola, Serr & Nelson 2012). However, only a limited number of studies have focused on on the concept of number which is an important aspect of determining the mathematical content for preschoolers (Jennings et al., 1992; Hong, 1996; Young-Loveridge, 2004; Van den Heuvel-Panhuizen, Elia & Robitzsch, 2016). On the other hand, in Turkey, a study on the support of number development with a storybook-based program was not found but only one study by Öçal, Öçal and Şimşek (2015) overwiewed mathematical concepts and skills in storybooks. However, the concept of number is a universal skill (Smith, 2013) that is earned at early ages and is the milestone of mathematics programs (NCTM, 2000). Since early ages, children should be able to logically use number and number systems, count forward and backward, fluently perform basic addition and subtraction operations, read and write numbers, and calculate measurements reasonably. (Smith, 2013; MoNE, 2013). These skills are both a prerequisite for teaching advanced math skills (Charlesworth, 2012; Nguyen et al., 2016) as well as being the most important determinant of advanced mathematics skills (Demir-Lira, 2016). The contribution of number development to the acquisition of advanced mathematical concepts and skills requires examining the factors that influence number development. The socioeconomic level, the level of poverty in the child's income and the level of education of family members, is one of the factors affecting children's development of number concept (Jordan, Kaplan, Locuniak & Ramineni, 2007; Ramani & Siegler, 2008; Clements & Sarama, 2008; DeFlorio & Beliakoff, 2015). When the literature is examined, it is seen that the performance levels related to the numbers, which are key concepts in the acquisition of mathematical skills, are low in the children who come from low socioeconomic level in preschool period (Arnold & Doctoroff, 2003; Jordan, Kaplan, Olah & Locuniak, 2006; Unutkan, 2007; Starkey & Klein, 2008; Siegler 2009; Kandır & Koçak-Tümer 2013). From this point of view, it was aimed to investigate the effect of Story-based Number Program on the development of the number concept of 60-72 month old children from low socioeconomic level. To this end, the following sub-objectives were identified:

1. Is there a significant difference between the posttest scores of children in the experimental and control groups in terms of Numbers / Counting Test and Counting Development Evaluation Tool?
2. Is there a significant difference between the pretest and posttest scores of the children in the experimental group in terms of Numbers / Counting Test and Counting Development Evaluation Tool?
3. Is there a significant difference between the pretest and posttest scores of the children in the control group in terms of Numbers / Counting Test and Counting Development Evaluation Tool?
4. Is there a significant difference between the posttest and follow-up test scores of the children in the experiment group in terms of Numbers / Counting Test and Counting Development Evaluation Tool?

## **METHOD**

### *Research Design*

A quasi-experimental design with pretest-posttest control group was used to investigate the effect of the Story-based Number Program on the development of the number concept of 60-72 month old children from low socioeconomical level. Because it is difficult for children to be assigned to groups in a non-selective manner in the educational settings, semi-experimental designs are preferred, in which the groups present can be matched over certain variables (Gay, Mills & Airasian, 2005). The first factor of the 2x3 mixed experimental design used in the research identified the independent factor groups (experiment and control) as the second factor showed repeated measures (pretest-posttest-follow-up) for the dependent variables.

In the direction of this design, Numbers / Counting Test and Counting Development Evaluation Tool were administered to the children in the experimental and control groups as a pretest before the process. Following the pretest measurements, children in the experimental group were administered the Story-based Number Program twice a week for 12 weeks. In this process, no action was taken on the control group. After the completion of the experimental process, the children in the experimental and control groups were given Numbers / Counting Test and Counting Development Evaluation Tool as posttests. Four weeks after the posttests were given, the same tests were administered as follow-up tests to the children in the experimental group.

### *Participants*

The population of the study was composed of the 60-72 month old children who were attending preschool sections of elementary schools affiliated to Aydın-Turkey Provincial Directorate of National Education and showing normal development. The study group was created using analogous sampling method amongst the purposive sampling methods. In this sampling method, the sample is composed of a similar subgroup in the context of the research problem (Yıldırım & Şimşek, 2004). Initially, a list of the preschool centers in which the children of the low socioeconomic level families were attending was obtained of the working group, from the Provincial Directorate of National Education.

Obtained lists were examined by the researchers, they interviewed with school administrators and preschool teachers to find out whether a special education program was implemented in any developmental area in that educational setting. Accordingly, two classes consisting of children from low-socioeconomic level families and had not been included in any education program were identified and these two classes were assigned as the experiment and the control groups. It is stated that the neighborhood where the preschool was located, which was determined as the study group in the master thesis work done by Şahin (2008), has been heavily emigrated from the eastern and southeastern Anatolian cities such as Siirt, Bitlis and Muş after 1980 and could be considered as a shanty town located in the city center. In the aforementioned study, involving 300 people in the neighborhood, it was seen that 13% of them did not work, 8% worked in a government agency, 46% construction workers and 34% temporary workers. In economic data, 37% of the people living in the neighborhood stated that they earned 500 TL or less, 46% got between 500-1000 TL while 18% earned 1000 TL or more. For 2008, the official amount of minimum wage per month for workers was 638.70 TL (MLSS, 2017). In the strategic plan 2011-2015 of the school to which the selected group of children were attending, it was clearly stated that "the school was located in the suburban area and the socio-economic level of the school environment was low". Considering the employment status and economic income level and strategic plan data, it can be said that the parents of the children in the working group did not have a permanent job and a regular income, so they were in low economic level.

When the distribution of the children in the study group by gender were examined, it was determined that 6 of the children in the experimental group were female, 8 were male, while 7 of the children in the control group were male and 7 of them were female. In order to test the effectiveness of the method / treatment in experimental studies, it is necessary to determine whether there is a significant difference in the effect of the groups before the implementation of the treatment (Heppner, Wampold & Kivlighan 2008). For this purpose, Mann Whitney U Test Test was used to determine whether there was a significant difference between pretest score distributions of children in the experiment and control groups obtained through the Numbers / Counting Test and Counting Development Evaluation Tool before the implementation and the results are presented in Table 1.

**Table 1:** Mann Whitney U Test Results Regarding the Experiment and Control Group Children's Pretest Scores From Numbers / Counting Test and Counting Development Test

<i>Tests Used</i>	<i>Group</i>	<i>n</i>	$\bar{X}$	<i>Sd</i>	<i>Mean Rank</i>	<i>Rank Sum</i>	<i>MWU U</i>	<i>p</i>
Numbers / Counting Test	Experiment	14	15.2	5.02	16.4	230.5	70.5	.569
	Control	14	13.1	5.15	13.6	175.5		
Counting Development Evaluation Tool	Experiment	14	11.4	3.87	15.3	215.0	86.0	.177
	Control	14	10.6	4.30	12.5	191.0		

According to Table 1, pre- test scores of the children in the experimental and control groups were not significantly different in terms of Numbers / Counting Test ( $U=70.5$ ,  $p> .05$ ) and Counting Development Evaluation Tool ( $U=86.0$ ,  $p>.05$ ). Therefore, it can be said that at the beginning of the implementation, the experiment and control group have similar characteristics in terms of number concept development.

#### *Data Collection Tools*

The Number / Counting Subtest of School Readiness Composite of Bracken Basic Concept Scale-III: Recipient Form and Counting Development Evaluation Tool were used as the data collection tools in the study.

#### **The Number / Counting Subtest of School Readiness Composite of Bracken Basic Concept Scale-III: Recipient Form:**

Numbers / Counting subtest is a subtest of the School Readiness Composite of Bracken Basic Concept Scale-III: Recipient Form (BBCS-III: A) which was developed by Bracken (1984) and reviewed again for the third time in 2006. The Numbers / Counting subtest is composed of 18 items and contains odd and even numbers and counting them. Content validity, criterion-referenced validity and the Kuder-Richardson (KR20) analyzes were performed for the Bracken Basic Concept Scale-III: Recipient Form, School Readiness Composite by Angin, Arı, Deniz and Hamarta (2016). In terms of reliability, the coefficient for Numbers / Counting subtest was found out to be .94.

**Counting Development Evaluation Tool:** The evaluation tool was developed by Olkun, Fidan and Babacan Özer (2013) in the direction of the questions used in the study of Sophian (1987) for the purpose of examining the situation the development of the counting principles in children between 5-7 years of age, the number counting knowledge levels of these ages and counting in different problem situations. Unlike the 14 items used in the Sophian's (1987) study, it was aimed to remove the possibility of choosing the one-to-one mapping path by moving the objects in the groups by using the situations shown in the picture on paper and concrete objects, especially in the items that measure the comparison of the object groups. The KR-20 reliability coefficient was calculated as .64 in the validity and reliability study of the Number Development Evaluation Tool on 74 children aged 5-7 years in 5 different regions of a large province in Central Anatolia Region of Turkey (Olkun, Fidan & Babacan Özer, 2013).

**Story-based Number Program:** The Story Based Number Program developed by the researchers is a program based on supporting the development of the number concept of children aged 60-72 months. In the course of program development, initially books, studies and illustrated children's books with the concept of number were investigated regarding the development of number concept and use of children's books to support mathematical skills. As a result of literature review, eight children's books related to the number concept were identified and the content of the program was arranged in such a way that the program included identification of numbers from 1 to 20, the comparison of numerical quantities, the invariant sequence principle, one-to-one matching and cardinal value principle.

For the Story-based Number Program, children's books named *The Cheerios Counting Book*, *Sayabilirim (I Can Count)*, *Sonbahar ve Sayılar (Autumn and Numbers)*, *Küçük Prenses ile Sayıları Öğreniyorum (I am Learning Numbers with Little Prince)*, *Mini Mini Mualla (Tiny Mini Mualla)*, *Spinderella*, *Eğlenceli Matematik Masalları*

*(Fun Math Tales)*, *Daha Eğlenceli Matematik Masalları (More Fun Math Tales)* were selected, and the activities were planned accordingly to the content of these books from easy to difficult (numbers from 1 to 10, and numbers from 1 to 20). *The Cheerios Counting Book* did not have a translated version of the children's book. However, because the content of the book was of one sentence under each illustrations of the numbers from 1 to 20, the content was translated into Turkish by the researchers and the texts written on the small papers were pasted under the relevant page.

The preparation of the content of the program was based on the achievements and indicators included in the Early Childhood Education Program (2013) of the Turkish Ministry of National Education (MoNE), along with literature review and selected book content. The program included integrated activities that focus on the individual interests and developmental characteristics of the children, as well as the interests and needs of the children and the characteristics of the environment in line with the determined achievements and indicators. Attention had been given to the fact that the activities were interesting and that they are of a quality that will make them learn while they entertain the children. In addition, concrete visual materials had been drawn up that can make a difference in the educational environment and attract attention to facilitate children's participation in the activities.

The activity plans consisted of individual, small and large group activities and the preparation of Turkish, mathematics, music, drama, art and emergent literacy activities in an integrated manner. The selected children's books were placed in the book center for children's access and told to the children through different story telling techniques (puppets, story cards, slides, etc.). Questions related to descriptive, affective, achievement and connection to life were prepared in the direction of MoNE Early Childhood Education Program (2013) so that children can clearly express their thoughts for evaluation stage after the activity. The Story-based Number Program contains a total of 24 integrated events for two days a week in a total of 12-week period. The duration of the event is planned to be 60-90 minutes per day.

After the program was developed, it was presented to five field experts. Experts were asked to evaluate the training program as "appropriate", "partially appropriate", "not appropriate" taking into consideration such criteria as the content of the selected books, the appropriateness of the selected achievements and indicators for the purpose of the program, the adequacy of learning processes, the appropriateness and adequacy of the materials used and the clarity of the instructions and explain their thoughts and suggestions in a written format. Based on the criticisms and suggestions made by the experts on the training program, necessary amendments were made and the final version of the Story-based Number Program was given.

#### *Implementation of Story-based Number Program and Collection of Data*

After the pretests were administered by the researchers, Story-based Number Program was initialized to be implemented on the experimental group children by their own teacher. The children in the experiment group were trained by their own teachers, just like the children in the control group, and they all felt safe. Thus, the difference between the experiment and the control group in terms of implementer (teacher-researcher) was ignored practically. Before the Story-based Number Program was introduced, the researchers presented detailed information and training to the volunteer teacher who was assigned in the experimental group regarding the characteristics of the program to be implemented, achievements and indicators, organization of the training environment, methods and techniques to be used and learning and evaluation processes in the program. In addition, the activities planned for the scheduled days (Wednesdays-Fridays) were explained by the researchers one stage before the teacher in the experiment group and the researchers had a preliminary trial about the activity so that the teacher would be more effective in the activities. The same situation was repeated for each week for 12 weeks by the researchers in the Story-based Number Program. In the control group, the current program was followed by their own preschool teacher in the natural course. After the implementation of the program was completed, the Numbers / Counting Test and Counting Development Evaluation Tool was administered as a posttest to the children in the experimental and control groups. Four weeks after the posttest were given, the tests were given again by the researchers to the children in the experimental group as a follow-up test to test the permanency of the treatment.

### Analysis of Data

In experimental studies, the fact that the number of subjects in the groups is less than 30, which is not a definite rule for the size of the appropriate sample size, leads to the weakness of the parametric statistic to be applied (Büyüköztürk Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2014). Non-parametric tests were used because of the fact that the number of children in the groups was less than 30 and the normality test Shapiro-Wilk test showed no normal distribution of the data. Mann Whitney U test was used to test whether the difference between the groups was significant while Wilcoxon Signed Ranks test was used to test whether the difference between the measurements was significant in this respect. The significance level was set at .05 by the researchers.

### FINDINGS

In this section, the findings obtained from the research to examine the effect of the Story-based Number Program on the development of the number concept of children aged 60-72 months are presented in tabular form.

**Table 2:** Mann Whitney U Test Results Regarding the Posttest Scores of Experimental and Control Group Children from Numbers / Counting Test and Counting Development Evaluation Tool

<i>Tests Used</i>	<i>Group</i>	<i>n</i>	$\bar{X}$	<i>Sd</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>U</i>	<i>p</i>
Numbers / Counting Test	Experiment	14	17.5	2.00	19.75	276.50	24.50	.000*
	Control	14	14.2	3.59	9.25	129.50		
Counting Development Evaluation Tool	Experiment	14	13.2	1.60	17.61	246.50	54.50	.029*
	Control	14	11.2	3.49	11.39	159.50		

\*p<.05

According to Table 2, the results indicated that the posttest scores of Numbers / Counting Test (U=24.50, p <.05) and Counting Development Evaluation Tool (U=54.50, p <.05) showed significant differences in favor of experimental group. When the mean ranks were taken into consideration, it was seen that the scores of the children of the experimental group in which the Story-based Number Program was implemented were higher than the scores of the children in the control group from the Number / Counting Test and the Counting Development Evaluation Tool. The findings showed that the Story-based Number Program was effective on the development of the concept of numbers.

**Table 3:** Wilcoxon Signed Ranks Test Results Regarding Pretest-Posttest Test Scores of of the Children in the Experiment Group from the Numbers / Counting Test and Counting Development Evaluation Tool

<i>Tests Used</i>	<i>Posttest-Pretest</i>	<i>n</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>Z</i>	<i>p</i>
Numbers / Counting Test	Negative Ranks	0	.00	.00	-2.03	.043*
	Positive Ranks	7	3.00	15.00		
	Ties	14				
Counting Development Evaluation Tool	Negative Ranks	0	.00	.00	-2.38	.017*
	Positive Ranks	5	4.00	28.00		
	Ties	14				

\*p<.05 \*\* Based on negative ranks

As seen in Table 3, the differences between pretest-posttest scores of the children in the experimental group from Numbers / Counting Test (Z = -2.03, p <.05) and Counting Development Evaluation Tool (Z = -2.38, p <.05) were significant. When the sum of ranks of the difference scores for the test and evaluation tool were examined, it was determined that this difference was in favor of the posttest scores. According to these results, it can be said that the Story-based Number Program is an important effect of children in the development of number concept.

**Table 4:** Wilcoxon Signed Ranks Test Results Regarding Pretest-Posttest Test Scores of the Children in the Control Group from the Numbers / Counting Test and Counting Development Evaluation Tool

<i>Tests Used</i>	<i>Posttest-Pretest</i>	<i>n</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>Z</i>	<i>p</i>
Numbers / Counting Test	Negative Ranks	5	4.20	21.00	-1.07	.282
	Pozitive Ranks	6	7.50	45.00		
	Ties	3				
Counting Development Evaluation Tool	Negative Ranks	3	4.00	12.00	-1.64	.101
	Pozitive Ranks	7	6.14	43.00		
	Ties	4				

\*Based on negative ranks

According to Table 4, it was found that the difference between pretest-posttest scores obtained by the children in the control group from Numbers / Counting Test ( $Z = -1.07$ ,  $p > 0.05$ ) and Counting Development Evaluation Tool ( $Z = -1.64$ ,  $p > 0.05$ ) was not significant.

**Table 5:** Wilcoxon Signed Ranks Test Results Regarding Posttest-Follow-up Test Scores of the Children in the Experiment Group from the Numbers / Counting Test and Counting Development Evaluation Tool

<i>Tests Used</i>	<i>Posttest-Pretest</i>	<i>n</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>	<i>Z</i>	<i>p</i>
Numbers / Counting Test	Negative Ranks	1	1.00	1.00	-1.00	.317
	Pozitive Ranks	0	.00	.00		
	Ties	13				
Counting Development Evaluation Tool	Negative Ranks	1	2.00	2.00	-5.77	.564
	Pozitive Ranks	2	2.00	4.00		
	Ties	11				

\*Based on negative ranks

The results of the analysis in Table 5 indicated that there was no significant difference between the posttest scores and the follow-up test scores of the children in the experimental group by means of Numbers / Counting Test and Counting Development Evaluation Tool ( $Z = -2.619$ ,  $p > 0.05$ ). In this respect, the effectiveness of the Story-based Number Program on the development of the number concept was preserved in the screening measures administered four weeks later.

## DISCUSSION AND CONCLUSION

In this study, the effect of the Story-based Number Program on the development of the number concept of 60-72 month old preschoolers' from low socioeconomic level was investigated. As a result of this study, it was found out that the children of the experimental group in which the Story-based Number Program was implemented had an increase in number concept development and that this effect was preserved in the follow up measurements made after four weeks. In addition, the posttest scores of the children in the experimental and control groups were compared by means of the Numbers / Counting Test and the Counting Development Evaluation Tool, and it was determined that there was a significant difference in favor of the experimental group. These results support the sub-objectives of this research. In this case, it can be said that the Story-based Number Program is an effective program in the development of the number concept. These results for the development of the number concept are consistent with the results of other studies in the literature (Jennings et al., 1992; Hong, 1996; Young-Loveridge, 2004; Van den Heuvel-Panhuizen et al., 2016).

In the experimental study conducted by Young-Loveridge (2004), it was reported that the treatment program including number books and number games was very effective on the number development of the children of five years of age at low socioeconomic level. In another experimental study on the effect of children's books, it was

found out that storybook-based education programs provided positive attitudes to mathematics and increase mathematical skills based on number and number concepts on preschoolers from low socioeconomic level (Jennings et al., 1992). Hong (1996) found that children participating in a treatment program based on storybooks showed more progress not only in number development but also in classification skills, and that they were more successful in tasks related to shapes as well. In a study carried out by Van den Heuvel-Panhuizen et al (2016), the researchers tested the effect of reading children's books aloud on the mathematical understanding of preschoolers' using the pretest-posttest control group experimental design. In their study involving a large group (384 children - 199 in the control, 185 in the experiment group), children in the experimental group were not given any programs as a treatment but only short story books containing three important mathematical subjects (number, measurement and geometry) were read. As a result of their study, it was found that the children in the experimental group had higher scores on the PICO test including items about number, measurement and geometry, but not statistically significant, than the children in the control group. This study, which has similar results to the research findings mentioned in the literature, showed that the picture storybooks can be used to support the development of number concepts in preschool period and once again emphasized the importance of integrating children's books and mathematics.

In this study, it is necessary to consider the limitations of this research while it claims to reveal important findings regarding the effect of the story books on the development of the number concept. In this respect, the presence of 28 children and the presence of children only from low socioeconomic levels can be considered as a limitation to this study. Working with a larger sample may contribute to the validity of the results obtained in this study. Another limitation of the study is that the follow-up test was performed only once. For this reason, it is possible to test long term efficacy of the treatment given by administering follow-up tests at different periods. It is also thought that prospective studies on using story books for different mathematical content and standards will contribute to the literature.

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# Effects of Writing an Argument Language with Contextual Approach to Unveil Critical Thinking Skills

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## **ABSTRACT**

This study is aimed to explain the facilitate writing an argument Indonesian language with the contextual approach to unveil critical thinking skills students. Competence Indonesian appropriate curriculum includes components of language skills and skill to compose covering aspects of listening, speaking, reading, and writing. The argument is one of a kind development in the writing paragraphs written with the aim of convincing. The sample totalled 107 students, consisting of four classes with samples taken by multistage random sampling. Based on this finding, the researcher concluded that critical thinking skill and contextual learning approach has significant influence toward argumentative writing skill.

**Keywords:** Contextual Approach, Writing Argument, Indonesian Language, and Critical Thinking Skills

## **INTRODUCTION**

Language skill has four components: listening, speaking, reading, and writing. The four components of language skills stretcher closely related to one another. Language skills aimed by a regular order. Early childhood learning to listen, if learn to speak, after learning to read, and then learn to write. Fourth-speaking skill basically a unity that cannot be separated from one another. Indonesian competence in implementation is often overlooked. Competence Indonesian appropriate curriculum includes components of language skills and skill to compose covering aspects of listening, speaking, reading, and writing. Competence is what should be obtained learners of Indonesian subjects. Writing skills is one aspect of language skills in expressing ideas, ideas in the form of writing (Bueno, 2010). Writing is an integral part in the whole process of learning experienced by students during their studies at school. Writing requires skills for necessary exercises ongoing and continuous, especially in the subjects of Indonesian4.

The main role of the faculty in the process of learning to write that lecturers are required to motivate students to write a paragraph in the learning process in class. Writing is a process of the human mind to be supporting soul to others, or to themselves in writing. Activity fabricate this is a conscious human activity and trending, have work or mechanics that need attention so that arrangements work well. Work These include activities at the confirmation stage ideas and activities at this stage of essay writing (Hidi and Boscolo, 2007).

Capabilities such language would need to be trained so that skilled human language. In connection with that, the skill of writing is the most complex language skills compared to other language skills, the skills of listening, speaking, and reading. Several factors must be owned by a person in order to skilled writing, among others (1) acquisition of indirect communication, (2) mastering the rules of the language used, (3) mastery of the technique of writing, and (4) mastering the skill to express ideas into written form.

Writing skills that are complex causes a person to feel hard when writing. Many people have ideas, but it's difficult to express ideas in writing. This happens because of difficulties such as lack of exercise to write down ideas. Someone often find it easy to put ideas orally compared to express their ideas in writing. Verbally express the idea may be helped by gestures or other cues. In addition, a person's condition at the time of expressing ideas verbally assists the speaker in conveying the message. Meanwhile, the idea of a written submission cannot be helped by gestures or situations immediately (Newell et al, 2011). Therefore, the authors reveal possible sentences incomplete, unclear, which in the spoken language can be clarified through the use of cue point (Hamed, 2014).

Thoughts, feelings, hopes, wishful thinking, or whatever expression must be submitted in written form clearly and completely through the use of written language obey rules so that the edict to be captured properly by the reader (Qin, and Karabacak, 2010). That being said effective writing; one thinks something is written in accordance with his mind, and was captured by a reader in accordance with the message that comes to mind, and also in accordance with the author's intended. Thus, the level of thought a writer will determine the success of delivering a message to the reader. Someone who thinks regularly will be able to express ideas on a regular basis anyway, whereas someone who thinks less regularly it would be difficult to convey the message written in an orderly and systematic (Puengpipattrakul, 2014).

Regularity thinking in writing activities must be trained to someone in order to form as a habit. In this context, a regular habit of thinking will facilitate the person in conveying the message, ideas, and feelings regularly, including in writing activities. Thus, in the teaching of writing, writing practices rather than theory primacy of writing a better way to train students to be skilled writing. Learning to write is more directed at the theoretical aspects will lead to students less active and less productive writing though aspects of the theory and techniques of writing have been mastered. That many graduates majoring in linguistics and literature unproductive write prove mastery of theory writing does not guarantee the production of paper.

A scholar or a student is required to be able to pour the ideas and thoughts into written form in accordance with the rules speak Indonesian well and correctly. On this basis, a person writing skills must be based on critical thinking skills. Critical thinking skills a person can be obtained by various means, including by the many searching for information through books, the Internet, and other media publications. Based on the above problems, the formulation of the problem to be studied in this research is how facilitating Indonesian writing skills through contextual approach to improve students' critical thinking.

## **THE STUDY**

Basic writing argumentative nature is critical and logical thinking. Thus, the necessary facts and accurate data, which can lead to a logical narrative and to the conclusions that can be accounted for. Based on these facts, before talking about the argumentative writing, will be raised about the important basis on which the argument (Ferretti, et al, 2009). The basics are:

- a. Proposition  
When talking about the literary form of the argument, there is an important thing which is called reasoning. Definition of reasoning was Reasoning is a thought process that tried to link the facts or evidence of evidence of which is known to lead to a conclusion<sup>6</sup>. Reasoning is not only can be done by using the facts are still shaped plain, but can also use the facts that have been formulated in sentences in the form of opinions or conclusions. Based on the above understanding, the sentence in the form of opinions or conclusions in relation to the process of thinking is called a proposition. Thus, the proposition defined as statements that can be verified or can be rejected because of errors contained therein. A statement can be justified if there are materials or facts to prove it. Conversely, a statement or proposition can disprove or rejected if there are facts that oppose it. Proposition always form a sentence that is declarative sentences.
- b. Inference and Implications  
The fact is whatever there is, good deeds done and the events that happened or something that exists in nature<sup>11</sup>. The fact is that there was no notice or questioning how the people think about it. On the contrary, the opinion was the conclusion (inference) assessment, judgment, and beliefs about the facts. Inference is a conclusion derived from what is or from the facts that exist, while the implication is a summary, which is a considered there because it has been summarized in a fact or evidence of itself (Newell, et al, 2011).
- c. Form of evidence of  
The most important element in the debate is evidence of writing. In essence, is the evidence of all the facts, all the testimonies, all of the information, authority, and so on are linked to prove the truth. In its capacity as evidence of the facts should not be confused with what is known as a statement or assertion. They form the least evidence of it in the form of data or information (Nimehchisalem, 2011).

## METHOD

In this research was conducted in the fourth semester students of the Department of Indonesia Language and Literature Education, University of Sultan Ageng Tirtayasa, Indonesia. This study was conducted during one semester with the number 16 times face to face meeting. The sample totalled 107 students, consisting of four (4) classes with samples of this study were drawn from a population with a multistage random sampling.

According to the independent variables, namely the learning approach (X) consisting of contextual learning approach (X) and the skill to think critically (Y) which consists of the skill to think critically high (Y1) and the skill to think critically low (Y2). Approach constellation of problems can be described as follows.

Variable Attributes		Variable Treatment	Contextual Approach (X)
		High (Y1)	XY1
Critical thinking skill (Y)	High (Y1)		XY1
	Low (Y2)		XY2

**Figure 1.** Approach Constellation

Information:

Treatment (A): Learning Approach

X1: Contextual

X2: Contextual

Attribute (B): Critical Thinking Skill

Y1: High

Y2: Low

This approach is used to see the effect of treatment with checking the critical thinking skills of students first. Experiments treatment is contextual learning approach and learning approach contextual teaching materials written arguments.

Researchers took four classes to be tested for the skill to think critically. Retrieved 13 students who think critically high IVA of the semester and 13 students who think critically low IVB of the semester. Both of these classes to trial as a class experiment. Retrieved 13 students who think critically high of IVC semesters and 13 students who think critically lower than half of IVD. Class IVC and IVD as the control class. Research in the experimental class using contextual learning approach and grade control using approach contextual. Data critical thinking skills obtained by performing tests covering the following aspects: (1) contrasted the knowledge consists of the skill: (a) draw up a list, (b) establish a table, and (c) identify, (2) the skill to express thoughts in open free and consists of: (a) the skill to quote the opinion that pro and (b) cites the opinion of the cons, (3) the skill understand views of the authors consist of: (a) explained, (b) summarizes his own, and (c) establish, (4) skill to analyse consist of: (a) compare, (b) contrast, (5) The skill to draw up the synthesis that combines the results of the analysis of each item into conclusions, and (6) the skill to evaluate arguments

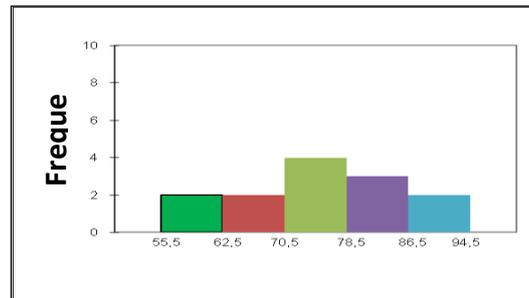
Before the critical thinking instruments are used in research, first tested on 20 students to determine the validity and reskill. Test the validity of the instrument's skill to think critically item statement made by the excel program by entering the formula Pearson product moment into the program. The criteria used to test the validity of statements that are considered eligible if the validity is the correlation  $r_{count} > r_{table}$  at the level of  $\alpha = 0.05$ . Based on an analysis using product moment formula above, turned out of the 30 items that were distributed to 20 students, obtained 26 items accepted or 86.67% were declared valid (accepted) and 4 items or 13.33% were declared invalid.

The calculation of the reskill coefficient is done by using Cronbach alpha formula. Criteria used to determine the reskill of the instrument is indicated by coefficient alpha.

Based on the analysis, it turns out of 26 grains of critical thinking instruments that were distributed to 20 student obtained the reskill of 0.91.

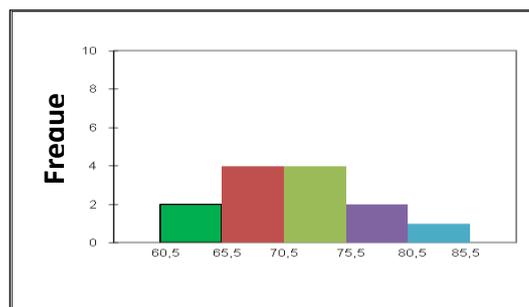
## FINDINGS

The results of the group's argument writing skills critical thinking skills high learning approach contextual (XY1). From the data writing skills of argument group of high critical thinking skills by learning approach contextual overall, the results obtained with the range of scores from 50 to 78. The average score of the skill of writing the argument is 74.54, with a standard deviation of 11.39 and 4 People (30.77%) got the skill to write arguments below average, 4 people at an average grade (30.77%), and 5 people (38.46%) above the mean Avg. Here are presented the data writing skills scores argument group of high critical thinking skills by learning approach contextual in the form of a histogram.



**Figure 2.** Histogram Results argument group writing skills critical thinking skills high learning approach contextual (XY1)

The results of the group's argument writing skills critical thinking skills by learning approach contextual lower (XY2). Data writing skills of argumentation groups critical thinking skills by learning approach contextual lower overall, the results obtained with the range of scores from 60 to 85. The average score was 70.46 written arguments skills, with a standard deviation of 6.54 and 6 people (46.15%) got the skill to write arguments, 4 people at an average grade (30.77%), and 3 people (23.07%) above the mean Avg. Here are presented the data writing skills scores argumentation groups with low critical thinking skills contextual learning approach in the form of a histogram.



**Figure 3.** Histogram Results argument writing skills to think critically low capability group learning approach Contextual (XY2)

Based on fig.3 Testing the assumption in this study was conducted using analysis of variance (Anova) in both directions. For that data have been collected prior to analysis first tested the requirements, which include tests for normality by using Liliefors test and homogeneity test using the test Barlett.

Normality test is done to score written arguments skill from each treatment group. Therefore, there are eight sets of data will be tested for normality of distribution using Liliefors test at significance level  $\alpha = 0.05$ .

- a. The calculation result of normality test group contextual learning approach critical thinking skills high (XY1) with  $n = 13$  obtained by  $L_h = 0.149$  and  $L_t = 0.234$ . Thus, for  $L_h$  is smaller than  $L_t$  it can be concluded that the approach group contextual learning critical thinking skills high overall population sample derived from normal distribution.

b. The calculation result of normality test group learning approach contextual skill to think critically low (XY2) with  $n = 13$  obtained by  $L_h = 0.163$  and  $L_t = 0.234$ . Thus because  $L_t L_h$  is smaller than it can be concluded that the approach group learning critical thinking skills contextual low overall population sample derived from normal distribution.

c. The calculation result of normality test contextual learning groups (X) with  $n = 26$  obtained by  $L_h = 0.096$  and  $L_t = 0.174$ . Thus because  $L_t L_h$  is smaller than it can be concluded that the group as a whole contextual learning approach samples come from populations with normal distribution.

Test of homogeneity of variance on four groups of cells to design experiments in question is the homogeneity test score data writing skills of argument between the group's skill to think critically high with contextual learning approach, the group's skill to think critically high learning approach contextual, the Group's skill to think critically low with contextual learning approach, and the group's skill to think critically low learning approach contextual.

Value  $\chi^2_{count} 4.08$  at which is small compared with  $\chi^2_{table} 7,18$  or  $\chi^2_{count} < \chi^2_{table}$  at significant level  $\alpha = 0.05$ . Thus assumption accepted. This means that the data group writing skills tested argument is homogeneous.

Furthermore, based on the results of the test requirements, the test for normality and homogeneity tests and proven to meet the requirements, the test of the assumption have been fulfilled and to do. Research assumption testing is done by using Anova in both directions. Furthermore, if there is an interaction analysis used is by Tukey's test. The reason a further test using Tukey's test because the data owned by the same group number. Two-way analysis of variance was used to test the main influence (main effect) and interaction (interaction effect) independent variable approach's of learning and critical thinking skills to the dependent variable, namely the writing skills of argumentation.

Based on the calculation of variance analysis of the interaction between the learning approach and skill to think critically about the writing skills of argument, as a whole. Evident that there is an interaction between the learning approach and critical thinking skills, which gained 5.54 Fh price that was much larger from Ft amounted to 4.030 with dk numerator  $V_1 (a-1)(b-1) = 1$ , dk denominator  $V_2 ab (n-1) = 2 \times 2 (1-1) = 48$ . It means that the null assumption that states there are interaction between the learning approach and critical thinking skills in their influence on the writing skills of argument was accepted, meaning that the research assumption is accepted. In other words, it can be stated that the achievement level of writing skill argument is influenced by the interaction between the learning approach and critical thinking skills.

Based on research data obtained an average score writing skills of argument which has a high critical thinking skills are trained with a contextual learning approach is at 82.15 and having the skill to think critically low is at 74.54. For an average score writing skills of argument that has the skill to think critically high approach learning trained with contextual amounted to 66.77 and has the skill to think critically low is at 70.46.

Thus the second assumption test results proved that there effectiveness the learning approach and skill to think critically about the writing skills of argumentation. It can be concluded that there is interaction between the learning approach and critical thinking skills. To further clarify the interaction between the learning approach and skill to think critically about the writing skills of argument can be seen in Figure 4.

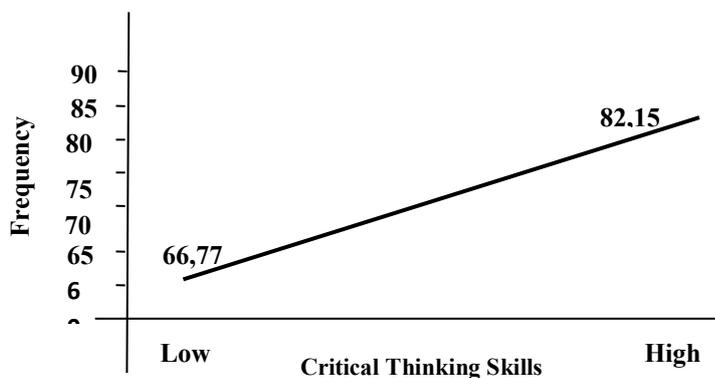


Figure 4. Interaction Approach of learning contextual and critical thinking skills

Based on fig 4. Writing Skills Argument Contextual Learning Approach with Contextual Owns High Critical Thinking Skills. Based on the calculation of variance stage further by testing Tukey the writing skills of argument between contextual approaches for those who have the critical thinking skills of high and low. Proven that there is a difference for the group that has the skill to think critically high and low between contextual learning. In the group XY1 calculate the  $Q_{\text{value}} (Q_h) = 14.14$  is greater than  $Q_{\text{table}} (Q_t) = 2.79$  or  $Q_h > Q_t$  at significance level of 0.05. Thus the null assumption is rejected it means that the results of the writing skills of argument with contextual learning is higher than the writing skills of argument = 82,15.

Writing Skills Argument Between Contextual Learning Approach with contextual Who Have Low Critical Thinking Skills Based on the results of variance calculation stage further by Tukey test the contextual approach and the approach for those who have the skill to think critically low.

## CONCLUSION

Based on these findings we can conclude that the results of learning writing skills besides arguments determined by the use of the learning approach effectiveness supported by students' critical thinking skills. Learning to write arguments using appropriate learning approach will provide better learning outcomes (Monte, and Sano, 2013). For students who have a high critical thinking skills can use contextual approach.

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# Elementary School Teacher'S Concept of Child Aspirations

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## ABSTRACT

This text focuses on elementary school students' aspiration level in relation to learning as seen by an elementary school teacher. The purpose of the study is to analyse these teachers' concepts of elementary school pupils' aspirations in the light of known aspirations of their respective parents. The data collection method used was in-depth interviews with elementary school teachers.

## INTRODUCTION

### *ELEMENTARY EDUCATION IN THE CZECH REPUBLIC*

The first stage of education includes the first 5 years of school attendance and is the subject of the present study of the elementary school teachers' concept of pupils' aspirations. Compulsory school attendance in the Czech Republic starts at the age of 6, at which time students must be officially enrolled in order to attend. Last year there were 4115 schools in the Czech Republic; these are owned by municipalities, the state, churches or private entities. Schools serve their catchment areas and are obliged to admit children from their catchment area, but parents can choose any school for their children, including out-of-school education facilities, subject to availability. Elementary school teachers must be graduates of Master's programs.

### *LIFELONG EDUCATION*

Aspiration is considered a cornerstone of lifelong education; hence, attention to aspirations of pupils from an early age is vital to educational success. Indeed, educational aspiration is currently a popular subject of research, particularly among secondary school students. According to Švarcová and Gabrhel (2012), out of a sample of 854 secondary school students, one fifth of the respondents had no idea as to what their educational aspirations even were and lacked any specific, concrete focus for their future education and/or professional career. How can this deficiency be prevented? In early childhood, the family and its approach to the child's intellectual development takes a primary role in formation of the child's self-concept. After compulsory school attendance commences, this role is taken over by the school, the teacher and the class in which the child acquires its first education. Focusing on the teacher, relevant considerations include awareness and vigilance in his/her work with his/her pupils' aspirations, as well as his/her ability to diagnose and work with these aspirations systematically.

### *PERSONALITY OF ELEMENTARY SCHOOL TEACHER*

The role of the teacher, according to Franclová (2013), involves creation of a safe environment for the pupils, getting to know the pupils and their families, development of appropriate strategies, assistance in relationship building among classmates, and cultivation of feelings of belonging within the group or class. The teacher deals with the intellectual and emotional impacts of school assessment on the pupil and teaches his/her pupils how to adopt the right attitude with respect to errors, success or failures. Development of these skills is connected with the pupil's present and future aspirations and aspiration level; thus, the teacher should become a sensitive and perceptive guide for the students, able to recognise what is happening in the child's mind and to identify and address the causes of potential problems as needed. Further, the teacher must inspire parents to help their own children on their way to education acquisition, to notice the child's trouble and mediate, when necessary the rules of school life. "The teacher motivates his/her pupils not only to learning but also to attending and staying at school" (Franclová, 2013, p. 22). Attention and recognition on the part of the teacher is important as well, and the teacher should provide socio-intellectual space for the child to boast of its success and achieved objectives.

### **ASPIRATION AND ASPIRATION LEVELS**

According to Hart (2009, p. 58) aspiration is the 'level and structure of objectives man sets for himself and strives to achieve. Man assesses objective achievement according to the difference between expectations and

achieved results, whereas while success increases the level of aspiration, failure decreases it". As further stated by Hart (2016), assumptions concerning our capabilities may be affected by social conventions; cultural or other capital; social relations and other people; and power relations or social context. Aspirations without origin and setting in local conditions and period mean little and are difficult to interpret alone, out of any context.

A simple definition of aspiration level is offered by Mareš (2013, p. 270): "Aspiration level is the level of objectives the individual defines for himself and expects to achieve". Approaches to objective and aspiration level allocation are accompanied by two-sided emotions, with fear of failure on one side and idea of success on the other. According to Mareš (2013, p. 373) "the individual draws from experience in himself and previous successful task fulfilment". This awareness is especially important in school work, pupil assessment by the school and feedback about its abilities, as these identify what is and what is not correct and the nature of or conditions for task fulfilment and objective achievement.

Aspiration is dynamic, not static; therefore, its level as a relative evaluation must be constantly considered and revised. As defined by Mareš (2013, p. 373), "aspiration is a set of individual expectations of oneself and the level of personal objectives set by the individual for himself. The individual keeps comparing his expectations and his actual performance, with the result of the comparison pointing to either success or failure" (Mareš, 2013, p. 373). Mareš considers the main problem contributing to aspirational deficiency to be the inability of the pupil to foresee for what its skills will be sufficient or insufficient. What is important in this context is consideration of current skills, which may be affected by a number of variables-- for example, by health conditions or developmental tasks experienced by the student in the course of the educational process. According to Mareš (2013) in practice there are pupils who overestimate themselves, meaning that the pupil sets objectives for itself that cannot be achieved in order to garner prestige and the envy of classmates. Conversely, there are students who underestimate themselves, setting objectives which fall short of their real capabilities present no foreseeable challenges to success; the main motivation for this is avoidance of failure. In this case of the latter, teacher encouragement, positive incentives, and enumeration and allocation of partial or incremental tasks for the pupil to fulfil are important mechanisms in allaying the student's fears of failure and making intimidating tasks more manageable. Equally important is the teacher's own understanding of the concept of aspiration and its meaning and importance within the educational construct. This understanding manifests in the quality of the instructor's diagnostic abilities and, subsequently, their efficacy in supporting students' setting of-- and achieving-- realistic objectives corresponding to their abilities.

According to Straková (et al. 2006) research had shown that the family environment greatly impacts the educational aspirations of pupils in the Czech Republic. Further, level of aspiration was found to vary with significant consistency along gender lines as well, with girls showing higher educational aspiration levels than boys. Unlike the previously presented understandings of the concept, which identified such factors as formation of educational aspirations the socio-economic status of the family, the shared family talents and values and quality of the attended school as decisive in the formation of educational aspiration, ,decisive factors in Matějů (2007) makes the claim that aspiration formation is further affected by: "the structure of the educational system, the level of its stratification, orientation on professional education, permeability and link to the job market". This is the structural level, while the socio-economic status of the family plus the other aforementioned factors are on the individual level. According to Katrňák (2004) educational aspirations in the Czech Republic are mainly affected by demographic characteristics, employment status of the student's parents, educational and cultural sources, values of the family and measurable capabilities of the pupil.

(<http://www.soc.cas.cz/publikace/educational-aspirations-comparative-perspective-role-individual-contextual-and-stuctual>)

#### *WHAT IS THE RELATION OF ASPIRATION TO OTHER NOTIONS?*

Aspiration is closely connected to motivation. According to Franclová (2013, p. 55) it is a "system of driving forces inspiring, directing and maintaining human activity ". Aspiration is further related to the psychological notion of attribution, a notion explaining from the psychological point of view the causes to which pupils ascribe to their successes or failures. Important considerations here include is trust in one's own capabilities, motivation, and the method of and reason for setting individual objectives in relation to the pupil's aspirations. The teacher's feedback and belief in the pupil's success or failure is also important, in that it affects the teacher's approach to

the student in terms of support and attention. Aspiration level is further connected with the pupil's self-concept, which must be formed systematically by its educators. Self-concept consists of self-understanding, self-feeling, self-assessment and self-fulfilment. According to Franclová (2013) a key role is performed by the student's assessment of its own capability or insufficiency, its awareness of popularity in class, reactions to success or failure, orientation towards optimism or pessimism and overall development of the child's personality. According to Online Research Cardiff (2014), differences in pupils' aspirations are relevant for and manifest in relation to the results of their education. Cardiff (2014) notes that even students coming from socially disadvantaged environments set high-level educational goals and that there is a difference between the feasibility of the objective and the actual potential for achieving it.

(<http://www.tandfonline.com/doi/abs/10.1080/03054985.2014.953921>)

#### *IMPORTANT FACTORS SUPPORTING EDUCATION AND PROFESSIONAL GROWTH*

According to Šed'ová (2014, p. 27) there are important family-originating factors affecting child's aspirations and objectives, including reading books, engagement in after-school activities (sensible time management) and their degree of variety, family interactions, pressure on success (reflecting parents' aspirations and expectations), language use (opportunities to develop various levels of linguistic expression), academic leadership (assistance in school preparation, explanations of the incomprehensible), family activities (leisure-time activities outside school), intellectual level (opportunities to think and develop imagination in everyday activities), and work habits (regularity and space and time organisation). According to Matějček & Klégrová (2011) inadequate parental aspirations are one of the most frequent causes of low aspirations among students. Excessive stress, overwork, or high demand of parents may result in apposite outcomes on the part of the pupil. The child may develop indifference to education as a defensive reaction to stress, leading to the development of dissonance between the parents' and the child's aspiration levels.

#### *THE SCHOOL AND THE FAMILY - INTERCONNECTED ENVIRONMENTS*

The family and the school are the two main socialisation factors acting on the child in first grade elementary education. Indeed, the fact that, when the child starts its school attendance, the influence of the family retreats to the background and is taken over by the school has long been widely accepted among educational researchers. The role of the school in the child's socialisation, education and upbringing gains importance over time, and the teacher's actions and personality are a major influence in this process. However, the teacher (and parents, incidentally) can only motivate the pupil effectively if they are well acquainted with the child's positive and negative personality features. As confirmed by Šulová (2014), knowledge of the aspiration level and cognitive maturity of the child by its teacher and parent demonstrates respect for the objectives the child itself defines for its own achievement. The school is oriented towards education and achievement of the defined educational objectives, formally organised and managed according to a set of discrete and explicit plans; education at school is provided by teachers and supervised by public authorities. Work with pupils at school is systematic and implemented on the basis of binding educational documents. Students' educational results are assessed according to pre-defined standards and binding rules. While the family is the site of primary socialisation, the school is the site of secondary socialisation.

The school and the family can be opposed environments. A current trend is to eliminate this opposition and make the two environments cooperate in pursuit of a common objective. Family environment is typically considered an informal environment, while school is a formal institution with its own subcultural traditions and folkways. The ideal resolution would be unification of these two institutions, in which they would be complementary to one another and collaborating toward the achievement of mutually recognized goals. In the ideal, when the family has reservations or deficiencies with respect to a given process in goal achievement, the school may partly step in and perform functions the family does not or cannot fulfil. Simply, school results often direct the further educational orientation and professional career of the child, but are nonetheless affected by a wide range of factors in combination. According to Havlík, Kota (2007) school influence is absolutely necessary for the individual and his social and cultural evolution. School is the environment cultivating the pupil, helping it acquire cultural knowledge and skills for future life. The child comes from its family to school with some basic idea of its capabilities, accustomed to praise and support for certain behaviours depending on the family's values. The child may be brought up with freedom and excessive praise or high demand on performance with minimum praise, with innumerable combinations of such therein. With little exaggeration, twenty students in

class represent twenty family approaches to upbringing. The students' subsequent upbringing is taken over, to varying degrees, by the teacher, who is expected to follow the family standards despite significant variability; hence, the importance of his/her knowledge of the pupils cannot be understated. There are big differences between pupils; some pre-school children already attend various activities and are directed towards certain orientations, while others have been largely homebound. If the child is provided with sufficient stimuli for versatile development, it will be positioned to experience feedback about its real capabilities. This helps form the first foundations for the aspiration level, which, after commencement of school attendance, affects all habits and activities of the child and determines motivation for school-task fulfilment. School also helps the student form ideas about its identity and which objectives it wishes to pursue. The pupil's conduct thus is directed towards acceptance and fulfilment of school requirements. Social or physical handicaps can make it difficult for the pupil to cope with school requirements, achieve, social integration, learn communication skills, develop and use language and acquire motivation for learning activities.

#### *PARENT - SCHOOL RELATIONSHIP*

Hartl and Hartl classify "parents and school" as the cornerstones of education. Student, teaching plan, teacher, group relations and parents, in many cases teachers can improve school results of their pupils only with the help of the pupils' parents." (Hartl, Hartl, 2009, p. 511) The assumptions of a good school-parent relationship include mutual openness, information and willingness for mutual communication. Indeed, my own four-year classroom experience has taught me that parents of active pupils are more active in communication with the class at-large, the teacher and the school. According to Průcha (2008, p. 203) a thriving parent-school relationship fosters "a significant social relation affecting success of the educational process, pupils' learning and personality development". The school is the main initiator of mutual communication with parents by publishing information about school activities, asking parents for cooperation, initiating parents in the school subculture, and development and cultivation of mutual relations with the school. Parents can actively participate in school life, attend courses, get involved in projects and contribute to school management in the parent council. (Průcha 2008)

The family and the school are the main sources of the child's socialisation, ideally in complementary cooperation. If the family has limitations, the school may partly replace the family in its functioning and create opportunities for remediation of such deficiencies. The family affects the way the child copes with school requirements, and the results of the child's school work as a collaborative product, in turn, determine the future life of the child.

#### **METHODOLOGY**

Qualitative methodology with data collection through in-depth semi-structured interview was selected. Teachers from 5 elementary schools in Zlín were contacted by email. The main respondent selection criteria were occupation as elementary school teacher and willingness to cooperate. Just 2 teachers were willing to cooperate and contribute to research on their concept of pupil aspirations. Both teachers worked with 4th grade elementary school students and possessed more than 13 years of experience in elementary school teaching.

#### *Data Collection and Processing Methods*

In-depth interview was chosen because of the need to grasp this phenomenon in its complexity, the possibility to ask open-ended questions which provide respondent an opportunity to more fully express his/her feelings, experience and knowledge. For this purpose, semi-structured interview was chosen with pre-formulated questions. Two interviews were conducted, recorded on a dictaphone and transcribed, a process which, according to Švaříček and Šedřová (2014), was appropriate both from the temporal point of view and for the possibility for the data visualisation necessary for later data coding.

#### *Research Limitations*

We are aware of the low number of respondents, attributing the unwillingness to cooperate to the part of the school year in which the research was implemented, this being two months before the school year's end when the teachers are at their busiest. We do not present these results as suggestive of generalizations; rather, we only analyse the approaches of two teachers in the context of their experiences with their current class.

*Research Results*

The teacher's concept of the pupil's aspirations is one of the key parts of pedagogic diagnostics. Effective work with aspirations can help lead the student, cultivating its self-concept and self-defined objectives.

**Figure 1 How do teachers understand the notion of aspiration?**

Aspiration

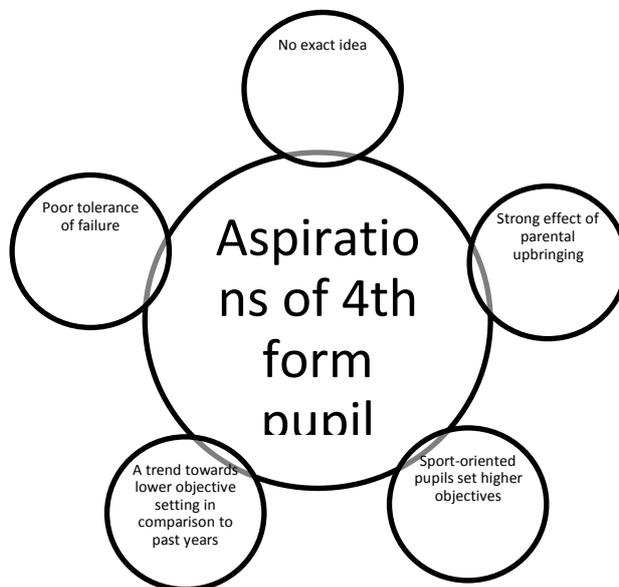
- Effort
- Goal settings
- Pathway toward objective achievement
- Self-confidence
- Awareness of one's own capabilities



**Figure 2 Characteristic aspirations of 4th grade elementary school pupil**

Characteristic

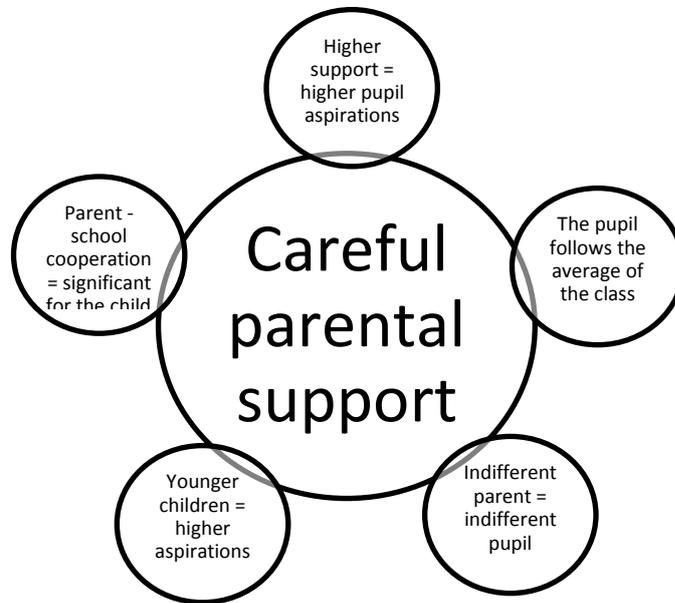
- No exact idea of aspirations
- Strong effect of parental upbringing
- Sport-oriented pupils set higher objectives
- A trend towards lower objective-setting in comparison to past years
- Poor tolerance of failure



### Figure 3 Careful parental support

#### Support

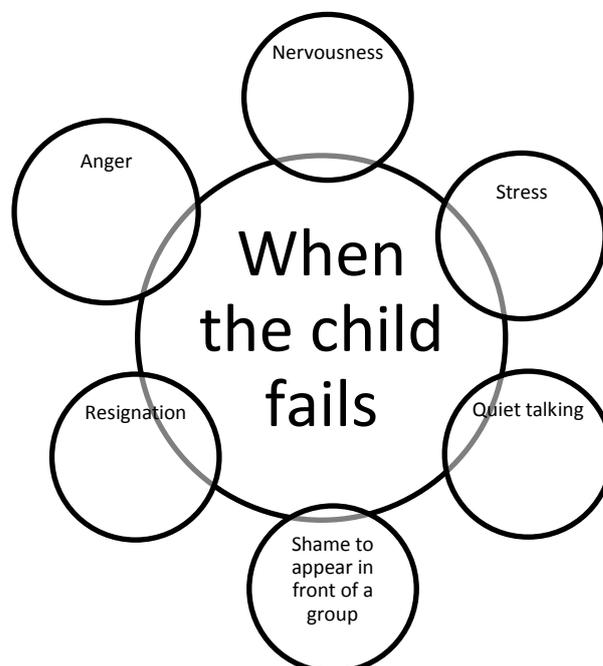
- Greater support = higher pupil aspirations
- The pupil follows the average of the class
- Indifferent parent = indifferent pupil
- Younger children = higher aspirations
- Parent - school cooperation = significant for the child



### Figure 4 What happens when the child fails?

#### Consequences of child's fails

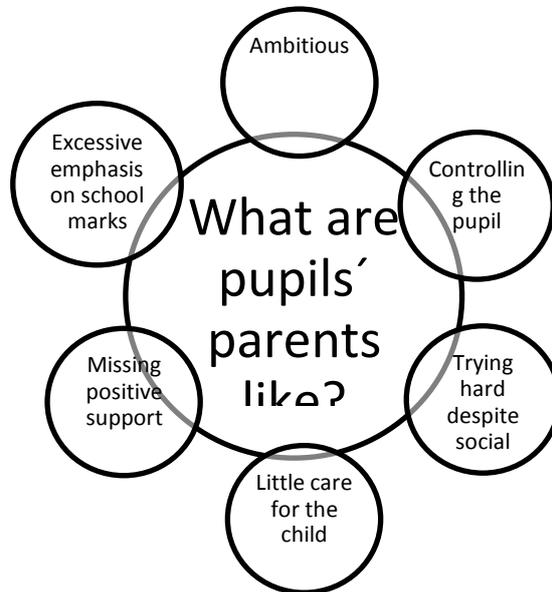
- Nervousness
- Stress
- Quiet talking
- Shame when appearing in front of a group
- Resignation
- Anger



**Figure 5 What are pupil's parents like?**

Pupils parents

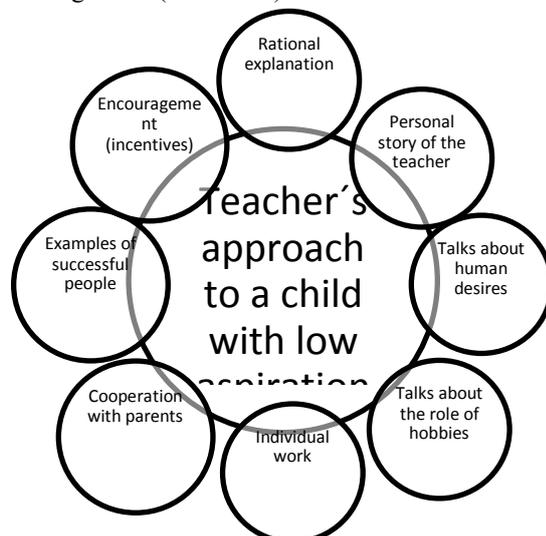
- Ambitious
- Controlling of the pupil
- Trying hard despite social drawbacks
- Little care for the child
- Missing positive support
- Excessive emphasis on school marks



**Figure 6 Teacher's approach to a child with low aspiration level**

Teachers approach

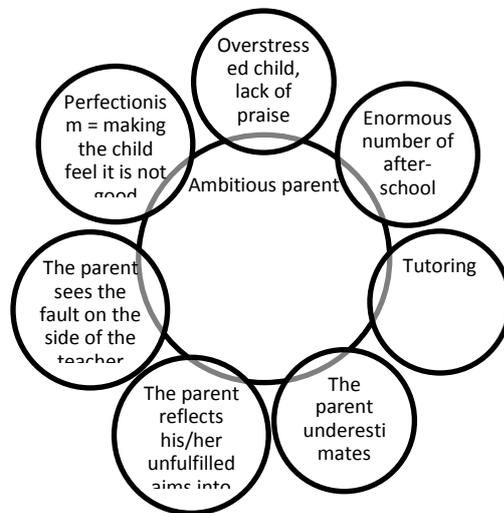
- Rational explanation
- Personal story of the teacher
- Talks about human desires
- Talks about the role of hobbies
- Individual work
- Cooperation with parents
- Examples of successful people
- Encouragement (incentives)



### Figure 7 Ambitious parent

#### Ambitious parent

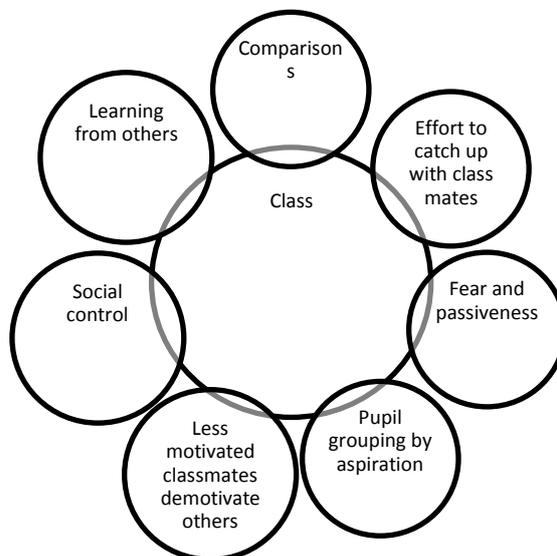
- Overstressed child, lack of praise
- Enormous number of after-school activities
- Tutoring
- The parent underestimates class influence
- The parent reflects his/her unfulfilled aims into the child
- The parent sees the fault on the side of the teacher
- Perfectionism = making the child feel it is not good enough



### Figure 8 Class effect on pupil's aspirations

#### Class effect

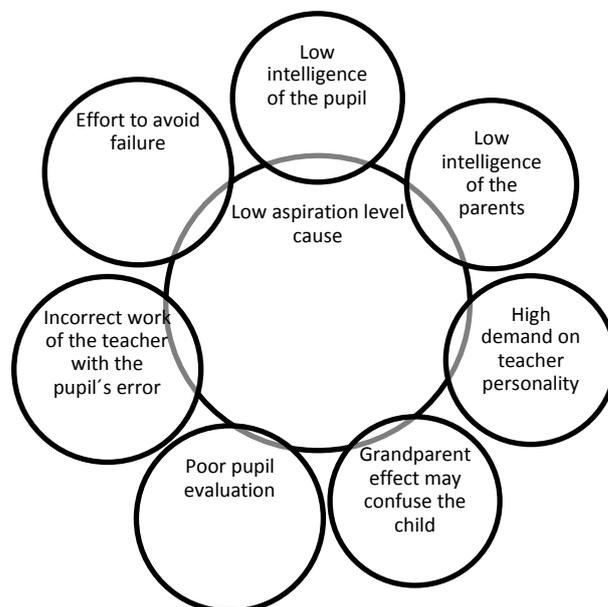
- Comparisons
- Effort to catch up with classmates
- Fear and passiveness
- Pupil grouping by aspiration
- Less motivated classmates demotivate others
- Social control
- Learning from others



### Figure 9 Low aspiration level cause

#### Causes

- Low intelligence of the pupil
- Low intelligence of the parents
- High demand on teacher personality
- Grandparent effect may confuse the child
- Poor pupil evaluation
- Incorrect work of the teacher with the pupil's error
- Effort to avoid failure



### CONCLUSION

It does seem teachers have a variety of how to understand the notion of aspiration, characteristic of 4th grade elementary school pupil has a lot of options. Every child is unique and manifestation of their aspirations differently also parents show several attitudes to how to support their children. It is not a finding of this research because it was not the aim, but parent's support has significant influence on child's aspirations. Pupils' aspirations are projected to the children's reactions when they are failing at school tasks. We consider parent's cooperation with teacher and child necessary.

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# Engineering a Woman: Marketing Opportunities and Challenges

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## ABSTRACT

*Purpose and Motivation:* Engineering plays a key role in supporting the growth and development of a country's economy as well as in improving the quality of life for citizens. Most of developed countries witnessed economic growth with the contribution of women in engineering field. In developing countries like India women remained under-utilized resource. Women in engineering are probably the single best investment that can be made in the developing world. There is clearly room for improvement – not only in recruiting women into engineering, but also in retaining and promoting those women who wish and do enter the profession. This study was designed to investigate a perception and determination of undergraduate women towards accessing Engineering Education. The study has highlighted women's perceptions and experiences on accessing engineering education through institute's Marketing Mix strategies which enables women to take up strategic positions to enjoy success in engineering education and career. Findings of this study revealed that women students in engineering are better satisfied and act of referring services/program to others is higher than men students in terms of numbers for a particular set of marketing mix applied to gender.

*Research Methodology:* A qualitative research survey through a structured questionnaire for the students who are studying or have recently completed their engineering education from reputed engineering institutes affiliated to the North Maharashtra University, Jalgaon was conducted.

*Findings:* The study discloses women's approach to engineering education in terms of marketing mix; program, price, place, promotion, people, physical evidence and process. Women tended to rate most the marketing criteria as having a higher level of importance than men. Women needed more communal support while making decision making of selection of engineering education.

*Research Limitations:* The survey is delimited to the engineering education belonging to North Maharashtra University, Jalgaon and Khandesh region, a rural part of India.

*Practical Implications:* Findings of the study will be useful for the institutes and direct and indirect service providers of engineering education in developing a communication program and should be utilized and integrated into all aspects of the marketing program to attract women in engineering.

**Key words:** Gender, Women, Engineering Education, Selection, Marketing Services.

## INTRODUCTION

By educating a woman, we educate the whole family and directly or indirectly, we educate nation. Given that a woman has the responsibility of the whole family on herself, several studies proved that an educated woman is better capable of taking care of the health, nutrition and education of her children and family. Gender refers to the socially constructed roles, behaviors, activities and attributes that a given society considers appropriate for men and women [1]. In virtually all but a handful of countries, there are severe constraints on women's entry into higher levels of education and their work in senior professional and managerial jobs [2]. The status of women in India has been subject to many great changes over the past few millennia [3]. With a decline in their status from the ancient to medieval times, to the promotion of equal rights by many reformers, the history of women in India has been eventful [4][5]. Women in India now participate fully in areas such as education, sports, politics, media, art and culture, service sectors, science and technology, etc. [5]. Families of engineering students provide exceptional levels of support to their children.

For women in engineering, this support is crucial from the pre-college level onward. In particular, female engineers' parents tend to raise their daughters with fewer gender stereotypes and place greater weight on education and learning [6]. Education of girls is vital not only on grounds of social justice but also because it accelerates social transformation and human resource development of the nation. Studies have indicated that there is a strong correlation between female education and several developmental indicators such as increased economic productivity, improvement in health, increased political participation and effective investments in the next generation. There is also evidence that lower gender disparity in educational attainment for a developing country correlates with lower overall income disparity within society [7]. Negative cultural and societal attitudes, different standards- roles for boys and girls, competing demands on the girls time, economic reasons like; lack of resources, distance from college, lack of facilities for girls, lack of female teachers, lack of security both in and outside the college, curriculum not relevant and flexible, gender stereotyping in curriculum, gender unfriendly classroom environment, early marriage and child bearing, absence of women role models, fear of deterioration of social structure are the most frequently quoted stumbling blocks to female education [8]. Which leads to a very limited presence of females in higher education and the high-wage labor market. Although women are given high respect in Indian society [9], women working outside the home have been looked down upon. Reference [10], found that traditional and cultural inhibitions acquired by women from childhood, nurtured by parents, and reinforced by their socialization was the key hurdle that inhibited their urge to be in an executive or leadership position. This is further supplemented by a lack of self-direction, independence and self-motivation to enter the male-dominated world. However, those who have reached higher echelons of organizations are seen as determined to stay, confront the barriers and secure the requisite familial support and personal drive [11]. Results of senior secondary school examinations regularly show the outstanding performance of girl students with many of them topping the merit list [12], which is a good mark for the graduation of women. As per the article published in Times of India, girls' candidates carried a tradition of surpassed boys in the Higher Secondary Certificate (HSC) examination over the last few years [13]. One notable success came in 2013, when the first two girls ever scored in the top 10 ranks of the entrance exam to the Indian Institutes of Technology (IITs) [14]. Unfortunately, due to a combination of factors including limited exposure and opportunities and lack of encouragement from role models and mentors, many qualified and talented young women do not consider a nontraditional career choice such as engineering.

## **WOMEN IN ENGINEERING**

Engineering plays a key role in ensuring the growth and development of a country's economy as well as in improving the quality of life for citizens within the country. There is an important link between a country's engineering capacity and its economic development [15]. Engineering is viewed in the public sphere as masculine, competitive, objective, impersonal qualities that are at odds with our images of what women are. Because engineering is a traditionally male-dominated field, women may be less confident about their abilities, even when performing equally [16]. Countries like; Myanmar (65%), Tunisia (42%) and Honduras (41%) lead the world in gender parity among engineers, according to latest data on female engineering graduates from the United Nations Educational, Scientific and Cultural Organization (UNESCO) [15], followed by Denmark (35%), India (30%) and Sweden (29%). Women only make up 22% of engineering graduates in the UK. with Switzerland 14% and Japan 12%. As per 2011 Censes of India, sex ratio was 943 females per 1000 male; female 48% of total population [17]. In India, reservation for women cuts across all classes and communities and is a horizontal and not vertical reservation and counts 33.33% [18] in the state of Maharashtra and Gujrat. As per the report 2015- of All India Survey for Higher Education, out of 42.28 lakh students enrolled in Engineering and Technology, the share of female participation in this sector was relatively low; 11.84 lakh, 28% only [19]. As per the statistics available on the website of All India Council for Technical Education (AICTE dashboard), female enrollment in Engineering and Technology undergraduate program during 2012-13, 2013-15, 2014-15 and 2015-16 was 33.83%, 27.77%, 27.71% and 28.28% respectively, which shows decline interest of women in engineering [20]. Women have contributed to the diverse fields of engineering in modern and historical times. Women are often under-represented in the fields of engineering, both in academia and in the profession of engineering.

A number of organizations and programs have been created to understand and overcome this tradition of gender disparity [21]. In India, women's presence is known to range between a high of 5.8 per cent [10] to a low of roughly 3 per cent [22] of all administrative positions. They can be seen mainly in HR, IT and servicing activities.

As per the report of [23], India Hiring Intent Survey found that employment gender ratio is still at 71:29. The report further said that by providing an impactful training program to hire fresher female candidates and shape them into the high performing executives of tomorrow, the future might be completely different from today's reality' [23]. The report further emphasized that despite of number of political and industrial forums, mandated Government Policies and widespread discussion in the media, the issue of gender diversity continues to remain largely unresolved. Indeed, men's and women's jobs differ greatly, whether across sectors, industries, occupations, types of jobs, or types of firms [23]. As per the report, women constitute more than 50% of the workforce in sectors like E-commerce and Retail, however, manufacturing and engineering have less than 25% of females in their workforce, whereas, for sectors like BFSI, BFS, BPO and ITES this percentage is restricted to 25. The report further observed gender pay gap favoring full-time working men over full-time working women with the reasons like; seniority & work experience, salary negotiations, breaks in employment. Surprisingly, report noted 7% rise in employment of women compared to last year. There is good sign that the differences in employability percentage of gender is going minimum in every year passed which the report said as a good sign for India [23].

### **MARKETING MIX AND WOMEN'S ACCESS TO ENGINEERING EDUCATION**

Boys and girls differ in how they are involved in education and choice processes, illustrating changing forms of young people's gendered identities and subjectivity [24]. There has also been research focusing on gender differences in decision-making processes [25]. Reference [26] found evidence to suggest that the attributes important in determining self-esteem for women and men are different. Due to biological factors, women and men show different behaviors in terms of mood, personality or natural inclination for some skills [27]. In the decision-making process, women have a tendency to rely on emotion that can be presented by harmony, affiliation, and betterment of self and others [28]. Marketing mix is a set of controllable marketing tools that an Institutes uses to produce the responses it wants from its various target markets [29]. Reference [29] & [30] had discussed 7P approach in order to satisfy the needs of the service provider's customers: product (program), price, place, promotion, people, physical facilities and processes are discussed below.

#### ***Program (Product):***

When it comes to educational offers, Kotler firstly refers to curricula and services [30]. Technical educational program like engineering, pharmacy etc. are the products/services of the technical educational institutes. The program and curriculum must be appropriately developed and adapted to meet the needs of the students [29]. Brooks proposes that a career must be perceived as both attainable and attractive before a woman will be motivated to choose it [31]. In adapting Vroom's (1964) [32] expectancy model of motivation to women's career choices, Brooks first describes three components of expectancy: career self-efficacy, perceived structure of opportunity and perceived social support. It is not only the course content which discourages women from doing engineering but also the selection criteria which is used to screen prospective students [33].

Men prefer practical, physical or managerial occupations while women prefer supportive, clerical, and socially oriented occupations [34]. Reference [35] hypothesized that women at the college age perceive nontraditional fields to be incompatible with having a family. Indeed, women in nontraditional programs (like engineering) expect more difficulties than women in traditional programs [34]. Reference [36] found that there is a lack of Pre-College Experience and Knowledge in Engineering due to the absence of engineering awareness from the K-12 curriculum. A lack of interest was a factor for women not choosing careers in engineering or science [37]. For women, having highly educated parents, a strong desire for control, prestige and influence and a desire for positive interaction with others are primary influencers on nontraditional occupational choice [38]. Another construct commonly used to explain women's discomfort in engineering has been "math anxiety," a profound fear of mathematics and the belief that only white men succeed in math [39].

Findings of [40] suggest that women may be more likely than men to view education as a means to influence social change and improve race relations. Reference [40] also indicated that women tend to be more satisfied than men with their college courses and instruction. In a finding of reference [41], female students appear to be slightly more interested than male students in the overall reputation of the school and its degrees and what both can do for them after graduation. Studies of engineering students have also shown that women rate their abilities lower than men, despite higher GPAs [42]. Some researchers have found that the lack of self confidence among female engineering students stems partly from their lack of technological experience and expertise, qualities deemed especially important in the engineering “culture of technical knowhow” [43].

***Price:***

The price element of the services marketing mix is dominated by what is being charged for the degree or tuition fees that are required [29]. Tuition fee, fee concessions, scholarships, educational loan, cost of education, fee installments offered by the service providers (institutes) for the service delivered to the service receiver (students) includes in this category of service mix.

Because of social and economic reasons, parents may be unwilling to spend on education as well as the dowries of their daughters [8]. Parents of female students are less likely to save for college. This may be one reason why, once in school, freshman women were more likely than male freshman to report major concern about financing their education and were more likely to indicate low tuition was an important factor for them when selecting a college [44].

***Place:***

Place is measured in terms of accessibility, acceptability and convenience. This refers to location of institutes & distance of institute from the targeted future students native place. The location can refer to the place where the institute is. Then, it can refer to the characteristics of the area in which the institute is located. Location can also have a relative meaning, i.e. it can be viewed in relation to where current and future students and high school students live [30].

In the rural areas, the girl child is made to perform household and agricultural chores. This is one of the many factors limiting girls' education. Physical safety of the girls, especially when they have to travel a long distance to school is the other reasons that impede girls' education [8]. Two studies, reference [45] and reference [46] have measured differences in this college selection criterion between college men and women, the results, college women believed location was more important as a selection criterion than college men.

***Promotion:***

Promotion encompasses all the tools that institute can use to provide the market with information on its offerings: advertising, publicity, public relations and sales promotional efforts [29]. Promotion is a process of communication between an institute and service user with an aim to create a positive attitude on products and services, leading to their favoring in the process of purchase on the market [30]. As per the reference [47], most educational institutions use public relations, marketing publications and to a lesser extent, advertising. The communication is made through presentations, print & visual advertisements, digital marketing, displays, internet & social media [47].

Women engage in a more complex information search process than men [48]. Many studies have suggested that as a result of socialization pressures, the feminine personality emerges in terms of communion with others [49] and as a result, women see relationships as more important in their lives than men do [50]. Women appear to be more strongly motivated by affiliation needs [51] and tend to express a higher degree of interest in person-oriented professions [52]. Studies have also shown that women who enter engineering hold its extrinsic (i.e., social) value in higher regard than men do [53]. Social value is sought when individuals seek to shape the response of others [54]. For instance, when it comes to advertising on the web, males were found to have a more positive attitude than females [55]. In online purchases, word of mouth is a more influential tool for women than for men in terms of reducing perceived risk and increasing willingness [56].

***People:***

People is a key instrument in educational process. Because most services are provided by the people and experienced by the people by their motivation and behavioral characteristics, they make a huge difference in customer satisfaction [57]. As per reference [58], Previous Teachers, Alumni, Current-Students, Parents, Siblings, Relatives, Management People and Prospective students themselves affect the decision of selection in technical education.

Career “modeling and mentoring” is essential for girls and women of all ages and races and at every developmental stage of the life span [58]. Girls in engineering perceive that they receive more parental support than their peers in any other discipline [59]. Studies have found that girls are advantaged in both non-academic areas such as parental, peer and teacher expectations and non-cognitive skills such as organization, self-discipline, attentiveness, dependability and seeking help from others [60]. Social cues can also easily discredit women and dissuade them from pursuing a degree in a field where they are underrepresented [61]. Women view their professors as advisors and role models [62] and look to them to help them understand engineering. Some have found that institutional proportionality (a large percentage of women in faculty and administrative positions) may have a greater effect on women’s persistence in a major than peer group proportionality (a large percentage of female peers) [63]. An awareness of others’ feelings is a trait exhibited more strongly by women than men [64]. In case of girls, parents generally take the decision regarding the academic stream to be pursued [8]. As per focus group discussions made by [40], The lack of female faculty members was discouraging to many of the young women. However, they wanted to find supportive, strong faculty advisors, regardless of gender. Parents were highly influential in students’ decisions about the major, with others who influenced students were likely to be engineers or high school math or science teachers [40]. Women are more likely than men to feel that their faculty provide them with personal and professional support, thus accounting for women’s greater satisfaction with faculty, curriculum, and the overall sense of community on campus [40].

***Process & Physical Evidence:***

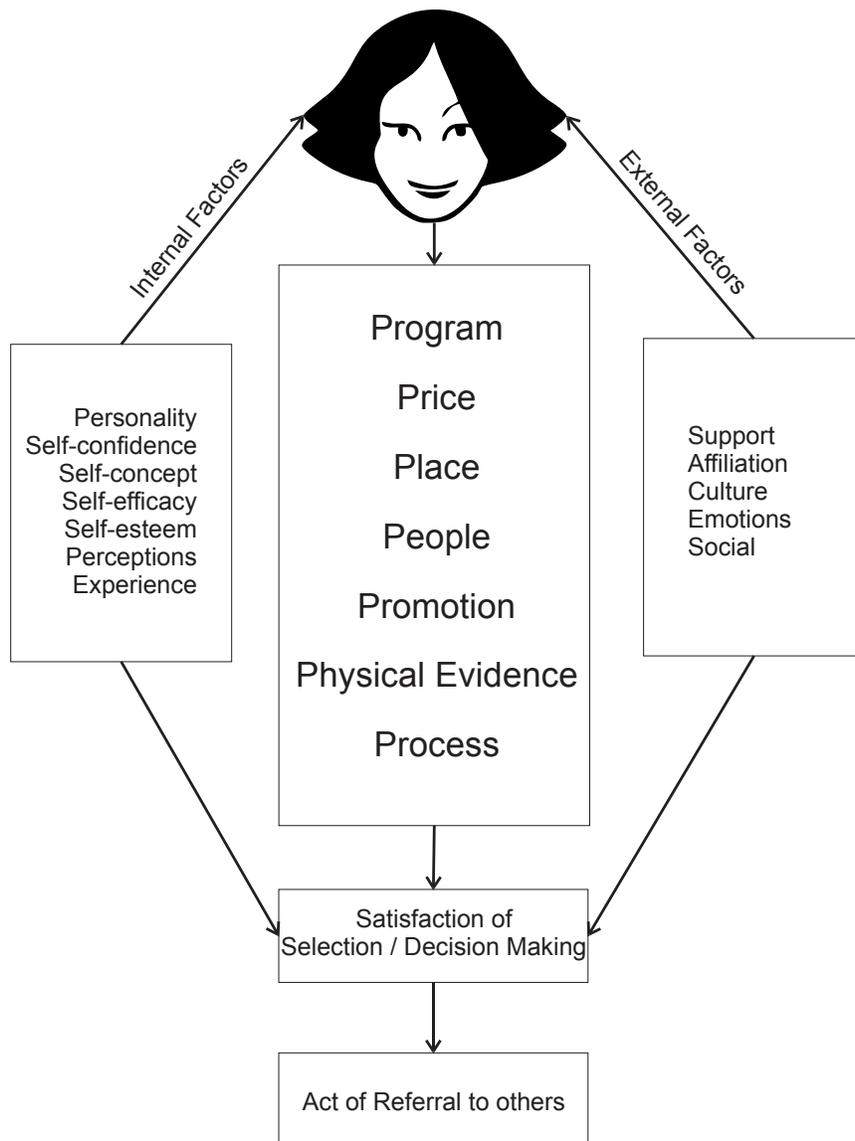
Educational services are personal and characterized by intensive, intellectual, emotional and/or physical participation of students in a service process. Services are often realized in a number of steps, which, basically, constitute the very service process. There are numerous other processes that need to be implemented concurrently (with the finance system, accommodation, time tabling and the library) to ensure the highest level of student satisfaction [29]. Reference [65] discussed several processes and physical evidence in the form of services to be delivered which includes; Operating Services like: Infrastructure & Technology, Faculty & Teaching Learning Methods, Library & Computational Facilities, Research Activities, Supporting Service like: Students Amenities & Recreation, Campus Placements, Industry Interactions & Tie-Ups, Co & Extra-Curricular Activities, Safety, Security & Medical Facilities, Gradation, Accreditation & Recognition, Alumni Interaction, Soft Skills & Technical Skills, Sports & Cultural Activities, Finance & Scholarships, and Extension Services like Campus & Social Life.

Women tend to be influenced by service quality more strongly than men [65]. At college entry, women place more value than men on the educational benefits of college, a differential that predicts women’s greater interest in social activism and to their stronger commitment to promoting racial understanding [40]. In another notable study, there is evidence to suggest that women display somewhat higher levels of computer anxiety [66]. Women from social categories are the most affected by the stratification of disciplines, programs and institutions [8]. Women lag men in extracurricular engineering experiences [36]. However, boys more often engage in play activity that tends to exercise their spatial-visual skills, whereas girls tend to exercise their verbal skills [67]. As per the focus group discussions conducted by reference [36], a heavy workload, a restrictive curriculum, and the practice of grading on a curve were discouraging to many of the women. Who participated in social enrichment activities—were less likely to leave engineering [36]. The survey also found that Campus Life/ Climate and Policies are directly affiliated with the encouragement and satisfaction of women students. Participation in support activities is vital to women undergraduates, who need to feel that they are part of a larger caring community in engineering. Community allows

students to build networks and to feel that their presence in engineering is important to others and valued. Networking can counteract the isolation that women feel—providing them with information, support, and the knowledge that they’re not alone in the challenges they face [36]. The survey also found that different kinds of activities influence women’s persistence differentially—those that promote social enrichment are most closely linked to women’s persistence in engineering. Time is an important variable to use the Internet in which men use the Internet more frequently and for long hours while women are in the categories of moderate user [68]. Females perceived Internet as a tool of maintaining social values. There is a slight variation in the usage pattern at home between men and women due to the influence of gender role [68].

**Conceptual Framework:**

Figure 1: Women’s access on marketing mix of engineering education (Own creation through literature review)



## RESEARCH METHODOLOGY

A qualitative research through a survey was made which comprised of a structured questionnaire sent through e-mail to the current-students enrolled and recently passed-out students belonging engineering education affiliated to North Maharashtra University. Sample size (n) was calculated at 95% Confidence Level for which Standard Normal Variate (Z) is 1.96 & at Standard Error (e) of 0.03 by  $n=Z^2 (p)(1-p)/e^2$ ; where n = Sample Size to be used for this study, N = unknown population, p = Estimated Portion of Population N. For p = 90%, 'n' comes out to be 550. Sample size of 550 was selected by quota sampling from technical institutes offering program in engineering and various students based on their location of native place and gender. The google form with questionnaire was sent through E-mail to the respondents which comprised structured and closed ended questions measuring importance, perception and experience on market mix activities of the institutes; program, price, place, promotion, people, physical evidence and process. To measure significance and impact made by marketing mix, respondents were asked to weight on a scale ranging from 0 to 5 on their perceptions / experience on the act of marketing mix. Mean of responses received gender-wise on each marketing mix activity was calculated by statistical software MiniTab 17. To measure level of satisfaction respondents were asked to weight on a scale ranging from 0 to 5, on question 'Are you satisfied with your decision to take admission in this Institute/College?' Value zero is low weightage and value five is high weightage. To find out the act of referral the respondents were asked 'Will you refer your college to other students for admissions?'. The responses obtained were 'yes' or 'no' type. The characteristics of the sample is described as below;

By Gender: Male: 361; Female: 189

By Native Place: District: 131; Taluka: 243; Village: 176

## DATA INTERPRETATION & OBSERVATIONS

### 1.1 *Women's perception on program:*

To find out women's perception on program, gender-wise mean of responses on the importance of program, their perception on benefits of program, reason for joining the program and age of institute i.e. age of program offered by the institute were obtained and are presented in figure 2.

(Figure 2: Perception on program)

[1]	Program					
				<i>Gender</i>	<i>St. Dev</i>	<i>Mean</i>
	1	Importance of Program				
				<i>Female</i>	0.89	↑ 4.22
				<i>Male</i>	1.03	↓ 4.08
	2	Age of Institute/Program				
				<i>Female</i>	1.69	↑ 3.1
				<i>Male</i>	1.67	↓ 3
	3	Reasons for joining Program				
	A	Job Prospectus and Career				
				<i>Female</i>	1.6	↑ 3.54
				<i>Male</i>	1.55	↓ 3.45
	B	Better quality of life				
				<i>Female</i>	1.55	↑ 3.58
				<i>Male</i>	1.57	↓ 3.56
	C	Talent & Strength				
				<i>Female</i>	1.57	↓ 3.46
				<i>Male</i>	1.54	↑ 3.47
	D	Entrepreneurship				
				<i>Female</i>	1.73	↓ 2.45
				<i>Male</i>	1.67	↑ 2.9

Women students (mean=4.22) have perceived more importance of engineering program than men students. Women weighted high on the age of institute i.e age of program. Women considers Job Prospectus (mean=3.54), Better quality of life (mean=3.58) are the main benefits that they perceived by joining the engineering program. On the other hand, women thought they have marginally less talent and strength than the men students. Women (mean=2.45) are less interested in the entrepreneurship than men (mean=2.9).

### 1.2 Women's perception on place:

To find out women's perception on place, gender-wise mean of responses on weightage given by the gender on distance of engineering institute from their native place while selecting an engineering institute were obtained and are presented in figure 3.

(Figure 3: Perception on place)

[2]	Place					
				<i>Gender</i>	<i>St. Dev</i>	<i>Mean</i>
	Distance from Native Place			<i>Female</i>	1.82	↑ 2.8
				<i>Male</i>	1.86	↓ 2.62

Women students (mean=2.8) have perceived more importance for a place/location of institute while selecting an engineering institute than men students (mean=2.62).

2) Women's perception on price:

(Figure 4: Perception on price)

Price		Gender	St. Dev	Mean
Cost of Education				
		Female	1.77	↑ 2.66
		Male	1.83	↓ 2.51

To find out women's perception on price, gender-wise mean of responses on weightage given by the gender on cost of engineering education while selecting an engineering institute were obtained and are presented in figure 3. Women students (mean=2.66) have perceived more importance for cost of education while selecting an engineering institute than men students (mean=2.51).

2. Women's perception on people:

(Figure 5: Perception on people)

[3] People		Gender	St. Dev	Mean
1 Parents				
		Female	1.74	↑ 3.36
		Male	1.82	↓ 2.95
2 Siblings				
		Female	1.89	↑ 2.63
		Male	1.89	↓ 2.19
3 Friends & Peer				
		Female	1.77	↓ 2.33
		Male	1.82	↑ 2.34
4 Current Students				
		Female	1.8	↑ 2.31
		Male	1.86	↓ 2.03
5 Alumni				
		Female	1.73	↑ 2.08
		Male	1.82	↓ 1.95
6 Previous Teachers				
		Female	1.82	↑ 1.77
		Male	1.81	↓ 1.74
7 Staff of Institute				
		Female	1.92	↑ 2.39
		Male	1.88	↓ 2.19
8 Management People				
		Female	1.58	↑ 3.55
		Male	1.72	↓ 3.16
9 Yourself				
		Female	1.55	↑ 3.6
		Male	1.66	↑ 3.6

Women students have taken support from all possible people resources while selecting an engineering institute. Their decision of selection is mostly supported by Parents (mean=3.36), Management People (mean=3.55) and Women themselves (mean=3.6).

5.3 Women's perception on promotion:  
(Figure 6: Perception on promotion)

[5]	Promotion	Gender	St. Dev	Mean
1	Advertisement (Print, Visual & Air)	Female	1.86	↑ 2.35
		Male	1.73	↓ 2.12
2	Banners / Hoardings	Female	1.81	↑ 2.48
		Male	1.75	↓ 2.22
3	Institute Website	Female	1.71	↑ 3.15
		Male	1.77	↓ 2.39
4	Social Networking Site	Female	1.68	↑ 3.05
		Male	1.82	↓ 2.45
5	Face-to-Face counselling	Female	1.89	↑ 2.5
		Male	1.86	↓ 2.24
6	Educational Fairs	Female	1.82	↑ 2.54
		Male	1.83	↓ 2.32
7	Leaflet / Brochure	Female	1.76	↑ 2.89
		Male	1.72	↓ 2.54
8	Sponsorship	Female	1.81	↑ 2.52
		Male	1.85	↓ 2.29
9	Publicity	Female	1.79	↑ 2.85
		Male	1.84	↓ 2.57

Like the 'people' marketing mix, women students have collected information from all sources of institute's promotional activities. They perceived all such activities are important in making their decision of selecting engineering institute. Their selection is mostly supported by Social Networking Site (mean=3.05), Institute Website (mean=3.15), Leaflet / Brochures (mean=2.89) and Publicity (mean=2.85).

5.4 Women's perception and experience on process and physical evidence:  
(Figure 7: Perception on process and physical evidence)

[6] Process & Physical Evidence						
				<i>Gender</i>	<i>St. Dev</i>	<i>Mean</i>
1	Infrastructure & Technology			<i>Female</i>	1.66	↑ 3.72
				<i>Male</i>	1.55	↓ 3.4
2	Faculty & Teaching Learning Method			<i>Female</i>	1.66	↑ 3.6
				<i>Male</i>	1.59	↓ 3.49
3	Amenities & Recreation			<i>Female</i>	1.64	↑ 3.32
				<i>Male</i>	1.6	↓ 3.1
4	Placement Activities			<i>Female</i>	1.7	↑ 3.4
				<i>Male</i>	1.67	↓ 3.01
5	Industry Interactions & Tie-up			<i>Female</i>	1.73	↑ 3.02
				<i>Male</i>	1.66	↓ 2.83
6	Library & Computational Facilities			<i>Female</i>	1.57	↑ 3.5
				<i>Male</i>	1.65	↓ 3.2
7	Co & Extra Curricular Activities			<i>Female</i>	1.67	↑ 3.2
				<i>Male</i>	1.72	↓ 2.85
8	Safety, Security & Medical Facilities			<i>Female</i>	1.72	↑ 3.1
				<i>Male</i>	1.73	↓ 2.88
9	Gradation, Accreditation & Recognition			<i>Female</i>	1.63	↑ 3.31
				<i>Male</i>	1.66	↓ 3.04
10	Alumni Interaction services			<i>Female</i>	1.71	↑ 3.34
				<i>Male</i>	1.67	↓ 2.94
11	Soft & Technical Skill services			<i>Female</i>	1.68	↑ 3.54
				<i>Male</i>	1.61	↓ 3.37
12	Sports & Cultural Activities			<i>Female</i>	1.76	↑ 2.94
				<i>Male</i>	1.8	↓ 2.67
13	Research Activities			<i>Female</i>	1.69	↑ 2.96
				<i>Male</i>	1.74	↓ 2.56
14	Finance & Scholarship Services			<i>Female</i>	1.7	↑ 3.04
				<i>Male</i>	1.74	↓ 2.91
15	Campus Life & Discipline			<i>Female</i>	1.7	↑ 3.6
				<i>Male</i>	1.74	↓ 3.3

To find out women's perception and experience on process and physical evidence i.e services offered by the institute in which they are enrolled in or studied, gender-wise mean of responses on infrastructural facilities, operating services, supporting services and extension services of the institutes were obtained and their perceptions and experiences are presented in figure 7.

Women students have weighted more, on the services of institute experienced by them than men students. They believed that Infrastructure and Technology (mean=3.72), Faculty and Teaching Methodology (mean=3.6), Campus Life and Discipline (mean=3.6), Soft and Technical Skill service (mean=3.54), Library and Computational Facilities (mean=3.5), Placement Activities (mean=3.4), Alumni Interaction Program (mean=3.34), Accreditation, recognition and Affiliation (mean=3.31) and Amenities and Recreation (mean=3.32) are the better facilities and services of institutes offered to them. On the other hand, Institutes are lagging in services like Sports and Cultural activities (mean=2.94) and Research Activities (mean=2.94).

#### 5.6 Women's satisfaction on the decision of selection of engineering institute and act of referral to others for admission:

Gender-wise responses collected from the sample of 550 students on their satisfaction of decision of selection of engineering institute and their act of referring others for the engineering admission in an institute where they graduated or doing engineering are presented in Table 1 & 2 respectively.

Gender	Completely Satisfied	Some-what Satisfied	Some-what Dis-satisfied	Completely Dis-satisfied
Female	133 (70.4%)	45 (23.8%)	10 (5.3%)	1 (0.5%)
Male	173 (47.92%)	154 (42.66%)	27 (7.47%)	7 (1.95%)

(Table 1: Gender-wise satisfaction on the decision of selection)

Gender	Will prefer for admission	Can't say	Will not prefer for admission
Female	169 (89.41%)	15 (7.94%)	5 (2.65%)
Male	230 (63.71%)	116 (32.14%)	15 (4.15%)

(Table 2: Gender-wise responses on the act of referring others for admission)

The research study revealed that for the same input of marketing mix activities of an engineering institute, 70.4% of women students are completely satisfied while 47.92% men students are completely satisfied. Also, dis-satisfaction level for the same marketing activities is higher (7.47+1.95=9.42%) for male students than women students (5.3+0.5=5.8%). 89.41% of female will refer others for the admission while 63.71% of male students have shown their desire of referring their institute to others for admission.

## EMPIRICAL FINDINGS AND DISCUSSIONS

*Challenges and Opportunities of marketing:* This research study finds that females tended to rate the majority of the criteria as having a higher level of importance than did males while accessing marketing mix strategies of engineering institutes. Practitioners should be aware that males and females look for differing levels of detail.

While accessing engineering marketing mix; program, place, price, promotion and people, women have rated high importance which indicates broader, intense and integrated marketing approach is needed to attract women. On the other hand, for the same strategies provided to gender, women perceived and experienced better services provided by institutes than men students for the services; physical evidence and process.

In terms of satisfaction, women are completely satisfied (70.4%) on their decision of selection of engineering institute than male students (47.92%) which is greater by 46.9% in terms of numbers, for the same marketing approaches. This shows, if one male student is satisfied, 1.47 women students will be satisfied for the same marketing approach. Similarly, 89.41% women students and 63.71% male students will refer others for the admission to their respective engineering institute, which is greater by 40.34% in terms of numbers. If one male

student act as a referral then, 1.40 women student will refer others for admission on the same marketing services of institute.

### THE ROAD MAP TO WOMEN’S INCLUSIVITY TO ENGINEERING

Understanding the facts that women do have a more diverse set of responsibilities and often need to wear multiple hats should not compromise their chances of success or progress in any of the worlds in which they operate, the transformation process for gender inclusivity requires mapping the journey. Below is the proposal of what this will look like:

<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>
<b>Pre-student Life (School Education)</b>	<b>Student Life (Engineering Education)</b>	<b>Post-student Life (On Job)</b>
Marketing Mix (Program, Place, People, Promotion)	Marketing Mix (Program, Price, Place, People, Process & Physical Evidence)	Marketing Mix (Process, People, Place, Promotion)
Knowledge, Awareness And creating importance	Gendered infrastructure, amenities and services	Social connectivity, Memberships
Involving Role Models	Retention and building confidence	Flexible work schedule or Time concession
Career Counselling	Engaging women staff with women students	Safe and secured transportation and residence nearby work location.
Family and social support	Financial support in terms of fee concession and scholarships	Awards and Rewards
Proposals/Offers	Safe and secured residential facility	Adequate Reservation
Equal treatments	Social activities	Grievance Management and lawful policies
Active Participation	Special coaching classes and training	Ensure gender mix in top management
Self-actualization	Adequate Reservation	Cross cultural exposure
	Grievance Management and lawful policies	
<b>Family, Schools, Society, Government</b>	<b>Institutions, Society, Government</b>	<b>Industry, Society, Government</b>
<b>↑ SUPPORT ↑</b>		

An ideal state in a process of inclusion is one where minorities are totally empowered. In this case, it means that women are empowered to make choices in all spheres of life and that the same opportunities available to anyone else (especially men) are available to them. This is different from saying they are equal, for it is time to move away from the original claim of the equality movement and towards one that recognizes differences and tailors responses relevant to those differences. The success of this roadmap is dependent on increased levels of awareness, acceptance and partnership from both sexes, the government and the society. Therefore, at many levels and in many ways, both men and women need to recalibrate their roles and expectations for this to happen.

## CONCLUSION

Equity does not just mean an equal number of women and men; it means equal chances of success and career development; average women will succeed as much as average men. The Indian governments initiatives like National Program for Education of Girls at Elementary Level (NPEGEL), Rashtriya Mahilakosh (RMK), Kasturba Gandhi Balika Vidyalaya (KGBV), Working Women Hostels, National Mission for Empowerment of Women (NMEW), Sarva Shiksha Abhiyan shall be extended and oriented further more towards engineering education for the dream come true of Digital India and Smart Cities with more encouragement of women in engineering. The strategic marketing aim must be to 'normalize' engineering as a career choice for women, so that people inside and outside of engineering no longer presume that 'the engineer' will be men. Marketing efforts to recruit more women into engineering must avoid appealing to gender which associate men and masculinity with 'things technical' and women with 'things social'. In sum, we must broaden the image and vision of engineering work from technical to techno-social if we are to attract and keep talented women in engineering. Engineering has room for diverse 'types' of people because it incorporates a wide variety of jobs and roles. Women engineering education is a multi-dimensional phenomenon; marketing efforts to attract women in engineering shall not be limited to the institutes/service providers, but it shall be responsibility of the government, NGOs and community as a whole, for India to be Super Power. If engineering education is a signifier of development, it should incorporate a gender perspective to it. Perhaps then, we will see more women enjoying success and fully participating in engineering education.

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# English Teachers' Opinions on the Problems Encountered in English Teaching

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## ABSTRACT

The aim of this study is to identify the problems encountered in English learning-teaching, and to reveal the differences of opinions on these problems based on the opinions of English teachers. Descriptive research method in the general screening model was used in the study. The study group includes 143 middle and high school English teachers working in Sultanbeyli district in Istanbul. The following findings were obtained at the end of the study: 1- According to the English teachers, the factor mostly affecting failure in learning and teaching English is the lack of English laboratories in schools while the factor least affecting is that teachers do not find themselves adequate in teaching English. 2- There is no significant difference in the English teachers' opinions on the problems encountered in English teaching in terms of gender, age, educational status, graduated program, institution of employment performed, seniority and marital status variables.

**Key words:** Teacher, Language Teaching, Foreign Language, English, Teaching.

## INTRODUCTION

The proliferation of languages is the increase in the number of speakers, language diversity and speech functions, exceeding the boundaries of the society in which they arise and are used (Cooper, 1989). Nowadays, the lifestyle and value judgments of countries with political, economic and technological power have begun to be adopted by other societies as a result of the inter-country transfer of increasing economy, technology and culture (Alptekin, 1989). For example, English is the first word that comes to mind when it comes to foreign language education in many countries whose official languages are not English (Shohammy, 2006). In this context, despite the general differences between countries, English has a privileged position among other languages. 90% of the students of all European Union member countries learn English as a compulsory foreign language (Trim, 1998). This widespread of English language, which can be portrayed as the most successful language expansion (Wardahaugh, 1987), draws attention and is regarded as a development of which reasons should be questioned. Many different factors such as political, political and military are shown to cause to this widespread (Pennycook, 1995). This widening has gained an international dimension, affecting almost all countries in the world.

Globalization, which is the most basic concept of the 21st century, is deepening its influence and affecting many areas of our lives (Tezcan, 1996). All fields of human being such as science, technology, communication, industry, education, medicine, art, architecture reflect the effects of globalization and this situation is increasing day by day (Oral, 2003). After the 1950s, especially in the field of communication, there have been great developments, and then people from all over the world have become able to communicate easily with each other as a natural consequence. With the effect of globalization, this process has resulted in the formation of social structures in which cultures and tongues are intertwined. Thus, it became difficult for societies to communicate with their own language, and knowing foreign languages became indispensable (Cangil, 2004). Thus, English has become a language of international economy, tourism and higher education (Teevno, 2011). This phenomenon has been affected as it should be in Turkey. Knowing a foreign language has become important both in terms of education and training as well as in post-training employment, which has led individuals to feel the need to learn at least one foreign language (Paker, 2007). In this context, teaching-learning arrangements, program development studies, textbooks and material arrangements have been made permanent by spreading foreign language teaching to all school levels during this historical process of foreign language teaching in Turkey. However, despite all these studies, the desired level of foreign language teaching has not been achieved. In Turkey, the English proficiency level of students studying English is well below expectations (Fareh, 2010).

In the studies on the causes of this situation, the problems faced in teaching English (Çelik ve Kocaman, 2016) can be listed as: professional inadequacy of teachers, teacher-centered English lessons, lack of motivation of learners and lack of English, lack of instruction on four basic skills development, inadequacy of textbooks, inaccuracies in evaluation process and absence of environments to be exposed to English. In his work on the problems faced in teaching English, Soner (2007) stated that such factors as the lack of sufficient number of teachers, the lack of tools and equipment, the fact that the teachers are not well educated, the classes are

crowded, the students are not interested in the classes, the contemporary methods are not used are the reasons for not fulfilling the desire in language teaching. Similarly, Güneş (2009) points out that the most basic problems in qualified English teaching are the lack of English teaching, the inadequacy of physical conditions in teaching foreign languages and the inability to meet the material needs. Haznedar (2010) shows the crowded classes, inadequate physical conditions and distress in teacher education, the language policies in our national education system and approaches to foreign language teaching as the reasons for failure in language teaching. Aribaş and Tok (2004) also point the inadequacy of the textbooks used, inadequacy of contemporary teaching methods in the lessons, inadequacy of weekly lecture hours in public schools, not using alternative assessment tools, not being used appropriately of homework and exercises, and absence of branch teachers in public schools as the basic reasons for problems in learning and teaching English.

The main problem of this study, unlike the above mentioned research results, is to reveal the reasons of this failure in learning and teaching English in Turkey according to English teachers who are the most basic subjects of the subject. In line with this main goal, the opinions of English teachers regarding the problems encountered in the English learning-teaching process were examined according to gender, age, education level, graduated institution, institution of employment, professional seniority and marital status variables. It is thought that the findings of the study will contribute to the overall interest and field in in the foreign language teaching in general, and in the increasing the effectiveness of the learning-teaching processes in private.

## METHOD

In the research, descriptive research method in the general screening model was used. The population of the research is composed of 143 English teachers who are working in the middle schools and high schools in Istanbul Sultanbeyli. A sample was not assigned for the reason of low number of teachers. All of the population was tried to be reached and 126 English teachers were involved in the research. As the data collection tool in the research, the “English Teaching-Learning Problem Questionnaire” developed by researchers was used. While preparing this questionnaire, Doğan (2009), Şahin (2013) and Altundiş (2006)'s survey items were benefited based on the expert opinions. The Cronbach Alpha ( $\alpha$ ) value of this questionnaire was found to be 0,889.

## FINDINGS

**1- Findings related to the Research Problem:** What is the Problem Encountered in English Learning-Teaching according to English Teachers?

**Table 1:** Percentage and Averages of English Teachers' Response to Questionnaire Items

		Strongly disagree		Disagree		Undecided		Agree		Strongly Agree		$\bar{X}$
		N	%	N	%	N	%	N	%	N	%	
<b>A1</b>	The Curriculum is inadequate in the successful implementation of English language teaching.	3	2,4	10	7,9	8	6,3	44	34,9	61	48,4	4,19
<b>A2</b>	Textbooks are far from attracting the attention of students.	3	2,4	15	11,9	9	7,1	47	37,3	52	41,3	4,03
<b>A3</b>	Textbooks are not enough to meet the learning needs of students.	3	2,4	12	9,5	11	8,7	50	39,7	50	39,7	4,04
<b>A4</b>	The activities in the textbooks are insufficient.	3	2,4	13	10,3	7	5,6	58	46,0	45	35,7	4,02
<b>A5</b>	Subject densities are too high in textbooks.	6	4,8	21	16,7	14	11,1	38	30,2	47	37,3	3,78
<b>A6</b>	The activities in the textbooks are not suitable for student level.	2	1,6	29	23,0	19	15,1	42	33,3	34	27,0	3,61
<b>A7</b>	The words in the textbooks are not suitable for the level of students.	2	1,6	40	31,7	15	11,9	44	34,9	25	19,8	3,39
<b>A8</b>	The language used in the textbooks is far from the real life.	4	3,2	42	33,3	17	13,5	38	30,2	25	19,8	3,30

<b>A9</b>	Four skills are not equally included in the textbooks.	2	1,6	30	23,8	18	14,3	43	34,1	33	26,2	3,59
<b>A10</b>	Textbooks are not suitable for the language levels (A1, A2, B1 ...) specified in the common framework program for teaching European languages.	2	1,6	25	19,8	21	16,7	49	38,9	29	23,0	3,61
<b>A11</b>	Every student cannot reach the supporting resources for teaching English.	0	0	17	13,5	6	4,8	56	44,4	47	37,3	4,05
<b>B12</b>	Class sizes are too high.	8	6,3	34	27,0	9	7,1	32	25,4	43	34,1	3,53
<b>B13</b>	There are no English laboratories in schools.	2	1,6	3	2,4	3	2,4	30	23,8	88	69,8	4,57
<b>B14</b>	There are insufficient technological resources to support teaching English to schools.	2	1,6	17	13,5	6	4,8	34	27,0	67	53,2	4,16
<b>B15</b>	There are no English Libraries in schools.	3	2,4	7	5,6	2	1,6	24	19,0	90	71,4	4,51
<b>B16</b>	The number of branches and the number of hours I have weekly is too high.	17	13,5	51	40,5	11	8,7	24	19,0	23	18,3	2,88
<b>B17</b>	Weekly course hours are insufficient for teaching English.	8	6,3	16	12,7	7	5,6	24	19,0	71	56,3	4,06
<b>C18</b>	I do not see myself full adequate in teaching English.	63	50,0	48	38,1	5	4,0	8	6,3	2	1,6	1,71
<b>C19</b>	I cannot apply different teaching methods.	29	23,0	47	37,3	16	12,7	23	18,3	11	8,7	2,52
<b>C20</b>	I usually focus on accuracy rather than fluency.	16	12,7	46	36,5	17	13,5	36	28,6	11	8,7	2,84
<b>C21</b>	I cannot use two-person or group work.	34	27,0	41	32,5	10	7,9	30	23,8	11	8,7	2,54
<b>C22</b>	I cannot provide student participation in my courses.	49	38,9	42	33,3	10	7,9	21	16,7	4	3,2	2,11
<b>C23</b>	I cannot use alternative types of assessment (self / peer assessment, portfolio and project) in my courses.	18	14,3	36	28,6	22	17,5	36	28,6	14	11,1	2,93
<b>C24</b>	I cannot use the European language co-framework plan in my classes.	13	10,3	28	22,2	24	19,0	39	31,0	22	17,5	3,23
<b>C25</b>	I cannot keep up with the developments in the academic field related to teaching English.	12	9,5	39	31,0	27	21,4	37	29,4	11	8,7	2,96
<b>C26</b>	I cannot reach the literature about English teaching.	15	11,9	42	33,3	32	25,4	29	23,0	8	6,3	2,78
<b>C27</b>	I cannot always keep up with innovations.	28	22,2	48	38,1	26	20,6	18	14,3	6	4,8	2,41
<b>D28</b>	Students do not have the motivation to learn	5	4,0	16	12,7	20	15,9	43	34,1	42	33,3	3,80

	English.											
<b>D29</b>	Students have a prejudice against English.	6	4,8	11	8,7	12	9,5	43	34,1	54	42,9	4,01
<b>D30</b>	Students do not show the importance for other classes to English class.	6	4,8	13	10,3	19	15,1	47	37,3	41	32,5	3,82
<b>D31</b>	Students do not do their homework properly.	7	5,6	16	12,7	19	15,1	50	39,7	34	27,0	3,69
<b>D32</b>	Students come to the class without adequate preliminary preparation.	3	2,4	7	5,6	11	8,7	51	40,5	54	42,9	4,15
<b>D33</b>	Students do not revise enough.	2	1,6	3	2,4	11	8,7	53	42,1	57	45,2	4,26
<b>D34</b>	Students do not use English in daily life.	2	1,6	2	1,6	13	10,3	31	24,6	78	61,9	4,43
<b>D35</b>	Students are not interested in English outside of school.	6	4,8	9	7,1	18	14,3	40	31,7	53	42,1	3,99
<b>D36</b>	Students do not use the technological tools (computer-TV-internet) to learn English.	7	5,6	17	13,5	15	11,9	45	35,7	42	33,3	3,77
<b>D37</b>	Student parents do not create enough study environment for students.	6	4,8	15	11,9	31	24,6	41	32,5	33	26,2	3,63
<b>D38</b>	Student parents do not provide enough support and encouragement to students.	9	7,1	12	9,5	29	23,0	42	33,3	34	27,0	3,63
<b>E39</b>	School administrators do not care enough about teaching English.	23	18,3	36	28,6	34	27,0	24	19,0	9	7,1	2,68
<b>E40</b>	School administrators do not help me with the material supply that meets the innovations in English teaching.	22	17,5	38	30,2	32	25,4	23	18,3	11	8,7	2,70
<b>E41</b>	Administrators are opposed to using additional resources in lessons.	29	23,0	46	36,5	24	19,0	17	13,5	10	7,9	2,46
<b>E42</b>	School and district coterie meetings are inadequate in terms of solving effect in English teaching.	12	9,5	13	10,3	18	14,3	47	37,3	36	28,6	3,65
<b>E43</b>	Applied central exams (TEOG / LYS) have a negative effect on student success.	8	6,3	23	18,3	43	34,1	28	22,2	24	19,0	3,29
<b>E44</b>	The presentations and solutions of the Ministry of National Education on English teaching are not enough.	4	3,2	6	4,8	19	15,1	47	37,3	50	39,7	4,05
<b>E45</b>	I do not think that the Ministry is investing the necessary infrastructure in teaching English.	6	4,8	7	5,6	20	15,9	41	32,5	52	41,3	4,00
<b>E46</b>	There are not enough in-	4	3,2	10	7,9	19	15,1	47	37,3	46	36,5	3,96

	service programs to convey contemporary developments in English teaching.											
<b>E47</b>	I do not think English language training programs in universities are successful.	17	13,5	29	23,0	34	27,0	27	21,4	19	15,1	3,01

According to Table 1, English teachers see the 13th item “There are no English laboratories at school.” ( $\bar{X}$ : 4,57) as the most influential factor in learning and teaching English.

According to English teachers, the items that have the greatest impact on the failure of learning and teaching English are listed from highest to lowest as follows: 15th item “There are no English Libraries in schools.” ( $\bar{X}$ : 4,51); 34th item “Students do not use English in daily life.” ( $\bar{X}$ : 4,43); 33rd item “Students do not revise enough.” ( $\bar{X}$ : 4,26); 1st item “The Curriculum is inadequate in the successful implementation of English language teaching.” ( $\bar{X}$ : 4,19); 14th item “There are insufficient technological resources to support teaching English to schools.” ( $\bar{X}$ : 4,16); 32nd item “Students come to the class without adequate preliminary preparation.” ( $\bar{X}$ : 4,15); 17th item “Weekly course hours are insufficient for teaching English.” ( $\bar{X}$ : 4,06); 11th item “Every student can not reach the supporting resources for teaching English.” ( $\bar{X}$ : 4,05); 44th item “The presentations and solutions of the Ministry of National Education on English teaching are not enough.” ( $\bar{X}$ : 4,05); 3rd item “Textbooks are not enough to meet the learning needs of students.” ( $\bar{X}$ : 4,04) and 2nd item “Textbooks are far from attracting the attention of students.” ( $\bar{X}$ : 4,03).

According to the English teachers, the least effective factor in failure to learn and teach English is item 18, "I do not see myself in teaching English full adequate." ( $\bar{X}$ : 1,71).

In addition, according to English teachers, the items that have the least impact on the failure to learn and teach English are listed from highest to lowest as follows: 22nd item “I cannot provide student participation in my courses.” ( $\bar{X}$ : 2,11); 27th item “I cannot always keep up with innovations.” ( $\bar{X}$ : 2,41); 41st item “Administrators are opposed to using additional resources in lessons.” ( $\bar{X}$ : 2,46); 19th item “I cannot apply different teaching methods.” ( $\bar{X}$ : 2,52); 21st item “I cannot use two-person or group work.” ( $\bar{X}$ : 2,54); 39th item “School administrators do not care enough about teaching English.” ( $\bar{X}$ : 2,68); 40th item “School administrators do not help me with the material supply that meets the innovations in English teaching.” ( $\bar{X}$ : 2,70); 26th item “I cannot reach the literature about English teaching.” ( $\bar{X}$ : 2,78); 20th item “I usually focus on accuracy rather than fluency.” ( $\bar{X}$ : 2,84); 16th item “The number of branches and the number of hours I have weekly is too high.” ( $\bar{X}$ : 2,88) and 23rd item “I cannot use alternative types of assessment (self / peer assessment, portfolio and project) in my courses.” ( $\bar{X}$ : 2,93).

## 2- Findings related to the Sub-Problems:

2.1- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of gender variable?

**Table 2:** t-test results related to the problems faced by English teachers in English learning and teaching in terms of gender variable

Gender	n	X	df	t	p
Female	95	3,5209	,46577	,146	,703
Male	31	3,4413	,45448		

According to Table 2, there is no significant difference between the English teachers’ opinions on the problems faced in English learning and teaching in terms of gender variable ( $p > 0.05$ ).

2.2- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of age variable?

**Table 3:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of age variable

Age	n	X	df	F	p
21-30	58	3,5275	,47069		
31-40	55	3,4596	,47457	,686	,562
41-50	11	3,5010	,30632		
50+	2	3,8936	,75224		

According to Table 3, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of age variable ( $p>0.05$ ).

2.3- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of educational status variable?

**Table 4:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of educational status variable

Educational Status	n	X	df	F	p
Graduate	120	3,4846	,45220		
Master	5	3,7872	,63652	1,856	,161
Ph.D.	1	4,0851			

According to Table 4, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of educational status variable ( $p>0.05$ ).

2.4- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of graduated program variable?

**Table 5:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of graduated program variable

Graduated Program	n	X	df	F	p
English Language Teaching	92	3,4618	,40565		
English Language and Literature	23	3,6207	,48529	,893	,550
Others	11	3,4043			

According to Table 5, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of graduated program variable ( $p>0.05$ ).

2.5- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of institution performed variable?

**Table 6:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of institution performed variable

Institution Performed	n	X	df	F	p
Secondary school	74	3,5403	,46749		
Private Secondary School	2	2,9149	,06018	1,754	,160
High school	46	3,4880	,45777		
Private high school	4	3,2287	,28565		

According to Table 6, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of institution performed variable ( $p>0.05$ ).

2.6- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of professional seniority variable?

**Table 7:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of professional seniority variable

Professional Seniority	n	X	df	F	p
0-1 year	6	3,3688	,41096		
1-3 years	18	3,4752	,43218		
3-5 years	22	3,6054	,54176	,431	,786
5-10 years	39	3,4981	,48471		
Over 10 years	41	3,4795	,42575		

According to Table 7, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of professional seniority variable ( $p>0.05$ ).

2.7- Is there a significant difference between the problems faced by English teachers in English learning and teaching in terms of marital status variable?

**Table 8:** ANOVA results related to the problems faced by English teachers in English learning and teaching in terms of marital status variable

Marital Status	n	X	df	F	p
Married	82	3,5161	,42408		
Single	44	3,4739	,53088	3,467	,065

According to Table 8, there is no significant difference between the English teachers' opinions on the problems faced in English learning and teaching in terms of marital status variable ( $p>0.05$ ).

## CONCLUSION

In this study, which was conducted in order to determine the opinions of English teachers on the problems they encounter in learning and teaching English, the most important item affecting the English learning-teaching process is "There are no English laboratories in schools." while the lowest one is found as "I do not see myself full adequate in teaching English.". These results are consistent with some research results in the literature (Ergüç, 2004; Akkuş, 2009; Gök Çatal, 2015). Accordingly, it can be said that Inadequate technologically and physically equipped classes or learning environments not suitable for being a foreign language class affect learning and teaching processes in English negatively.

The other findings of this study are similar to some of the study findings in the literature. For example, according to the research findings of Çelik and Kocaman (2016), that English is not used in everyday life is a disadvantage for English development. In the studies of Aküzel (2006), Doğan (2009) and Yılmaz (2005), English teaching programs are inadequate for maintenance of successful English teaching. According to Aküzel (2006) and Doğan (2009), textbooks are insufficient to meet the needs and expectations of students. These results show that the problems encountered in English learning-teaching livings are experienced in a similar way by all stakeholders without school or group distinction.

According to the research results, there are no significant differences between the English teachers' opinions on the problems faced in English learning and teaching in terms of gender, age, educational status, graduated program, institution performed, professional seniority and marital status variables. This shows that English teachers are on equal terms in English learning-teaching processes and have similar experiences. The followings can be suggested for research results and future research: 1- Special English classes should be created at schools. 2- English curricula should be revised; in this direction, related content, teaching methods, tools, resources and materials should be created. 3- Studies should be conducted on school administrators, academicians and parents about English learning and teaching. 4. Comparative studies with other countries should be conducted on English learning-teaching, and the results should be adapted to Turkey.

**P.S.** This study was produced from the master's thesis made at Sakarya University Institute of Educational Sciences.

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# Environmental Awareness and Knowledge Level of Higher Education Students

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## ABSTRACT

**Objective:** This study was carried out as a descriptive study, aiming to reveal the environmental awareness and knowledge levels of the students studying at Karadeniz Technical University Health Services Vocational School.

**Method:** The study was conducted with KTU HSVS students (n=184) in the 2016-2017 academic year. The data of the study were collected with "environmental awareness" and "environmental behavior" scales. Each of the scales was prepared with 13 items and 5 likert types. The significance level  $\alpha = .05$  was taken as the basis for the intergroup significance tests. SPSS-17 program was used for the analysis of the data. Data, descriptive statistics and unrelated samples were analyzed by t-test technique.

**Findings:** According to the results of the research, it was found that the students opinions were "totally agree" on the environmental awareness scale and "mostly" on the environmental behavior scale. In comparison by genders, the mean score of the environmental awareness scale was found to be significantly different in favor of female students. There was no statistically significant difference between the mean scores of the two scales by classification of class. When the results of all variables were examined in the study, it was found that the students had higher arithmetic average scores of environmental consciousness scale.

**Results:** It has been determined from the data that students have difficulties in turning their thoughts into behavior. In this context, a sense of education should be developed that relies on educating students, saving them from memorization and developing brainpower, self-evaluating, balanced and productive people.

**Keywords:** Students, Environmental Education, Environmental Awareness

## INTRODUCTION

Environment is defined as "all of the biotic and abiotic (social, cultural, physical, climatic, physical) factors that affect a living organism or a living community during its lifetime". The environment is a setting that has existed since the first living creature on earth. For many living creature, especially for humans, living in harmony with the environment has not been a problem. However, when the two main functions of life (nutrition and reproduction) were threatened by environmental conditions; environmental problems have arisen and therefore ecological science has gained importance. The main reason for the rapidly growing environmental pollution that leads to the deterioration of the human-nature balance is undoubtedly the industry which started in the 17th century and developed rapidly in the 19th century. This phenomenon led to rapid change of the natural environment in the 20th century and the emergence of a new social environment. The reason for this huge change has been production and technological development for the masses, two important features of the industry. When we look at today's conditions, the population is increasing rapidly. With the rapid increase of the population ratio, technological development has been increasing in parallel with industrialization and urbanization; and therefore the amount of solid wastes perched in the environment is rapidly increasing in terms of kinds and quantity. Many problems have arisen resulting from the unconscious and horny use of the

environment. The pollution of the nature has been accelerated and could not be avoided as a result of the rapidly increasing world population, distorted mantle, sludge scattering of wastes, waste of natural resources such as air, soil and water, nuclear tests, natural disasters, wars, greenhouse effect, ozone layer penetration and lack of education. (Morgil, Oskay and Göktaş (2005).

Humans living in the environment, where the disaster is prepared by humans' own hands, are affected negatively by this pollution, just like other living species. Today, air, water and soil are polluted, most of the plant and animal species are depleted and their energy resources are decreasing and disappearing. Thirst, drought and desertification is in an inevitable dimension. People are unhealthy, unhappy and hopeless of the future. Moreover, these problems affect not only one country and the people living there, but all the people living in any part of the world; regardless of language, religion, race discrimination. In this sense, the pollution of nature, the environmental problems become a rather international problem rather than a national one. All countries in the world are trying to do all they can to overcome or reduce these problems, to create common solutions, to bring out researches; "their biggest share in budget is to provide solutions to environmental problems and to leave the environment they live in to be able to live in the next generation". (Yiğit, E., Kıyıcı, F., Çetinkaya, G. 2014).

Acquiring environmental awareness means learning to stand against the environmental problems and the threats posed by these problems. Environmental pollution is at the beginning of environmental problems. Environmental pollution is the involvement of all kinds of matter or energetics in a quantity that is above the natural accumulation (Kıyıcı et al, 2005). With this substance or energies it is "the natural structure of the environment and its composition deteriorating, changing and thus affecting people negatively".

Environmental pollution emerges as pollution of air, water, soil, noise and radioactive matters (Çevre ve insan, 2001). Developed countries that have become aware of their responsibilities to be sensitive to the environment and to gain environmental awareness to all individuals have started to make their first attempts in this field in the 70s. It was for the first time in the United Nations Conference held in Stockholm in 1972, when environmental problems were brought to the agenda (Yasar, Ş., Gultekin, M., Kose, N., Girmen, P. & Anagun, S, 2005). Even the holistic view of environmental education, called "Agenda 21", was adopted by 175 countries at the first United Nations World Summit in Rio de Janeiro (Talero, 2004). For the first time in the world, countries that couldn't come together in most of the issues have reached a common decision on the environment; this puts the importance of the problem and the necessity of urgent solution proposals (Morgül et al, 2005). The aim of environmental education programs is to inform all sectors of the society about the environment, to raise awareness, to bring positive and lasting behavior changes and to provide active participation of individuals in solving problems. In line with this aim, a society that is sensitive to the environment will be established, it will be able to cope easily with existing environmental problems and prevent new problems from occurring, thus providing important benefits in terms of economy and time in solving problems. Environmental awareness has intellectual, emotional and behavioral dimensions. In other words, environmental awareness is made up of various thoughts, principles, opinions about the environment, thoughts that include comments, behaviors of these thoughts that are passed on to life. The development of such a comprehensive concept is undoubtedly not a simple process. This process of accelerating with the introduction of interaction with the environment of human beings continues throughout life. In line the development of the environment conscious personality, it develops through mutual interaction of various factors. These three dimensions have not always developed in the same proportion. For example, there may be individuals who are concerned about the environment and can not turn it into behavior, as well as those who are worried about the pollution of the environment but do not behave in a way that protects it.

For this purpose, this study was planned in order to determine the availability of high education students to certain terms in the environment. The results will reveal whether an environmental phenomenon had occurred among students.

This study was conducted with the aim of determining environmental awareness and behavior of Higher Education students. To achieve this goal, following problems were examined.

- 1) What are the environmental awareness and behaviors of higher education students?
- 2) Is there a statistically significant difference between the environmental consciousness and behavior according to the genders of higher education students?
- 3) Is there a statistically significant difference between environmental awareness and behavior according to the programs the higher education students' school type?

## Method

### Model of Study

This research was carried out to investigate the consciousness and behaviors of higher education students towards environmental awareness and consciousness level in terms of some variables. It is a descriptive study with screening model. The screening model is a research approach aimed at describing the past or present as it exists. By this model, the main subject of research is tried to be defined as an event, an individual or an object within its own conditions. No effort is made to alter or influence them (Karasar, 2005: 77).

### Universe and Sampling

The universe of the research consists of students studying at Karadeniz Technical University Health Services Vocational School in 2016-2017 academic year. The research sample consisted of 184 persons who completed the measurement instrument among Medical Imaging and Techniques (MIT), Medical Documentation and Secretariat (MDS), Medical Laboratory (ML) and First Aid and Emergency (FAE) Program students. The demographic characteristics of the students participating in the survey are given in the table below.

**Table 1.** Distribution of Students by Demographic Characteristics

Variables	f	%
<b>Gender</b>		
Female	104	56.52
Male	80	43.48
<b>Program</b>		
MIT	52	28.26
MDS	48	26.09
ML	42	22.83
FAE	42	22.83

### Data Collection Tools

The data used in the research were collected by environmental awareness and environmental behavior scales. Each of the scales consists of 13 items and is prepared as a 5-point likert type. While the environmental consciousness scale was rated as; - Totally Agree, -Agree, -Indecisive, -Disagree and -Totally Disagree; the environmental behavior scale was graded as -Always, -Mostly, -Sometimes, -Barely and -Never.

The cronbach alpha internal consistency coefficient of the environmental awareness scale was 0.82; whereas the cronbach alpha internal consistency coefficient of the environmental behavior scale was 0.78.

**Table 2.** Limitatios Considered in Assessing Measurement Tool Data

Degrees	Value Range
Totally agree	4.20-5.00
Always	
Agree	3.40-4.19
Mostly	
Indecisive	2.60-3.39
Sometimes	
Disagree	1.80-2.59
Barely	
Totally disagree	
Never	1.00-1.79

### Analysis of Data

Data were analyzed using SPSS-17 program. Besides the descriptive statistics, independent samples t-test technique was used in analysis of data.

### FINDINGS

The scores obtained from the environmental awareness and behavior scales of the students were analyzed by descriptive statistics technique for question 1 and by t-test technique for questions 2 and 3, and arithmetic mean and standard deviation distributions were tabulated.

**Table 3.** Environmental Awareness and Behavior Scales - Descriptive Statistical Data

Scale Type	N	Minimal	Maximal	X	SS
Environmental Consciousnes	184	1,00	5,00	4,81	0,53
Environmental Behaviour	184	1,00	5,00	3,97	0,54

The scores of the 184 students participating in the survey are given in Table 3. The arithmetic mean of the scores obtained from the environmental consciousness scale was  $X = 4.81$ , while the arithmetic mean of the scores obtained from the environmental behavior scale was  $X = 3.97$ .

**Table 4.** T-Test Results of Environmental Consciousness Scale By Gender of Students

Gender	N	X	SS	t	SD	p
Female	104	4,68	0,71		48	0,04*
Male	80	4,42	0,94			

\* $p < 0,05$

When Table 4 is examined, it could be concluded that chemistry teacher candidates according to their gender have a statistically significant difference in favor of female students between the average points of environmental consciousness scale [ $t(48) = -2,03$ ;  $p < 0.05$ ]. The mean score of the environmental consciousness scale of female students was  $X = 4.68$ , while the average of male students was  $X = 4.42$ .

**Table 5.** T-Test Results of Students' Behavioral Scale by Gender

Gender	N	X	SS	t	SD	p
Female	104	3,64	0,54		48	0,18
Male	80	3,81	0,52			

When Table 5 is examined, it could be concluded that there is no statistically significant difference between the average scores of the behavior scale scores of the students according to their gender [ $t(48) = -1,51$ ;  $p > 0.05$ ]. The average score of female students 'environmental behavior scale is  $X = 3.64$  while the average of male students' score is  $X = 3.81$ .

**Table 6.** T-Test Results of Environmental Consciousness Scale By Students' School Type

School Type	N	X	SS	t	SD	p
MIT	52	5,06	0,54			
MDS	48	4,35	0,53		0,08	48
ML	42	4,34	0,51			
FAE	42	4,31	0,52			

When Table 6 is examined, it could be concluded that there is no statistically significant difference between the average scores of environmental consciousness scale of students according to the programs [ $t(48) = -0,08$ ;  $p > 0.05$ ]. MIT Program students' average environmental awareness scale score was  $X = 5.06$ , MDS Program students' environmental awareness scale score was  $X = 4.35$ , ML Program students' environmental awareness scale score was  $X = 4.34$  and FAE Program students' environmental awareness scale was  $X = 4.31$ .

**Table 7.** T-Test Results of Environmental Behaviour Scale By Students' School Type

Program	N	X	SS	t	SD	p
MIT	52	4,17		0,36		
MDS	48	3,65		0,33		
				0,46	48	0,66
ML	42	3,69		0,31		
FAE	42	3,72		0,28		

When Table 7 is examined, it could be concluded that there is no statistically significant difference between the average scores of environmental behavior scale of students according to the programs [ $t(48) = -0,46$ ;  $p > 0.05$ ]. MIT Program students' average environmental behavior scale score was  $X = 4,17$ , MDS Program students' environmental behavior scale score average was  $X = 3,65$ , ML Program students' environmental behavior scale score average was  $X = 3,69$  and FAE Program students' environmental behavior scale was  $X = 3.72$ .

## DISCUSSION AND RESULTS

Investigating the consciousness and behaviors of higher education students, this study found out that the average level of environmental consciousness and behavior scores of the students was generally high. The lowest score in the scales is 1.00; while the highest average score is 5.00. These findings indicate that the average scores of the students participating in the survey are -totally agree for the environmental awareness scale and -mostly for the environmental behavior scale.

When the environmental awareness scale was examined as content, the students expressed the opinion that they should be educated and educated through media. It has been found that they are supporting the units working on environmental protection, increasing the production of recycled materials, replicating energy-saving products, producing and using environmentally friendly products, having chute units for all kinds of chemical wastes and using natural gas. However, it has been argued that car exhaust inspection is not so important and communication technology such as mobile phone does not heavily harm the environment. This situation is thought to be caused by the lack of information and misconceptions of the students. It is very well known that the lack of information on environmental issues causes many environmental problems (Karpudewan et al., 2007).

When the environmental behavior scale is analyzed as a content, the students stated that they did not follow the publications related to the environment, they did not spend time on the topic, they saved energy and they shared some of their old products with others instead of throwing them away. However, they pointed out that most of the recycled products they use are not delivered to the relevant units and that they use products that are known to be harmful to the environment. However, besides the use of chemical substances, it is seen that they are in favor of the use of natural substances when the use of natural substances is possible. This situation reveals the necessity of environmental practices for students as both consciousness and behavior.

It was found that there was no statistically significant difference between the average scores of environmental behavior scale scores of students according to their gender, and statistically significant difference was found between mean scores of environmental awareness scale in favor of female students.

It is thought that the reason for the favor of the girl students may be the result of the ideal image uploaded to the role of women in almost all societies (Sadık & Çakan, 2010). According to Kagıtcıbası (1990), women are generally expected to behave warmly, empathically, sensitively, tolerant, compassionate, thoughtful, orderly and responsible. It is thought that society expects these roles to lead women to be more sensitive in communication (akt, Sadık and Sari, 2010; Çimen, Yılmaz & Çimen, 2001). Gama (2003) stated that this result could be evaluated positively in terms of the female students' being a candidate for mother.

There was no statistically significant difference between the environmental consciousness scale and the environmental behavior scale average of the students according to the school type. In addition, it was observed that the average scores of MIT students were higher in both scales. As a result, the education they received was parallel to the students' perceptions of the environment, even at a low level, and this consciousness turned into behavior. However, this data also shows that students are not at a desirable level to show their environmental awareness in their behaviors. It could be argued that this is caused by the lack of adequate training in practice. As the first step to creating a sustainable environment, to obtain safe, green products and to design green operations; our current and future students will be educated more in the environmental field. Because education serves as a bridge between knowledge and actions.

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## **Environmental Education at Basic and Primary Schools in Tripoli-Libya**

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### **ABSTRACT**

This research studies the environmental attitudes and behaviors of Libyan students studying in the basic and primary Schools in Libya. The main purpose of this thesis is to analyze how environmental education at basic and primary schools in Libya and what effect it has on pupils. Additionally, thesis aims to describe environmental education relevance to our society and confronting challenges it has to deal with.

The study aims to get information about the relationship between these attitudes and behaviors of the students and the classes they study in, and to make a general evaluation about efficiency and effectiveness of the environmental education in Libya. The participants are 400 Libyan students studying in basic and primary schools in the 2016 academic year. This study, in which quantitative research method and relational screening model were used, was done by getting answers from the students to questions of the survey, which was used as a tool for collecting information.

While gathering the data, environmental knowledge test, survey of attitude and behavior were used. The data obtained from the results of the survey were evaluated by using SPSS 20 program. Frequencies and percentages were utilized while analyzing the efficiency of Libyan students' environmental education.

As a result, it has been noted that students are not as aware of environmental issues as they should have been expected. Of course, the identification and elimination of environmental problems is possible only if they are recognized. However, it is unlikely that individuals who are unaware of the problems are expected them to be sensitive to these problems and change their behavior to avoid the course of in conveniences. From this point of view, it is considered that determining and increasing the level of awareness of the individuals about environment as a whole is one of the preconditions for coping with environmental problems.

**Keywords:** Environment, Environmental Education, Environmental Protection, Attitude, Behavior.

### **INTRODUCTION**

Environment is the total of water, air, sound and land interrelationships furthermore with the individual, other living creatures and property. It incorporates physical, natural, social, social and practical components which constitute the surroundings of individual, who is both the maker and disintegrate of the earth (Pillai, 2012).

Human beings from their 35 start of life dependably have been attempted to get profits by nature to accommodate their requirements, and environment has been utilized to enhance their personal satisfaction. As a result of over employments of regular assets the characteristic parity has been separated and in this manner significant issue happened, which called ecological issues. Those issues have increased universal

degree as a consequence of mechanical advancement and industrialization that has been accomplished in the late decades (Gulgan et al., 2008).

To energize significant open support and environment, it is important to make mindfulness about environment contamination and related unfriendly impacts. Any Government at its own particular level can't accomplish the objective of environment preservation, until general society has a participatory part in it. Hence, there is an incredible need to ensure and safeguard our surroundings by expanding the level of mindfulness among general society and in addition the understudies, who are the eventual fate of a country. The part of understudies would go far in accomplishing such wanted objectives. So as to speedier their mindfulness towards environment, it is important to recognize what levels of mindfulness they have in these zones. For raising open mindfulness and upgrading the defensive states of mind towards the ecological issue, natural training is a standout amongst the best system or part. In the event that the people groups' observation, learning, mindfulness and demeanor toward ecological issues are high, it implies that the general population's natural proficiency rate is likewise high. Expanding ecological proficiency will prompt an adjustment in conduct or activity. Deciding, what individuals think about the earth, how they feel about it, and what moves they make that may help or mischief nature is required to building up the supportability of a group and to ensure the earth. Ecological instruction rate will be high when individuals' origination, learning, cognizance and conduct toward natural issues will be high. About environment, legitimate information for keeping up the earth, activities of the people groups about environment (Thapa, 2001., Stapp, 1969).

Ecological instruction is gone for delivering a citizenry that is educated concerning the biophysical environment and its related issues, to mindful of how to assistance to take care of these issues and to persuade to work towards their answer (Kumar, 2011).

The 1972 Stockholm meeting may have set the phase for more noteworthy attention to the need to progress Environmental Education globally however two consequent gatherings still stand today as the fundamental occasions for Environmental Education on the world stage. The International Workshop on Environmental Education, held in Belgrade, Yugoslavia in October of 1975 brought about what got to be distinctly known as The Belgrade Charter. The Belgrade Charter based on the structure of Stockholm and depicted the objectives, goals, crowds, and managing standards of Environmental Education and proposed what has turned into the most broadly acknowledged meaning of , Environmental instruction is a procedure went for building up a total populace that knows about and worried about the aggregate environment and its related issues, and which has the learning, mentalities, inspirations, duties, and abilities to work separately and all things considered toward arrangements of current issues and the avoidance of new ones (UNESCO-UNEP,1976) But the authoritative codification of Environmental Education as a global venture at last left the world's first Intergovernmental Conference on Environmental Education held in Tbilisi, Georgia, USSR in October of 1977. The report now known as The Tbilisi Declaration was figured amid this meeting and in many quarters remains the complete explanation on, what is Environmental Education and what should be. To these objectives give the establishment to quite a bit of what has been done in the field since 1978: To cultivate clear attention to, and worry about, financial, social, political and biological relationship in urban and rustic regions;

To furnish each individual with chances to secure the information, values, mentalities, responsibility and abilities expected to ensure and enhance the earth;

To make new examples of conduct of people, gatherings and society in general towards the earth (UNESCO, 1978) But while Environmental Education was picking up force universally, the same couldn't be said of Environmental Education back here in the USA (Bora, 2010).

## METHODS

### Research Model

In the study conducted to determine environmental education at basic and primary school levels in Libya and effects on pupils. More precisely, aims to describe environmental education in our society and challenges in general education system. The study is based on a field work carried out in Tripoli district, Libya in 2016. In order to make study more reliably, methods that were applied in experimental part of research were qualitative such as questionnaire, participating observation, focus groups, and informal talks. the data involved in study of textbooks, and curriculums, books, articles, internet sources, reports and studies of environmental education.

Scan researches are conducted with the aim to gather the date about significant aspects of a group (Büyükoztürk, 2009). According to Karasar (1999), scan models are the research approaches aiming to describe a situation, in the past or still happening, as the way it is.

### Participants and Sample

The population of this study 400 students at basic and primary schools students in Libya academic year 2016, The sample were from the city of Tripoli, where four schools for boys and girls in the city of Tripoli the questionnaire was distributed on all classes in basic and primary schools.

Table 1: The Status of The Participants

Participants	No. of The Students
Boys	215
Girls	185
Total	400

### Data Gathering Tools

In this research, the "Personal Information", "Environmental Attitudes – Behavior Scale Test" and "Environmental Knowledge and Information Test" was used as the data collection tool.

### Scoring Scale Classification of The Substance

The levels of Basic And Primary School students participating in this research about environmental education were revealed and interpreted in regards to the survey questions.

### Analyses That Was Performed

The data obtained from the surveys were evaluated in computer environment by using SPSS 20.0 program. While determining whether their awareness level change according to their genders about the attitude and behaviors of environmental protection of the students from Libya in this study, the questions of the scale for environmental protection have been created based on expert opinion and literature review. Then, analysis by descriptive method research

### Research Ethics

The research to be valid and reliable, and science throughout the process research ethics has been considered. of the people interviewed thought is given to direct quotations. This excerpts are presented at the bottom of the issues managed in research. Researchers have endeavored to demonstrate an objective attitude during negotiations and to influence participants were required to exhibit works behavior.

## FINDINGS AND COMMENTS

Whether or not there is a significant difference in test results applied to determine consciousness, attitudes and behaviours of the participants is given in the following:

Table 2. Do You Recycle or Your Parents Recycle?

Answers	Frequency	Percent
Yes	104	26,0
No	296	74,0
Total	400	100,0

Considering Table 2, the participants forming the exemplary answered as %26 “yes” and %74 “no” the question “Do You Recycle or Your Parents Recycle?”. Considering the answers given by the participants, we can see that they are mostly “no” with 70%. This answer demonstrates that the participants forming the sampling have knowledge about recycling.

Table3. Briefly Answer Why Do You Recycle or Don't Recycle Waste?

Answers	Frequency	Percent (%)
To preserve environment	116	29,0
To reduce waste	143	35,8
We do not have places to recycle waste	141	35,3
Total	400	100,0

Considering Table 3, in relation to the question *Briefly Answer Why Do You Recycle or Don't Recycle Waste?*, 29% of the participants forming the exemplary answered “to preserve environment”, %35,8 “to reduce waste”, and %35,3 “we do not have places to recycle waste. Considering the answers given by the participants, we can see the majority in “to reduce waste” with %35,8. This answer shows that the participants forming the exemplary have environmental awareness.

Table4. Have You Chosen Extra Curricular Activity At School / Outside School?

Answers	Frequency	Percent
Yes, if yes, what kind is this activity	90	22,5
No	310	77,5
Total	400	100,0

As it can be seen in Table 4, regarding the question *Have You Chosen Extra Curricular Activity At School or Outside?*, out of the participants forming the exemplary 22,5% answered as *yes if yes, what kind is this activity*, and %77,5 as “no”. Considering the answers given by the participants, we can see mostly the option “no” with 77,5%, namely they do not participate in any activity outside school. We can say that some of the participants are weak in participating in activities considering this answer.

Table5. How in Your Opinion Could Libya Help to Take Care More of Natural Environment?

Answers	Frequency	Percent
The government responsible	153	38,3
The ministry of agriculture	110	27,5
The ministry of education	137	34,3
Total	400	100,0

Considering Table 5, in relation to the question “How in Your Opinion Could Help Libya To Take Care More of Nature Environment?” out of the participants forming the exemplary 38,3% answered as “the government responsible”, 27,5% “the ministry of agriculture”, 34,3% “the ministry of education”. We can see that “the government responsible” option constitutes the majority with 38,3% considering the answers of participants. This answer shows that participants have knowledge about protecting the environment, but they say that protection of the environment is the responsibility of the government.

Table6. Distribution of the Participants According to Their Answers for Consciousness Questions

Grades	Questions	Answers	Number of Students	Percent (%)
Basic	Do You or Your Parents Recycle?	No	296	74,0
Primary	Briefly Answer Why Do You Recycle or Don't Recycle Waste?	To Reduce Waste	143	35,8
Basic	Have You Chosen Extra Curricular Activity At School / Outside School?	No	310	77,5
Primary	How in Your Opinion Could Libya Help to Take Care More of Natural Environment?	The Government Responsible	153	38,3

We can see in Table 6 that students who attend preschool education say “No” mostly considering their answers for consciousness questions. This result shows that preschool students do not have sufficient consciousness.

Nevertheless, considering the answers given by students attending preschool education for the consciousness questions, the participants expressed their opinions by answering the questions as “*The Reduce Waste*” and “*The government Responsible*”. Considering these results, we can say that students attending preschool education have knowledge.

Table7. Have You Picked Litter from the Public Place?

Answers	Frequency	Percent
Sometimes	199	49,8
Always	84	21,0
Often	51	12,8
Never	66	16,5
Total	400	100,0

Considering Table 7, for the question “*Have You Picked Litter From The Public Place?*”, out of the participants forming the exemplary 49,8% answered as “*sometimes*”, 21% “*always*”, 12,8% “*often*”, 16,5% “*never*”. Considering the answers given by the participants, we can see the majority in “*sometimes*” with 49,8%. For this answer, we can say that participants have environmental consciousness, but they sometimes may have to throw their litters into the ground when there is no litter basket in open areas.

Table8. Briefly Answer Why Do You or Do Not You Buy Water in Plastic Bottles?

Answers	Frequency	Percent
To keep clean my town	221	55,3
I am not responsible	179	44,7
Total	400	100,0

Considering Table 8, for the question “*Briefly Answer Why Do You or Do Not You Buy Water in Plastic Bottles?*”, out of the participants forming the exemplary 55,3% answered as “*to keep clean my town*” and 44,7% “*I am not responsible*”. Considering the answers given by the participants, we can see the majority in “*to keep clean my town*” with 55,3%. This answer shows that the participants have environmental awareness.

Table9. Do You Use Bags for Shopping?

Answers	Frequency	Percent
Yes, I use plastic bags	121	30,3
Yes, I use fabric bags	37	9,3
Yes, I use paper bags	28	7,0
No, I buy new one every time	214	53,5
Total	400	100,0

Considering Table 9, for the question “*Do You Reuse Bags for Shopping?*”, out of the participants forming the exemplary 30,3% answered as “*Yes, I reuse plastic bags*”, 9,3% “*Yes, I reuse fabric bags*”, 7% “*Yes, I*

reuse paper bags”, 53,5% “No, I buy new one every time”. Considering the answers given by the participants, we can see the majority in “No, I buy new one every time” with 53,5%. This answer shows that the participants have environmental knowledge but do not care about it.

Table10. How Often Do You Use Bicycle?

Answers	Frequency	Percent
Everyday	46	11,5
Once a week	25	6,3
Few times a month	38	9,5
Few times a year	65	16,3
Only in summer time	74	18,5
I don't use a bike	152	38,0
Total	400	100,0

Considering Table 10, for the question “How Often Do You Use Bicycle?”, out of the participants forming the exemplary 11,5% answered as “everyday”, 6,5% “few times a month”, 16,3% “few times a year”, 18,5% “only in summer time”, 38% “I don't use a bike”. Considering the answers given by the participants, we can see the majority in “I don't use a bike” with 38%. This answer shows us that the participants want to use bike but they cannot use it. We can show the reason as the roads are not convenient for using bike.

Table 11. For What Purpose Do You Use Bicycle?

Answers	Frequency	Percent
Play	115	28,8
Sport	111	27,8
As Transport	61	15,6
Bicycle	113	27,8
Total	400	100,0

Considering Table 11, for the question “For What Purpose Do You Use Bicycle?”, out of the participants forming the exemplary 28,8% answered as “play”, 27,8% “sport”, 15,6% “as transport”, 27,8% “bicycle”. Considering the answers given by the participants, we can see the majority in “play” with 28,8%. This answer shows us that the participants use bike only for fun due to the fact that there is no convenient road for using bike.

Table12. From Which of Those Sources You Know about Nature?

Answers	Frequency	Percent
Most important	256	64,0
Important	128	32,0
Less important	16	4,0
Total	400	100,0

Considering Table 12, for the question “From Which of Those Sources You Know about Nature?”, out of the participants forming the exemplary 64% answered as “most important”, 32% “important”, 4% “less important”. Considering the answers given by the participants, we can see the majority in “most important” with 64%. Considering this answer, we can say that participants have very important information about the nature.

Table 13. Comparison of Students' Attitudes Attending Pre-school and Kindergarten Education.

Grades	Questions	Answers	Number of Students	Percent (%)
Primary	Have you picked litter from the public place?	Sometimes	199	49,8
Primary	Briefly answer why do you buy or do not buy water in plastic bottles?	To keep clean my town	221	55,3
Basic	Do you use bags for the shopping?	No, I buy new one every time	214	53,5
Basic	How often do you use bicycle?	I don't use a bike Play	152	38,0
Basic	For what purpose do you use bicycle?	Most important	115	28,8
Primary	From Which of Those Sources You Know about Nature?		256	64,0

Considering Table 13 and when we compare environmental attitudes of students attending kindergarten education, we can see that they are higher than the attitudes of students attending preschool education.

Table14. Write From Which Sources Do You Mostly Get Information about Nature, Ecology?

Answers	Frequency	Percent
Geographic	225	56,3
Sciences	175	43,8
Total	400	100,0

As it can be seen in Table 14, for the question "*Write From Which Sources Do You Mostly Get Information about Nature, Ecology?*", out of the participants forming the exemplary 56,3% answered as "*geographic*", and 43,8% "*sciences*". Considering the answers given by the participants, we can see the majority in "*geographic*" with 56,3%. Considering this result, we can say that they obtained such information about the nature and ecology from their geography books.

Table15. Do You Attend Ecological / Environmental Events?

Answers	Frequency	Percent
Sometimes	178	44,5
Always	58	14,5
Often	36	9,0
No	128	32,0
Total	400	100,0

Considering Table 15, for the question "*Do You Attend Ecological / Environmental Events?*", out of the participants forming the exemplary 44,5% answered as "*sometimes*", 14,5% "*always*", 9% "*often*", 32% "*no*". Considering the answers given by the participants, we can see the majority in "*sometimes*" with 44,5%. Considering this answer, we can say that the participants take part in activities arranged for the environment.

Table 16. Rank Those Ecological Issues

Answers	Frequency	Percent
No answer	7	1,8
Deforestation	368	92,0
The depletion of ozone layer	25	6,3
Total	400	100,0

As it can be seen in Table 16, for the question “Rank Those Ecological Issues”, out of the participants forming the exemplary 1,8% answered as “no answer”, 92% “deforestation”, 6,3% “the depletion of zone layer”. Considering the answers given by the participants, we can see the majority in “deforestation” with 92%. Considering the question about the issue, we can see that participants specify as one of the reasons of environmental problems to be deforestation. This answer shows that the participants have environmental awareness.

Table17. List Local and Global Ecological Issues You Know

Answers	Frequency	Percent
I don't know	127	31,8
Climate change and etc.	128	32,0
We don't learn yet	135	33,8
Save energy	10	2,5
Total	400	100,0

Considering Table 17, for the question “List Local and Global Ecological Issues You Know”, out of the participants forming the exemplary 31,8% answered as “I don't know”, 32% “climate change and etc.”, 33,8% “we don't learn yet”, 2,5% “save energy”. Considering the answers given by the participants, we can see the majority in “we don't learn yet” with 33,8%. Considering these answers, we can see that participants have not yet learned about global environmental problems.

Table18. Sign Most Interesting Topics with ( + ) and Least interesting Topics with ( - ) ?

Answers	Frequency	Percent
Most interesting topics	207	51,8
Least interesting topics	85	21,3
Close	108	27,0
Total	400	100,0

Considering Table 18, for the question “Sign Most Interesting Topics with (+) and Least Interesting Topics with (-)”, out of the participants forming the exemplary 51,8% answered as “most interesting topics”, 21,3% “least interesting topics”, 27% “we do not have places to recycle waste”. We can see that the answers of participants are mostly “most interesting topics” with 51,8%.

Table19. Have You Used Advices from School in Your Daily Life at Home?

Answers	Frequency	Percent
Yes, many advices	123	30,8
Yes, some advices	194	48,5
No, there are no conditions for this	25	6,3
No	58	14,5
Total	400	100,0

Considering Table 19, for the question “Have You Used Advices from School in Your Daily Life at Home”, out of the participants forming the exemplary 30,8% answered as “yes, many advices”, 48,5% “yes, some advices”, 6,3% “no, there are no conditions for this”, 14,5% “no”. Considering the answers given by the participants, we can see the majority in “some advices” with 48,5%. Considering these answers, we can

see that the participants apply the information about the environment they learn at school to their daily life too.

Table20. If You Answered Yes, Please Write What Exactly You Use in Your Daily Life?

Answers	Frequency	Percent
Waste Sorting	110	27,5
Healthy Food	117	29,3
Control Natural	173	43,2
Total	400	100,0

Considering Table 20, for the question “*If You Answered Yes, Please Write What Exactly You Use in Your Daily Life*”, out of the participants forming the exemplary 27,5% answered as “*waste sorting*”, 29,3% “*healthy food*”, 43,2% “*control natural*”. Considering the answers given by the participants, we can see the majority in “*control natural*” with 43,2%. Considering these answers, we can see that participants care much about keeping the environment clean.

Table21. Briefly Answer Why Do You Buy or Do Not Buy Water in Plastic Bottles?

Answers	Frequency	Percent
Because the plastic bottle is so clean	53	13,3
I can buy it from any shop	84	21,0
I do not like buy the water from out side	263	65,8
Total	400	100,0

Considering Table 21, for the question “*Briefly Answer Why Do You Buy or Do Not Buy Water in Plastic Bottles*”, out of the participants forming the exemplary 13,3% answered as “*because the plastic bottle is so clean*”, 21% “*I can buy it from any shop*”, 65,8% “*I do not like buy the water from outside*”. Considering the answers given by the participants, we can see the majority in “*to reduce waste*” with 65,8%. Considering these answers, we can say that participants have environmental knowledge.

Table22. How Often Do You Use Public Transport (Bus, Train and Other)?

Answers	Frequency	Percent
Everyday	123	30,8
Once a week	48	12,0
Once a month	33	8,3
Few times a year	78	19,5
I don't use public transport	118	29,5
Total	400	100,0

Considering Table 22, for the question “*How Often Do You Use Public Transport (Bus, Train And Other)?*”, out of the participants forming the exemplary 30,8% answered as “*everyday*”, 12% “*once a week*”, 8,3% “*once a month*”, 19,5% “*few times a year*”, 29,5% “*I don't use public transport*”. Considering the answers given by the participants, we can see the majority in “*everyday*” with 30,8%. Considering these answers, we can say that participants use bus, train in their daily life in order to prevent environmental problems.

Table23. Do You Often Buy Mineral Water in Plastic Bottles?

Answers	Frequency	Percent
Yes	273	68,3
No	127	30,7
Total	400	100,0

Considering Table 23, for the question “Do You Often Buy Mineral Water in Plastic Bottles?”, out of the participants forming the exemplary 68,3% answered as “yes” and 30,7% “no”. Considering the answers given by the participants, we can see the majority in “yes” with 68,3%. Considering these answers, we can see that participants mostly use plastic bottles because they do not know that they are very harmful to the environment.

Table 24. Comparison of Behavioural Levels of Students’ Attending Pre-school and Kindergarten Education According to Grade

Grades		Questions	Answers	Number of Students	Percent (%)
Behaviour	Basic	Have you used advices from school in your daily life at home?	Yes, some advices	194	48,5
	Basic	If you answered yes, please write what exactly you use in your daily life?	Control natural	173	43,2
	Primary	Briefly answer why do you buy or do not buy water in plastic bottles?	I do not like buy the water from out side	263	65,8
	Basic	How often do you use public transport (bus, train and other)?	Everyday	123	30,8
	Primary	Do you often buy mineral water in plastic bottles?	Yes	273	68,3
Attitude	Primary	Have you picked litter from the public place?	Sometimes	199	49,7
	Primary	Briefly answer why do you take or do not take other litters?	To keep clean my town	221	55,3
	Primary	Do you reuse bags for the shopping?	No, I buy new one every time	214	53,4
	Basic	How often do you use bicycle?	I don’t use a bike	152	38,0
	Primary	Have you chosen extra-curricular activity at school / outside school?	No	310	77,5
	Primary	From which of those sources you know about nature?	Most important	256	64,0
	Basic	Who in your opinion, could help and/or promote Libya to take care nature/ more of environment?	The government responsible	153	38,3

Considering Table 24, we can see that there are differences when environmental behaviours of both students attending kindergarten education and students attending preschool education are compared. Considering environmental awareness, we can see that there is little difference on environmental awareness of both students attending kindergarten education and students attending preschool education.

When behaviour and awareness levels of participants are compared separately according to grades, we can see that students attending kindergarten education have less than students attending preschool education.

Table25. Comparison of Behavioural Levels of Students' Attending Pre-school and Kindergarten Education According to Age

Age		Questions	Answers	Number of Students	Percent (%)
Behaviour	Basic	Have you used advices from school in your daily life at home?	Never	66	16,5
	Primary	If you answered yes, please write what exactly you use in your daily life?	Waste Sorting	110	27,5
	Basic	Briefly answer why do you buy or do not buy water in plastic bottles?	Because the plastic bottle is so clean	53	13,3
	Basic	How often do you use public transport (bus, train and other)?	Once a month	33	8,3
	Primary	Do you often buy mineral water in plastic bottles?	No	127	31,7
	Attitude	Basic	Have you picked litter from the public place?	Often	51
Primary		Briefly answer why do you take or do not take other litters?	I am not responsible	179	44,7
Basic		Do you reuse bags for the shopping?	Yes, I reuse paper bags	28	7,0
Basic		How often do you use bicycle?	As Transport	61	15,6
Primary		Have you chosen extra-curricular activity at school / outside school?	Yes if yes, what kind is this activity	90	22,5
Basic		From which of those sources you know about nature?	Less important	16	4,0
Primary		Who in your opinion, could help and/or promote Libya to take care more of nature/ environment?	The ministry of agriculture	110	27,5

Considering Table 25, we can see that there are differences when environmental behaviours of both students attending kindergarten education and students attending preschool education are compared according to age. We can say that environmental behaviours of students attending kindergarten education are more outstanding than students attending preschool education.

When environmental awareness levels of participants are compared, we can say again students attending kindergarten education have more difference levels than students attending preschool education.

Table26. Comparison of Behavioural Levels of Students' Attending Pre-school and Kindergarten Education According to Gender

Gender		Questions	Answers	Number of Students	Percent (%)
Behaviour	Primary	If you answered yes, please write what exactly you use in your daily life?	Waste Sorting	110	27,5
	Basic	Briefly answer why do you buy or do not buy water in plastic bottles?	Because the plastic bottle is so clean	53	13,3
	Primary	Do you often buy mineral water in plastic bottles?	No	127	31,7
Attitude	Basic	Have you picked litter from the public place?	Often	51	12,8
	Primary	Briefly answer why do you take or do not take other litters?	I am not responsible	179	44,7
	Primary	Have you chosen extra-curricular activity at school / outside school?	Yes if yes, what kind is this activity	90	22,5
	Primary	Who in your opinion, could help and/or promote Libya to take care more of nature/environment?	The ministry of agriculture	110	27,5

Considering Table 26, we can see that both environmental behaviours and difference levels of preschool students are higher than kindergarten students when their environmental behaviours and awareness levels are compared according to gender.

Table27. Distribution of Pre-school and Kindergarten Students According to Their Knowledge Levels on Environmental Behaviours and Awareness

Questions	Answers	Number of Students	Percent (%)
Do you recycle or your parents recycle?	No	296	74,0
Write from which sources do you mostly get information about nature, ecology?	Geographic	225	56.3
Do you attend ecological / environmental events?	Sometimes	178	44.5
Rank those ecological issues	Deforestation	368	92,0
List local and global ecological issues you know	Climate change and etc	128	32,0
Briefly answer why do you or don't you recycle waste?	We do not have places to recycle waste	296	74,0
Sign most interesting topics with ( + ) and least interesting topics with ( - )	Most interesting topics	264	66,0

Considering Table 27, the rates of answers obtained from participants with regard to the following questions are: 74,0% for "Do you recycle or your parents recycle?" "No", 56,3% for "Write from which sources do you mostly get information about nature, ecology?" "geographic", 44,5% for "Do you attend ecological / environmental events?" "Sometimes", 92% for "Rank those ecological issues" "Deforestation", 32% for "List local and global ecological issues you know?" "Climate change and etc.", 74% for "Briefly answer why you recycle or don't recycle waste?" "We do not have places to recycle waste", 66% for "Sign most interesting topics with (+) and least interesting topics with (-)" "Most interesting topics". Considering these results, we can say that students have sufficient knowledge about environmental behaviour and awareness.

Table28. Difference of Knowledge Levels of Pre-school and Kindergarten Students on Environmental Behaviours and Awareness According to Gender

	Sex	N	Article Number	Average	SS	p
Environmental Awareness	Male	215	7	15,82	5,43	.003
	Female	185		17,53	4,46	p<0,05
	Total	400		19,63	5,07	
Environmental Behaviour	Male	215	5	13,43	4,27	.000
	Female	185		11,67	3,72	p<0,05
	Total	400		15,36	4,27	

In Table 28, it is clear that there is a significant difference between genders of students attending pre-school and kindergarten education when their total scores on environmental awareness and environmental behaviours are evaluated ( $p<0,05$ ).

According to the results obtained about the knowledge, attitude and behaviour of Libyan students at basic and primary schools towards the environmental education there was highly significant difference between the two levels and there should be an educational training with regard to this issue.

## CONCLUSION

There are differences when environmental behaviours of both students attending kindergarten and preschool education are compared. Considering environmental awareness, we can see that there is little difference on environmental awareness of both students attending kindergarten education and students attending preschool education. When behaviour and awareness levels of participants are compared separately according to grades, we can see that students attending kindergarten education have less than students attending preschool education. The results of studies conducted on different exemplary groups both at home and abroad demonstrate that awareness regarding the environment and environmental issues are below the desired level which is similar to the results of this study (Shobeiri, Omidvar&Prahallada, 2007; Hassan, Juahir&Jamaludin, 2009; Ahuja, 2010; Hassan, Noordin and Sulaiman, 2010; Larijani, 2010; Aminrad, Zakaria&Hadi, 2011).

We can see in the research that there are differences when environmental behaviours of both students attending kindergarten education and students attending preschool education are compared according to age. We can say that environmental behaviours of students attending kindergarten education are more outstanding than students attending preschool education. When environmental awareness levels of participants are compared, we can say again students attending kindergarten education have more difference levels than students attending preschool education. Uzun (2007) also obtained the same result in his study.

It is clear that there is a significant difference between genders of students attending pre-school and kindergarten education when their total scores on environmental awareness and environmental behaviours are evaluated. This result shows parallelism with the results of the studies conducted by Kaya, Akıllı ve Sezek (2009)., Çabuk ve Karacaoğlu (2003)., Gündüz, Dağlı ve Aslanova (2015)., Kesicioğlu ve Alisinanoğlu (2009).

When environmental behaviours and awareness levels of pre-school and kindergarten students were compared, significant differences were found. Considering these results, we can say that students have sufficient knowledge about environmental behaviour and awareness. In some environmental researches that were conducted by many researchers before, similar values to this result were obtained (Altınöz, 2010; Kışoğlu, 2009; Kibert, 2000; Karatekin, 2011; Gündüz et al, 2015).

As a consequence, it was detected that students are not well aware of the issues regarding the environment as expected. Surely, it will be possible to identify environmental problems and resolve them by only being aware of them. Because it is not possible to expect such individuals to be aware of environmental problems, to be sensitive against such problems and to change their behaviours that may cause problems. That is why it is thought to be one of the prerequisites of dealing with environmental problems to determine and increase awareness levels of individuals about the environment and environmental problems.

## RECOMMENDATION

The following suggestions are made in light of the data obtained from the research;

- Education seminars can be arranged and made available for teachers regarding “Environmental Education Program” and the use of materials in pre-school educational institutions. The participation of students to scientific students should be ensured and the issues like environmentally harmful chemical substances, benefits of public transport vehicles in terms of environment, classification of litters and recycling bins firstly should be included in these studies.
- Environmental education should be included in formal education programs. At least teachers and administrators should be informed about air, water, ecological balance and especially soil pollution, and scientific activities regarding environmental sensitivity should be provided in accordance with all education levels.
- Certain researches investigating the relationship between environmental awareness of pre-school children and educational environment provided at home and attitudes regarding environment based skills of their parents can be conducted.

- Accordingly, “projects for environment-based educational situations” supporting environmental awareness can be prepared and conducted with pre-school children.
- Due to the fact that environmental education has an aspect comprising every segment of society, it can be ensured to be integrated in all types and levels of education. Environmental education should be carried out in a mentality to direct applied activities as well as theoretical knowledge on environmental education for contributing the formation of knowledge, skills, attitudes and values in individuals towards environment. The sensitivity of children and their families on this issue should be supported by arranging activities and studies about ecology from young ages. Furthermore, collaboration should be made with civil society institutions in developing environmental sensitivity.
- Approaches like family education, family participation, school-family cooperation should be included in environmental education studies in pre-school periods. Longitudinal studies where the results of environmental education programs to be given to little children are monitored in a wide time interval should be conducted.
- Environmentalist preschools should be increased and school concept having environmentalist perspective should be spread and encouraged by various applications.
- One of the important points is that we should do more research about environmental education at basic school in English research because there is a few especially in Libya.
- To be successful, we need to apply the basic and primary school into the environmental education more in that to transfer their knowledge by positive action in the lifestyle.

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# Essentials of Governance and Educational Reform in Morocco: A Critical Discourse Analysis Approach

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## ABSTRACT

This paper is an attempt to sift the reality of the Moroccan university as an institution which is supposed to be a nursery for future professionals and decision-makers. To be up to this target, the Moroccan university is called for to work out suitable governance-bound policies that can ease its production of marketable human assets on national and international scales. In this Critical Discourse Analysis (CDA) account, I begin with a theoretical background about governance as an evolving concept that has been circumscribed with various definitions. The managerial styles and official guidelines at the Moroccan university level are given keen consideration with particular reference to the National Charter of Education and Training. Against this background, I conduct an analysis of His Majesty King Mohammed VI's speech on the occasion of the Revolution of the King and the People (August 20<sup>th</sup>, 2013)- a cornerstone and far-sighted speech wherein His Majesty capitalizes on some strengths of the Moroccan educational system and, more importantly, warns against executive dysfunctions which hamper the implementation of solid, competitive and productive educational practices, especially in higher education. Ultimately, I provide some suggestions to rethink some governance-bound endeavors so as to come up with a dynamic, fruitful university governance style. Within this realm, this paper seeks to come up with answers to the following research questions: (i) What is the status quo of the Moroccan higher educational system? (ii) What governance-related guidelines can be gleaned from the historic 2013 Royal speech? The emerging findings of these questions will upgrade the critical cycles of analysis to conduct more accurate probing of (iii) What has been achieved so far? And what about the road ahead? As a theoretical framework, the CDA approach is the major underpinning of this analytic enterprise.

**Keywords:** Higher education; Morocco; Governance; Critical Discourse Analysis; Recommendations

## INTRODUCTION

In recent years, the issue of educational governance has gained widespread attention among scholars from around the world (Altbach 2005; Amaral et. al. 2002; Johnson 1997; Shattock 2006; Joshua 2010). The bulk of work done internationally is geared towards offering operational suggestions and road maps that can ensure the accountability and pre-eminence of western educational institutions. In tune with this reform-oriented trend, the issue of educational governance in Morocco has been subject to utmost consideration of intellectuals, politicians and opinion leaders.

This paper examines the reality and the future prospects of governance linked to Moroccan tertiary education. Several Moroccan researchers (Chetoui 2005; Chtouki 2006; Echoundi 2006; El Moussaoui 2004; Gherib 2010; Harakat 2011) have tackled the issue of educational governance in Morocco. While these researchers have addressed the issue of governance in idiosyncratic ways and from diverse angles, they seem to have reached a tacit consensus that educational, and particularly higher education, governance in Morocco constitutes a real challenge for the years to come. This is due to the fact that the Moroccan university is supposed to be a stepping stone towards the achievement of durable, sustainable national progress. The university is not just a place where academic learning takes place; it is rather a genuine nursery for future leaders, managers, professionals and decision-makers. To be up to this target, the Moroccan university has to be endowed with appropriate governance styles.

In Morocco, there seems to be a hard-to-dislodge conviction among the elite circles about the urgent need for proficient governance styles that can help elevate the quality of the educational system to international eminence. In his speeches, His Majesty King Mohammed VI has time and again accentuated the central role of education in the process of development. In his 2003 Throne ceremony speech, King Mohammed VI made it clear that the issue of education in Morocco ranks second after the primordial territorial integrity issue. In a recent speech on the occasion of “Tawrat Al Malik Wa Chaab” “The Revolution of the King and the People” (20 August, 2013), King Mohammed VI devoted a very large portion to diagnose the ills of the educational domain in Morocco stressing the urgent need for appropriate, collaborative and efficient governance.

The questions remain, however, to what extent have the recurrent governmental policies managed to keep up with the royal aspirations? Can we safely state that governance in Moroccan tertiary education is on the right path? If not, what governance measures should be taken to ensure the future competitiveness of our universities on regional and international scales? These questions will constitute the body of this contribution through which we aim at exploring avenues that can unpack the working of governance at the Moroccan university level and possible ways for making this governance all the more dynamic and fruitful.

### **On The Concept Of Governance**

For sure, the concept of governance has been subject to consecutive re-definitions ever since its appearance in late 1980s. At the outset, governance referred to conscientious, rational public affairs management in all fields, be they political, social, economic or whatsoever. Johnson (1997: 1) uses the term “Remodelling public management” (Remodellage de gestion publique” to put into focus the fact that embryonic definitions of governance were basically related to the way public, government-specific policies were supposed to be implemented in terms of managing economic and social resources.

This traditional view of governance as a ruling elite-bound concept has been contested by several international institutions, namely the United Nations, the European Union and the World Bank (See these institutions reports on governance). According to these institutions, effective governance is a top-down as well as a bottom-up process that calls for interactive, participatory involvement of all citizens, institutions and organizations. In this respect, Chetoui (2007: 13) states that governance is a wholistic, three-layered process that includes the following axes:

- 1- The means by which rulers and decision-makers are chosen and supervised.
- 2- The government effective resource management and policies’ implementation.
- 3- Citizens and rulers mutual co-management of the institutions in charge of the economic and social endeavors.
- 4-

The United Nations programme for development along with the World Bank recommend the intricate and overlapping interrelationship between political, economic and social governance. The European Union has gone a step further by emphasizing, in addition to the above tenets, democracy and human rights as cornerstones of effective and efficient governance.

It seems that the concept of governance as a uni-directional, government-related process is now considered as a sheer fallacy. The ordinary individual citizen and the ruling elite are supposed to work hand in hand to bring about sustainable development at the local as well as the national levels. Differently put, the view of every citizen as a potential capital for sustainable development is now a matter of international consent.

Accordingly, the concept of governance is an evolving process that can be adopted and adapted to the fields and circumstances in point. Several countries, Morocco is no exception, have started to set governance policies which respond to international norms and recommendations. In this regard, we need to acknowledge the existence of idiosyncrasies since every country models its governance styles around available human and capital resources.

In Morocco, the issue of governance in education has always been a primordial issue in the academic and political spheres. As early as 1999, the Special Committee for Education and Training saw light having as a purpose the visualization of a road map that can lead to substantial reforms in the Moroccan educational orientations and policies. The corollary of the concentrated work done by this committee of experts gave birth to the National Charter for Education and Training “Al Mitak Al watani Li Tarbiya Wa Takwin”- a charter that gained wide popular support given the pertinent, realistic guidelines and recommendations it came up with, which targeted grass-root reforms in educational governance in Morocco.

### **Higher Education Governance in Morocco: Toward a bureaucracy-free perspective**

In the last decade, the higher education system in Morocco has witnessed remarkable modifications with a view to revitalize the governance of universities and higher institutions. Gharib (2006: 372) specifies that the new governance system in Moroccan higher education constitutes a real step away from traditional, bureaucratic modes of governance. According to Gharib (2006), there is a quest for a higher education sector that can serve as a locomotive for the empowerment of parallel sectors, particularly the economic sector. This is, indeed, a rational aspiration given that days when higher education was dissociated from the socio-economic sphere should definitely belong to the past. In light of the Charter of Education and Training, university affairs are to be rationally and collaboratively managed by actors from within the higher education field and, most importantly, by potential socio-economic actors who do not necessarily belong to higher education.

### **Governance in Moroccan Higher Education: Official guidelines**

The official charter of education and training, especially in the fifth and the sixth recommendations, claims the key importance of rational management based on participative and fund-based approaches. In this respect, the charter has specified a three-fold orientation of the Moroccan university. First, the Moroccan university should be an integral entity having total financial independence and a distinguished academic profile (statement 150/1). Additionally, the university is solicited to be a well-structured entity based on common core levels, bridges and project-based orientations, especially projects which can yield additional, financial revenues. These latter have to be invested and distributed among the university affiliated schools and institutions in the most equitable and rational way possible. Relatedly, the university is supposed to benefit from governmental funding, which needs to be allocated following strict, public criteria. In addition to financial resources, the above statement dwells on the need for effective, logical investment of the human resources deemed as priceless assets of the university. Second, the charter advocates the creation of a national council in charge of boosting cooperation between universities and related institutions on a nationwide scale (statement 151/1). Of course, this is to be achieved within absolute respect not only of each university’s autonomy but also in total abidance by the guidelines and orientations of the national higher education system.

Third, the charter accentuates the need for participative approaches regarding “the managerialism” of universities (statement 152/1). In line with this statement, the universities are to be managed by a board of university presidents, deans and higher institute directors, representatives of the teaching staff (faculty), representatives of students and eminent personalities in the economic and socio-cultural sectors.

It seems that the official guidelines in Morocco clearly advocate generic principles and recommendations in support of shared governance and cooperative decision-making. In contrast to traditional management styles, the university is assigned more freedom in terms of implementing new governance structures in tune with the culture of change outlined in the National Charter of Education and Training. Overall, the university is bound to open up to its surrounding and be committed to develop a profile that responds to the needs of individual citizens and communities. Nevertheless, the outcome of the recent consecutive policies in higher education have been subject to outspoken criticism concerning the way Moroccan university managerial structures have been operating so far.

### **The Royal perspective: An educational governance that leaves to be desired**

As mentioned earlier, His Majesty King Mohammed VI has always voiced his concern for the field of education as a basic cornerstone underpinning national development within and across sectors. In reference to His Majesty's last speech on the 60<sup>th</sup> memorial of the Revolution of the King and the People issued on August 20<sup>th</sup>, 2013, I will provide a succinct discursive analysis of the speech and pin down how it calls for rethinking educational policies in Morocco.

At the outset of the speech, His Majesty capitalizes on the historical ongoing of the king and peoples' revolution stating that "it is a continuous revolution which calls for the mobilization of everyone. It requires that everyone invests strongly in the workshops of development so as to fulfill current and future challenges and to concretize the legitimate aspirations of our citizens" (Translation is henceforth mine). Importantly enough, this excerpt shows that no genuine current or future development can take place without the actual involvement of every single individual- an idea that reflects the royal full awareness of the uselessness of any single-handed attempt to bring about sustainable progress.

Labeling youth's potential as "our national renewable richness", His Majesty goes on to focalize on the absolute necessity for Moroccan youth to be an integral part of the change process. However, His Majesty stresses the need for "sane" good education as a gateway to procreating young citizens capable of facing "the innovations of the modern times".

While outlining the positive education-related points realized so far, such as the availability of the basic infrastructures and the increase of schooling of female citizens, His Majesty emphasizes that the road ahead is still strenuous:

However, the road to go is still long and tough for this sector [education] to assume its role of a locomotive for social and economic development. For, indeed, the actual question which continues to be posed is the following: How come that a portion of our youth do not manage to realize their legitimate aspirations at the professional, material and social levels?

His Majesty, thus, assumes that the educational sector in Morocco needs to refine its standards and structures to produce marketable brains.

While praising the work done in the domains of professional, technical and artifact training as educational factions "which offer to graduates more chances for direct and quick access to employment and insertion opportunities in professional life", His Majesty warns that this is not the case for "university graduates in some options, notwithstanding the praiseworthy efforts deployed by university professors. These [universities] should not be factories for the unemployed, especially in some outdated disciplines".

The importance of student-related assets are also considered primordial in the success of higher education governance. As a component of the corporate structure of tertiary education, the student remains a priceless human capital that needs to be invested in the right way. As a case in point, His Majesty puts forth the Moroccan students' natural propensity towards opening up to others and their desire to know about foreign cultures and languages, which is a positive distinguishing aspect of Moroccan students:

It is mandatory to consolidate this [university] training by a judicious exploitation of a virtue that characterizes the Moroccan citizen, namely his/her natural tendency for opening up and his/her willingness to know foreign cultures and languages.

His Majesty elaborates on foreign language learning as a complementary parameter that can raise chances of employability in various domains. Simultaneously, national official languages are also to be ascribed due importance in His Majesty's viewpoint..

As an actor within the Moroccan university circle, I believe that in the global world of today, learning foreign languages is an urgent must. Every university is supposed to invest more in this issue by encouraging linguistic sojourns in native countries, by supporting the creation of international university students' communities and by providing the material logistics, such as professional computer language laboratories, to get students to work on their language skills in favorable conditions. By having this governance orientation, we can surely boost students' chances' for employment at the national and international scales.

At a later stage of the speech, His Majesty refers to the National Charter of Education and Training which, in the words of His Majesty, was "adopted in the frame of large, participative national approach." Past governments, according to His Majesty, made good and concentrated efforts to ensure the success of the emergency plan, which was devised to save the national education from further recession. Faithful to this tradition, the current government, in His Majesty's viewpoint, is urged "to capitalize on the strengths and achievements of the last government which did its best to, although under strict time constraints, implement the guidelines of the national charter". Thus, the achievement of a national, fruitful and dynamic educational governance is a long, ongoing and, more importantly, cooperative process.

In addition to these corrective measures, His Majesty brings forth a serious issue that hampers the implementation of highly efficient, cooperative educational governance. The field of education should not be an object for "political auction and rivalry". Here, indeed, lies one of the serious dysfunctions of the educational sector in Morocco. Every newly-elected government brings along new plans and governance measures which, in stead of dovetailing with and reinforcing previous ones, cast doubt on their predecessors. In this way, the element of continuity as a key of success is not accounted for and the ills of the educational system worsen.

All in all, the royal assessment of the governance styles in the Moroccan educational system is so critical and insightful. If we want to incorporate an educational system that guarantees young graduates' insertion in the national and international job market, we certainly need to work hand-in-hand and put the nation's interests on top of personal, secular or political coveting and greed.

### **Governance in Moroccan Universities: The road ahead**

Several researchers from around the world have analyzed the status quo of universities in an attempt to put forth refined models of how universities could be more effectively managed. Altbach (2005: 16) specifies that although models of university governance may differ, they still have things in common. Similarly, Coldrake, Stedman and Little (2003: 3-5) underscore the fact that universities worldwide have a common heritage. Therefore, the alternative governance measures they uphold could be applied to all universities; Moroccan universities are, needless to say, no exception.

In the last decades, universities have been asked to display more human-oriented inclinations, more involvement in the developmental process and more logical resource management. Mc Master (2007: 1-5) emphasizes the fact that universities are under tight pressures to rethink "administrative work at all levels". According to several other researchers, it is of key significance to have new and updated managerial skills within and across departments, such as the marketing department, HR department, finance department, accounting, students affairs, syllabus development, to cite just a few departments (For further details see Shattock, 2006 and Joshua, 2010).

In line with this perspective, I believe that the Moroccan university is recommended more than ever before to invest in two overlapping assets, namely the human asset and the material/financial one. For methodological constraints, I will limit myself to the human side while another future work could be devoted to diagnosing financial practices within Moroccan universities. At the human level, the students, the teaching staff as well as the administrative faculty are the treasures of the university- treasures that should be concretely bucked up to do their best for the success and eminence of the university.

**At the student level:**

The student is, for sure, a major constituent in the governing process of the university life. Gone should be the days when the student was considered the weakest ring in the governing body of the university. I believe that the western hierarchy according to which the student is at the top line of the academic pyramid is a logical and beneficial concept. Students are leaders and professionals of tomorrow. As such, we need to get them involved in the management of university life by taking their opinions about new projects and ways to make their university life quite productive and rewarding. By doing so, we can surely find out that the students can generate priceless benefits to the university.

**At the teaching staff level:**

The university professor is definitely an instrumental component of the university governance process. I believe that any attempt to correct the Moroccan university's governing operations should definitely take into account the key and substantial contribution of the teaching staff. It is true that in the National Charter of Education and Training, there is an official admittance of the fact that no educational progress can take place without a genuine involvement of the professor. However, in order to move from the realm of words to that of deeds, I think that the university professors' criticisms and future plans should be deeply considered. For instance, the university professors should enjoy the absolute freedom and right to implement new learning programmes and subjects

which they think would enhance the academic profile of the Moroccan university. Hence, the university professor can turn from an executor of dictated policies to a suggestive force which can have a say in the governance of the university at all levels. Additionally, the Moroccan university is supposed to invest in the teaching staff given their strategic position within the higher educational system. In this regard, I suggest that the university teaching staff needs to be allocated more sizeable funds so they can create projects and enhance their academic profile by getting engaged in various international academic endeavors.

**At the administrative staff level:**

The governing body of the university is made of several players each of which has got a role to perform in order to elevate the quality of the Moroccan university governance. Gone should be the days when the administration used to take decisions single-handedly. A participative approach whereby all the participants affected by the decision contribute in taking it is an urgent must. It is true that the university administration is in a position to draw the overall road map of the university operations. However, it is more beneficial to get all the university actors, students' unions, professors and their unions involved in the governing styles and operations of the university.

Nevertheless, the role of the administrative staff remains significant because the administration, regardless of its entity, assumes the role of a coordinator between the different actors who are eligible to suggest practical measures to ensure the success of the governing practices at the university. Here, it is vital to specify that getting administration staff to update their skills and governance knowledge is mandatory for the Moroccan university. In fact, having a qualified administration that has a clear vision of the governing strategies and targets of the university will be conducive to a governing style capable of ensuring dynamic, sustainable and efficient future higher education in Morocco.

Thus, it is a chain relationship wherein every element affects and is affected by the rest of the chain constituents. Of course, the elements tackled above are part of the solution to work out a fruitful, dynamic governance system that not only boosts the reputation of the Moroccan university but also, and most importantly, guarantees the marketability of our students at national and international scales. Achieving dynamic governance at the university level, let us reiterate, is an ongoing process that requires long, collective and time-consuming efforts. However, let us not forget that "the longest journey begins with a single step" as the Chinese proverb goes.

## CONCLUSION

Realizing that there exists little data in English about the issue of governance in non-western contexts, I try to explore different facets related to governance in general, and university governance in particular. The newness of this study lies in the fact that it takes the Moroccan university as a site of investigation. Adopting a researcher-bound analysis strategy, I start from a thorough examination of how the term governance has been defined and redefined by different scholars and international organizations. As explained in this paper, the concept of governance has evolved from a government-specific concept to a concept that claims the urgent need for collectivistic pro-activity wherein people from all walks of life and social positions contribute to wide-scale national development in the social, cultural, political and academic spheres.

In regard to higher education governance, I spotlight the working of tertiary education as a field that is supposed to serve as a locomotive for national durable progress. With particular focus on the Moroccan higher education system, I suggest some alternatives to make this sector all the more productive. In this respect, the elaboration of the National Charter of Education and Training stands out as a live example of how the elite circles in Morocco have tried to endow university governance with more dynamism and efficiency. Nonetheless, it seems that the aspirations of the charter-setters have not yet been met- a factual reality that can be clearly deduced from King Mohammed VI speech on the occasion of the Revolution of the King and the People (August 20<sup>th</sup>, 2013).

Taking this speech as data, I conduct a discursive analysis whereby I spotlight the implications of His Majesty's assessment of the flaws in the way the Moroccan higher education system has been operating. Accordingly, I find that king Mohammed VI is advocating a higher educational system that can boost the academic values of Moroccan universities, ensure the smooth insertion of university graduates in the job market and that constitutes a fertile site for collectivistic and continuous cooperation between governments regardless of how different their orientations and/or convictions might be. Through a discursive analysis of His Majesty's critical reading of the educational situation in Morocco, I put the accent on the idea that the existence of dynamic university governance is a primordial target for a large spectrum of the Moroccan population- a target that necessitates utmost consideration and active, collaborative efforts.

As a practitioner in the higher education sector in Morocco, I end my work with an opinion part in which I stress the need for more investment in the human capital at the university level. Of course, this does not necessarily mean that other corrective measures may be of minor importance. However, I believe that priority should be given to the following human assets: the student, the teaching personnel and the administrative staff. A real mutual involvement of these three components in the Moroccan university governance system would definitely be a strong step away from bureaucratic governance whereby decisions are unidirectional and most often fruitless and short-lived.

The findings of this study seem to be insightful in the sense that they unpack important parameters related to governance in Moroccan tertiary education. The Moroccan university is to be seriously reckoned with as a precious national heritage that needs to be nurtured and protected. Every single actor within the Moroccan university is in front of a historic moment in which she/he is invited to contribute so far may be possible in the implementation of a cooperative, dynamic and productive governance style.

**The Corpus: Retrieved at Morocco World News.com**

**Except from King Mohamed VI Speech, The Revoltion of the King and the People 60<sup>th</sup> anniversary, 2013. Dear Citizens,**

Considering the current state of the education and training sector, we need to pause, assess achievements and pinpoint shortcomings and inadequacies.

I wish to stress, in this respect, the importance of the National Charter for Education and Training, which was adopted through a broad-based national participatory approach.

Successive governments have all worked on the implementation of this charter, particularly the last one, which deployed all the necessary means and resources to implement the Emergency Programme. However, it only engaged in this process during the last three years of its mandate.

Unfortunately, the gains made since this programme's implementation was started have not been consolidated. On the contrary, some of its basic components, namely aspects related to syllabus change, primary school curriculum and high schools of excellence, have been dropped, without consulting or coordinating with the parties concerned.

In view of the above, the current government should have capitalised on the positive experience gained in the field of education and training, especially as this is a crucial project that will span several decades.

It hardly makes sense for each government to come with a new plan every five years, and disregard previous programmes, particularly as no government will ever have the time, during a single mandate, to fully implement its project.

The education sector should, therefore, not be included in the sphere of purely political matters, nor should its management be subjected to outbidding tactics or party politics. Rather, it should be part of a cultural, economic and social approach aimed at training and preparing human resources who can be incorporated into a dynamic development process, through an efficient education system.

**Dear Citizens,**

This frank diagnosis of the education and training system in our country, which is prompted by a keen sense of honesty and responsibility, and which may seem rather harsh, is that of a caring father who, like any father, loves his children deeply.

Admittedly, your Servant does not experience the same social or material difficulties as some segments of the population do, but we all, dear citizens, have the same concerns regarding our children's education and face the same problems in connection with the education system, as our children pursue their studies in the same education system and follow the same syllabi.

What is important in this regard is not money, status or social class, but the conscience that guides every one of us, and his or her patriotism and keenness to serve the best interests of the nation.

When I was Crown Prince, I studied in the Moroccan state school system and later went to the Law School at the Mohammed V University.

It is true that the Royal College has means that regrettably not all state schools have. Nevertheless, generations of national executive staff have actually been trained through state school curricula.

I am indeed sad to note that the state of education is worse now than it was twenty years ago.

As a result, and in spite of their limited resources, a large number of families are compelled to pay huge fees for their children to study in foreign schools or private education institutions in order to avoid the pitfalls of the state school and enrol their children in an efficient system.

In this regard, I refer you to the address I gave last year, on the same occasion, in which I laid down the guidelines for the reform of the education system and called for the implementation of the constitutional provisions regarding the Higher Council for Education, Training and Scientific Research.

I call on the government to speed up the adoption of the necessary legal texts relating to the new council.

In the meantime, I have decided to set in motion the Higher Council for Education with its current composition, in accordance with the transitional provisions stated in the Constitution, in order to carry out an evaluation of the achievements of the National Charter for Education and Training ten years after its launch and tackle this major national issue.

I am being frank with you on this issue, dear citizens, because of the responsibility I bear as your leader. I belong to no political party and take part in no election. The only party I proudly belong to, thank God, is Morocco.

To me, all Moroccans are equal. I make no distinction, be it on the basis of social status or affiliation. As far as I am concerned, there is no difference between a bank manager and a person who is unemployed, between a pilot, a farmer and a minister. They all are citizens with the same rights and the same obligations.

Therefore, we need a broad-based, constructive debate on all the major issues of concern to the nation, in order to achieve the tangible results Moroccans are looking forward to. What we do not need are sterile, disgraceful disputes which lead nowhere, except to settling scores, defamation and calumny. Such disputes only make problems more complex, instead of solving them.

### **Dear Citizens,**

Celebrating the anniversary of the glorious Revolution of the King and the People together with my birthday, amid my extended family whose members are you, loyal citizens, is a unique opportunity to show our respect and high esteem for the martyrs of independence and national unity, including first and foremost my revered grandfather His Majesty King Mohammed V, and my venerable father His Majesty King Hassan II. May they rest in peace.

It is also an occasion that should inspire all of us to do more to keep the flame of the renewed revolution of the King and the people alight, with a strong sense of patriotism, in order to achieve further unity, progress and comprehensive development.

Wassalamu alaikum warahmatullah wabarakatuh.

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# Estimation Performance of the Third and Fourth Grade Students About Measurement

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## ABSTRACT

In this study, third and fourth grade primary school students' performance of measurement estimation in real life situations was examined. Participants were third and fourth grade students. Totally 330 (130 third grades and 200 fourth grades) students in two primary schools located in Istanbul in a middle socioeconomic neighborhood attended. The data were collected with a measuring instrument consisting of six questions including linear measurements of real objects (classroom door, their desks and their mathematics course book). According to the results of the study, it can be concluded that except the one question in every questions more than half of the students could not estimate the measurements of the objects correctly. Both third and fourth grade students estimated the measurement of the height of the classroom door. The performance of the students in the other five questions seems to be low. Another result of the study that both groups have issues while estimating measurements of the real life situations

**Key words:** Estimation, measurement estimation, elementary school student

## INTRODUCTION

There are many important mathematical skills students should have in elementary school. Estimation is one of the most important skills that used in many occasions of daily life and activities related to mathematics education. In such situations, for example if we are shopping or in a restaurant and there is no paper and pencil then we tried to estimate the money that we will pay or in solving a mathematical problem we sometimes estimate the results of problems as well. Estimation is a process rather than content knowledge in the mathematics curriculum, and it applies to several strands (Bana & Dolma, 2004). In many document importance of estimation skills are emphasized (NCTM, 2000; MEB, 2009; MEB, 2015). In estimating, students demonstrate their understanding of number magnitude, number relationships, and the meaning and effect of operations (Alajmi, 2009). Estimation serves as an important companion to computation. It provides a tool for judging the reasonableness of calculator, mental, and paper-and-pencil computations (NCTM, 2000).

There are different estimation types defined in the literature. Some researchers classified estimation as computational and measurement estimation (Segovia & Castro, 2009; Çilingir & Türnüklü, 2009). Some researchers divided estimation into three categories: numerosity, measurement, and computational estimation (Sowder, 1992; Hanson & Hogan, 2000). Hildreth (1983) indicated that because of the three reasons such as (1) Estimation practice helps students develop a mental frame of reference for the sizes of units of measure. (2) Estimation is a useful, practical skill and (3) Estimation is an activity that provides practice with basic proper ties of measurement, measurement estimation should be in the curriculum. The ability to estimate also provides a way to quickly judge the reasonableness of answers obtained by actual physical measurements or to assess the validity of a particular measurement method. Estimation also plays an important role in learning both the principles and procedures of measurement (Gooya et al., 2011).

Measurement estimation to judgments made about the value of a certain quantity or the result that would be found by taking a measurement (Segovia & Castro, 2009). Towers and Hunter (2010) defined measurement estimation as a complex domain, relying on teachers' and students' capacities to integrate measurement concepts and estimation capabilities. As cited in Gooya et al. (2011) measurement estimation can be described as making a measurement without using measurement tools. Sowder (1992) defined measurement estimation such as "measurement estimate can be made without using any arithmetic operations, although some simple ones are frequently involved".

Measurement estimation is an important real-life skill (Gooya et al. 2011). The conceptual prerequisites for measurement estimation fall into two categories: logical reasoning processes described by Piaget and knowledge of specific measurement concepts (Joram, Subrahmanyam & Gelman, 1998). For developing measurement estimation skills of students it is necessary to develop their logical reasoning and knowledge of measurement concepts. In NCTM (2000) it is indicated that estimation activities in prekindergarten through grade 2 should focus on helping children better understand the process of measuring and the role of the size of the unit. Elementary school and middle-grades students should have many opportunities to estimate measures by comparing them against some benchmark. According to Turkish National Mathematics curriculum (MEB, 2015) there are several requirements related with estimation in measurement for primary school students. At the end of the fourth grade, students are able to estimate a length using most appropriate measurement unit. Also, one of the general aims of Turkish national education is to develop students' estimation skills.

Measurement estimation requires the participant to provide estimates of length, height, weight, liquid capacity, and similar measures, usually for common objects in the environment. Typical items include estimates of the weight of a car or pencil, the height of a building, the length of a rope, and the perimeter of a field (Hogan & Brezinski, 2003). Length measurement is called also linear measurement. The estimation of linear measurement involves applying an imagined standard or non-standard length unit to mentally quantify a given segment, object, or path (Chang et al., 2011).

In this study, it was aimed to find out estimation performance of the third and fourth grade students about length and height measurements of classroom door, desk and math course book. In this context, the answers of following questions were examined.

- What are the third grade students' estimation performance related to length and height measurements of classroom door, desks and math course book?
- What are the fourth grade students' estimation performance related to length and height measurements of classroom door, desks and math course book?

## **THE STUDY**

### **Method**

Totally 330 (130 third grades and 200 fourth grades) students in two primary schools located in Istanbul in a middle socio-economic neighborhood attended in the study.

### **Data collection**

Data were collected through a measurement estimation task consisting of six questions related to estimate length and height measurements of classroom door, desk and math course book. Before the data collection, expert opinions on questions were taken. The experts indicated that data collection instrument was appropriate for the third and fourth grade primary students. Data were collected by researchers with one lesson hour for each class in spring semester of 2016-2017 academic year. All students voluntarily agreed to participate this study.

### **Data analysis**

All responses of students were listed and categorized. Responses to real measurements at 20% prediction interval were accepted as the correct estimate by researchers. This 20% prediction interval was determined by researchers. Frequency and percentage of responses were calculated and given as table.

## FINDINGS

Responses of third grade students related to length and height measurements of classroom door, desks and math course book were given in Table 1.

Table 1. Responses of third grade students related to length and height measurements of classroom door, desks and math course book

Questions	Real Measurements	Approximately 20% estimation (cm)	f	%	Upper 20% estimation (cm)	f	%	Real response		Issue	
								f	%	f	%
1	195 cm: The height of the door	156-234	76	58.46	Less than 156 or more than 234	45	34.61	2	1.53	7	5.38
2	92 cm: The length of the door	73.6-110.4	44	33.84	Less than 73.6 or more than 110.4	68	52.30	-	-	18	13.84
3	107 cm: The height of the desk	85.6-128.4	29	22.30	Less than 85.6 or more than 128.4	41	31.53	-	-	60	46.15
4	45 cm: The length of the desk	36-54	21	16.15	Less than 36 or more than 54	83	63.84	-	-	26	20
5	27 cm: The height of the math course book	21.6-32.4	29	22.30	Less than 21.6 or more than 32.4	78	60	3	2.30	20	15.38
6	19 cm: The height of the math course book	15.2-22.8	22	16.92	Less than 15.2 or more than 22.8	67	51.53	4	3.07	37	28.46

Table 1 shows that very few third grade students could mention real measurements of the classroom door, desk and math course book. Among the six questions, the most correctly answered question (%58.46) was the first question including measurement estimation of the height of the door. Measurement estimation of the length of the desk question was least-answered (%16.15) question. Responses in the range of 20% greater than actual measurements were considered as no measurement estimation. Some of the responses did not reflect the measurement estimation for that reason those responses were coded as issue.

Responses of fourth grade students related to length and height measurements of classroom door, desk and math course book were given in Table 2.

Table 2. Responses of fourth grade students related to length and height measurements of classroom door, desks and math course books

Questions	Real measurements	Approximately 20% estimation (cm)	f	%	Upper 20% estimation (cm)	f	%	Real response		Issue	
								f	%	f	%
1	195 cm: The height of the door	156-234	127	63.5	Less than 156 or more than 234	49	24.5	15	7.5	9	4.5
2	92 cm: The length of	73.6-110.4	82	41	Less than 73.6 or more than	102	51	5	2.5	11	5.5

	the door				110.4							
3	107 cm: The height of the desk	85.6-128.4	90	45	Less than 85.6 or more than 128.4	77	38.5	7	3.5	26	13	
4	45 cm: The length of the desk	36-54	50	25	Less than 36 or more than 54	124	62	4	2	22	11	
5	27 cm: The height of the math coursebook	21.6-32.4	45	22.5	Less than 21.6 or more than 32.4	125	62.5	8	4	22	11	
6	19 cm: The height of the math coursebook	15.2-22.8	65	32.5	Less than 15.2 or more than 22.8	98	49	9	4.5	28	14	

As seen from the Table 2 very few fourth grade students could mention real measurements of the classroom door, desk and math course book. Among the six questions, the most correctly answered question (63.5%) was the first question including measurement estimation of the height of the door. Measurement estimation the height of the math coursebook question was least-answered (22.5%) question. Responses in the range of 20% greater than actual measurements were considered as no measurement estimation. Some of the responses did not reflect the measurement estimation for that reason those responses were coded as issue.

## CONCLUSIONS

Being one of the most important skills that used in many occasions of daily life and activities related to mathematics education is measurement estimation. In NCTM (2000) it is recommended that “students should be encouraged to explain their thinking frequently as they estimate. Length measurement estimation ability provides a way to quickly judge the reasonableness of answers obtained by actual physical measurements. The main aim of this study was to assess the performance of third and fourth grade elementary school students in estimating in real life situations of classroom door, desk and their math course book.

As a result of the study it can be concluded that both third and fourth grade students estimated the measurement of the height of the classroom door. The performance of the students in the other five questions seems to be low. Another result of the study that both groups have issues while estimating measurements of the real life situations. There may be many reasons for that issue. It may be due to logical reasoning or knowledge of specific measurement concepts being of conceptual prerequisites for measurement estimation (Joram, Subrahmanyam & Gelman, 1998). As Towers & Hunter (2010) emphasized measurement estimation is a complex domain because it relies on teachers’ and students’ capacities to integrate measurement concepts and estimation capabilities. When comparing the classroom levels, third grade students have more issues than fourth grade students.

Much more measurement activities can be placed in elementary school mathematics curriculum. Moreover, what kind of strategies they preferred to use while estimating measurement of real objects should be investigated. Furthermore, students should be motivated to apply imagined standard or non-standard length unit to estimate measurements.

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# Evaluating the Effectiveness of a Bespoke Training Intervention in Neonatal Resuscitation Training in Zambia – Establishing Grounds For Further Rollout

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## BACKGROUND

Funding has been secured to support the evaluation of a model of neonatal resuscitation training in Zambia. This is preceded by a neonatal care scoping exercise which was undertaken in summer 2015. One of the suggestions made in the scoping report\* was the need to improve staff knowledge and skills in neonatal resuscitation. Therefore, a bespoke programme was developed and delivered to 50 relevant health care professional in Zambia in summer 2016. This employed an outreach strategy and a train the trainer approach to enhance sustainability. It was also hoped that a rolling programme of neonatal resuscitation training would be created to ultimately contribute towards the improvement of neonatal morbidity and mortality rates which are among the highest globally (Central Statistical Office (CSO) 2015; Chisunka 2013). A review of immediate post training outcomes was overwhelmingly positive, as well as an average 20% increase in staff knowledge as measured by pre- and post training test scores\*.

Aims:

The current focus of the project is to evaluate wider elements of the effectiveness of the educational intervention. Effectiveness in this context includes a range of pedagogical and continuing professional development outcomes including the following: evidence of further training undertaken by the trainers; more staff trained since the initial training; the quality and integrity of training has been maintained, as observed using an appropriate tool; positive impact on trainee knowledge as evidenced by pre- and post- training test results; that the goals set by the trainers to improve aspects of neonatal care provision in their respective clinical areas have been reasonably met\*; and that there may be other evidence of positive change in clinical practice as a result of the training.

The project will therefore seek to answer the following questions:

- What further trainings have been undertaken beyond the initial, and how many more staff have been trained?
- How effective have these been in regards to impact on knowledge and skill attainment?
- How well has the quality of training been maintained?
- In what ways have the goals that were set by the trainers been achieved?
- Is there anything that has changed in practice as a result of the training?

## METHODOLOGY:

Fundamentally an approach that evaluates outcomes of an intervention, considers a range of data including qualitative and quantitative, and seeks to answer cause and effect, whilst considering the unique individual context of the subject, will be considered. The latter, together with the opportunity for triangulation through multiple sources of evidence probably makes the case study (Cronin 2014) most suited for this work.

Methods:

The following methods will be used:

- Interviews – of trainers (to determine how much training has been delivered; consider progress towards achievement of goals); candidates at the training session will be asked about how the training has affected their knowledge and skills. Focus groups using a semi-structured questionnaire will be undertaken.
- Observation of training undertaken by the trainers (utilising an appropriate tool to determine the quality of training)
- Document review – records of training to review numbers of staff that have been trained and how much training has so far been delivered; records of pre and post- training knowledge test scores of staff that have been trained to determine effectiveness of training; and a review of the clinical practice reflective logs provided at initial training.

Data analysis

Qualitative elements of the data, for example interviews, will be analysed using thematic analysis drawing out key themes from the findings. The NVivo software will be considered for this process (Leech & Onwuegbuzie 2011).

Appropriate statistical tools will be used to analyse the numerical data to establish change between pre- and post-training test scores thus demonstrating in one way whether learning has occurred. Written consent will be obtained from participants and anonymity will be maintained (Cowan 2009).

#### Research Ethics

Ethical requirements to support this undertaking have been appropriately addressed.

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\* A copy of this information is available on request

# Evaluating the Factor Structure of the Proactive and Preventive Coping of Graduate Students

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## ABSTRACT

The aim of this study is to present the results of the evaluating process confirming whether the proactive and preventive coping scales are both unidimensional constructs as measured by the Proactive Coping Inventory. The construct validity was empirically confirmed in part using an exploratory and confirmatory factor analysis with data from 125 graduate students from a medium-sized private university in the Southwestern United States. Moreover, item analysis and intercorrelations between the coping scales, social support, well-being and depression were carried out. The present study broadens our knowledge in the field of future-oriented behavior by which challenges are not appraised as negative threats. Instead, they are perceived positively and motivate people to overcome the stressful situations.

## INTRODUCTION

Coping is traditionally seen as a set of reactive behaviors or strategies engaged subsequent to the experience of stress. However, more recently, the concept of coping has come to include behaviors undertaken prior to or in preparation for the stressful situation actually occurring. For its positive approach to dealing with stressors, positive promotion of health (Taylor et al., 2000) and creation of constructive habits for improving quality of life and preventing psychological pathology (Seligman & Csikszentmihalyi, 2000) proactive coping is being explored across various sectors and industries. In this time of widespread sociocultural dynamism, proactive coping has become an important strategy for responding to both familiar and unanticipated stressors.

Individuals of any age can benefit from proactive coping concerning study- or work-related stress or personal burnout. The target group consists of graduate students experiencing high demands and intense pressures as a result of their studies; specifically, students entering helping professions (social workers, healthcare workers, teachers, etc.), stand to benefit substantially from those proactive coping mechanisms which focus on quality-of-life management. Self-confident, optimistic individuals who believe in their own abilities and harbor a realistic and positive sense of self-worth may be more likely to practice conscientious health habits, (Aspinwall & Taylor, 1997; Greenglass, 2008) which can then be transposed into their job-related activities.

Proactive coping strategy is anticipatory and future-oriented because the stressful events have not occurred yet (Gan, Yang, Zhou, & Zhang, 2007). It draws on general emotional resources which facilitate promotion of self-directed goals and personal growth, perceiving difficult situations as challenges rather than potential sources of harm or loss. Moreover, proactive copers have a clear, concise vision of the stress experience, in which coping becomes a form of goal management (Greenglass, 2008). Additionally, proactive coping and preventive coping feature characteristics similar to one another, such as resource accumulation, interpersonal- and functional skill development, and long-term planning. However, concerns are more evident in preventive coping behavior than in proactive coping. Preventive coping may be defined as an anticipation of potential stressors, commencement of preparation, and risk management before these stressors – various unknown risks – develop fully.

In order to measure proactive and preventive coping, the Proactive Coping Inventory (PCI; Greenglass et al., 1999) was developed. This multidimensional coping inventory integrates utilization of social resources, self-regulatory goal attainment, strategic planning, emotional and instrumental support seeking, reflective coping and avoidance coping. Researchers have largely implemented PCI within various empirical settings and the latent structure of the whole instrument (Almássy, Pék, & Papp, 2014; Bhushan, Gautam, & Greenglass, 2010; Renard & Snelgar, 2014; Vaculíková, 2016) as well as its separate dimensions have been widely tested (Drummond & Brough, 2016; Sohl & Moyer, 2009).

In the case of proactive and preventive coping, some studies have recognized them together in a unidimensional factor structure (Gan et al., 2007; Greenglass, Schwarzer, & Taubert, 1999; Roesch et al., 2009), and others have recognized the two constructs being multidimensional (Lopez & Cunha, 2008). Although the same instrument measuring proactive and preventive coping was used the number and nature of items vary across studies. For example, Drummond and Brough (2016) reported evidence that in younger samples, proactive and preventive coping are distinct from each other, yet the conceptual distinctions may not be supported empirically in older and more educated samples. Therefore, possible reasons for these discrepancies, besides type of analyses used, might be related to the samples utilized in each study. Based on the mixed results on the dimensionality of the respective proactive and preventive coping and based, too, on the increasing use of these constructs in the current research, this study tests the hypothesis which questions their construct validity.

## **METHOD**

### **Participants**

The University Human Resources Ethics Committee and Institutional Review Board of the participating university issued permission to conduct research. All participating students were invited to participate individually on a voluntary basis and the data selection was conducted via online questionnaire.

The sample was comprised of 125 graduate students from a medium-sized private university in the Southwestern United States. Final questionnaires were selected for use from students aged 21 to 39 years ( $M = 29.74$ ,  $SD = 6$ ). 21 males with an average age of 29.6 years (age ranged from 23 to 39 years,  $SD = 5.73$ ) and 87 females with an average age of 29.8 years (age ranged from 21 to 39 years,  $SD = 6.09$ ) participated in the study. Approximately two thirds of respondents were full-time graduate students (72, 66.7%) and 36 (33.3%) of respondents were part-time graduate students in helping professions. 17 respondents did not identified gender or type of study.

### **Measures**

**Measure of proactive and preventive coping.** The Proactive Coping Inventory (PCI; Greenglass et al., 1999), was implemented to measure proactive and preventive coping with referred Cronbach  $\alpha$ 's ranging from .80 to .85 (proactive coping subscale), and between .79 and .83 (preventive coping subscale). Fourteen items within the proactive coping subscale include self-regulatory goal-attainment cognition and behavior (item examples: "I turn obstacles into positive experiences", or "If someone tells me I can't do something, you can be sure I will do it"). Ten items falling on the preventive coping subscale (item examples: "I plan for future eventualities", or "I think ahead to avoid dangerous situations") are directed toward a potential but uncertain threat in the future by drawing on existing experience, knowledge, or anticipation (Greenglass, 2008). A four-point Likert scale was used with point 1 assigned to "not at all true", 2 to "barely true", 3 to "somewhat true", and 4 to "completely true". There were three reversed items on the proactive coping subscale (i.e., "When I have a problem, I usually see myself in a no-win situation", "I often see myself failing so I don't get my hopes up too high", and "I try to let things work out on their own") that were recoded before conducting further analysis. A mean score was calculated to assess proactive coping and preventive coping behavior (ranging from 1 to 4).

**Measure of social support.** The MOS Social Support Survey (MOS; Sherbourne & Stewart, 1991) was used with a four-point scale ranging from 1 "none of the time" to 4 "most of the time". Items are spread across four dimensions

of social support, more precisely: emotional/informational support, tangible support, affectionate support, and positive social interaction with additional item of measuring support of an activity partner to provide mental distraction. The question asks how often each of these types of social support are available to respondents should the need arise, with higher scores indicating greater availability of support. An example item is “Someone to confide in or talk to about yourself or your problems”, or “Someone to help you if you were confined to bed”. The Cronbach’s alphas all exceeded .90 with the CFA model representing an adequate fit to the data (Robitaille, Orpana, & McIntosh, 2011). A mean score was calculated to assess social support (ranging from 1 to 4).

**Measure of well-being.** The Schwartz Outcomes Scale-10 (SOS-10; Blais et al., 1999) was used to measure psychological well-being over the past two weeks. A four-point scale ranging from 1 “never” to 4 “all or nearly all of the time” was employed with a higher score representing greater well-being. An example item is “I have confidence in my ability to sustain important relationships,” or “My life is progressing to my expectations.” The measure is suitable for respondents 17 years old and up and assesses five key areas, including life satisfaction, positive self-appraisal, optimism, interpersonal effectiveness, and the absence of psychiatric symptoms. A test-retest reliability of .86 and .87 and Cronbach’s alphas ranging from .84 to .96 were reported. A mean score was calculated to assess well-being (ranging from 1 to 4).

**Measure of depression.** The existence of symptoms of depression were measured with the 18-item Clinically Useful Depression Outcome Scale (CUDOS; Zimmerman, Chelminski, McGlinchey, & Posternak, 2008). The measure was studied under research conditions in more than 1,400 psychiatric outpatients and found that the scale had high internal consistency and test-retest reliability in evaluating the quality and efficiency of care in clinical practice. Included items assess all of the DSM-IV inclusion criteria for major depressive disorder and dysthymic disorders as well as psychosocial impairment and quality of life. A five-point Likert scale ranging from 1 “not at all true” to 5 “almost always true” was used. A mean score was calculated to assess depression (ranging from 1 to 5).

### **Research methodology**

The main objective of the presented research is to verify construct validity and internal consistency of proactive and preventive coping behavior sets as measured by selected scales of the PCI. First, confirmatory factor analysis (CFA) was used to test the factor structure gleaned from prior research and theory (Greenglass et al., 1999). A good model fit was assessed by the  $\chi^2$ , the chi-square to degrees of freedom ratio ( $\chi^2/df$ ), and GOF indexes: the Root Mean Square Residual (RMR), the Comparative Fit Index (CFI), the Goodness-of-fit Index (GFI), the Root Mean Square Error of Approximation (RMSEA), the Adjusted Goodness-of-fit Index (AGFI), and the  $p$  of Close Fit (PCLOSE). The cut-off levels of mentioned indexes were checked to determine the model fit (Schreiber, Stage, King, Nora, & Barlow, 2006).

Second, exploratory factor analysis (EFA) was used to explore the latent factor structure of the data that did not support the latent structure mentioned by the theory and research in the first step. The number of remaining factors was based on a visual inspection of the Catell’s scree plot and a combination of the Kaiser–Guttman criterion. The principal component analyses (PCA) with the Oblimin rotation were used. The decision to remove the item from the scale was based on: (1) item loadings below .40, and (2) cross-loadings on more than one factor above .40. The purpose of this setting is to make the orientation in the resulting structure more transparent by excluding values nonessential to interpretation of the factors. Stevens (2002) recommends setting a limit value of the item loadings of .40. A clear interpretation of the factors, although failing to display some lower statistically significant factor loadings, is desirable since the statistical significance of factor loadings is not decisive for the purpose of the factors’ interpretation.

## RESULTS

### Data preparation

Data cleaning indicated occurrence of invalid responses, missing values or errors created during transcription into the SPSS data matrix. The hypothesis that data are missing completely at random was satisfied prior to replacing missing values with Expectation Maximization (EM) imputation technique. The data had a non-significant Little's Missing Completely at Random (MCAR) test, clarifying the use of the EM algorithm to replace missing values with predicted values (Field, 2005). The discriminant validity was calculated by a correlation coefficient within a variables: subjective well-being, feelings of depression, and social support. Preliminary analyses were checked to ensure analysis assumptions. AMOS v. 21 and SPSS v. 22 were used.

### Confirmatory factor analysis

The model fit was tested by CFA using a maximum likelihood method (see Figure 1). First, goodness-of-fit (GOF) statistics were calculated;  $\chi^2(df = 251, p = .00) = 1831.3$ ,  $\chi^2/df = 7.3$ , RMR = .04, RMSEA = .22, CFI = .31, GFI = .67, AGFI = .61, and PCLOSE = .00 pointed out that the model was not fit with the expected level. Moreover, factor loading of each item from the proactive coping varied between .11 (item 8) to .75 (item 53), and .24 (item 11) to .73 (item 18) from the preventive coping.

In the next step, three error covariances were added between these items existing in the same factor (e16-e24, e6-e8, and e4-e12). Results of the second analyses,  $\chi^2(df = 248, p = .00) = 1765.7$ ,  $\chi^2/df = 7.12$ , and their GOF indexes values RMR = .04, RMSEA = .22, CFI = .34, GFI = .69, AGFI = .63, PCLOSE = .00 pointed out that the model still was not fit with the expected level. Therefore, the third analyses was conducted after deleting item 8 and 11 for their very low factor loadings. Results of the analyses,  $\chi^2(df = 206, p = .00) = 1652.5$ ,  $\chi^2/df = 8.02$ , and their GOF index values RMR = .04, RMSEA = .24, CFI = .34, GFI = .70, AGFI = .64, PCLOSE = .00 pointed out that the model still was not fit with the expected level. On this basis, exploratory approach in the following analyses was implemented to find out what was being measured by the PCI

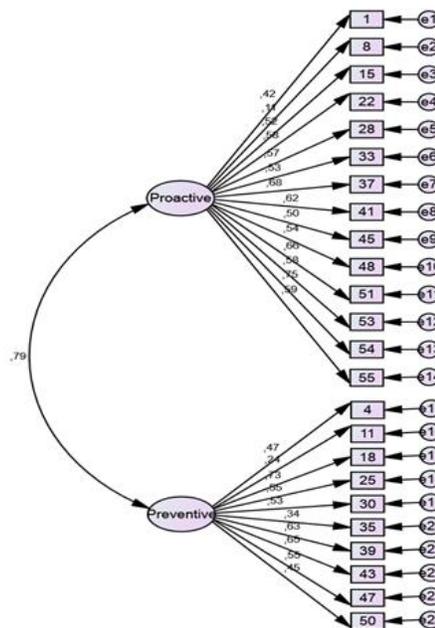


Figure 1: Factor model of the proactive and preventive coping scales

### Exploratory factor analysis

The internal consistency was calculated using Cronbach's alpha coefficient. Prior to performing PCA, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value was checked. KMO of .72 exceeded the recommended value of .60 (Kaiser, 1960) and the Bartlett's Test of Sphericity reached statistical significance ( $\chi^2(276) = 2372.13, p < .001$ ), supporting the factorability of the correlation matrix.

Computed PCA revealed the presence of seven components with eigenvalues exceeding 1, explaining 69% of the variance, ranging from 30% to 4%. However, an inspection of the scree plot revealed a clear break after the second component and the pattern matrix did not show an interpretable structure. On this basis, the Oblimin rotation was implemented, yielding an interpretable two-factor structure with items falling into the proactive coping or preventive coping factor. An exception was reversed item 35 (“When I have a problem, I usually see myself in a no-win situation”) and item 47 (“I plan strategies for what I hope will be the best possible outcome”) from preventive coping falling into proactive coping factor. However, both items deal with future threats by envisioning the situation and planning the next steps before the threat fully develops. Therefore, these might better correspond to the proactive coping factor, showing that respondents did not evaluate planning future actions as a preventive but rather as a proactive outcome that is deepening positive motivation.

The two-factor solution accounted for 41% of the variance, comprised of factors measuring proactive coping (12 items) and preventive coping (9 items). Moreover, item 15 (“After attaining a goal, I look for another, more challenging one”), item 8 (“I try to let things work out on their own” – reverse scored), and item 1 (“I am a “take charge” person”) did not load on any of the factors, resulting in their deletion. Discrepancies of the PCI items have been previously mentioned across a range of varied samples from different cultures (Gan et al., 2007; Lopez & Cunha, 2008; Roesh et al., 2009; Wu, Chen, & Yao, 2008). The factor loadings of the proactive coping (F1) and preventive coping (F2) factors and their descriptive characteristics are displayed in Table 1.

**Table 1:** Pattern Matrix for PCA with Oblimin Rotation on 2-factor Solution

No. Item*	F1	F2	$h^2$	$M (SD)$	$\alpha-i$
33. Despite numerous setbacks, I usually succeed in getting what I want.	.86		.68	3.54 (.50)	.88
35. When I have a problem, I usually see myself in a no-win situation. (r)	.83		.64	3.34 (.54)	.88
54. When I experience a problem, I take the initiative in resolving it.	.,78		.61	3.47 (.52)	.88
41. I always try to find a way to work around obstacles; nothing really stops me.	.72		.51	3.24 (.60)	.88
51. I turn obstacles into positive experiences.	.67		.48	3.36 (.56)	.88
37. I try to pinpoint what I need to succeed.	.66		.49	3.50 (.55)	.88
22. I like challenges and beating the odds.	.57		.38	3.33 (.67)	.88
48. When I apply for a position, I imagine myself filling it.	.55		.35	3.61 (.56)	.88
55. I develop my job skills to protect myself against unemployment.	.52		.34	3.63 (.49)	.88
28. I visualise my dreams and try to achieve them.	.50		.36	3.45 (.62)	.88
53. If someone tells me I can't do something, you can be sure I will do it.	.43		.37	3.23 (.62)	.88
47. I plan strategies for what I hope will be the best possible outcome.	.42		.38	3.55 (.47)	.88
43. I think ahead to avoid dangerous situations.		.66	.57	3.50 (.58)	.88
18. I prepare for adverse events.		.66	.59	3.18 (.65)	.88
45. I often see myself failing so I don't get my hopes up too high.		.61	.50	3.38 (.62)	.88
4. I plan for future eventualities.		.58	.34	3.50 (.62)	.89
50. I try to manage my money well in order to avoid being destitute in old age.		.57	.31	3.31 (.70)	.89

30. I plan my strategies to change a situation before I act.	.55	.35	3.37 (.58)	.88
25. Before disaster strikes I am well-prepared for its consequences.	.51	.34	2.95 (.53)	.88
11. Rather than spending every cent I make, I like to save for a rainy day.	.50	.24	3.16 (.70)	.89
39. I make sure my family is well taken care of to protect them from adversity in the future.	.43	.42	3.44 (.58)	.88
Cronbach's alpha	.88	.81		.89
Number of items	12	9		21
<i>M</i> ( <i>SD</i> )	3.41 (.37)	3.24 (.41)		
Eigenvalue	7.4	2.5		
Explained variance in %	31	10		

Note: \* = presented numbers of the items correspond to the original order of the PCI; (r) = reversed items;  $h^2$  = Communalities; *M* = Mean; *SD* = Standard deviation;  $\alpha$ -*i* = Cronbach alpha if the item is deleted.

The best explained variability of the two factors was in variable 33 (“Despite numerous setbacks, I usually succeed in getting what I want”) and variable 35 (“When I have a problem, I usually see myself in a no-win situation” – reverse scored). Further inspection of the item-total correlations showed that measured items fit the meaning of the averaged measure, i.e. the correlation coefficients did not increase after deleting the items from the subscales.

Proactive coping and preventive coping can differentially enable students to perceive demanding situations in college life as personally challenging. According to the results, the central values of the proactive coping ( $M = 3.41$ ,  $SD = .37$ ) and preventive coping ( $M = 3.24$ ,  $SD = .41$ ) of the four-point scale used in the survey, ranging from not at all true (point 1) to completely true (point 4), lie above the midpoint of the scale. The differences in the mean values of the proactive and preventive coping are statistically significant,  $z = -4.76$ ,  $p < .001$ , with a large effect size ( $r = .43$ ). The result suggests that respondents are higher on proactive coping compared to preventive coping. Thus, on average students deal with future threats largely by employing these coping strategies.

Furthermore, reliability of the new 2-factor model fit reached a good internal consistency of  $\alpha = .89$  covering 21 items. More specifically, proactive coping reached  $\alpha = .88$  (12 items) and preventive coping  $\alpha = .81$  (9 items). Taken together, EFA suggests that the general model representing students enrolled in the formal education system from the Southwestern United States with two factors covered by 21 items is a reasonable representation of the data.

### Correlations

Discriminant validity of the proactive and preventive scale was further investigated by calculating the correlations between the coping scales and other psychological variables representing social support, well-being and signs of depression. First, positive relationship among the social support, well-being and revised coping scales was expected, as these measurements represent improved psychological outcomes. Conversely, negative relationship with the measured signs of perceived depression and positive outcomes of revised scales was highly anticipated.

Preliminary analysis using Shapiro-Wilk test ( $p < .001$ ) and Kolmogorov-Smirnov test ( $p < .001$ ) showed that the data are not normally distributed. Therefore, Spearman's  $\rho$  coefficient was calculated (see Table 2). The findings showed a large significant positive correlation between proactive and preventive coping ( $r_{rho} = .50$ ,  $p < .001$ ,  $r^2 = 25\%$ ), as expected. Proactive coping also positively and significantly correlated with well-being ( $r_{rho} = .29$ ,  $p < .001$ ,  $r^2 = 8\%$ ) and negatively correlated with depression; the latter, however, did not reach a statistically significant extent. Preventive coping was positively associated with mentioned well-being ( $r_{rho} = .38$ ,  $p < .001$ ,  $r^2 = 14\%$ ) and also with social support ( $r_{rho} = .25$ ,  $p < .001$ ,  $r^2 = 6\%$ ). Moreover, age of respondents did not reach statistical significance, showing relative independence of usage of coping strategies by respondents and their age.

**Table 2:** Intercorrelations between the Coping Subscales, Social Support, Well-Being, Depression, and Age

Variables	Measurement	<i>M (SD)</i>	Proactive coping	Preventive coping
Proactive coping	PCI	3.41 (.37)	(.88)	
Preventive coping	PCI	3.24 (.41)	.502**	(.81)
Social Support	MOS	2.26 (1.66)	.149	.248**
Well-being	SOS-10	2.24 (1.62)	.294**	.378**
Depression	CUDOS	1.18 (.94)	-.038	.152
Age	Age in years	29.74 (6)	.148	.018

Note: \*\* =  $p < .01$ . Alpha coefficients are presented on the diagonal.

## DISCUSSION

Proactive and preventive coping are future-oriented constructs dealing with stressful events that are not yet present (Schwarzer & Taubert, 2002). While some studies have recognized uni-dimensional latent factor structure (Gan et al., 2007; Greenglass, Schwarzer, & Taubert, 1999; Roesch, Aldridge, Huff, Langner, Villodas, & Bradshaw, 2009), others have confirmed a multi-dimensional nature (Lopez & Cunha, 2008). Therefore, the primary purpose of this study was to examine the psychometric properties of the proactive and preventive coping scales as measured by PCI for a sample of American graduate students. The distinction of the proactive and preventive coping measured by the PCI (Greenglass et al., 1999) was tested using CFA and EFA. The presented results of the analyses are somewhat ambiguous.

The hypothesis that observed variables can be explained by two latent variables (factors) was investigated using CFA. Together, three CFAs were performed. Results of the analyses pointed out that the model was not fit with the expected level. On this basis, EFA was employed to find out what was measured by the PCI. Prior to performing PCA, the KMO value and the Bartlett's Test of Sphericity were checked supporting the factorability. The final two-factor solution covering proactive coping (12 items) and preventive coping (9 items) accounted for 41% of the variance. Moreover, item 1, item 8, and item 15 were deleted for their low factor loadings. Furthermore, reliability of the revised coping scales reached a good internal consistency of  $\alpha = .89$ . More specifically, proactive coping reached  $\alpha = .88$  (12 items) and preventive coping  $\alpha = .81$  (9 items). Taken together, EFA suggested that the general model representing students enrolled in the formal education system from the Southwestern United States with two distinct factors covered by 21 items is a reasonable representation of the data. However, this result was not supported by CFA in the previous steps.

Discriminant validity of the revised scales was further checked. Correlation coefficients between the coping scales and social support, well-being, and depression were calculated and the relationships between measured personality variables and coping scales were only partly confirmed. There, is however, contention in the literature regarding similar inconsistent correlations with personality and psychological strain across samples (Dunkel-Schetter, 1984; Gan, Hu, & Zhang, 2010; Greenglass & Fiksenbaum, 2009; Holland & Holahan, 2003). Those who employ coping strategies based on proactive and preventive skills more often perceive well-being and, in the case of preventive coping, also dispose of a wide social support. Surprisingly, revised coping scales were not associated with decreasing tendency of feelings of depression as mentioned otherwise (Almássy et al., 2014). Therefore, in this case, being proactive did not seem to influence perceived level of psychosocial impairment in the form of depression. The different findings may be due to respondents' sociodemographic differences, i.e. their lower age and a narrow study specialization in helping professions.

There are several limitations to the current study that should be acknowledged. First, the study privileged female respondents' input due to their majority representation in the population. Second, the current findings apply only to graduate students with similar demographic characteristics. Moreover, results might have been slightly different if there were no missing values with no valid imputation technique needed. Additionally, the PCI scales do not measure all dimensions of proactive coping and are dispositional. Therefore, specific external stressors can cause different responses (Roesch et al., 2009). Lastly, the sample size should be greater than 100 and 5 times the number

of items. However, even sample sizes on the order of 50 respondents can be taken as a reasonable absolute minimum (Winter, Dodou, & Wieringa, 2009). Employment of the CFA followed by the EFA is, in practice, less frequent. Since the latent nature of the presented data was not known, this procedure is seen as adequate.

## Conclusions

This study contributes to the recent discussions on factorial structure and the unidimensionality of proactive and preventive coping as measured by the PCI. The mixed evidence in support of their independent factor structure is provided. Presented investigation of the psychometric properties of the PCI subscales suggests serious refinements of these two scales are in order. Future research involving large-sized samples with separate structure testing by influencing sociodemographic characteristics (such as gender, age, study specialization, etc.) could generate results elucidating what significantly differentiates the factor structure. Moreover, subsequent empirical verification of the constructs on the population may expand our knowledge of the theoretical and empirical distinction between the proactive and preventive coping strategies.

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# **Evaluation of Classroom Teachers' Opinions about In-service Training (The Case of Muğla)**

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## **ABSTRACT**

The current study aimed to evaluate the classroom teachers' opinions about in-service training process. Thus, the current study was designed as a descriptive case study. A total of 28 classroom teachers constituted the sample group of the research. The research process was carried out on the classroom teachers working in state elementary schools in the city of Muğla. A semi-structured interview form was used as the data collection tool in the research and the data were collected through focus group interviews. The results showed that teachers experienced significant problems related to in-service trainings and they found such trainings useful for their professional development. Moreover, the teachers made different suggestions for the improvement of these trainings.

**Keywords:** Classroom teachers, in-service training, teacher opinions

## **INTRODUCTION**

It seems to be a must for individuals to update themselves according to developments and changing conditions during their professional lives as well as during their pre-service training to be able to adapt to the society and to perform a particular job. Institutions where individuals work are as important as their personal endeavor for their professional development. Individuals' in-job training is called in-service training. In-service training is the training given to individuals employed in workplaces belonging to private or legal organizations for them to acquire knowledge, skills and attitudes required by their duties (Taymaz, 1981). In-service training also aims to provide employees with the knowledge, skills and attitudes that will enable them to be more successful, productive and happy in their profession (Gültekin & Çubukçu, 2008). It will be possible to achieve the desired outcomes during the educational process by providing teachers who are the basic element of education with opportunities to constantly renovate themselves through in-service and professional development trainings to be scientifically organized and conducted (Erisen, 1998). In other words, the ability of teachers to do their jobs best can only be improved through in-service training programs. The in-service training programs to be applied to teachers also have a very important place in terms of their personal and professional development and the continuity of the education.

One of the most important elements that make an education system effective is teachers trained with quality education. Seen from this perspective, the effectiveness of the learning-teaching process seems to depend on the quality of in-service training as well as of pre-service training. However, it can be said that teachers in Turkey have had important problems in terms of their in-service professional development. In this regard, it can be said that the lack of cooperation between the Ministry of National Education (MNE) and higher education institutions is the most serious one. Another important problem is the inadequate resources allocated to education by the MNE. It has been determined that the budget allocated for in-service training from the budget of the Ministry of National Education is quite low (TED, 2009). In this sense, it is not possible for MEB to organize qualified and effective in-service training activities to meet teachers' needs with such low budget. It is stated that in-service training courses organized by the In-Service Training Department are directed to different areas and to the participation of a limited number of teachers. It is also emphasized that in-service training programs do not take into account regional and local differences, and that teachers from different schools and from different regions cannot make

adequate use of these programs (Kaya & Kartalioğlu, 2010). In many studies on this field, it has been concluded that the in-service training activities of teachers are not functional enough (Aydoğan, 2002; Uçar, 2005; Durmuş, 2003; Önen, Mertoğlu, Saka, & Gürdal, 2009; Özen, 2004). Thus, it seems difficult to say that teachers' in-service training activities are effective enough.

The focus of the current study are classroom teachers working at elementary school level and this level of schooling includes a very important educational process in terms of laying the ground for the further levels of schooling and the personality development of children. It is possible to say that the quality of education in elementary school which plays an important role for the further stages of education is directly proportional to the quality of classroom teachers working here. Continuous in-service training is as important as pre-service training for teachers who take such a crucial role and deliver many courses in different areas and serve as role models for children to fulfill their instructional and educational duties effectively. In addition, given that classroom teachers come from different disciplines and that many people who did not receive any teacher formation training are still in office, it is necessary for classroom teachers to acquire the knowledge, skills, attitudes and behaviors required by the profession through in-service training programs, courses and seminars. Moreover, the development of new approaches and models in the education system with each day and the implementation of some of them have led to the change in the functions of educational institutions and the roles of the teachers working here. Seen from this perspective, it is imperative for teachers to be professionally developed because the knowledge and skills they have acquired during their pre-service training are not sufficient for effective teaching.

Determination of the training needs of teachers and provision of training in accordance with these needs can be seen as one of the most important duties of the Ministry of National Education, which is the institution responsible for schools and education. In fact, for schools to accomplish their services and functions effectively, teachers must be professionally developed and take an effective role (Boilen, 1988; Budak, 1999). In-service training programs to be organized for teachers will enable teachers to adapt to developing conditions while at the same time they will serve an important function for teachers to compensate for their pre-service weaknesses during the trainings (Karaküçük, 1987). However, for in-service training programs to accomplish their objectives, such programs should be prepared and conducted considering participants' needs and expectations (Gökdere & Çepni, 2004). Although the Ministry of National Education has organized seminars in different fields and topics, it seems possible to say that the inadequacies in teachers' professional content knowledge still persist. One of the most important reasons for this is the fact that the in-service training programs organized for teachers are planned without taking into consideration the needs and these programs are applied without being subjected to an evaluation process. The purpose of evaluating in-service training programs is to judge the effectiveness of the training programs as well as to determine which elements of the programs problems and flows arise from so that necessary corrections can be made and new programs can be developed in light of these evaluations. In this regard, while in-service training programs are being prepared, it is first necessary to carry out needs analysis and to develop the programs in line with these needs. Taking teachers' views is one of the most objective ways not only to determine in-service training needs but also to evaluate in-service training programs (Retalick & Mithani, 2003). However, it seems very difficult to say that the in-service training programs prepared by the MNE are adequately evaluated or that the programs are prepared according to the needs analysis considering the program development principles. Thus, it is quite difficult to argue that the in-service training programs developed and evaluated without considering teachers' opinions can be successful. Therefore, it seems to be of great importance to evaluate the in-service teacher training programs applied to classroom teachers on the basis of their opinions. The current study is an attempt to evaluate in-service teacher training programs by seeking an answer to the question "What are classroom teachers' opinions about in-service teacher training programs? To this end, answers to the following sub-questions were sought?

1. What are the classroom teachers' opinions about the effect of the in-service training courses they have participated in on their professional development?
2. What are the classroom teachers' opinions about the planning and preparation of in-service training programs?
3. How do the classroom teachers evaluate the content of in-service training programs?
4. What are the problems the classroom teachers encounter in in-service training courses?
5. How much importance is attached to classroom teachers' needs while in-service training courses are being organized?

6. What are the solutions suggested by the classroom teachers for effective in-service training?

### **PURPOSE OF STUDY**

The purpose of the current study is to determine the classroom teachers' opinions about in-service teacher training programs.

### **METHOD OF THE STUDY**

This is a descriptive case study. The most commonly used data collection methods in case studies are interview, observation and document analysis. In the current study, the focus group interview technique was employed (Yıldırım & Şimşek, 2013). The focus group interview was adapted by Morgan (1992, 1996) and started to be used in different disciplines such as sociological, pedagogical, educational and political sciences. The focus group interview refers to a discussion conducted by an existing or newly constructed group in an atmosphere of an interactive communication about any topic within a given time period (Brotherson, 1994; Överlien, Aronsson & Hydén, 2005).

### **SAMPLE OF THE STUDY**

The study group of the current research is comprised of 28 classroom teachers selected from five different schools with varying socio-economic levels in the city of Muğla. The teachers participated in the study on a volunteer basis. The data were collected by means of focus group interviews conducted in the spring term of 2016-2017 school year. Of the participant teachers, 15 are males and 13 are females. The ages of the teachers range from 34 to 57. The professional experience of the participants varies between 11 years and 35 years. Of the teachers, 13 hold an undergraduate degree and 8 hold an associate's degree in the field of classroom teacher education and 8 are graduates of different departments. All of the participants were found to have taken in-service training seminars in different periods.

### **Data Collection and Analysis**

As a data collection tool in the study, a semi-structured interview form was used. For the development of the form, the relevant literature was reviewed and thus the interview items were constructed. In light of expert opinions, some changes were made on the items. Then the piloting of the form was performed and some questions were discarded and final form with 6 items was obtained. Yet, while conducting interviews, some probing questions were also asked on the basis of expressed opinions. The interview form included; besides questions to elicit personal information, questions asking whether they have participated in any in-service training program, whether the in-service program they participated in made some contributions to their professional development, whether in-service programs are sufficient, problems they experienced during in-service training and their suggestions for solutions to the problems experienced during in-service training. The interviews were conducted as a focus group during the seminar period in June 2016-2017 with teachers, either in classrooms or in the teachers' room. With the permission of the teachers, the interviews were tape-recorded. The data from the interviews were analyzed by two researchers through the content analysis. The data obtained from the interviews were first transferred to the computer environment using the Office program. The texts were read several times line by line and the coding for this was created. Concepts used during coding were derived from the data in connection with the literature. During the analyses, continuous comparison method was employed. The continuous comparison method allows the researcher to clearly and accurately present the data (Kvale, 1996). The codes were then grouped together to find common themes (categories) that would form the main lines of research findings. The codes under the determined themes are explained in relation to each other and interpreted and the results are put forward in line with the aim of the research (Maykut & Morehouse, 1994).

### **Validity and Reliability**

Concepts such as credibility, transferability, verifiability and consistency are used instead of the concepts of validity and reliability in qualitative research. In the current study, the themes emerging from the analysis of the data were directly supported with quotations and thus transferability of the research was tried to be ensured. As for verifiability, it is recommended that the characteristics of the participants should be described in detail, the research process should be explained, and data collection and analysis processes should be explained clearly (Yıldırım & Şimşek, 2013). Great care was taken for the detailed explanation of these elements in the method and

findings section of the research. For the consistency of the study, help of another researcher was sought in the analysis of the data. Both researchers co-encoded the data together and reached a consensus on codes and themes.

## FINDINGS

In the current study aiming at evaluating the in-service training programs on the basis of the opinions of the classroom teachers, some findings were obtained about the contribution of in-service training to the professional development of teachers, the problems experienced in in-service training programs and suggestions for solutions. Findings related to the problems expressed by the classroom teachers in relation to the planning of in-service training seminars are given in Table 1.

**Table 1.** Findings related to the Classroom Teachers' Opinions about the Problems in the Planning of In-service Training Seminars

Codes	f
There is no needs analysis	9
There is no planning and preparation	6
Teachers' opinions are not sought	3
The timing is bad	13
Teachers' needs are ignored	6
There is a lack of organization and seriousness	9

When Table 1 is examined, it is seen that the highest number of teachers complain about the bad timing of in-service trainings (f:13), which is followed by absence of needs analysis (f:9), lack of organization and seriousness (f:9), lack of planning and preparation for seminars (f:6), negligence of teachers' needs (f:6), and lack of attention to teachers' opinions (3). In this connection, some quotations from the teachers' statements are given below.

SÖ 6. "In-service training programs are organized for the sake of organizing."

SÖ12. "In-service training programs are offered due to procedural requirements."

SÖ17. "I believe that in-service training programs should be initially planned well. Planning them before the school opens between September 1 and 15 seems to be highly suitable. In-service training programs organized when the school opens is not very useful."

SÖ18. "Our opinions are not sought while in-service training programs are being planned."

SÖ22. "In-service training programs are not prepared considering our needs."

SÖ24. "I believe that in-service training programs are conducted very superficially; we cannot get the intended benefits."

SÖ26. "In-service training programs are inadequate; as they are planned without considering the real classroom environment, we cannot implement what we have learned in our classrooms. Classroom teachers' needs should be determined and the in-service training should be designed according to these needs."

SÖ27. "Our opinions are taken every year. But we see that these opinions are not considered while programs are being planned."

**Table 2.** Findings related to the Classroom Teachers' Opinions about the Benefits of In-service Training Programs

Codes	f
It did not meet my needs, did not make any contribution	12
It was beneficial	9
It was partially beneficial	7
The ones we voluntarily participated in were beneficial	9
The ones we were required to participate in were not beneficial	6
Those given outside the MNE were beneficial	4

As can be seen in Table 3, different opinions were reported about the benefits of the in-service training. While the highest number of teachers stated that it did not meet their needs (f:12), some others were of the opinion that it was partially beneficial (f:7); on the other hand, the number of those stating that it was beneficial is not small (f:9). The teachers also stated that whether the participation is required or voluntary is important in terms of finding the in-service training beneficial. In this connection, while some of the teachers stated that the seminars they voluntarily participated in were more beneficial, some others stated that they could not get any benefits from the seminars in which participation was required. Some participants stated that seminars organized outside the MNE were more beneficial (f:4).

SÖ 2 “very few of the seminars I participated in were useful and these were organized by some other institutions apart from the MNE. They were very useful. For example, one of them was organized by ÖRAV.”

SÖ 5 “They were partially beneficial, we cannot say they accomplished their objectives. They made some contributions.”

SÖ7. “In-service training is not very efficient most of the time. Everybody wants to leave the training immediately after they have signed. The seminars organized by the Teacher Academy of Garanti Bank were wonderful. They were practice-based. The seminars of The Ministry of National Education are not so effective.”

SÖ8. “I think that in-service training programs are partially useful because while deciding on the topics of training, general topics concerning Turkey are selected.”

SÖ 18. “In-service training is useful. Timing can be bad sometimes. If they are within the term, we have to hurry to arrive on time after the class. If they were organized in better times, they could be more beneficial.”

SÖ19. “Some of them are unnecessary. Yet, there are also some useful ones.”

SÖ21. “In general they contributed to my professional development but there are some not conducive. Depending on the topic they focus on, this changed. I did not get much benefit from the ones in which participation was required. On the other hand, the ones I voluntarily participated were useful.”

SÖ26. “If in-service training programs are conducted in suitable time and place, then they will be beneficial.”

SÖ28. “Of course, in-service training seminars are useful, as long as they fit for purpose.”

**Table 3.** Findings related to the Classroom Teachers’ Opinions about the Content of In-service Training Seminars

Codes	f
Theory-based Content	9
Lack of practice	7
Limited content	4
Lack of emphasis on topics we want	6
Lack of emphasis on classroom application.	7
Inclusion of topics irrelevant to us.	6

As can be seen in Table 3, the classroom teachers are of the opinion that the content of in-service training programs mostly includes theory (f: 9), not enough emphasis is put on practice (f:7), classroom applications are not much included in the content (f:7), the content is limited ( f:4) and topics irrelevant to them are also included in the content. Some quotations related to these findings are given below:

SÖ 6 “The content of in-service training courses is somewhat empty.”

SÖ 7 “The titles seem to be wonderful but the content is very limited. I think one of the reasons for this is the limited time.”

SÖ14. “The time is very limited in in-service trainings. A lot of information is tried to be given in a very limited time period, and of course this is not good.”

SÖ11. “Regular in-service trainings are always focused on theory. Practice is lacking.”

SÖ28. “If we can meet our needs then they can be useful for; if we are presented with information that we won’t use in the class, then it is useless. But in general, they are not suitable for our needs. Irrelevant topics are presented. If they present information about classroom applications and children, then they will be more useful.”

**Table 4.** Findings as regards the Problems Encountered by the Teachers during the Implementation of In-service Training Seminars

Codes	f
Lack of practice	11
Use of traditional methods	19
Lack of teacher participation	5
Bad planning of time	16
Unsuitable places	12
Lack of equipments	8
Lack of instructors	14
Lack of seriousness in the organization	8
Transportation, food and beverage	3

As can be seen in Table 4, the most important problem experienced by the teachers during the in-service training seminars is the use of traditional methods (f:19) and it is followed by the bad timing because seminar are usually held when schools are open (f:16), lack of instructors giving in-service training (f:14), unsuitable places where in-service training is given (f:12), lack of seriousness in the organization and implementation of in-service training programs (f:8) and lack of teacher participation (f:5). Some quotations related to these findings are given below:

SÖ3 "Seminars are given in a very short time span; thus, in general they do not have any benefits."

SÖ5. "I find the timing and place unsuitable."

SÖ7. "When the place is unsuitable, teachers may perceive it as an unrespectful attitude towards them. This is very important because in many other professions such trainings are organized in hotels with a nice atmosphere. I do not mean we want this. But, this is the indication of respect shown to your profession, personality. We have never felt this respect. We are given in-service training in cold places while sitting on hard chairs."

SÖ8. "Instructors giving the in-service training should plan their training with an awareness of the fact that they are addressing teachers and what their levels are. This should not be done with ordinary techniques."

SÖ10. "When such courses are applied, they become more useful for me. If they are not so, they are not efficient."

SÖ11. "If in-service training courses became more practice-based and included more sample applications showing how teachers could be more useful for their students, then they would be more useful."

SÖ14. "Places are not very suitable. There is no practice; there is only pure lecturing and it is very boring".

SÖ15. "When in-service training programs are held within the term, then we have to hurry to arrive on time. Sound systems are not good in places thus we cannot hear well."

SÖ24. "We are trained in small and airless halls. Therefore, trainings should be given in better places suitable for teachers."

SÖ26. "When starting their in-service training seminars, instructors tell that it would not be long, which kills our enthusiasm. They are in a hurry to finish their training."

SÖ27. "I think we are not motivated enough. We are not told why we should take this seminar."

**Table 5.** Findings related to the Teachers' Participation in the Planning Process of In-service Training Seminars

Codes	f
Our opinions are not taken	7
Our opinions are taken but not reflected into the application	18
Courses we want are not opened	6
Participation is required	7
Our opinions are taken	2

As can be seen in Table 5, many teachers stated that although their opinions are taken, they are not reflected into the application (f:18). Some of them are of the opinion that their opinions are not taken while in-service training programs are being prepared (f:7), some others stated that the courses they want are not opened (f:6). On the other hand, some teachers think that the courses they are required to participate in are not very useful (f:7).

SÖ 2. "Our opinions are taken. Some of them are put into practice. But, in general, they are overlooked."

SÖ 3. "Opinions are taken but more importance is attached to their own opinions while planning seminars."

SÖ 4. "Opinions are taken for in-service trainings. Then, some of these opinions are not taken into consideration."

SÖ5 "Initially, opinions are taken but then they do not find any reflections in practice."

SÖ9. "Our opinions are asked but the courses we want are not opened."

SÖ 12. "In-service training courses we want are not opened. We do not willingly participate in courses organized by the Ministry of National Education as they do not much cater to our needs."

SÖ15. "The Ministry prepares a plan for a year. Our opinions are taken at the end of the school year through teacher committees. Yet, these are not taken into consideration most of the time."

SÖ16. "Sometimes our opinions are taken through questionnaires. Yet, most of the time, our opinions cannot find reflections in practice."

SÖ22. "We are generally reporting what kinds of in-service training we want through our teacher committees. Yet, as understood, they are not taken into consideration while trainings are being planned. Topics are presented in general, specific issues are not addressed. Therefore, we cannot get enough benefits."

SÖ 24. "Our opinions are not taken into consideration."

**Table 6.** Findings related to the Solutions Suggested by the Classroom Teachers for In-service Training Seminars to be More Effective

Codes	f
Needs analysis	9
Instructors specialized in the field	15
Better timing	14
Attaching greater importance to the teacher	3
Motivating teachers	4
Building places for in-service training	5
More emphasis on practice	8
Taking teachers' opinions into consideration	5
Cooperation with universities and other institutions	8
Utilization of active methods	6
More suitable educational environments	14

As can be seen in Table 6, the teachers think that for better in-service training instructors should specialized in their field (f:15), timing of in-service trainings should be better planned (f:14), educational environments should be more suitable in terms of equipments, tools and sound systems (f:14), special places should be built for giving in-service trainings (f:4), greater importance should be attached to teachers (f:3), teachers who participate in seminars should be rewarded to increase their motivation (f:4), instead of lecturing and reading from slides, active methods promoting teacher participation should be used (f:6), cooperating with universities and other institutions while organizing in-service training programs should be encouraged (f:8), teachers' opinions should be taken into consideration while organizing in-service training programs and they should find reflection in practice (f:5) and needs analysis should be conducted to determine teachers' needs (f:9). Some quotations related to these findings are given below:

SÖ2 "Instructors should be qualified, I think that it would be more beneficial to organize in-service trainings within the two weeks before the school opens and after it closes."

SÖ4 "It could be more effective to organize seminars in the summer holiday within June and September."

SÖ5 "Standardized in-service training centers should be built in each city. These centers should be well equipped so that we go there enthusiastically. "

SÖ6. "We are people doing practice in the field. Therefore, such in-service training programs should be more practice-centered."

SÖ8. "If our opinions are taken into consideration through teacher committee meetings and end-of-term meetings, they can be more efficient."

SÖ8 "Cooperation can be established with universities."

SÖ9 "Practice-focused applications taking teachers' needs into consideration would be more useful."

SÖ10 "If instructors are more qualified and places are more comfortable, then in-service trainings will be more effective."

SÖ12. "They should be conducted in cooperation with universities. Especially education faculties should be involved and academicians specialized in their relative fields should prepare and give these training programs."

SÖ14. "The time of in-service training should be better planned and they must be applied. A very good preparation

*needs to be done.”*

*SÖ16. “Teachers should not always be in the position of listeners, it would be better if they actively participated in.”*

*SÖ18. “If they are given in smaller groups, then they will be more effective.”*

*SÖ19. “Better planning of time, good places, qualified instructors will make in-service training more effective.”*

*SÖ20. “Extra points can be given to those participating in in-service trainings by the Ministry. Additional course fee should be given to those participating in weekend and evening seminars.”*

*SÖ22. “The needs of teachers should be precisely determined, and the trainings should be developed on the basis of these needs.”*

*SÖ23. “Teachers participating in seminars should be rewarded.”*

*SÖ24. “Participation should be on a volunteer basis not required. If teachers are called at the weekend, additional course fee should be paid to them. Points should be given to teachers participating in seminars.”*

*SÖ25. “I think larger budget should be allocated. Private sector is a good example of it because they allocate a really good budget. ”*

*SÖ26. “Pre-interviews should be conducted for in-service trainings to be successful. If teachers’ problems and needs are determined and seminars are developed according to these, then they will be more effective. ”*

## **CONCLUSIONS**

The interviews conducted with the classroom teachers revealed that there are some problems related to planning and implementation of in-service training programs. Regarding the planning, they pointed out that in-service trainings are carried out without conducting needs analysis, taking teachers’ opinions, without enough planning and preparation work. In the study conducted by Pepeler, Murat, and Akman (2016) on elementary school teachers, it was revealed that the teachers complained that their in-service training seminars were not well planned, they were not motivated in their work and that there was no co-operation. In the study conducted by Sıcak and Parmaksız (2016), they found that there was no role of teachers in the process of needs analysis within the context of professional development activities. As can be understood from the research results, while conducting in-service trainings, the first thing to be done is to conduct needs analysis; yet, this is not done and moreover, teachers’ opinions are also not taken into consideration while planning and implementing trainings and these are the most important factors affecting the effectiveness of in-service training programs. In fact, without determining the problems and needs of teachers, it seems to be not possible to develop in-service training programs that can have goals, content, learning processes and evaluation to meet teachers’ needs.

In the study conducted by Sıcak and Parmaksız (2016), it was determined that the contribution of developmental activities to the professional development of teachers was at the theoretical level, the methods and techniques used in in-service training programs were not appropriate and the evaluation process was inadequate.

Findings derived from the teachers' opinions show that in-service training is not as efficient as desired. In the same way, the opinions of the teachers indicating that the seminars they participated in on a volunteer basis were more effective than the required ones also show that seminars teachers willingly participate in are more functional than the required ones. Some of the classroom teachers stated that though they experience some problems arising from physical conditions, in-service trainings are useful in general. In a similar manner, Özen (2006) also reported that though elementary school teachers find in-service trainings useful, they experience problems arising from timing and physical conditions. In Madden’s (2003) study, it was concluded that in-service training activities can partially impart the intended knowledge to teachers; yet, they cannot make adequate use of this knowledge in their professional life; thus, such trainings do not increase teachers’ efficiency in work places at the desired level.

Regarding the content of in-service training, the classroom teachers mostly stated that the programs cover theoretical issues, that classroom practices are not adequately provided, that the content is very limited and that topics that are needed by them are not generally included in programs. As can be seen at the end of the current research, the organized in-service training seminars cover theoretical topics rather than the classroom-based content that the teachers need. In this regard, it seems to be quite difficult for teachers to carry what they have learned in the seminars into their classrooms. Similar to the research results, it has been found out that in-service training seminars are more theoretically structured, the application dimension is ignored, scheduling is inappropriate, places are not suitable and eating and drinking facilities are inadequate (Eroglu, 2005; Seferoğlu

2001; Özen, 2006).

As a result of the current research, it was seen that the classroom teachers encountered many problems during the application process. According to the teachers, these problems are mostly due to the fact that the theoretical issues in the implementation of the in-service training programs are explained by reading from the slide, the timing is not functional since the school is usually open, the places where the in-service training is given are inappropriate and the trainers providing in-service training are inadequate and teachers cannot actively participate in the process. In the study conducted by Özen (2006), it was determined that the in-service training programs are not serious in practice, the teachings are mostly about theory, there is very little practice, scheduling of programs is not appropriate and the physical and technological facilities are inadequate. In the literature, it has also been reported that teachers participating in in-service training programs sometimes make use of what they have learned in these programs. The reasons for not utilizing what they have learned are claimed to be lack of physical facilities at school, theoretical knowledge's not being functional in practice and crowded classroom (Kanlı & Yağbasan 2002; Tekin & Ayas, 2005).

According to the results of the current research, the vast majority of the classroom teachers stated that while their opinions are taken to plan in-service trainings, their opinions do not find enough reflection in practice and very few of the topics they want are included in programs.

The classroom teachers who participated in the research have made remarkable suggestions to make in-service training programs more effective. Some of these suggestions are as follows; instructors should be qualified in their fields, in-service training programs should be scheduled so that teachers can participate in when schools are closed, places where in-service trainings are organized should be made more suitable in terms of physical conditions, tools and equipments, places for in-service trainings to be organized should be built in cities, comfortable environments should be created for teachers to participate in in-service trainings, material and spiritual rewarding systems should be established to increase the motivation of teachers, active methods should be employed to encourage teachers to participate, cooperation should be developed with universities and other institutions while organizing in-service training seminars, teachers' opinions should taken into consideration while organizing in-service training programs and needs analysis should be conducted to determine teachers' needs. Günbayı and Taşdoğan (2012) found that teachers are positively affected by in-service training programs when the participation is voluntary, in-service trainings are qualified, they are given people specialized in their fields, they are applied, teachers participate actively, in-service training programs meet the classroom needs of teachers and in-service training programs have up-to-date and interesting topics. In the same study, it was determined that the most important expectation of teachers in terms of effectiveness of in-service training is the improvement of educational environments. On the basis the teachers' opinions, following suggestions can be made for more effective in-service training;

- In-service training programs should be designed on the basis of needs analysis and by taking teachers' opinions into consideration,
- Places and educational settings where in-service training programs are held and equipments and tools to be used should be organized in such a way as to allow effective learning,
- In-service training programs should be conducted as practice-centered and to allow teacher participation,
- In-service training programs should be organized when schools are closed so that more teachers can participate,
- Teachers participating in in-service training programs should be provided with different opportunities such as additional course fee, service points and promotion,
- Instructors who will give in-service trainings should be selected from among those specialized in their fields,
- Food, beverage and transportation should be provided for teachers who will participate in in-service trainings,
- More resources should be allocated to in-service training of teachers,
- Cooperation should be developed with universities and other institutions for in-service trainings.

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# Evaluation of School Quality

Süleyman GÖKSOY

## ABSTRACT

The present research aims to determine the effectiveness of schools in the aspects of principals, teachers, students and parents and to investigate whether school efficacy has significant difference in terms of gender, age, branch, service period in the profession and service period in the school according to teacher perspectives. Scanning model was used in order to establish the current situation. Scale was used for collecting data. The data collected by using data collection tool was analyzed statistically with normality test first and data range was analyzed by using Kolmogorov-Smirnov and Shapiro-Wilk tests. Following the analyses, the data was analyzed and interpreted with Whitney-U and Kruskal Wallis-H tests from nonparametric statistical tests since the data did not demonstrate normal range. The study group consists of 1912 teacher from kindergartens, primary, secondary and high schools in Ereğli district in Zonguldak in 2016-2017 academic year. The sampling consists of 340 teachers who were selected with case sampling method and they represent the research universe. The following results were obtained in the research: Teachers think that the quality of school environment and students is high. According to teachers, parents carry out their roles in school processes in medium level. It can be concluded that the gender (male teacher, female teacher) and the profession (branch) of the teachers do not have a meaningful impact on school efficacy according to teacher opinions. It can be inferred that teachers who have higher professional seniority regard the schools and school aspects more qualitative and effective than teachers who have lower seniority. It can be deduced that the service periods of the teachers in their current schools do not have a meaningful impact on school efficacy.

**Key Words:** Teachers, principals, students, school environment, parents

## PROBLEM STATUS

School quality is formed with the effect of many factors such as respond to student differences, emphasis on active learning, educational program, different educational approaches, time management, evaluation, heterogeneous grouping, cooperative learning, technology and high expectations (Lunenburg, 1992). Edmonds (1986) defined the qualified and effective school as the school that involves effective leadership, humanistic environment, high expectations, necessary facilities, that monitors student improvement and that focuses on teaching important skills to the students (Lunenburg and Ornstein, 2013). In fact, experiences of a school cannot be directly implemented to the situation of other schools. The conditions of each school are unique and they require to implement unique combinations in terms of learning theories, materials and methods (Senge, Cambron, McCabe, Lucas, Smith, Dutton, Kleiner, 2012). Basaran (2000) states that management processes should be arranged in order to improve the effectiveness of the schools. In this context, Basaran (2000) puts the emphasis on planning, accomplishment of educational, organizational and managerial goals, provision of necessary inputs, setting the organizational structure, utilization of all strengths in line with the school mission, communication, effect of management and response of the subordinate, interaction, supervision and the process of implementation of the management plan while avoiding deviations.

There are some accepted indicators in determining the ideal and effective school criteria or the efficacy of a school. According the research findings carried out on this topic, some of the features of an effective school are as follows (Sisman, 2002a; Sisman and Turan, 2006; Lunenburg and Ornstein, 2013; Balci, 2013): School has clear aims and policies. It embodies successful academic and educational leadership. The school staff includes devoted, well-trained people who have good humanistic qualifications. School staff participates in educational activities continuously and improves themselves. They expect high levels of success from the students and believe that they can achieve it. There occurs academic volume in the school schedule and in all kinds of activities. Teachers spare a great deal of time to their professions and to the school. They guide the development of the students and monitor their improvement. They detect learning disabilities beforehand, take precautions accordingly and develop strategies. There is a positive

school environment and atmosphere. The school has a culture based on positive school climate and perfection. School-parent relationships are in the highest rank and parents contribute to the school both material and non material. The decisions made are school-based, teachers participate in activities and take responsibilities. Teacher develops different strategies in order to increase the motivation of the students. Also students are given the opportunity to participate and take responsibilities. Each student is given individual attention.

The current research aimed to determine the effectiveness levels of the schools. The following questions were sought:

- 1) According to teacher perceptions, to what extent are the schools effective in the aspects of principals, teachers, students and parents?
- 2) According to teacher perceptions, is there a significant difference in school effectiveness in terms of gender, age, branch, service period in teaching and service period in the school?

## **METHOD**

### **Research Model**

Scanning model (Karasar, 2006) was used in the research in order to detect the current situation. Data were collected by a scale in order to determine the school effectiveness. Suggestions were developed after interpreting the obtained findings.

### **Data collection Tool**

A scale was used in order to collect data in line with the research objectives. Effective School Scale developed by Balci (2013) consists of five parts. The first part includes personal information about the research subjects. Other subparts consist of the aspects as principals (n=12), teachers (n=23), school environment (n=21), students (n=6) and parents (n=6). Alpha coefficients of the scale was calculated by Balci (2013) respectively as follows; principals (.88), teachers (.92), school environment (.94), students (.77) and parents (.87). In the present research, the scale alpha confidence results were recalculated and they were found as follows; principals (.88), teachers (.88), school environment, (.87), students (.88), parents (.91) and the general scale confidence value was calculated as (.85).

### **Data Analysis Method**

In the statistical analysis of the data obtained via data collection tool of the research, a normality test was carried out primarily then the data distribution was examined with Kolmogorov-Smirnov and Shapiro-Wilk tests. Since the data did not demonstrate normal distribution, the data were analyzed by using Whitney-U and Kruskal Wallis-H tests from nonparametrical statistical techniques. In line with the quinary grading scale used in the study, score intervals were determined as 100- 1.79 (none), 1.80-2.29 (little), 2.30-3.39 (moderate), 3.40-4.19 (very much), 4.20-5.00 (completely)

### **Population and Sampling**

The research consists of 1912 teachers who work in all kindergarten, primary, secondary and high schools placed in Zonguldak, Ereğli in 2016-2017 academic year (Ereğli Directorate of National Education 2016). The sampling consists of 340 teachers who were chosen with easily accessible case sampling method and who represent the population. The aim of implementing easily accessible case sampling is to provide objective selection of the participants, to give right to be selected to each individual in the population and to facilitate selection process by providing the participation of volunteer individuals. The distribution of teachers participated in the research was given in the tables below. The distribution of the teachers according to gender variable is given in Table 1.

Table 1. Frequency and Percent Values for Gender Variable

Groups	<i>f</i>	%	% <sub>gec</sub>	% <sub>yig</sub>
Male	127	37,4	37,4	37,4
Female	212	62,4	62,4	99,7
Total	340	100	100,0	

The research sampling consists of % 62,4 female and % 37,4 male teachers.

The distribution of the teachers participating in the research according to age variable is given in Table 2.

Table 2. Frequency and Percent Values for Age Variable

Groups	<i>f</i>	%	% <sub>gec</sub>	% <sub>yig</sub>
24 and below	30	8,8	8,8	8,8
25-29	72	21,2	21,2	30,0
30-34	79	23,2	23,2	53,2
35-39	77	22,6	22,6	75,9
40-44	35	10,3	10,3	86,2
45-49	31	9,1	9,1	95,3
50 and above	16	4,7	4,7	100,0
Total	340	100,0	100,0	

The majority of the teachers are between the ages of 25-39 and the minority consists of teachers at the age of 50 and above.

The distribution of the teachers participating in the research according to branch variable is given in Table 3.

Table 3. Frequency and Percent Values for Branch Variable

Groups	<i>f</i>	%	% <sub>gec</sub>	% <sub>yig</sub>
Social Sciences, Philosophy, History, Geography	25	7,4	7,4	7,4
Turkish-Literature	43	12,6	12,6	20,0
Mathematics	32	9,4	9,4	29,4
Fine Arts-Painting- Music-History of Art	23	6,8	6,8	36,2
Others	217	63,8	63,8	100,0
Total	340	100,0	100,0	

63.8 of the teachers participated in the research are from other branches. The majority of the teachers from other branches is from primary school teaching branch.

The distribution of the teachers participating in the research according to service period in teaching profession variable is given in Table 4.

*Table 4. Frequency and Percent Values for Service Period in Teaching Profession Variable*

<i>Groups</i>	<i>f</i>	<i>%</i>	<i>%<sub>gec</sub></i>	<i>%<sub>yig</sub></i>
1-5 Years	90	26,5	26,5	26,5
6-10 Years	72	21,2	21,2	47,6
11-15 Years	91	26,8	26,8	74,4
16-20 Years	42	12,4	12,4	86,8
21 and above	45	13,2	13,2	100,0
Total	340	100,0	100,0	

There are teachers who newly started their professional lives as well as teachers who have been teaching for 21 years and more in the research sampling.

The distribution of the teachers participating in the research according to service period in the school variable is given in Table 5.

*Table 5. Frequency and Percent Values for Service Period in the School Variable*

<i>Groups</i>	<i>f</i>	<i>%</i>	<i>%<sub>gec</sub></i>	<i>%<sub>yig</sub></i>
1-2 Years	131	38,5	38,5	38,5
3-4 Years	105	30,9	30,9	69,4
5-6 Years	34	10,0	10,0	79,4
7 Years and above	67	19,7	19,7	99,1
Total	340	100,0	100,0	

The majority of the teachers in the research sampling have been teaching in the same school for 1-2 or 3-4 years.

## FINDINGS

### 1- Quality of schools according to teachers

Table 6 includes the distribution of effectiveness levels of the schools according to teachers participated in the research in terms of different values.

*Table 6. Arithmetic Means and Standard Deviation Values of Effective School Scale Subdimensions*

<i>Dimensions</i>	<i>N</i>	$\bar{x}$	<i>ss</i>
Principal	340	4,0336	,82912
Teachers	340	4,0257	,65443
School environment	340	3,9421	,71009
Students	340	3,5931	,86151
Parents	340	3,2392	1,03509
Total	340	3,7667	65625

When the table is examined, it can be seen that teachers` perspectives towards principals, teachers, school environment and students are high but their perspectives towards parents are at the moderate level. The average of teachers` opinions about the schools is high. The current findings demonstrate that teachers regard the quality of principals, teachers, school environment and students as high. Also teachers think that parents carry out their roles related to school operations at the moderate levels.

**2- In terms of Gender Variable**

Table 7 includes the distribution of effectiveness levels of the schools according to teachers opinions in terms of gender variable.

*Table 7. Results of Mann Whitney-U Test carried out to determine whether effective school scale points differ according to gender variable*

<i>Groups</i>	<i>N</i>	$\bar{x}_{sira}$	$\sum_{sira}$	<i>U</i>	<i>z</i>	<i>P</i>
Male	127	164,65	209,00			
Female	212	173,20	367,00	127,00	-,777	,437
Total	339					

Mann Whitney-U Test was carried out in order to determine whether effective school scale points differ according to gender variable. In the test results, there is not a statistically significant difference between the opinions of male teachers (Median 164,65) and of female teachers (Median 173,20). (U=127,00, p>0,05).

**3- In terms of Age Variable**

Table 8 includes the distribution of effectiveness levels of the schools according to teachers opinions in terms of age variable.

*Table 8. Results of Kruskal Wallis-H Test carried out to determine whether effective school scale points differ according to age variable*

<i>Groups</i>	<i>N</i>	$\bar{x}_{sira}$	$x^2$	<i>sd</i>	<i>p</i>	<i>Difference</i>
24 and below	30	94,98				1-3,1-4,1-5,1-6,1-7
25-29	72	143,79				2-3, 2-4,2-5,2-6,2-7
30-34	79	170,97	34,60	6	,000	
35-39	77	199,15				
40-44	35	189,76				
45-49	31	193,76				
50 and above	16	204,91				

*Kruskal Wallis-H Test was carried out to determine whether effective school scale points differ according to age variable and a significant difference was observed in teacher opinions ( $x^2=34,60$ , p<0,05). In order to determine the group that the difference stems from, multiple comparisons were made with Mann Whitney U test. Multiple comparisons demonstrated that the difference have occurred between the following groups; 1 and 3, 1 and 4, 1 and 5, 1 and 6, 1 and 7, 2 and 3, 2 and4, 2 and 5, 2 and 6, 2 and 7.*

**4- In terms of Profession (Branch) Variable**

Table 9 includes the distribution of effectiveness levels of the schools according to teachers opinions in terms of branch variable.

*Table 9. Results of Kruskal Wallis-H Test carried out to determine whether effective school scale points differ according to branch variable*

<i>Groups</i>	<i>N</i>	$\bar{x}_{sira}$	$x^2$	<i>sd</i>	<i>p</i>
(1) Social sciences, Philosophy, History, Geography	25	178,64			
(2)Turkish-Literature	43	165,94	9,29	4	,054
(3)Mathematics	32	144,34			
(4) Fine Arts- Painting- Music- History of Art	23	124,39			
(6)Others	217	179,21			

Kruskal Wallis-H Test was carried out to determine whether effective school scale points differ according to branch variable. In the test results, no significant difference in teacher opinions about the branches was observed. ( $x^2=9,29$ ,  $p>0,05$ ).

**5- In terms of Professional Service Period Variable**

Table 10 includes the distribution of effectiveness levels of the schools according to teachers opinions in terms of professional service period variable.

*Table 10. Results of Kruskal Wallis-H Test carried out to determine whether effective school scale points differ according to professional service period variable*

<i>Groups</i>	<i>N</i>	$\bar{x}_{sira}$	$x^2$	<i>sd</i>	<i>p</i>	<i>Difference</i>
1-5 Years	90	132,06				1-3, 1-4,1-5
6-10 Years	72	161,23				2-3
11-15 Years	91	194,79	24,35	4	,000	
16-20 Years	42	194,19				
21 and above	45	190,99				

Kruskal Wallis-H Test was carried out to determine whether effective school scale points differ according to professional service period variable. The results demonstrated a significant difference in teachers opinions about professional service period variable ( $x^2=24,35$ ,  $p<0,05$ ). Multiple comparisons was made with Mann Whitney-u Test in order to determine the group in which the difference has occured. With the multiple comparisons, the difference was observed in the groups 1-3, 1-4, 1-5, 2-3.

**6- In terms of Service Period in the School Variable**

Table 11 includes the distribution of effectiveness levels of the schools according to teachers opinions in terms of service period in the school variable.

*Table 11. Results of Kruskal Wallis-H Test carried out to determine whether effective school scale points differ according to service period in the school*

<i>Groups</i>	<i>N</i>	$\bar{x}_{sira}$	$x^2$	<i>sd</i>	<i>P</i>
1-2 Years	131	167,26			
3-4 Years	105	159,04	4,04	3	,257
5-6 Years	34	166,66			
7 Years and above	67	189,20			

Kruskal Wallis-H test was carried out to determine whether effective school scale points differ according to service period in the school and no significant difference was observed in teacher opinions in the test results. ( $x^2=4,04$ ,  $p>0,05$ ). Therefore, it can be inferred that the service period of the participants in a particular school does not have a meaningful impact on their opinions about the school effectiveness.

**RESULTS AND SUGGESTIONS**

. The research aimed to determine the effectiveness levels of schools in the aspects of principals, teachers, students and parents according to teacher opinions. Also the research aimed to reveal whether school effectiveness depend on gender, age, branch, professional service period and service period in a particular school considering teacher opinions. The following results were obtained:

- 1) Teachers regard the quality of school environment and students as high. It can be stated that students think that schools are well managed by the principals, that teachers and students are successful above average and that the school environment is at good level. however, it is clear that although teachers have positive opinions about the schools, they do not think the sam efor the parents. According to teachers, the parents do not fulfil their responsibilities enough. They moderately respond to the needs of the school. Similarly, the research carried out by Balci (2013) demonstrates that parents roles in the school environment is provided in moderate or low levels and that the relationships between the school-environment and school-parents are not healthy. That the roles and responsibilities of the parents is not sufficient in the process of improving school quality is clear. It can be suggested that the roles and responsibilities of the parents should be increased and developed.
- 2) It can be stated that the gender of the teachers (male teachers, female teachers) does not have an effective impact on the improvement of the school effectiveness.
- 3) Significant difference between the opinions of teachers about the age variable was observed. According to current findings, teachers think that older teachers are regarded as more qualified than younger ones. Also younger teachers think that their schools are less qualified and less effective in comparison with the opinions of older teachers. this dissensus may stem from the fact that newly appointed and younger teachers have greater expectations about the school, school structure and school items and think that current structure and applications do not meet the requirements of an effective school. This may be the reason of the difference in the opinions of teachers from different age groups.
- 4) It can be inferred that the profession (branch) variable does not have any meaningful impact on teacher opinions towards school effectiveness.
- 5) In the analysis of the professional service period variable, it was observed that teachers with higer professional service periods think that the school aspects are more qualified and effective in comparison with the teachers who are newly appointed or who have shorter professional service periods. The current finding may indicate that younger teachers and older teachers do not think the same about the expectations and existing standards.
- 6) It can be interpreted that the service period of the teachers in a particular school does not have a meaningful impact on their opinions about the school effectiveness. According to teachers, there is no need for long period studies in

order to understand and examine the positive and negative situations in schools. They think that one or two year long studies may be sufficient to have an overall view about the effectiveness of the applications in schools.

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# Evaluation of The Effectiveness of Peer Teaching Method in Social Studies Lesson

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## ABSTRACT

The present study aimed to determine the impact of using the Peer Instruction Method in 7th grade Social Studies Course on the academic achievements of students, their attitudes towards the course and the retention of learning. Quasi-experimental design with pre-test, post-test, single experiment and single control group empirical research method was used in the study. The study was conducted in the 2014-2015 academic year spring semester with 7th grade students in a secondary school in Turkey. The data obtained in the study were analyzed with SPSS (Statistical Package for Social Sciences) 21.0 software. Descriptive statistical methods were used to assess the study data. Data analysis was conducted with t-test, ANOVA, Mann-Whitney U, and "between the groups and intra-group mixed analysis of variance" (Repeated Measure-ANOVA). Based on the study findings, it was determined that the achievements of the students in the study group where the Peer Instruction Method was used were higher when compared to that of the students in the control group ( $F = 7,805, p < ,05$ ). Based on the retention test results, no significant difference was found between the groups. Based on the attitude scale findings, it was observed that there was an upward tendency towards the end of the process between the pretest and posttest scores of the students in both the study group where peer instruction method was used and the control group where the instructions and activities listed in the curriculum was used. However, it was observed that there was no significant difference between the pretest and posttest attitude scale scores of the students in the study and control groups.

**Keywords:** Social studies education, peer instruction, academic achievement, attitude.

## INTRODUCTION

For the students to acquire the desired behavior, it is necessary to conduct in-classroom activities in all levels of formal education institutions (Arslantaş, 2011, p.488). The question of how to make the students to acquire the content most effectively leads us to instruction methods. The path of instruction includes instructional approaches, instruction methods and instruction techniques.

Instruction method is a path of instruction where the techniques, the subject matter, tools, materials and resources should be organized and integrated and provided for the students (Aydın, 2001, p.55).

Today, interesting, attention-grabbing and student-oriented instruction methods that activate the students are preferred instead of conventional teacher-oriented instruction methods and techniques that bore the students. In a way, when using these approaches, the objective is to teach the student how to learn. Several studies demonstrated that the methods and techniques that enable active participation of the students render a more effective, quality and retained instruction. One of the methods that improve the quality of education and enable active student participation in the classroom is the method of Peer Instruction.

Peer instruction method, which is an interactive method, is also one of the most significant, highly effective methods and productive that could be applied in social studies courses due to high student participation and guidance towards democratic approaches, having both cognitive and emotional aspects, and ability to enable communication within the classroom.

## **THEORETICAL BACKGROUND AND PREVIOUS STUDIES**

Peer instruction was first developed by Eric Mazur, a physicist, in its current applied form, which was scrutinized in the present study. Eric Mazur, who has been teaching physics courses with traditional methods for several years, has made certain changes in instruction techniques, aiming both to improve the positive attitude of the students towards the course and to provide a retained learning. After some trial and error, he finally developed a method known as Peer Instruction worldwide (Ünalın, 2010, p.23). The main objective of peer instruction method is to focus the attention of the students to the basic concepts using the student interaction throughout the course. Instead of instructing the knowledge in the textbook or lecture notes in detail, it aims to conduct the course with classes where the key points are instructed in a series of presentations, followed by brief conceptual questions on the topic and focusing the attention of the students with discussions on the questions that enable high interaction among the students (Mazur, 1997, p.10). Mazur, who used this method effectively in the classroom thanks to technological advances in computer technology, asked every student to think about the question for a few minutes after the question is projected on the screen. The silence is maintained in the class during this period. Then everyone chooses one of the answer options using a little tool that looks like a remote control. These instruments, which communicate with the teacher's computer, transmit the response of each student to the computer. The answers of all the students are evaluated with the software installed on the computer, and after a few seconds, a bar graph depicting the a, b, c, d options appears on the screen. Everyone has the opportunity to see what percentage of the class chooses which choice. Since it is not clear who selected which choice, shy and hesitant students automatically overcome the fear of giving incorrect responses and their participation is ensured. Then, the students form small groups to discuss the question with their peers. They explain the reasons for their choices to each other and try to convince each other. During this activity, the teacher who walks around the classroom also participates in the discussions when it is necessary and requested by the students. Then they take the remotes and repeat the answering process. Usually, with the second answers provided after this step, the bar graph changes to favor the correct answer. Peers, then, attempt to assist other who are not yet persuaded. (Ünalın, 2010, p.23) If most students have responded correctly to the concept test, a new topic is introduced. If the percentage of correct answers is too low, the topic is re-instructed in more detail and a new concept test is given

Naturally, the peer instruction method has many advantages based on the findings of previous studies. This method breaks the inevitable monotony in static courses as a result of the persuasion efforts of the student towards her or his peer (Mazur, 1997, p.14). It provides permanent learning.

Several studies were conducted on peer instruction and the impact of peer instruction on individual's academic achievement and attitude towards the course, cooperation and collaboration between individuals, cognitive, affective and behavioral development of the individual was investigated in these studies. In these studies, it was observed that peer instruction method was effective on the abovementioned achievements (Eryılmaz, 2004; Tokgöz, 2007; Can, 2009; Demirciođlu & Şekerciođlu, 2009; Şen, 2010; Kavanoz & Yüksel, 2010; Şekerciođlu, 2011; Akay, 2011; Gok, 2012; Yavuz, 2014).

Trent (1996) investigated the effects of the peer instruction method on the performance of chemistry students. Further studies investigated the effects of peer instruction on physiology education (Rao&DiCarlo,2000), comprehension of the concepts of forces and movement by 9<sup>th</sup> grade students (Harvey, 2003), learning experiences of engineering students at a college in the UK (Nicol & Boyle, 2003), comprehension of biological concepts by the students in biology classes at University of Colorado (Smith et al., 2009) and English language instruction in Switzerland (Dumont, 2013). Thus, previous studies produced successful results.

The results of a ten years long study on peer instruction was reported by Crouch, Watkins, Fagen and Mazur (2007). Butchard, Handfield and Restall (2009) investigated the impact of peer instruction on philosophy and logic instruction and critical thinking skills of the students in a study they conducted. These studies reported that peer instruction yielded positive results as well.

When using peer instruction method in courses, the probable results of certain changes in the process were tested. For example, in a study by Lucas (2009), a peer instruction method where students used i-clickers, in

other words an electronic response system, when answering the questions instead of flash cards or response cards that are regularly used in peer instruction. It was observed that peer instruction with i-clicker had a significant impact on learning.

In a study by Perez, Strauss, Downey, Galbraith, Jeanne, & Cooper (2010), the effect of the type of implementation of the peer instruction method was tested. In that study, whether the second responses provided after the first discussion using i-clicker or the personal response system had bias was investigated.

Porter, Bailey-Lee, Simon & Zingaro (2011) also investigated the effect of the Peer Instruction method applied in computer courses on achievement. Particularly, it was observed that the success rate climbed to 85-90% with this method, which focused on discussion in the study.

In conclusion, several studies were conducted on the effectiveness of the Peer Instruction method and significant number of the previous studies reported that this method was effective. Although the method is called Peer Instruction in only a few of these studies, it was considered appropriate to include all since they focused on the role of the peer instruction in education despite the fact that they did not fully comply with the method developed by Eric Mazur (Perez, Strauss, Downey, Galbraith, Jeanne, & Cooper, 2010; Turpen, & Finkelstein, 2010; Allison, 2012).

## **METHOD**

In this section, the research method, study group, data collection instruments, data collection process and analysis are discussed.

### **Research Method**

The present study is a semi-experimental study based on the assignment of groups before the application and other features. Semi-experimental design is a research method where the participants are not randomly assigned to groups. This is preferred when the researcher is unable to artificially form a group for the experiment (Creswell, 2008, p.313). The most used design in semi-experimental research is "non-equivalent comparative group design". This design includes both experimental and comparison (control) groups. But the participants are not assigned to the groups randomly. The studies conducted with similar designs are called semi-experimental research. In other words, these studies are conducted without full compliance to internal and external validity, which are the criteria for the empirical status of a study.

### **Study Group**

The study was conducted with primary school 2<sup>nd</sup> level, 2nd grade (7th grade) students attending a secondary school in Turkey during 2014-2015 academic year. The study groups were divided as experimental and control groups in the study.

### **Experimental Stage**

Initially, a comprehensive literature review was conducted to determine peer instruction method applications in Turkey and worldwide. For this purpose, students that would be included in the study were determined with cluster sampling method based on the quasi-experimental design. Certain criteria were considered for the implementation of the cluster sampling. These were;

- 6th grade GPAs of the students
- 7th grade first semester GPAs of the students
- Similar female and male student distribution
- Pretest scores

Gender distribution among the experimental and control groups is as follows:

**Table 1:** Gender distribution among the experimental and control groups

Groups	Female		Male		Total
	N	%	N	%	N
Experiment	16	45	20	55	36
Control	19	53	17	47	36

Table 1 demonstrates a homogenous distribution between the experimental and control groups with respect to gender. The fact that the sizes of the groups were equal or similar was positive.

**Table 2:** t-test Results on Experiment and Control Group Term Averages

CLASS	N	$\bar{X}$	SS	Sd	t	p
6 <sup>th</sup> GRADE C	34	46,88	3,80	64	,375	<b>,709</b>
1 <sup>st</sup> SEM. E	32	46,50	4,48	64	1,63	<b>,110</b>
6 <sup>th</sup> GRADE C	34	48,18	2,62	64	1,44	<b>,156</b>
2 <sup>nd</sup> SEM. E	32	46,78	4,13	64		
7 <sup>th</sup> GRADE C	34	47,52	2,78	64		
1 <sup>st</sup> SEM. E	32	46,31	3,95			

It was shown that the grade point averages in experimental and control groups were equal. In other words, the groups complied to group formation criteria based on the abovementioned predetermined criteria.

**Table 3:** t-test Results Based on Social Studies Course Average Grades in Experiment and Control Groups

CLASS	N	$\bar{X}$	SS	Sd	t	p
6 <sup>th</sup> GRADEC	34	4,53	,614	64	-,380	<b>,705</b>
1 <sup>st</sup> SEM. E	32	4,59	,756	64	1,464	<b>,144</b>
6 <sup>th</sup> GRADEC	34	4,91	,287	64	-,642	<b>,523</b>
2 <sup>nd</sup> SEM. E	32	4,78	,420	64		
7 <sup>th</sup> GRADEC	34	4,70	,462	64		
1 <sup>st</sup> SEM. E	32	4,78	,490			

Table 3 demonstrates that experiment and control groups were equal based on social studies course average grades as well.

#### Comparison of Pre-Test Achievement Scores of Experiment and Control Groups

**Table 4:** Descriptive Statistics Results for Pre-Test Academic Point Averages of Experiment and Control Groups

Group	N	$\bar{X}$	SS	Skewness	Kurtosis
Experiment	36	70,86	14,89	-,817	,373
Control	36	72,71	11,70	-,207	,437

**Table 5:** ANOVA Results for Pre-Test Academic Point Averages of Experiment and Control Groups

	Degree of Freedom	F	P	Effect Size	Observed Power
GROUP	1	,343	,560	,005	,343
ERROR	70				

Table 5 demonstrates that there was no significant difference between the pre-test scores of the experimental and control groups ( $F(1,70) = .343$ ,  $p = 0.560$ , Partial Eta-Square = 0.05, Power = 0.343). As a result, the null hypothesis cannot be rejected; thus, we can assume that the experimental and control groups were equal based on the pre-test achievement scores.

### Comparison of Experiment and Control Groups' Pre-Test Attitude Scores.

**Table 6:** Descriptive Statistics Results for Pre-Test Attitude Scores of Experiment and Control Groups

Group	N	$\bar{X}$	SS	Skewness	Kurtosis
Experiment	33	2,47	,25	,276	1,313
Control	32	2,58	,20	-,552	-,296

**Table 7:** ANOVA Results for Pre-Test Attitude Scores of Experiment and Control Groups

	Degree of Freedom	F	p	Effect Size	Observed Power
GROUP	1	3,350	,072	,050	,438
ERROR	70				

Table 7 demonstrates that there was no significant difference between the pre-test scores of the experimental and control groups ( $F(1,70) = 3.35$ ,  $p = 0.072$ , Partial Eta-Square = .050, Power = 0.438). As a result, the null hypothesis cannot be rejected; thus, we can assume that the experimental and control groups were equal based on pre-test attitude scores.

### Data Collection Instruments

For the purposes of the present study, the achievement test (pretest, posttest and retention test) that was designed based on the 7<sup>th</sup> grade social studies curriculum "Economy and Social Life" unit content and Social Studies course attitude scale were used as the data collection tools. This section includes information on the acquisition, development and data collection process conducted with data collection instruments.

### FINDINGS

In this section, the findings on the topic of the present study; the impact of the use of peer instruction method in the social studies course on academic achievements of the individual, the individual's attitude towards the course and the retention of the knowledge, are presented.

### Academic Achievement Test Findings

**Table 8:** Descriptive Statistics Results for Pretest – Posttest and Retention Test Academic Achievement Point Average Scores of Experiment and Control Groups

Group	N	Pretest		Posttest		Retention Test	
		$\bar{X}$	S	$\bar{X}$	S	$\bar{X}$	S
Experiment	36	71	14,89	85,29	12,42	83,60	12,55
Control	36	73	11,69	78,77	10,33	82,27	8,52

Table 8 demonstrates that the mean academic achievement pre-test, post-test and retention test scores differentiated among the groups. There was a difference of about 6 points favoring the experimental group in the posttest. Whether or not this difference was statistically significant would be seen as the result of the ANOVA. In other words, whether this difference could be generalized for the population would be revealed by inferential statistics.

**Table 9: Covariance Matrix Analysis for Pretest – Posttest and Retention Test Academic Achievement Point Average Scores of Experiment and Control Groups**

Box's Test of Equality of Covariance Matrices <sup>a</sup>	
Box's M	7,945
F	1,262
df1	6
df2	35501,887
<b>Sig.</b>	<b>,271</b>

There should be no difference between the covariance of the groups for aired combinations of measurement groups (Can, 2015: 252). Box test conducted to test this condition demonstrated that there was no significant difference between the covariance of the groups as shown in Table 9 ( $p > 0.050$ ).

**Table 10: Sphericity Mauchly Test Results**

Within Subjects Effect	Approx.		Chi- df	Sig.	Epsilon <sup>a</sup> Greenhouse-	
	Mauchly's W	Square			Geisser	Huynh-Feldt Lower-bound
Time	,962	2,682	2	,262	,963	1,000 ,500

Sphericity Mauchly test results shown in Table 10 demonstrated that the significance of the “Mauchly’s test of sphericity” that tested the null hypothesis “there is no difference between the variance of the differences between the measurements” was greater than 0.005, thus the sphericity condition was met ( $p = .963$ ).

**Table 11: Repeated Measure ANOVA Results for Pretest – Posttest Academic Achievement Point Average Scores of Experiment and Control Groups**

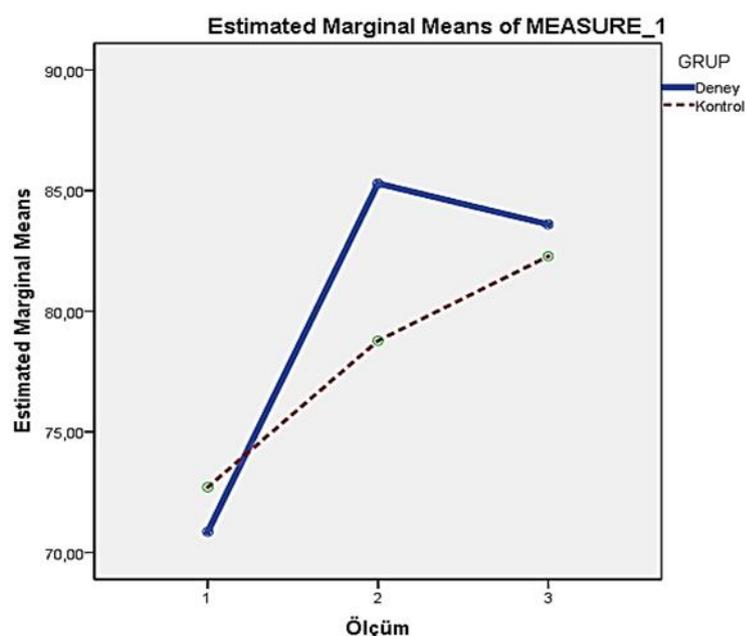
Source of Variance	Sum of Squares	df	Mean Squares	F	p	Partial Squared	Eta Squared
Measurement Sphericity Assumed	5530.384	2	2765.192	32.284	,000	0.316	
Measurement *Sphericity GROUP Assumed	<b>642.004</b>	<b>2</b>	<b>321,002</b>	<b>3.748</b>	<b>,026</b>	<b>,051</b>	

Table 11 demonstrates that the difference between measurements and groups was significant. In other words, it was observed that the differences between the pre-test, post-test and retention tests and the groups were significant. When the effect size of the difference between measurements was examined, it was observed that the impact was also significant. On the other hand, when the measurement \* group interaction was examined, it was observed that use of the Peer Instruction method in the experimental group had an impact on the academic achievements of the students. In other words, there was a significant difference between the experimental group ( $\bar{X} = 85,29$ ) and the control group ( $\bar{X} = 78,78$ ) favoring the experimental group. ( $F = 7,805$ ,  $p < .05$ ). The effect size also appeared to be significant (Cohen, 1988; cited by Tabachnick & Fidell, 2007, p.56).

**Table 12:** Levene Test Results on Group Pretest and Posttest Scores

	F	df1	df2	Sig.
Pretest	1,352	1	70	,249
Posttest	,418	1	70	,520
Retention test	4,928	1	70	,050

Table 12 demonstrates that the variance in pretest, posttest and retention test results of all groups was equal based on Levene test results ( $p > .050$ ).

**Figure 1:** Pretest and Posttest Scores of the Groups

As shown in Figure 1, group averages that were close to each other in the first measurement differentiated favoring the experiment group in the second measurements.

That is, the achievement scores of both experimental and control groups in posttest were higher than the pretest scores. Thus, it could be observed that the achievements of both the experimental and the control groups increased. However, the achievement of the experimental group was significantly higher than that of the control group. In fact the increase in the achievement of the experimental group was significantly higher when compared to the

achievement of the control group (Partial Eta Square = 0.10).

#### “ATTITUDE TOWARDS THE SOCIAL STUDIES COURSE” SCALE FINDINGS

**Table 13:** Descriptive Statistics Results for Pretest – Posttest and Retention Test Attitude Scores of Experiment and Control Groups

Groups	Pretest			Posttest			Retention test		
	N	$\bar{X}$	S	N	$\bar{X}$	S	N	$\bar{X}$	S
Experiment	33	2,48	,254	33	2,53	,219	33	2,53	,236
Control	32	2,58	,201	32	2,59	,262	32	2,52	,195

Table 13 demonstrates that the attitude pre-test, post-test and retention test mean scores were similar. To determine whether the differences were statistically significant, between groups and in-group mixed analysis of variance (repeated measures) was used, and the findings were listed.

**Table 14:** Covariance Matrix Analysis for Pretest – Posttest and Retention Test Average Attitude Scores of Experiment and Control Groups

<b>Box's Test of Equality of Covariance Matrices<sup>a</sup></b>	
Box's M	5,087
F	,804
df1	6
df2	28679,57
<b>Sig.</b>	<b>,567</b>

For paired combinations of measurement groups, there should be no difference between the covariance of the groups (Can, 2015: 252). The box test conducted to test this condition demonstrated that there was no significant difference between the covariance of the groups as shown in Table 14 ( $P > 0.050$ ).

In cases where more than two measurements are conducted for repeated measures, the variances of the differences between any two measurements should be equal. This most significant condition of the test is controlled by the Mauchly's Test of Sphericity, the results of which are presented in the table below.

**Table 15:** Mauchly's Test of Sphericity Results

Within Subjects Effect	Mauchly's W	Approx. Square	Chi-df	Sig.	Epsilon <sup>a</sup>		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Zaman	,999	,086	2	,958	,999	1,000	,500

Since the significance value of "Mauchly's Test of Sphericity", which tests the null hypothesis "there is no difference between the variances of the differences between the measurements," was greater than 0.005 ( $p = .958$ ), the sphericity condition was met based on the results presented in Table 1.

**Table 16:** Repeated Measure ANOVA Results for Pretest – Posttest and Retention Test Average Attitude Scores of Experiment and Control Groups

Source of the Variance	Sum of Squares	Sd	Mean Sq.	F	p	Effect Size	Obsrved Power
<b>Between subjects</b>	1932	64					
<b>Group</b>	<b>,040</b>	<b>1</b>	<b>0,40</b>	<b>1,318</b>	<b>,255</b>	<b>,020</b>	<b>,204</b>
<b>Error</b>	1,892	63	,030				
<b>In-Subjects</b>	4,802	130					
<b>Measure (Pretest-Posttest-Retention)</b>	,038	2	,019	,561	,572	,009	,141
<b>Group*Measure</b>	,110	2	,055	1,613	,203	,025	3,226
<b>Error</b>	4,312	126	,034				

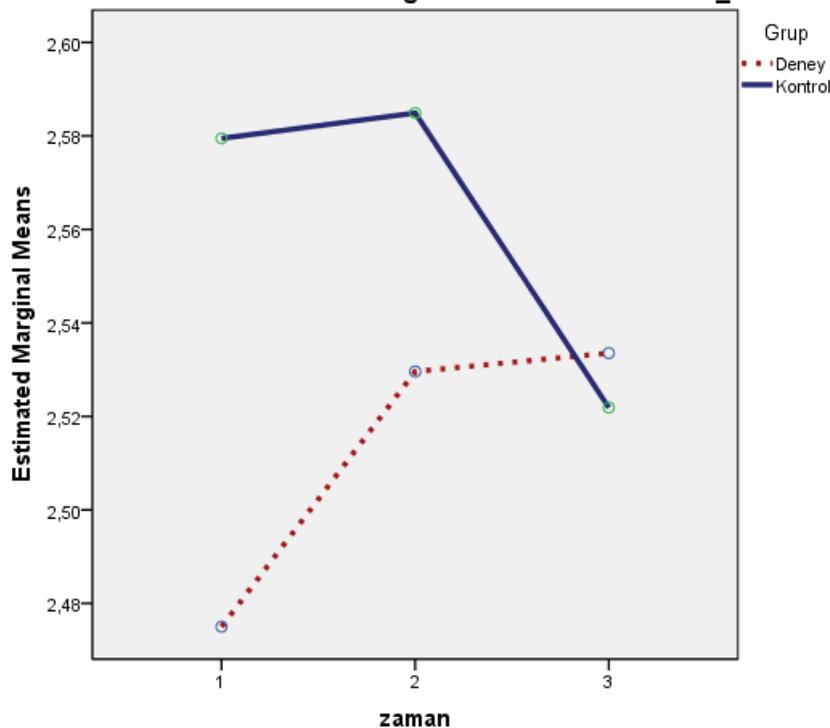
Table 16 demonstrates that there were no significant differences between the attitude scale scores of the students in experiment and control groups before and after the experiment. In other words, there was no evidence that the common effects of being in different groups and repeated measure factors on attitude scale scores were significant. Based on the mixed analysis of variance results conducted on three-step achievement test scores of the groups (pretest-posttest-retention), there was no evidence that the group effect [ $F(1,63) = 1.318, p > 0.050$ ], the between the measures effect [ $F(2,126) = .561, p > 0.050$ ], and the common effect (group \* measure) [ $F(2,126) = 1.613, p > 0.050$ ] were statistically significant.

**Table 17:** Levene test results on group pre-test, post-test and retention test scores

	F	df1	df2	Sig.
Pretest	,908	1	63	,344
Posttest	,143	1	63	,706
Retention Test	,261	1	63	,611

As seen in Table 17, the results of the Levene test findings indicated that the group variances were equal in the pre-tests ( $F = .908, p > 0.050$ ), post-tests ( $F = .143, p > 0.050$ ) and retention tests ( $F = .261, p > 0.050$ ).

**Figure 2: Variation in Group Average Attitude Scores with Pretest, Posttest and Retention Test results**  
**Estimated Marginal Means of MEASURE\_1**



Examination of Figure 2 would demonstrate that the most striking finding was the higher experiment group average retention posttest score in the experiment group when compared to the average retention pretest score, while the average retention posttest score in the control group was lower than average retention pretest score. Furthermore, the highest increase between the pre-test and post-test scores was observed in the experiment group. Thus, although there was no evidence that there was a statistically significant difference between the experimental and control groups based on both the inter-measure and inter-group attitude scores, it could be argued that

there was a more prominent improvement in the experiment group based on the impact and observation power when the score intervals between the groups were examined.

## DISCUSSION AND CONCLUSION

The study findings demonstrated that the Peer Instruction method tested in the Social Studies course had serious impact on the academic achievement attitudes towards the course and the retention of the learned knowledge of the individual. Since this method was developed by Eric Mazur, dozens of domestic and international experiments have been conducted and dozens of articles have been written on this method.

In every study that could be accessed since the Peer Instruction method was first applied, it was observed that the positive effects, the shortcomings and different elements related to the method were examined in detail. In previous studies conducted on peer instruction, its effects on academic achievements of the students and retention of knowledge, on the interest and attitudes of the students towards the course, their attitudes towards the administration, its role in the achievement of scientific process skills, its effect on comprehension levels,

conceptual learning, motivation and self-efficacy of the students were investigated and domestic studies revealed that it resulted in serious achievements although its effect size and rate differed from one study to another.

Previous studies conducted on Peer Instruction revealed that the findings were consistent with the results of the present thesis. Based on the literature reviewed within the context of the present study, the current thesis was the first in examining the peer instruction method in the field of social studies. The effect of using the Peer Instruction method in the social studies course was investigated based on the three dimensions of academic achievement of the individual, the individual's attitudes towards the course and the retention of learning. However, it was considered that peer instruction could have an impact on student development in several fields based on the subject matter, goals and achievements of the social studies course. It was predicted that the skills included in the Social Studies curriculum, which are expected to be acquired, developed and transferred to life in the learning process, were directly related to this method and that the peer instruction method would make a significant contribution for these skills. The effect of the Peer Instruction method on the individual's critical thinking skills was directly investigated and it was found that it contributed positively based on the pre-test and post-test results. Furthermore, based on previous studies, the characteristics of the method and the nature of social studies, it could be predicted that the method would have positive contributions for the skills such as communication skills, problem solving skills, decision making skills, information technology literacy skills, entrepreneurship skills, good and effective use of Turkish language, social participation and empathy skills, which are the target skills of the social studies curriculum. It was also anticipated that it would have positive contribution for the target values of social studies course such as scientific values, solidarity, tolerance, respect, responsibility and philanthropy.

In conclusion, a holistic assessment of Social Studies course and other studies conducted with Peer Instruction method would demonstrate that this method affects several student dimensions positively. Naturally, this does not mean that the method of Peer Instruction possesses no disadvantages. Thus, both the limitations and benefits of the method are listed below as determined both by the researcher and by previous studies.

### **Achievement Test Findings**

The findings of the present study demonstrated that the student achievements increased in the experimental group where the instructions were conducted with the Peer Instruction method and in the control group where the current curriculum instruction and activities were utilized. However, the comparison between the groups showed that the experimental group was more successful when compared to the control group.

Based on the retention test applied after the predetermined period upon the completion of the instruction, it was observed that distant group averages in the posttest scores approached similar values in the retention test. This was due to the high increase in control group retention test scores when compared to posttest scores. Finally, the group averages were compared and no difference was determined.

### **Attitude Scale Findings**

It was observed that in both the experimental group where the Peer Instruction method was used and in the control group where the instruction and activities were conducted based on the current curriculum, there was an upward trend between the pre-test and post-test scores, in other words, the attitude levels had slightly increased. However, it was observed that students' attitude scale scores in experiment and control groups did not demonstrate any significant difference between the pretest and posttest applications. In other words, there was no evidence that the common effects of different group membership and repeated measure factors on attitude scale scores were significant. It was observed that pre-test attitude scores were already high.

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## **Evaluation of Students' Knowledge About Cultural Concepts**

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### **ABSTRACT**

Culture includes many tangible and intangible elements that a society has shaped and possessed over the centuries. For example; elements like traditions, customs, folk architecture, anonymous folk literature products, traditional music, crafts and so on are in the scope of culture.

The study group consisted of 100 students from 9th grade from two schools under the Ministry of National Education of the TRNC. In order to gather the data, the students were asked to write a composition about culture revealing how they perceive cultural concepts and what they know about culture. At the same time, what needs to be done in order to ensure that cultures are not forgotten and maintained, was determined from the student's views. Percentage and content analysis were used in the analysis of the obtained data. As a result of the findings, it is seen that there is a little knowledge in the subjects related to culture like art works, traditions and customs, food, drinks, dishes and sweets-savouries, folk dances, language, historical artefacts, religious beliefs, clothes, festivals and it was also explored that they did not give information about a lot of values related to culture. Views were also gathered about the importance of books, magazines, television programs, films, festivals and theatres to learn about the forgotten values.

**Keywords:** Culture, concept, student, society, composition.

### **INTRODUCTION**

It can only be possible with a culture that a society can turn into a nation, survive throughout history, and sustain its continuity. Thus, when a community life occurs at a place where various values have emerged, culture is formed. A society often depends on its tangible and intangible values which are brought from its past, but keeps its own cultures open to innovation and development, and allows them to be passed on to future generations. Güvenç says "Culture is learned, historical and continuing, social, ideal or idealized system of rules, satisfying and satisfies needs, integrative, changeable "(1994:101-104). From the point of view of Güvenç, we can say that culture belongs to community, it can be learned, it is formed and continues in the historical process, it emerges in the direction of a certain purpose, it is necessary to meet needs, it is an important element in ensuring unity and the unity of society.

According to Tylor, culture or civilization, as a member of society, is the knowledge, art, morality, tradition etc. that the human beings gain and it is a complexity that covers other abilities, skills and habits (1903:1). Ziya Gökalp states that religion, law, morality, tradition etc. which are the basis of value judgments form the intangible part of culture and work, knowledge, skills and the whole structure of the technology form the tangible part of the culture. In addition, Gökalp states that tangible and intangible cultural values cannot be considered separately and that it is possible to see some reflections and influences of intangible culture during the evaluation of tangible culture (Yüksel, 1987:29).

Erdentuğ sees culture as a system of symbols shared by people and transmitted to future generations (Erdentuğ, 1981:35). Tomlin also mentions that the culture word has two meanings that concern us. He claims that culture means growth or nurture and a cultural man means a nurtured man. Then he points out the ritual, ceremony etc. meanings of culture and that a life without ceremony is meaningless and that in developed cultures there must be

ceremonies for important events of life such as birth, death and marriage (Tomlin, 1959:31-32).

According to Saffet, culture is the spirit of a nation, an elixir of life; and is the biggest effect of salvation and ascension. Saffet also says that if a soulless body cannot survive, it is also impossible for a nation to survive forever without culture (Saffet, 1933:351).

Culture is the sum of all the language, science, art, philosophy, customs, customs which were created according to the conditions of civilization in nation (Ülken, 1948:7). In order to transfer all these values belonging to a nation to future generations and to keep them, it is necessary for new generations to have a broad knowledge about culture.

The aim of this study is to explore whether the students in the Turkish Republic of Northern Cyprus know cultural concepts like traditions and customs, language, religion, literature, arts, folk dances etc. or not, and to determine how much they know about their own culture. Another aim is to get feedback from these students about what can be done in order not to forget culture.

## **METHODOLOGY**

### **Participants**

The study group consists of 100 students from the 9th grade from the Ministry of National Education of the TRNC. 50 students from Turkish Maarif College and 50 students from the Hala Sultan Theology College, all originating from Turkey and North Cyprus, contributed to the study. During the selection of the students, random method was used. It is considered appropriate for the students to be selected from these classes because the culture issue is mostly taught in the 9th grade.

### **Collection of Data**

In order to collect the data, a "Composition on Culture" was written by the students so their cultural knowledge was obtained. At the same time, "Student Interview Form" was applied to the students to get ideas from them about how to protect cultural values.

### **Analysis and Interpretation of Data**

In this study, percentage analysis and content analysis were used to analyse the data obtained from the compositions. The collected data from the "Student Interview Form" was also analysed by using percentage and content analysis. In addition, several data sources were used in the selection of direct quotations and the data were analysed by separating them into certain categories.

## **RESULTS AND COMMENTS**

The findings obtained from "Composition about Cultures" and "Student Interview Form" were examined under separate headings.

### **A. Findings Related to "A Composition about Culture" Written by Students**

**Table 1.** Percent Results of Findings from Composition

<b>Tangible and Intangible Values</b>	<b>%</b>
Art Works	56
Traditions and Customs	54
Food, Drinks, Meals and Sweets-Savouries	51
Folk Dances	35
Language	30
Historical artefacts	28
Religious Beliefs	23
Clothes	19
Festivals	14
Law	3
Flag	2

#### **1. Art Works**

Table 1 clearly shows that the students mostly have knowledge of arts and crafts, in other words, fine arts and handicrafts of cultural values. 56% of the students reported their knowledge of fine arts and crafts. The works of art are examined under two headings:

##### **a. Fine Arts**

In the compositions, they gave information about literature, music, painting, theatre and sculpture from fine arts. Students, wrote about theatre, story, rhyme, poetry, myth, novel, folk song in literature; 'Al Yemeni Mor

Yemeni' (take the headscarf give the headscarf) folk song, Dillirga (a village name in North Cyprus) folk song, musical instruments, saz (a stringed instrument which somewhat resembles a lute), kamancha ( a small violin played like cello); Karagöz and Hacivat (two famous characters in Turkish literature) in the theatre. Some examples of fine arts are:

*"The song 'Al Yemeni Mor Yemeni' is a very beautiful example, which reflects Cyprus culture." (S13)*

*"Musical Instruments such as saz and kamancha, which belong to Turkish culture, are valuable to us." (S65)*

*"The folk products such as folk, rhyme etc. reveal the joys and sorrows of our ancestors." (S26)*

*"There is a myth in every society, but there are traces of our own culture in the myth of every society, and the Myth of the Five Finger Mountain in Cyprus has traces from us." (S71)*

#### **b. Handicrafts**

Students revealed their knowledge of Lefkara Handicraft ( a village handicraft), wood carvings, wicker basket, oven trays, baskets, rugs, pots and earth furnace. Examples of handicrafts are:

*"The wicker basket is made of coloured wheat stalks and the basket is called 'sesta'". (S52)*

*"Woven rugs carrying the characteristics of Turkish cultures are sold abroad to earn money." (S8)*

*"Furnaces made from earth are available in almost every home in Cyprus and are used to make bread, kup kebabs (meat cooked in furnace) etc." (S90)*

#### **2. Traditions and Customs**

54% of the students referred to values in customs and traditions. The students gave information about the 40th day of infants (it is celebrated in Turkish culture), circumcision, weddings, bairams, festivals, wedding, marriage, military service, customs, hospitality, cooperation, not interrupting while older people are talking, kissing the elders' hands. Information on tradition and customs are:

*"In our culture, the hands of the elders are absolutely kissed." (S82)*

*"In Cypriot culture, guests are welcomed with rose water, coffee, walnut confection, citrus confection." (S36)*

*"Religious Bairams vary from society to society, Bairams like Eid al-Fitr (Bayram of Sweets) and Eid al-Adha (Sacrifice Bayram) are the symbols of Turkish culture." (S15)*

*"It is one of our traditions and customs to take the bride from her house on a horse on the wedding day." (S7)*

#### **3. Food, Drinks, Dishes and Sweets-Savouries**

It is seen in Table 1 that 51% of the students gave information about food, drinks, meals and Sweets-Savouries.

##### **a. Food**

The students wrote that they know about Cyprus halloumi, Cyprus cheese, olives, grapes, oranges, carob, green olive ( cut green olive), carob molasses, which are grown in Cyprus and are unique to Cyprus.

*"Harnup, olives and oranges are the most popular products in Cyprus, and it is possible to cultivate these products easily in Cyprus, which has a Mediterranean climate." (S89)*

*"The halloumi made by the Cypriot people is a kind of cheese that reveals our culture and is liked by all the countries of the world." (S94)*

##### **b. Drinks**

The students gave information about coffee, rose syrup, zivaniya (a high alcoholic drink) and Cypriot cognac.

*"Zivaniya is a drink that Cypriots cannot give up." (S12)*

*"When a guest arrives, service always starts with coffee, and when it is served, it is first given to the elder then the young and then to the host." (S71)*

##### **c. Meals**

It is seen that students mostly referred to Cyprus, and at a lesser extent to Turkey. These include magarina bulli (chicken and pasta), molihya (a meal made from the leaves of a plant called molihya), bumar (a kind of rice made in the intestines of a lamb), seftali kebab (a kind of meatball rolled in fat and barbequed), zucchini flower stuff, Kolokas (sweet potatoe), tarhana (a type of soup), potato meatballs, kuyu kebab (a kind of kebab roasted in furnace), anchovy rice, Adana kebab.

*"The best example of the food culture of the Black Sea is anchovy rice." (S63)*

*"Seftali kebab, molihya, zucchini stuff is the food that Cypriots make and love the most." (S2)*

##### **d. Desserts-Savouries**

The students also wrote about sweet and savouries, which is also unique to Cyprus and Turkey. They gave information about walnut confection, citrus confection, ekmek kadayifi (a kind of desert made by cheese and cake), gullurikya (molasses dumplings), watermelon confection, sini katmeri (a kind of desert with syrup), tel kadayifi (a kind of desert with syrup), tahinli (a desert made by sesame oil), hellimli (a kind of savoury made by

helloumi), künefe (a desert including cheese and peanuts).

*"Gullurikya is made from molasses that grows a lot in Cyprus." (S50)*

*"Walnut confection and citrus confection are very difficult desserts made by Cypriots, but they are long lasting." (S44)*

#### **4. Folk Dances**

Folk dances are kind of dances with traditional clothes belonging to that society and with a music that come from that community. 35% of the students mentioned folk dances like 'Zeybek, greeting, couch, handkerchief, millet, carpenter and sailors'.

*"There is greeting, Zeybek and handkerchief from Turkish Cypriot folk dances." (S88)*

*"The local dances of Cyprus like Zeybek, duality, caravans etc. are staged at festivals both in Cyprus and in Turkey." (S100)*

#### **5. Language**

Language is the most important tool in conveying cultural values to future generations. However, only 30% of the students think that language reflects many elements related to the culture, focusing on the concepts of Cypriot dialect, Turkish, common language and Cypriot dialect.

*"Every society has a common language, and every society carries its culture through this common language." (S17)*

*"Cypriot dialect which is actually Turkish is different from the one used in Turkey. For example, grandchildren 'torun' word is 'angoni' in Cypriot dialect. This shows that we were influenced by the languages of other nations." (S65)*

#### **6. Historical Artefacts**

Historical artefacts made by every nation for a certain purpose may show some differences visually and in terms of materials used. The students gave information about the historical buildings belonging to both our culture and other cultures. Also, the students have the knowledge of which cultural heritage they belong to. 28% of the students gave information about Kyrenia Castle, Great Khan, Salamis Ruins, St. Peter's Basilica, St. Hilarion Castle, Selimiye Mosque and Lala Mustafa Pasha Mosque.

*"There are many historical monuments in Cyprus as it was conquered by many states. Selimiye Mosque, Büyük Khan and Kyrenia Castle are some of them. They reflect the cultures of every civilization." (S5)*

*"Khans and mosques were important for the Ottoman State, so when the Ottoman Empire conquered Cyprus, they built the Great Khan." (S46)*

#### **7. Religious Beliefs**

People, who are members of a community, are connected with certain beliefs, and shape their lives in the direction of these beliefs. 23% of the students wrote the concepts of religion, which are Muslim, Islamic and Christian.

*"Muslims understand the hungry when they fast during Ramadan. This is a symbol of a culture." (S17)*

*"Each religion's belief is different, for example Muslims believe in Prophet of Muhammad and Christians believe in the views of Jesus." (S10)*

#### **8. Clothing**

Every nation has its own unique range of clothes. Even different colours, patterns, fabrics in different regions can be seen. It is also seen that the clothes have the features. Although these garments are often the same in purpose, the models vary considerably. 19% of the students gave information about folk dress costumes and costumes worn on the 40<sup>th</sup> day of babies.

*"When the babies are forty days old, it is celebrated and on these customary days, children are dressed in special clothes." (S32)*

*"The folk dances of each region are different, and the clothes they wear in folk dances are different." (S74)*

#### **9. Festivals**

Various festivals are organized in different regions of a country. Festivals are held and many values related to the folklore of that region are introduced. 14% of the students wrote about festivals held in Cyprus like Güzelyurt Orange Festival, Mehmetçik Grape Festival, Girne Olive Festival, Tatlısu Carob Festival and Yeşilirmak Strawberry Festival.

*"The products that are grown in Cyprus, Cypriot folk dances and handicrafts are introduced in such festivals like Güzelyurt Orange Festival and Yeşilirmak Strawberry Festival." (S41)*

*"At the Tatlısu Carob Festival you can see many products made from carob." (S20)*

## 10. Law

The peace and welfare of a nation are provided by law. However, every nation has a different understanding of law. It is also an irrefutable fact that the law has been shaped according to traditions and customs and has changed so far. 3% of the students referred to law.

*"When we say culture, law can be associated too. For example, in our culture, when a person is prosecuted for rape, that person can be imprisoned and executed elsewhere." (S56)*

## 11. Flag

The flag is used as a symbol of a nation and is shaped according to the character of that nation. 3% of the students gave information about the colour of the flag and the symbol on it.

*"The Turkish flag is red, because it reminds us of our history. Many soldiers shed blood for this country so red color is used." (S28)*

## B. Findings related to 'Student Interview Form'

Views of the students on what should be done to ensure that the culture is kept and remembered, were taken. The views were divided into the following categories and they are listed as follows:

**Table 2.** Views of the Students on What Should be Done to Ensure that the Cultures are Kept and Remembered

Codes	Supportive Sentences	%
Books and Magazines	<i>"Our culture can be mentioned in works such as novels and stories." (S19)</i> <i>"There may be more cultural topics in textbooks." (S95)</i> <i>"The meaningful sayings that our ancestors said years ago must be put in books." (S48)</i> <i>"We have to leave permanent artefacts in order to transfer our culture from generation to generation and to keep it alive. Thus, it is important to be careful when writing books." (S6)</i> <i>"Our food culture should take place in various magazines." (S64)</i>	36
Charity Fairs	<i>"Schools can organize fairs to promote food related to Cyprus." (S12)</i> <i>"The food and drink made by villagers can be sold at fairs." (S37)</i> <i>"To help, handicrafts such as Lefkara handicraft, rugs, oven trays linen can be sold, and with the help of these our culture is remembered." (S50)</i>	25
Films and Television Programs	<i>Movies and Television Programs "Programs should be made on television to show customs and traditions." (S86)</i> <i>"Old people's lives should be filmed, because they know our culture better." (S73)</i> <i>"Our culture can be taught to more people through films." (S54)</i>	20
Festivals	<i>"These folk dances must be shown at festivals in order to ensure that folk dances are not forgotten." (S13)</i> <i>"All our cultural values can be promoted, with the help of festivals." (S82)</i> <i>"General culture competitions must be held at festivals." (S35)</i>	11
Theatres	<i>Theatres "We can teach our cultural values with the help of drama" (S28)</i> <i>"Materials used on the stage at the theatre must be unique to culture." (S9)</i> <i>"The sorrows and joys that a society experienced in the past can be conveyed through the theatre, so people learn how their ancestors lived and their past." (S80)</i>	8

In Table 2, the vast majority of our students claimed that it is possible to ensure that the culture is not forgotten and maintained mostly by books and magazines, then with the help of charity fairs, films, television programs, festivals and theatre's. 36% of the students supported books and magazines, 25% fairs, 20% films and television programs, 11% festivals and 8% theatre to promote cultures and transfer them to future generations.

## CONCLUSIONS AND RECOMMENDATIONS

It can be argued that most of the learners have a little knowledge about cultural values and there is no information about most values yet. Although the students gave information about artworks, traditions and customs, food, drinks, meals and sweets-savouries, folk dances, language, historical artefacts, religious beliefs, clothes, festivals, law and flag, their knowledge is still not enough. It was found that the students mostly have knowledge about artworks, traditions and customs, food, drinks, meals and sweets-savouries among cultural

values. However, there are many values that students did not even mention. Some of these are the burial of death, prays; henna night, which is one of the wedding traditions and customs; dowry, pregnancy craving, to become pregnant, sacrificing which is one of the religious beliefs, dedication, curses and prays, folk medicine, fortune-telling; house shapes, names and nicknames used by the people and the names of villages, towns, neighbourhoods and streets.

The following suggestions obtained from students' views are useful to ensure that the culture is not forgotten and transferred to the next generation:

- The first thing to do is to undertake a wide range of identification, compilation and archiving studies related to culture of the country covering all settlement areas by the relevant departments of the Ministry of Culture.
- In this way, it becomes clear what can be used in education, in art, in cinema, in theatre, in literature, or in cultural terms.
- Of course, at the first stage of these studies, the most forgotten values can be explored and they should be shared with the public.
- More topics on culture can be placed in textbooks.
- In some lessons, information about forgotten children's games can be given and these games can be played.
- Students can research cultural values and discuss their findings in class.
- People who are interested in folklore (folklorists) as professionals or who are interested in folklore as amateurs (writers, poets, teachers etc.), can introduce cultural values by organizing conferences, panels etc. in schools.
- It is important to ensure that fairs and festivals are reflective of our culture.
- It may be noted that plays to be performed at schools are reflective of our culture.
- Various museums exhibiting products that reflect our culture, public knowledge and cultural values (e.g. Intangible Cultural Heritage museums) can be opened.

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# **Examination of Picture Books in Terms of Illustration and Colour Harmony with Regards to Appropriateness for Children**

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## **ABSTRACT**

Picture books have a significant place in children's development and education with their properties of being informative, entertaining and being preparative for life. In picture books, the illustration particulars and colour harmony is as important as the story told, language and editing because of the fact that they reinforce the emotion that is aimed to be expressed and enhance the visual perception. If the visual language that is used in picture books starts the visual perception of child in early ages and supports it, the educational attainments we desire for children will be easier to achieve. If the picture books are prepared and printed as a result of a professional study by keeping the needs and expectations of the child, a significant step towards raising a generation that likes reading will be taken.

The purpose of this research is to examine the illustrations and pictures aimed at children, in children picture books in terms of appropriateness for development of visual perception and illustration and colour harmony.

The sample set of the research is 54 children's picture books that are originally written in Turkish, or translated into Turkish. The books are limited to the "picture books" that are chosen by the preschool teachers working Kadıköy district printed between the years of 2009 and 2014. The chosen picture books are also limited to the ones that are for 5-6 ages. The research method used is descriptive survey model used for qualitative research. The descriptive survey model is preferred because it consists of the interpretation of the data by scanning and evaluation of it within generalizations.

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## **INTRODUCTION**

Art is a field where humans make themselves valuable in the process of being human. Humans expressed their beings with art and interpreted their reason of existence by art; thought through it, criticised and explored; grasped the world with art. Without human, there would be no art. The creator and the consumer of art is again humans. Art is an integral part of modern education. In every stage of modern education, art is benefited from in terms of both artistic thought and critical thought in either independent art classes or art education related to different disciplines. Particularly children's education, their aesthetical development is valued as much as the art education to uncover and develop the artistic skills. Literature, being one of the fields of art, starts to get into an individual's life in early childhood. Children's literary products naturally have to be pictured because of the fact that they are produced for children who are illiterate and engage books visually and auditory. Books that are prepared for children that are between infancy and the age of 7 are named as "Picture Books" (Turla, Tür, 1999). Picture books are books that give less space to text than pictures (Gönen, 1998). Children's books are deemed to be one of the important factors that help children to "form a rich language environment" in the process of acquisition of linguistic skills starting from pre-school period (Sever, 2003). Nas, on the other hand emphasise on the stimulant effect of picture books for language being pictured on the development of the child (2002).

Picture books have an informative and entertaining side for children. The practices of life that are preparatory for children and given to them unaware have an important place in their development and education. In picture books, picturing features and the used colour harmony is as important as story, language and editing because they reinforce the emotion that is given and enhance the visual perception. The visual language used in picture books start the visual perception development of the child in early ages. Children develop their thinking skills with making use of their auditory and visual perceptions. They process the data acquired through perceptions and learning occurs. According to Arnheim, who states that without a perceptive component it would be impossible

for an individual to develop creative thought in any field (2007), there is no reason to not name the process “thinking” which occurs during the act of seeing. Because, thinking fundamentally is, perceptive. Hence, visual perception is thinking.

Reaching a child with the use of visual language should be done by experts who know child reality. Here, the notion of “appropriateness for children” rises. Bilgin (2011), defines this notion as “a work, product or thought revealed to call out to child’s world of thought, to watch out for the child’s language and grasping levels, to form the selected words, sentences and narrative techniques accordingly for the child. Here, the appropriateness for children notions should be looked upon within the extent of pictures. Drawing for children can be also stated as using figures that children can understand. Children show interest to pictures in pre-school ages. They learn the colours and draw simple figures. Hence, it is a natural outcome that children at that age to be interested in pictured books. Pictures drawn for a child should be simple enough for the child to understand, but creative enough to be thought-provoking. A simple figure may ensure a child imagine. Pictures that cover a full page that are drawn in order to tell the story are of no use, except for being a strain in the eyes. Whereas, when a simple picture that include figures also include hints, it becomes ideal for a child (Taşdemir, 2005). Child sees the narration in the picture as well as self-interpret using the hints. Features such as colours, space, perspective, and shadowing in the drawn picture, provides the child to correctly perceive the picture and form the connection between the story and the picture easier. Having said that, a picture drawn correctly and aesthetically becomes the start of a child’s art education.

Children prioritize their attention on to pictures in a book because of being illiterate in pre-school ages (Abacı, 2000). Therefore, use of colours is very important for children to comprehend the text as they examine the pictures in the books. Objects, events and situations taking place in text should be supported with colours. For example, colour harmony is very important with regards to describing the emphasized objects and still or dramatic events with pictures. Colour harmony is one of the best criteria for children to see the objects or understand the events correctly. Also, colour harmony is the most important criteria for expressing the emotion to the child. The harmony of the selected colours of the illustration corresponding to the emotion expressed in the text enhances the reality of the story. Thus, becomes easier for the children to understand the story as well as the value that is desired to be given to the child is given easier.

## **METHOD**

Reading narratives and interpreting explanations are integral parts of qualitative research. Qualitative research aims to understand the actions, narrations and how these intersect (Glesne, 2012). Since reading the visual language is equal to narrations, qualitative research method is preferred in this study. The model used is survey model because the study is based on the examination of 54 picture books that are oriented at 5-6 year old children that are published between 2009-2014, in terms of illustration and colour harmony with regards to appropriateness for children. Survey model is a research approach that aims to define and portray a situation that happened in the past or that moment. In descriptive survey model, scientific studies such as monitoring, recording, identification of relationships between events generalisation upon controlled and constant relationships (Karasar, 2007). The survey model used in this research is descriptive survey model which is included in general survey model. It was deemed appropriate to use descriptive survey model because it includes examination of data and interpretation by generalisation. Descriptive survey model is the technique of gathering data by examination of existing records and documents. The practices of searching, finding, reading, examination and evaluation of all kinds of records, documents, materials or works that are related to subject are included in descriptive survey model (Taşdemir, 2000).

## **THE STUDY**

Senior year students of Marmara University Department of Pre-School Teaching were assigned in the study group. Picture books that are preferred as teaching materials by pre-school teachers, who are working in pre-schools in Kadıköy district of İstanbul were determined. These books were sorted by publishers and writers, 54 picture books were randomly chosen from 29 publishers. Thirty six native and eighteen translated picture books were examined with regards to colour harmony characteristics seen in the illustrations. Of all these books, 38 of them belong to Turkish authors and painters and books that have foreign authors and painters were 16. There are

8 picture books among a total of 54 books which have same author and painter. The numerical data that has been formed as a result of examinations are calculated by percentage. The frequency results gathered are interpreted accordingly to descriptive survey model of qualitative research methods.

### LIMITATIONS

The sample of the research is 54 picture books for children written either in Turkish or translated to Turkish. The books are limited to the "picture books" chosen by teachers who teach at institutions belonging to Kadıköy district.

The books are chosen from books published between the years of 2009-2014

The chosen picture books are limited to books that are appropriate 5-6 year old children.

The chosen books are limited to only picture books.

### FINDINGS

**Table 1.** Distribution of the examined books with regards to being native or translated

	f	%
Native Picture Books	36	66.6
Translated Picture Books	18	33.3
Total Picture Books	54	100

Table 1: Out of 54 picture books published between the years of 2009-2014, 36 of them were native picture books that are written, illustrated and published in Turkey. It can be seen that this is predominant with a ratio of 66.6%. Picture books that are translated into Turkish are 18 among the 54 and their ratio is 33.3%.

**Table 2.** Distribution of the examined books with regards to author and painter

	f	%
Picture books with Turkish author	38	70.33
Picture books with foreign author	16	29.66
Picture books with Turkish painter	38	70.33
Picture books with foreign painter	16	29.66
Author and the painter is same	8	14.80
Total book	54	100

Table 2: Picture books that are prepared and published in Turkey with a Turkish author are 38 with a ratio of 70.33%, while translated picture books that have foreign authors are 16 with the ratio of 29.66%. With the same numbers and ratios, Picture books that are prepared and published in Turkey with a Turkish painter are 38 with a ratio of 70.33%, while translated picture books that have foreign painters are 16 with the ratio of 29.66%. Among these pictured books, only 8 picture books have the author and the painter as the same person with a ratio of 14,80%.

**Table3.** Colour harmony characteristics of illustrations of picture books

	f	%	f	%
There is analogous colour harmony	51	94.44	3	5.56
Does analogous colour harmony match the text?	44	81.48	10	18.52
There is complementary colour harmony	41	75.92	12	24.08
Does complementary colour harmony match the text?	38	70.37	16	29.63
There is primary colour harmony	48	88.88	6	11.12
Does primary colour harmony match the text?	47	87.03	7	12.97

Table 3: When the illustrations of the pages of 54 picture books were examined in terms of analogous colour harmony, it was observed that analogous colour harmony was used by a ratio of 94.44% and it did not exist by a ratio of 5.56%. When the pages that contain analogous colour harmony was examined with regards to it matching the story narrated, it was seen that it does match with a ratio of 81.48%, and it does not match with a ratio of 18.52%.

When the illustrations of the pages of 54 picture books were examined in terms of complementary colour harmony, it was observed that analogous colour harmony was used by a ratio of 75.92% and it did not exist by a ratio of 24.08%. When the pages that contain analogous colour harmony was examined with regards to it matching the story narrated, it was seen that it does match with a ratio of 70.37 %, and it does not match with a ratio of 29.63%.

When the illustrations of the pages of 54 picture books were examined in terms of triadic colour harmony, it was observed that analogous colour harmony was used by a ratio of 88.88% and it did not exist by a ratio of 11.12%%. When the pages that contain analogous colour harmony was examined with regards to it matching the story narrated, it was seen that it does match with a ratio of 87.03 %, and it does not match with a ratio of 12.97%.

## CONSLUSIONS

Book illustrations are important with regards to illiterate children getting an idea about the text of the picture books through the illustrations and illustrations improving effect of visual perception on children. The colour harmony should be taken into consideration as much as illustration techniques. The main element that is examined in this study is the use of appropriate colour harmony of the illustration of text. Because, colour harmony is an effective component for subject to be understood and intended emotions to be created.

Analogous colour harmony, which is also defined as the harmony of similar colours, is the colour harmony that is applied by using accent colours which is also called mix colours and pastel tones. Analogous colour harmony is the colour harmony formed by the use of colours that does not strengthen each other's effects, rather the use of colours that would form a union.

Colours used in analogous colour harmony are the colour harmonies made by made by pairs of two (blue-purple, red-orange), or triple colour groups (such as purple-red-orange) and three mixtures of colour (orange-purple-green) side by side in colour wheel (Abacı, 2007). It is very effective for expressing emotions such as tranquillity, happiness, and peace. Compositions practicing analogous colour harmony create a more peaceful and calmer mood in the individual. In pictures that make use of analogous colour harmony, objects or events do not move ahead of each other and there are not prominent situations. Colours balance each other in analogous colour harmony and do not strain the eyes. It is appropriate to use this colour harmony especially in nature portrayals and chapters in which no object or story characters come into prominence. It was seen that the pages of the examined books were in line with these properties with a ratio of 94.44%. As for the ratio of text and illustrations harmonising was 81.48%. The highest ratio was seen in analogous colour harmony compared to other types of colour harmonies.

Complementary colours are the colours that stand in opposite sides of each other on the colour wheel. The accent colour, which is the mix of the two primary colours that stands on the opposite side of each primary colour, is the complementary colour of the chosen primary colour. These are red - green, yellow - purple, blue - orange. Complementary colours, when used together, enhance each other's chromatic effect; the dominant colour increases the intensity of the other (Abacı, 2007). It is used to draw attention to an element in a composition. For example, an orange bird flying in a deep blue sky would not go unnoticed as the red cardigan of a child playing in a verdant green meadow would immediately be spotted. Complementary colour harmony is important in children books with regards to children developing their visual perception and understanding the text correctly. For example, if the text mentions a red apple and this red apple is in predominant, a red apple on a green surface could be drawn in the illustration. In this way, the red apple could be the most striking object on the page. It is especially important to pay attention to this rule on the pages where the protagonist is illustrated. Otherwise, insignificant object or events may become predominant in the picture. In turn, making the story harder to

understand. It was seen that the pages of the examined books were in line with these properties with a ratio of 75.92%. As for the ratio of text and illustrations harmonising was 70.37%. This shows us that complementary colour harmony is used the least compared to other colour harmonies.

Primary colour harmony is at the same time the harmony of disparate colours. It is the colour harmony created by distant colours, generally three primary colours (red, blue, yellow) (Abacı, 2007). When two of the distant colours come together, a colour changes the type of the other one. For example, when red and blue come together, blue would push the red towards orange while red would push the blue towards green; thus it is possible to obtain vibrant colours by making use of fewer colours (Temizsoylu, 1987). Primary colour harmony adds dynamism to the picture. The primary colour harmony, in which all three primary colours are used, is a conscious choice for texts that contains chaos, action and enthusiasm. Primary colour harmony is used to illustrate subjects such as festivities, playgrounds, market-squares in order to emphasize the dynamic structure of the subject. It was seen that the pages of the examined books were in line with these properties with a ratio of 88.88%. As for the ratio of text and illustrations harmonising was 87.03%.

According to results, it can be seen that analogous colour harmony is preferred by painters while the ratio of it on the match between text subject and colour harmony being lower than all other colour harmonies shows us that painters do not take into consideration of colour harmony matching the subject. Primary colour harmony is the second choice of colour harmony. On top of that, the match between the text and the colour harmony is better compared to other colour harmonies. This suggests that the illustrations made for young children are drawn with the assumption that children love vibrant colours. It was seen that complementary colour harmony was the colour harmony that was least preferred while being the colour harmony that would contribute to development of visual perception.

It can be seen in Table 3 that all three colour harmonies were used in all 54 picture books. This indicates that painter did not take emotions that were desired to convey to the reader into consideration and used the colours independently from the emotion of the subject while just keeping in mind which colours children would like. It seems that the colour portrayals that adhere to the reality of the world we live in with and colourfulness that is considered to be liked by children were the priorities of the painters with regards to illustration of picture books. It is our opinion that many publishers that produce high quality children books in Turkey should take this subject into consideration, for the benefit of the children's ability with developing their visual perception.

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# Examination of the Accounting Courses in Terms of Accreditation in Business Management Graduate Programmes

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## ABSTRACT

Accounting education is given at multiple levels of education from high school to associate degrees, undergraduate studies and graduate studies. Graduate studies are usually geared towards academicians or future academicians. For this reason, content, similarities and differences become prominent. Because, ensuring a similar program for the education provided both domestically and internationally would become important in terms of using the same language. To this end, experience and skills required for the vocation were established with various regulations of the American Accounting Association (AAA), International Federation of Accountants (IFAC) and the European Union.

This study aims to look into existence, programs, characteristics, ECTS and AKTS statuses of the accounting courses provided for Business Management graduate programs in Turkey. This study also attempts to highlight the importance and necessity of accreditations. Main subject of examination of the study is the institutes of social sciences of the state and foundation (private) universities listed on the Turkish Institute of Higher Education (YÖK) website. For the assessments, syllabi of the accounting courses and other courses related to accounting provided in business management, accounting, accounting and financing, and accounting auditing graduate programs under the social sciences institutes of the universities were examined and these courses were evaluated.

**Keywords:** Graduate programs, Education Accreditation, Accounting Education

## INTRODUCTION

The studies regarding accounting education has been done both in Turkey and in various countries of the world. One of these is the studies of the Education Committee established within the International Federation of Accountants (IFAC).

Education Committee has done studies in the line of expectations from accounting education in order to eliminate ongoing differences between practitioners and accounting educators, satisfy needs and improve quality (Zaif and Ayanoglu, 2007: 118).

Until today, a total of 8 International Education Standards (IES) have been published, some of them by IFAC Education Committee, some by IAESB.

International education standards include international recognition, admittance, and potentially applicable basic methods and techniques (archive.ismmmo.org.tr).

Positive expectations about the future in accounting education gain further importance each passing day. However, as in other areas, we are not alone in accounting education, and as well as a global economic system, an accounting education system that can satisfy both their and information users' request and needs of information is required to emerge. In this regard, the education committee established within the international federation of accountants attempts to improve the quality of accounting education by developing standards and guidelines (Ercan and Çelik: 1995)

When we look at the accounting history considering expectations and searches we see that the thought of arrangement of accounting practices, increase of quality, elimination of disarrangement by getting to their bottom, has gained further importance especially after international accounting standards became functional. The regulation of curriculum of accounting education, the continual protection and development of quality of education in terms of accounting education has become remarkable throughout the way of the arrangements of (IFAC) International Federation of Accountants (Öncü Semra, Aktaş Hüseyin:1992).

In this sense, international federation of accountants has defined the information as content of curriculum programs, and information is a part of accreditation from its aspect (Sayar et al., 2017:19).

Accreditation is a nongovernmental process that involves the review of an educational institution's ability of offering quality programs by those other than that educational institution and that is based on volunteerism principle. The reviews made in the scope of accreditation include self-evaluation, reckoning in colleague, committee's reviews and the development of detailed strategic plans. The mission of educational institutions, characteristics of faculty members, and course contents are examined in this process.

The international accreditation institution (AQAS) is a non-profit independent institution consisting of accreditation of training programs, quality assurance agency, academic associations and higher education institutions. The institution established in 2002 in Germany both assesses the accreditation of partner organizations and common and double diploma programs, and certifies its compliance with the European Standards and principles through its accreditation program.

The accreditation process in the field of business is carried out by The Association to Advance Collegiate Schools of Business (AACSB). AACSB Accreditation is a specialized and professional organization with international recognition for business and accounting programs at the undergraduate, graduate and doctorate levels.

AACSB accreditation guarantees to provide the highest quality education in business faculties. Accreditation also allows employers to be ready for business life from the first day they are employed. Moreover, the AACSB accreditation also benefits faculty members by attracting successful students, increasing their research opportunities and providing international recognition. As of December 2010, 607 institutions in 38 countries around the world have AACSB accreditation.

Istanbul University Faculty of Business Administration in Turkey was accredited by The Association to Advance Collegiate Schools of Business (AACSB), which is an important organization that accredits business faculties all over the world, a non-profit organization founded in 1916. Thus, it has been the first faculty that was accredited by AACSB among the business faculties of state universities in Turkey (<http://isletme.istanbul.edu.tr>)

In the field of accounting, The Association to Advance Collegiate Schools of Business (AACSB) accredits undergraduate and graduate business and accounting programs. ([Http://www.egitimcadesi.com/universitelerde-akreditasyon-nedir/](http://www.egitimcadesi.com/universitelerde-akreditasyon-nedir/))

## **A STUDY ON ACCOUNTING COURSE CONTENTS TAUGHT IN GRADUATE PROGRAMS OF UNIVERSITIES AND ON AKTS FORMS**

### **Purpose of Research**

In this study, it is aimed to determine the existence of accounting courses taught in business graduate programs in Turkey and their characteristics, especially determination of AKTS situations.

### **Method of Research**

Master and doctorate programs such as business administration, accounting, accounting audit, accounting finance etc. which were opened under the social science institutes of the public and foundation universities in Turkey were discussed in the study. The research was conducted between 01 and 31 May 2017.

### **Scope and Limits of the Study**

The main body of this work consisted of 184 public and foundation universities in Turkey. As a sample, the oldest and largest 30 universities, involving 20 public and 10 foundation universities, were reviewed in the study.

The study range was consisted of the contents and AKTSs of accounting courses in graduate and doctorate education programs. First the credits and AKTSEs of graduate courses, and then those of doctorate programs were presented in tabular form. In this sense, while international federation of accountants defines the knowledge; the international accountant federation's emphasis in the direction of that curriculum programs and their inclusion should also be included in the programs was also taken into account.

### 1.GRADUATE

**Table 1.1: Cost Accounting / Management and Management Accounting and Cost Analysis**

Graduate							Graduate						
Cost Accounting / Management							Management Accounting and Cost Analysis						
	2 C	3 C	4 C	5 C	Unvalued	Total		2C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		1				1	5 ECTS		1				1
5 ECTS		2				2	6 ECTS						
6 ECTS		4				4	7 ECTS						
7.5 ECTS		1				1	7,5ECTS						
<b>Total</b>		<b>8</b>				<b>8</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.2: Financial Accounting and Management Accounting**

Financial Accounting							Graduate						
							Management Accounting						
	2C	3C	4C	5C	Unvalued	Total		2C	3C	4C	6C	Unvalued	Total
3 ECTS		1				1	3 ECTS						
4 ECTS		1				1	4 ECTS		1				1
5 ECTS		1				1	5 ECTS		1				1
6 ECTS		1				1	6 ECTS		4				4
7 ECTS							7 ECTS						
7,5 ECTS		2				2	7,5 ECTS		1				1
10 ECTS							10 ECTS		1				1
<b>Total</b>		<b>6</b>				<b>6</b>	<b>Total</b>		<b>8</b>				<b>8</b>

**Table 1.3: International Accounting Standards and Term-end Applications**

Graduate							Graduate						
International Accounting Standards							Term-end Applications						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		2				2	4 ECTS						
5 ECTS	1	3				4	5 ECTS		2				2
6 ECTS		4				4	6 ECTS		1				1
7,5 ECTS		1				1	7,5 ECTS						
10 ECTS		1				1	10ECTS						
15 ECTS		1				1	15ECTS						
<b>Total</b>	<b>1</b>	<b>12</b>				<b>13</b>	<b>Total</b>		<b>3</b>				<b>3</b>

**Table 1.4: Corporate Accounting and International Financial Reporting /Standards**

Graduate							Graduate						
Corporate Accounting							International Financial Reporting /Standards						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		1				1	4 ECTS						
5 ECTS		1				1	5 ECTS		1				1
6 ECTS		5				5	6 ECTS		2				2
7 ECTS							7 ECTS						
<b>Total</b>		<b>7</b>				<b>7</b>	<b>Total</b>		<b>3</b>				<b>3</b>

**Table 1.5: Accounting and Auditing Standards and Accounting Auditing / Practices**

Graduate							Graduate						
Accounting and Auditing Standards							Accounting Auditing / Practices						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS						
6 ECTS							6 ECTS		3				3
7 ECTS							7 ECTS						
15 ECTS		1				1	15 ECTS		1				1
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>4</b>				<b>4</b>

**Table 1.6: Cost Audit and Audit**

Graduate							Graduate						
Cost Audit							Audit						
	2C	3C	4C	5C	Unvalued	Total		2 C	3 C	4C	6C	Unvalued	Total
4 ECTS		1				1	4 ECTS		1				1
5 ECTS							5 ECTS		1				1
6 ECTS							6 ECTS		3				3
7 ECTS							7 ECTS						
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>5</b>				<b>5</b>

**Table 1.7: Manipulatory Auditing and Auditing Theory**

Graduate							Graduate						
Manipulatory Auditing							Auditing Theory						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS		1				1
6 ECTS							6 ECTS						
7 ECTS							7 ECTS						
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.8: Audit Structure and Applications in Turkey and Activity Audit**

Graduate							Graduate						
Audit Structure and Applications in Turkey							Activity Audit						
	2C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS		1				1
6 ECTS							6 ECTS						
7 ECTS							7 ECTS						
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.9: Financial Tables and Analysis / Reporting and Internal Audit-Internal Control**

Graduate							Graduate						
Financial Tables and Analysis / Reporting							Internal Audit-Internal Control						
	2 C	3C	4 C	5C	Unvalued	Total		2 C	3C	4C	6C	Unvalued	Total
3 ECTS		1				1	3 ECTS						
4 ECTS		1				1	4 ECTS						
5 ECTS		2				2	5 ECTS		1				1
6 ECTS		5				5	6 ECTS						
7,5 ECTS		1				1	7,5ECTS						
<b>Total</b>		<b>10</b>				<b>10</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.10: Accounting Information System and Advanced Accounting**

Graduate							Graduate						
Accounting Information System							Advanced Accounting						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		1				1	4 ECTS						
5 ECTS		1				1	5 ECTS						
6 ECTS							6 ECTS		1				1
7 ECTS							7 ECTS						
10ECTS							10ECTS		1				1
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>2</b>				<b>2</b>

**Table 1.11: State Accounting and Foreign Trade Accounting**

Graduate							Graduate						
State Accounting							Foreign Trade Accounting						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
3 ECTS							3 ECTS		1				1
4 ECTS		1				1	4 ECTS		1				1
5 ECTS							5 ECTS						
6 ECTS							6 ECTS		1				1
7 ECTS							7 ECTS						
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>3</b>				<b>3</b>

**Table 1.12: Accounting Law and Accounting Theories**

Graduate							Graduate						
Accounting Law							Accounting Theories						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		2				2	4 ECTS						
5 ECTS							5 ECTS						
6 ECTS		2				2	6 ECTS		1				1
7 ECTS							7 ECTS		1				1
8 ECTS							8 ECTS						
<b>Total</b>		<b>4</b>				<b>4</b>	<b>Total</b>		<b>2</b>				<b>2</b>

**Table 1.13: Tax Accounting / Tax Accounting Applications and Accounting Valuation Transactions**

Graduate							Graduate						
Tax Accounting / Tax Accounting Applications							Accounting Valuation Transactions						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS		1				1	4 ECTS						
5 ECTS		1				1	5 ECTS						
6 ECTS							6 ECTS		1				1
7 ECTS							7 ECTS						
8 ECTS							8 ECTS						
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.14: Accounting Professional Ethics and Accounting Organization**

Graduate							Graduate						
Accounting Professional Ethics							Accounting Organization						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS		2				2	6 ECTS		1				1
7 ECTS							7 ECTS						
8 ECTS							8 ECTS						
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.15: Environmental Accounting and Accounting History and Theory**

Graduate							Graduate						
Environmental Accounting							Accounting History and Theory						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS		1				1
7 ECTS							7 ECTS						
8 ECTS							8 ECTS						
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 1.16: Financial Reporting Standards and Specialized Accounting**

Graduate							Graduate						
Financial Reporting Standards							Specialized Accounting						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS		2				2
6 ECTS		1				1	6 ECTS						
7 ECTS							7 ECTS						
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>2</b>				<b>2</b>

**Table 1.17: Cost Accounting Private and Financial Analysis Methods**

Graduate							Graduate						
Cost Accounting Private							Financial Analysis Methods						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS		1				1
6 ECTS		1				1	6 ECTS		1				1
7 ECTS							7 ECTS						
10 ECTS							10 ECTS		1				1
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>2</b>				<b>2</b>

**Table 1.18: Business Budgets and Business Combinations**

Graduate							Graduate						
Business Budgets							Business Combinations						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	6 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS						
7 ECTS							7 ECTS						
10 ECTS							10 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>1</b>				<b>1</b>

## 2. DOCTORATE

**Table 2.1: Advanced Management and Cost Accounting and Costing Systems**

Doctorate							Doctorate						
Advanced Management and Cost Accounting							Costing Systems						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS		1				1	5 ECTS		1				1
6 ECTS		1				1	6 ECTS		1				1
7,5 ECTS		1				1	7,5 ECTS						
8 ECTS							8 ECTS		1				1
10 ECTS		1				1	10 ECTS						
<b>Total</b>		<b>4</b>				<b>4</b>	<b>Total</b>		<b>3</b>				<b>3</b>

**Table 2.2: Ethics and Management and Accounting Theory**

Doctorate							Doctorate						
Ethics and Management							Accounting Theory						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS		1				1
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS		2				2
7 ECTS							7,5 ECTS		1				1
7,5 ECTS							10 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>5</b>				<b>5</b>

**Table 2.3: Accounting, Information and Control Systems and Control and Internal Audit**

Doctorate							Doctorate						
Accounting, Information and Control Systems							Control and Internal Audit						
	2 C	3 C	4 C	5 C	Unvalued	Total		2C	3C	4C	5C	Unvalued	Total
4 ECTS							4 ECTS		1				1
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS		1				1
7 ECTS		1				1	7 ECTS						
8 ECTS							8 ECTS			1			1
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>2</b>	<b>1</b>			<b>3</b>

**Table 2.4: Valuation and Financial Tables and Advanced Accounting / Selection Topics**

Doctorate							Doctorate						
Valuation and Financial Tables							Advanced Accounting / Selection Topics						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS		1				1	4 ECTS		2				2
5 ECTS							5 ECTS						
6 ECTS							6 ECTS		2				2
7,5 ECTS							7,5 ECTS		1				1
8 ECTS							8 ECTS		1				1
15 ECTS							15 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>7</b>				<b>7</b>

**Table 2.5: Contemporary / Current Accounting Problems and Accounting Research Seminar**

Doctorate							Doctorate						
Contemporary / Current Accounting Problems							Accounting Research Seminar						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS							7 ECTS		1				1

7,5ECTS		1				1	7,5 ECTS						
8 ECTS		1				1	8 ECTS						
15ECTS		2				2	15 ECTS						
<b>Total</b>		<b>4</b>				<b>4</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 2.6: Financial Reporting Seminar and Cost Management / Analysis**

Doctorate							Doctorate						
Financial Reporting Seminar							Cost Management / Analysis						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS							6 ECTS						
7 ECTS		1				1	7 ECTS		1				1
8 ECTS							8 ECTS		1				1
15ECTS							15 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>3</b>				<b>3</b>

**Table 2.7: Company Consolidation and Takeover and New Financial Instruments and Accounting Applications**

Doctorate							Doctorate						
Company Consolidation and Takeover							New Financial Instruments and Accounting Applications						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS							7 ECTS						
7ECTS		1				1	7,5 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 2.8: Research Methods in Accounting and Accounting Auditing / Techniques**

Doctorate							Doctorate						
Research Methods in Accounting							Accounting Auditing / Techniques						
	2 C	3 C	4 C	5 C	Unvalued	Total		2C	3C	4C	5C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS							6 ECTS		1				1
7 ECTS							7 ECTS						
8 ECTS			1			1	8 ECTS		1	1			2
<b>Total</b>			<b>1</b>			<b>1</b>	<b>Total</b>		<b>2</b>	<b>1</b>			<b>3</b>

**Table 2.9: Financial Accounting / Advanced Financial Accounting and Advanced Management Accounting/ Strategic Management / Management Accounting / Practices / Techniques**

Doctorate							Doctorate						
Financial Accounting / Advanced Financial Accounting							Advanced Management Accounting Strategic Management / Management Accounting / Practices / Techniques						
	2 C	3C	4C	5C	Unvalued	Total		2C	3C	4C	5C	Unvalued	Total
3 ECTS							3 ECTS		2				2
4ECTS							4 ECTS		1				1
5 ECTS		1				1	5 ECTS		1				1
6 ECTS		1				1	6 ECTS		3				3
7 ECTS							7 ECTS		2				2
<b>Total</b>		<b>2</b>				<b>6</b>	<b>Total</b>		<b>9</b>				<b>9</b>

**Table 2.10: Accounting and Financial Reporting Standards Applications and Accounting History and Theory**

Doctorate							Doctorate						
Accounting and Financial Reporting Standards Applications							Accounting History and Theory						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
3 ECTS		1				1	3 ECTS		1				1
5 ECTS							5 ECTS						
6 ECTS		2				2	6 ECTS		1				1
7ECTS							7,5 ECTS			1			1
8ECTS		1				1	8ECTS						
15ECTS		1				1	15ECTS						
<b>Total</b>		<b>5</b>				<b>5</b>	<b>Total</b>		<b>2</b>	<b>1</b>			<b>3</b>

**Table 2.11: Integrated Systems Based Accounting Applications and Financial Reporting Analysis**

Doctorate							Doctorate						
Integrated Systems Based Accounting Applications							Financial Reporting Analysis						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
3 ECTS							3 ECTS						
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS						
7ECTS							7,5 ECTS		1				1
10ECTS							10ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>2</b>				<b>2</b>

**Table 2.12: Advanced Audit and Audit Surveys**

Doctorate							Doctorate						
Advanced Audit							Audit Surveys						
	2C	3C	4C	5C	Unvalued	Total		2C	3C	4C	5C	Unvalued	Total
4 ECTS		1				1	4ECTS						
5 ECTS							5ECTS		1				1
6 ECTS		1				1	6ECTS						
7 ECTS							7ECTS						
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>		<b>1</b>				<b>1</b>

**Table 2.13: Research Applications in Accounting and International Auditing Standards**

Doctorate							Doctorate						
Research Applications in Accounting							International Auditing Standards						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS						
5 ECTS							5 ECTS		1				1
6 ECTS		1				1	6 ECTS		2				2
7 ECTS							7 ECTS						
8 ECTS							8 ECTS			1			1
15ECTS							15 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>		<b>4</b>	<b>1</b>			<b>5</b>

**Table 2.14: Accounting and Tax Practices and International Financial Reporting**

Doctorate							Doctorate						
Accounting and Tax Practices							International Financial Reporting						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
4 ECTS							4 ECTS		1				1
5 ECTS							5 ECTS						

6 ECTS						6 ECTS		2				2
7,5 ECTS		1				1	7 ECTS					
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>	<b>3</b>				<b>3</b>

**Table 2.15: Building Budget and Expertise Accounting**

Doctorate							Doctorate						
Building Budget							Expertise Accounting						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
3 ECTS							3 ECTS		1				1
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS		1				1	6 ECTS						
15 ECTS							15 ECTS		1				1
<b>Total</b>		<b>1</b>				<b>1</b>	<b>Total</b>	<b>2</b>					<b>2</b>

**Table 2.16: Current / Selected Topics in Accounting and Financial Control**

Doctorate							Doctorate						
Current / Selected Topics in Accounting							Financial Control						
	2 C	3 C	4 C	5 C	Unvalued	Total		2 C	3 C	4 C	5 C	Unvalued	Total
3 ECTS		2				2	3 ECTS		1				1
4 ECTS							4 ECTS						
5 ECTS							5 ECTS						
6 ECTS							6 ECTS						
<b>Total</b>		<b>2</b>				<b>2</b>	<b>Total</b>	<b>1</b>					<b>1</b>

## CONCLUSION

The European Union uses the Erasmus action plan, which is a part of the Socrates program, to establish a standard in accounting education. Through these programs, many issues such as the establishment of ECTS and the development of the curriculum were discussed. It is important to establish standards on academic programs, course credits of educations provided in universities, in the line with the direction of the programs. The Erasmus program will open the way for not only EU countries but also candidate countries to be accredited so as to facilitate the review of education programs and application of credit transfer. As a candidate country to the EU; the graduate programs of the oldest and largest 20 public and 10 foundation universities among 184 universities in Turkey, were reviewed.

- It was determined that 36 courses, different from each other, were taught in graduate program.
- It was found that 32 courses were taught in doctorate program.
- It was seen that majority course group in both graduate and doctorate program were consisted of international accounting and auditing standards, cost and management accounting and cost analysis and reporting.
- These most remarkable courses were seen to be taught at both graduate and doctorate programs.
- It was found that although ECTS s of the courses taught in these programs were different from each other, their credit values were the same.
- When the credit values of courses taught in doctorate programs were reviewed, it was found that 4 courses were with 4 credits, and 28 courses were with 3 credits.
- It was found that only 1 course was with 2 credits, the rest 35 courses were with 3 credits in graduate program.
- It was found that although ECTSs ranges between 3 and 15 in both graduate and doctorate programs, they were mainly 6.

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# Examining the Potential-Based Achievement Goals of University Students

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## ABSTRACT

The objective of this investigation is to adapt Potential-Based Achievement Goals Scale into Turkish language. The research was applied to 411 university students. The model consisting of 6 items was well fit according to confirmatory factor analysis. The internal consistency analyses of the scale was .82 and that was reliable enough for the adaptation research. According to item discrimination and confirmatory factor analysis results, 2 factors structure the scale was found appropriate for Turkish sample ( $\chi^2=30.07$ ,  $sd=8$ ,  $RMSEA=.082$ ,  $AGFI=.94$ ). In this research, the scale was found valid and reliable instrument to examine the levels of approach and avoid potential in education process for Turkish sample group.

**Key Words:** Approach Potential, Avoid Potential, Achievement Orientation, Adaptation, Validity, Reliability.

## INTRODUCTION

In the past couple of decades, achievement goals have been a fundamental research area of education domain (Dweck, 1986; Elliot and others, 2015; Nicholls, 1984). Achievement goals represent competence-relevant aims that students struggle for their success in an achievement setting (Elliot, 2005). In this investigation, lower parts of achievement goals have been concentrated to reveal that subset of achievement goals have various indicators such as past-based and potential based goals. While they can be assessed respectively, still pertain to the identical notional classification (Elliot et al., 2015). While the notion “achievement” symbolizes competence, the concept of “goals” stands for aims that leads and manages behaviour. Therefore the research of achievement goals can be taken into consideration as the investigation of competence – relevant aims that leads and manages behaviour (Elliot et al., 2015). Achievement goals point out to competence-relevant aims that students struggle for an aim in achievement environment (Elliot, 2005). According to widely accepted 2 x 2 achievement goal, achievement goals possess two main elements: definition and valence. There are four kinds of goals within the definition and valence elements results. These are mastery-approach, performance-approach, mastery-avoidance and performance-avoidance elements (Elliot & McGregor, 2001; Huang, 2012; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Goal orientation theory developed as an essential academic point of view on individuals’ motivation in learning settings (Anderman & Wolters, 2006; Elliot, 2005; Meece, Anderman, & Anderman, 2006; Pintrich & Schunk, 2002; Kaplan and Maehr, 2007). Goal orientation created a widespread investigation framework about motivational orientations that promotes improvement of adaptive engagement in learning environment such as schools (Ames, 1992; Maehr & Midgley, 1991, 1996; Kaplan and Maehr, 2007). Goal orientations generally emphasizes why and how individuals are striving to achieve different aims and including the real intention of achievement behaviour rather than focusing on what learners struggling to achieve (Anderman & Maehr, 1994; Kaplan and Maehr, 2007). While mastery goals orientation presents the aim of developing competence, performance goals orientation stands for the aim of showing competence. It means that performance-oriented

learners concentrates on establishing an effect of high ability and avoiding to demonstrate low ability (Ames, 1992; Dweck, 1986; Kaplan and Maehr, 2007). The notion of motivation was described in the mid of last century to understand learners' engagement in learning (Elliot, 1999). The notion of a goal is absolutely based on a motivational setup. Investigators struggle to better explain students' achievement behaviour. It has been proposed that the goals should be taken into consideration which are followed and aimed by students or learners to understand the nature of achievement behaviour of individuals (Dweck, 1986; Nicholls, 1984). Achievement goals stand for learners' interpreting and reacting to the cases, and so creating grounds for learning behaviour (Dweck & Leggett, 1988)

## METHOD

### *Study Group*

Target population of the study comprises of students in Sakarya University. The sample of the research consists of random chosen 411 students in Education Faculty of Sakarya University. 287 female and 124 male in total 411 students are involved in this study.

### *Data Collection Tool*

Potential-Based Achievement Goals Scale comprises of two sub-dimensions and 6 items. Scale was prepared in 5 Likert type and the items were graded from 1 (strongly disagree) to 5 (strongly agree).

## FINDINGS

### *Item Analyses and Reliability*

According to the results of analysis, the internal consistency of Potential-Based Achievement Goals Scale was found as .82 for the overall scale. Item analyses was performed to identify item discrimination strength of Potential-Based Achievement Goals Scale in undergraduate level. As a result of the analysis, corrected item total correlation of the scale ranged from .50 to .70. The findings are shown in Table 1.

Table 1: *Corrected Item Total Correlation of The Turkish version of the Scale Items*

	Corrected Item Total Correlation of The Scale Items	( $r_{jx}$ )
1	Sınavlarda mümkün olduğunca yapılabileceklerimin en iyisini yapmayı amaçlarım.	.50
2	Sınavlarda yapabileceğimin en iyisini yapmayı amaçlarım.	.52
3	Sınavlarda kişisel performansımın en iyisini yapmayı amaçlarım.	.51
4	Sınavlarda bildiğime kıyasla en zayıf dereceyi yapmaktan çekinirim.	.67
5	Sınavlarda bildiğimden daha kötüsünü yapmaktan çekinirim.	.70
6	Sınavlarda kendi seviyemin en kötüsünü yapmaktan çekinirim.	.69

### *Structure Validity*

The result of the exploratory factor analysis of the scale explains Kaiser-Meyer-Olkin Measure as .75 and total variance of structure as %80.

Table 2 : *Explained Total Variance*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,258	54,301	54,301	3,258	54,301	54,301
2	1,569	26,158	80,459	1,569	26,158	80,459

The results of confirmatory factor analysis for bidimensional model indicated that the fit indices values were found as ( $\chi^2=30.07$ ,  $sd=8$ ,  $GFI=.98$ ,  $RMSEA=.082$ ,  $IFI=.99$ ,  $NNFI=.97$ ,  $SRMR=.044$ ,  $AGFI=.94$ ,  $NFI=.98$ ,  $CFI=.99$ ). Factor loads of confirmatory factor analysis were shown in Figure 1. It consists of two parts as sub dimensions. These dimensions comprises of 1, 2, 3. items as approach potential and 4, 5, 6. items as avoid potential.

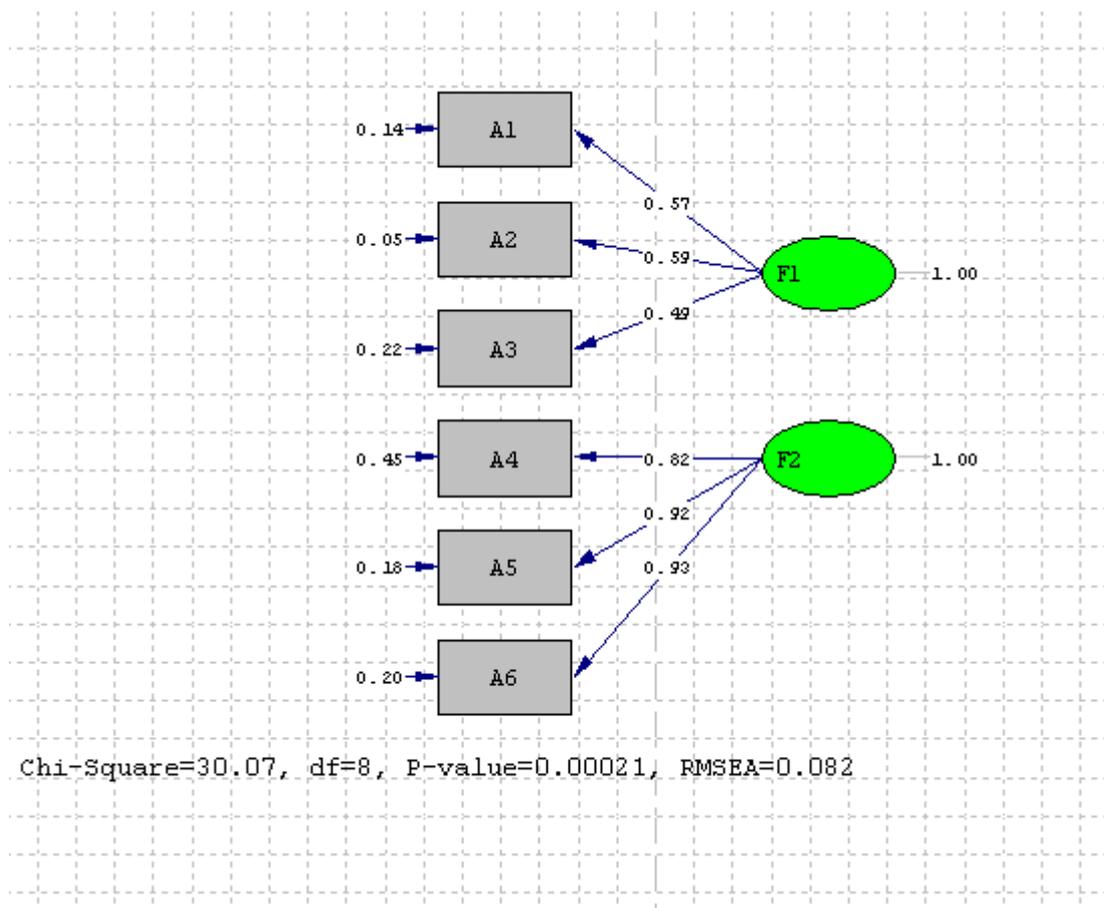


Figure 1. Factor loads of confirmatory factor analysis

## DISCUSSION

In this study, the validity and reliability of Potential-based achievement goals scale developed by Elliot, Murayama, Kobeisy, ve Lichtenfeld, (2015) was investigated on a group of Turkish students. Firstly, CFA was performed to examine structure validity of the scale. CFA result showed that the factor structure was compatible with the original scale. According to confirmatory factor analysis, two factor original scale was confirmed by testing CFA. Compatibility values gathered from the results are  $\chi^2=30.07$ ,  $sd=8$ ,  $RMSEA= .082$ ,  $AGFI=.94$ . According to compatibility values,  $\chi^2/df$  rate and compatibility index indicate that the model is well fit (Bollen, 1989).

Cronbach Alfa internal consistency parameter was utilized to measure the reliability of the scale. Cronbach Alfa internal consistency value of the scale was found as .82. According to this findings, Potential-based achievement goals scale was defined as valid and reliable measurement instrument. Whether the present structure represented in this investigation is confirmed with different sample groups can be examined. New findings about the validity of the present scale can be reached by the way of associating achievement orientations and different variables. Some investigations can be performed to determine if the scale is appropriate for different education grades which were adapted for the university students.

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		Kesinlikle	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle
	<b>Potansiyel Tabanlı Başarı Hedefleri Ölçeği</b>					
1	Sınavlarda mümkün olduğunca yapılabileceklerimin en iyisini yapmayı amaçlarım.	1	2	3	4	5
2	Sınavlarda yapabileceğimin en iyisini yapmayı amaçlarım.	1	2	3	4	5
3	Sınavlarda kişisel performansımın en iyisini yapmayı amaçlarım.	1	2	3	4	5
4	Sınavlarda bildiğime kıyasla en zayıf dereceyi yapmaktan çekinirim.	1	2	3	4	5
5	Sınavlarda bildiğimden daha kötüsünü yapmaktan çekinirim.	1	2	3	4	5
6	Sınavlarda kendi seviyemin en kötüsünü yapmaktan çekinirim.	1	2	3	4	5

# Examining the Relationship between Kinesthetic Intelligence Levels and Problem Solving Skills of Child and Young Sporters

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## ABSTRACT

The objective of this study is to examine the role of kinesthetic intelligence levels of child and young sporters aged 12 - 18 on determining problem solving skills. According to the study objective, the study group consisted of totally 363 licensed child and young sporters aged 12-18, who competed in clubs. 29,5% of participants were in the age group of 12-13 (n=107), 32,5,% in the age group of 14-15 (n=118) and 38% in the age group of 16-18 (n=138). Among the participants; 51% were female (n=185) and 49% male sporters (n=178). The study objective was achieved by using Problem Solving Scale, which was developed by Heppner and Peter'sen (1982) and was tested for validity and reliability by Sahin, Sahin and Heppner (1993), and Kinesthetic Intelligence Scale, which was adapted into Turkish by Saban (2002). The acquired data were analyzed by using SPSS 22.0 program. Data regarding both scales were analyzed via non-parametric analysis methods as they did not show a normal distribution. Kruskal Wallis H test was used in comparing the scale data according to the age groups of participants. Mann Whitney U test was used in determining the differences between the age groups in lower dimensions. Mann Whitney U test was used in comparing the scale data according to the gender of participants. Spearman Correlation Analysis was conducted for examining the relationship between the scores of Physical Intelligence Scale and Problem Solving Skills Scale. Examining the study findings; it was determined that there was no statistically significant finding between the kinesthetic intelligence levels and problem solving skills of sporters. As a consequence, it may be suggested that there is no systematic relationship between the kinesthetic intelligence level and problem solving skill within the scope of our study.

**Keywords:** Sport, kinesthetic intelligence, problem solving

## INTRODUCTION

Recently, one of the focal points for researchers in the field of sport science seems to be problem-solving skills of children and teenagers and how to improve these skills (Siedentop & Van der Mars, 2004; Wright, Burrows & MacDonald, 2004; Mitchell, Oslin & Griffin, 2003). Undoubtedly, the main factor which motivates researchers to conduct such studies is to find a way to improve the problem-solving skill, which is one of the basic skills that children and teenagers should have. Also, exploring factors related to the problem-solving skill is in a very important position within the framework of this main purpose.

Gardner (1999) defines intelligence as the capacity to create a product which is valued in one or more cultures, the ability to come up with effective and efficient solutions for real life problems, and the ability to solve new and complex problems which need to be solved. According to the Multiple Intelligences Theory, human intelligence consists of different intelligence domains (Armstrong 2000). It is suggested that there are eight different intelligence types including the kinesthetic intelligence which differ in terms of learning style, problem-solving method, thinking style, specific tools, and characters (Kelly and Tangney 2003).

Body is beyond a simple machine similar to other artificial objects in the world. It is also an instrument that allows the individual to perceive himself, his most personal emotions and desires and an entirety which sparks different responses in others due to its unique traits (Gardner 1983).

Kinesthetic intelligence corresponds to the ability to use one's body to express ideas and emotions as an actor, athlete, or dancer or the ability to use one's hands as a sculptor, surgeon, or mechanic or create new things with one's hands. This domain of intelligence is one's capacity to use certain body organs (e.g. hands or fingers) to solve a problem, build a model, or create a product. This type of intelligence also covers some physical attributes such as coordination, balance, strength, flexibility, and speed and some specific kinetic skills which allow these attributes to work together. The best way to learn for individuals who are strong in this domain of intelligence is by doing, living, and moving (Bowling 1998, Maasjo 2002, Saban 2004).

Students with a strong bodily/kinesthetic intelligence have difficulty in focusing on the subject in class settings where the class is taught through classical verbal presentations and occupy themselves with something else during the learning process. As a result, those who drift away from the educational process most easily are usually students with strong bodily/kinesthetic intelligence (Eren Yavuz, 2004).

Gardner (1999) defines intelligence as the ability to produce effective and efficient solutions for problems. The relationship between kinesthetic intelligence, which is noted to develop with experience in athletes (Eren Yavuz, 2004), and the problem-solving skill is an object of curiosity. In this context, it is necessary to clarify concepts of problem and problem-solving.

Problem is defined as a situation which disrupts coping processes of the individual due to certain obstacles such as uncertainty, conflict, hesitation, inadequate performance skills, and lack of support resources. In general, problems arise from the difference between the existing situation and the desired situation. Problems may occur due to personal or environmental reasons, chronic or acute, as well as in the form of a series of time-limited, associated or similar events. Problem does not appear as a property of the individual or the environment on its own. They occur as a result of the mutual relationship between constantly changing environmental variables and the individual. While the concept of problem may be different for each individual, different individuals may respond differently to the same event. Therefore, a situation which may be described as a problem for a given individual may not be a problem for another (D'Zurilla, Nezu, and Maydeu-Olivares, 2004).

A positive psychological state may be ensured if the individual possess problem-solving skills. The problem-solving proficiency has a determining role in one's life struggle and self-actualization. Individuals with high problem-solving skill may set an example and encourage others with whom they are constantly in contact to have success in problem-solving. In development of societies, individuals with high problem-solving skill may be suggested to have the power to reach the masses (Gültekin, 2006).

Studies conducted with different variables show that the problem-solving skill influences many states of the individual. For example, studies on depression show that depressed individuals lack the ability to solve interpersonal or social problems effectively (Heppner and Petersen, 1982). Kiremitçi, Canpolat, and Yıldız (2014) reported a statistically significant relationship between kinesthetic intelligence and problem-solving. In another study on the same subject, Genç (2012) reported that kinesthetic intelligence was correlated with problem-solving subdimensions. In addition to these variables, the problem-solving skill is also affected by age (Akpınar, 2015), educational level (Enç, 1981; Gültekin, 2006; Kaya, 2005; Sesli, 2013), work experience (Demirtaş and Dönmez, 2008; Kaya, 2005; Şahin, 2015), educational level of parents (Akpınar, 2014; Demirtaş and Dönmez, 2008), professions of parents (Akpınar, 2014), having received training on problem-solving (Şahin, 2015), development and maturity level, privileges in skill level, motivation, and socio-cultural setting (Enç, 1981). Also, Heppner (2010b) noted that problem-solving was correlated with social adaptation, depression, despair, suicidal tendencies, anxiety, alcohol abuse, bad dietary habits, and childhood traumas.

It is believed that revealing the individual's skills will allow for commenting on his characteristics such as reasoning, critical-thinking, and problem-solving skills (Talu, 1999). Based on this opinion, the purpose of this

study is to find out about kinesthetic intelligence levels of school-age child and young athletes, investigate the relationship between kinesthetic intelligence, which is the priority of our study, and the problem-solving skills, and interpret the effect of kinesthetic intelligence on problem-solving.

## **METHOD**

In this section, research group, measurement tools and statistical methods utilized in this research were exhibited.

### *Research Design*

In this study, survey method (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel, 2008; Karasar, 2009) and relational survey method were utilized (Büyüköztürk et al., 2008; Karasar, 2009; Büyüköztürk, 2014). According to Fraenkel and Wallen (2006), the purpose of relational researches is to investigate the relationships among two or more variables without interfering them. In the meantime, existence and degree of the relationships among dependent and independent variables were tried to be revealed based on the model (Crano and Brewer, 2002). Karasar (2009) describes purpose of relational survey models as determining existence and degree of relationships among two or more variables. On the other hand, survey model is the approach which tries to describe a past or present status as it is. Research subject, which could either be an event, a person or a subject, is tried to be defined within their unique conditions and as is (Karasar, 2009). In the present study, relational research, one of the quantitative research methods, was employed and this constitutes an example of a research conducted based on survey model.

### *Participants*

In line with the purpose of the study, the research group consisted of 363 licensed child and young athletes in the 12-18 age group competing in clubs. 29.5% of the participants were in the 12-13 age group (n=107), 32.5% were in the 14-15 age group (n=118), and 38% were in the 16-18 age group (n=138). 51% of the participants were female (n=185) and 49% were male (n=178).

### *Measuring Instruments*

For the purpose of the study, the Problem Solving Inventory (PSI) developed by Heppner and Petersen (1982) and tested for validity and reliability by Sahin, Sahin, and Heppner (1993) and the Kinesthetic Intelligence Inventory were used.

### *Problem Solving Inventory*

The Problem Solving Inventory (PSI) was developed by Heppner and Petersen (1982) to measure self-perceived problem-solving skills and tested for validity and reliability by Sahin, Sahin, and Heppner (1993). It is a six point Likert-type scale consisting of 35 items. While "1" indicates strong agreement, "6" indicates strong disagreement. A low score obtained from the scale shows efficiency in problem-solving, a high score indicates inability to come up with effective solutions. Studies show that the Cronbach's Alpha internal consistency coefficient for the overall scale is 0.90, whereas the coefficient for subscales varies from 0.72 to 0.85 (as cited in Savaşır and Sahin, 1997: 79). The Cronbach's Alpha reliability value of the inventory was found to be .80 and the inventory was decided to be acceptable.

### *Kinesthetic Intelligence Scale*

In order to determine levels of students in domains of multiple intelligence domains, the Multiple Intelligences Developmental Assessment Scale developed by Gardner and tested for Turkish validity and reliability ( $\alpha=0.93$ ) by Saban (2002) was used in the study. The reliability coefficient was found to be  $\alpha=0.85$  in the analysis performed to review the Self-Evaluation Inventory in Multiple Intelligence Fields for samples of the study. The items of the inventory are marked according to the following system: 0= Not at all like me, 1= A little like me, 2= Somewhat like me, 3= A lot like me, 4= Definitely like me. Scores obtained by each participant from eight sections of the inventory were summed to determine total scores in intelligence domains. Those with a total score of 33-40 in intelligence domains were categorized as highly developed, those with a total score of 25-32 were categorized as developed, those with a total score of 17-24 were categorized as moderately developed, those with a total score of 9-16 were categorized as average, and those with a total score of 0-8 were categorized as underdeveloped.

### *Data Analysis*

SPSS 22.0 was used for data analysis. Since the data obtained from both measuring instruments did not show normal distribution, non-parametric analysis methods were used. The Kruskal-Wallis H test was used to compare inventory scores of the participants by age group. Mann-Whitney U test was used to determine which age group

caused the difference between subdimensions. Mann-Whitney U test was also used to compare inventory scores of the participants by gender. The relationship between the Kinesthetic Intelligence Scale scores and the Problem-solving Skills Scale scores of the participants was investigated using the Spearman Correlation analysis.

## FINDINGS

**Table 1. Frequency and Percent Distributions Regarding Demographic Information of The Participants**

Variables	Age	f	%
Age Groups	12-13 age	107	29,5
	14-15 age	118	32,5
	16-18 age	138	38,0
Gender	Female	185	51,0
	Male	178	49,0

According to the study objective, the study group consisted of totally 363 licensed child and young sporters aged 12-18, who competed in clubs. 29,5% of participants were in the age group of 12-13 (n=107), 32,5,% in the age group of 14-15 (n=118) and 38% in the age group of 16-18 (n=138).

**Table 2. Descriptive Statistics Regarding Problem-solving Scores of The Participants**

Subscale	N	X	Ss
Problem-solving confidence	363	36,01	6,891
Approach-avoidance	363	53,25	7,970
Personal control	363	17,36	4,308
Problem-solving skill	363	106,62	12,284

The participants had moderate problem-solving confidence, approach-avoidance, personal control, and problem-solving skill levels.

**Table 3. Comparison of Problem-solving Levels of The Participants by Age Groups**

Subscale	Age	N	X	Ss	Sıra Ort.	X <sup>2</sup>	P
Problem-solving confidence	12-13 age	107	35,96	7,127	177,29	1,622	,444
	14-15 age	118	36,57	5,966	192,09		
	16-18 age	138	35,58	7,438	177,03		
Approach-avoidance	12-13 age	107	52,36	8,326	169,43	20,125	,000
	14-15 age	118	51,21	7,358	157,24		
	16-18 age	138	55,68	7,602	212,92		
Personal control	12-13 age	107	17,19	4,558	176,97	10,499	,005
	14-15 age	118	16,54	4,150	161,61		
	16-18 age	138	18,18	4,119	203,34		
Problem-solving skill	12-13 age	107	105,50	13,235	173,44	10,977	,004
	14-15 age	118	104,32	11,317	163,19		
	16-18 age	138	109,44	11,844	204,71		

As shown in the Table 3, it was found that there was no statistically significant difference between the age groups in the problem-solving confidence factor ( $p>0.05$ ), whereas statistically significant differences were found between the age groups in the approach-avoidance, personal control, and problem-solving skill factors ( $p<0.05$ ). The difference between the age groups in approach-avoidance and problem-solving skill levels was found to arise from the higher problem-solving skill levels of participants in the 12-13 age group and the 14-15 age group compared to participants in the 16-18 age group. The difference between the age groups in the personal control factor was found to arise from the higher scores of participants in the 14-15 age group compared to participants in the 16-18 age group.

**Table 4. Comparison of Problem-solving Levels of The Participants by Gender**

	Gender	N	X	Ss	Sıra Ort.	Sıra top.	U	P
Problem-solving confidence	Female	185	35,23	7,107	169,80	31412,5	14207,5	,024
	Male	178	36,83	6,581	194,68	34653,5		
Approach-avoidance	Female	185	54,45	8,372	196,96	36438,0	13697,0	,006
	Male	178	51,99	7,344	166,45	29628,0		
Personal control factors	Female	185	17,79	4,425	191,87	35496,0	14639,0	,066
	Male	178	16,90	4,147	171,74	30570,0		
Problem-solving	Female	185	107,48	12,774	190,29	35203,0	14932,0	,125
	Male	178	105,72	11,723	173,39	30863,0		

As shown in the Table 4, it was found that there was no statistically significant difference between the genders in terms of problem-solving skill levels ( $p>0.05$ ), whereas statistically significant differences were found between the genders in the problem-solving confidence, approach-avoidance, and personal control factors ( $p<0.05$ ). Female participants were found to have a higher skill level compared to male participants in the problem-solving confidence factor, whereas male participants were found to have a higher skill level compared to female participants in approach-avoidance and personal control factors.

**Table 5. Descriptive Statistics Regarding Kinesthetic Intelligence Scores of The Participants**

Questinnnaire	N	X	Ss
Kinesthetic intelligence	363	27,09	5,971

As shown in the table 5, the participants had moderate kinesthetic intelligence levels.

**Table 6. Comparison of Kinesthetic Intelligence Levels of The Participants by Age Groups**

Age Groups	N	□	Sd	Mean Rank	X <sup>2</sup>	P
12-13 Age	107	26,58	6,703	177,79	2,256	,324
14-15 Age	118	27,84	5,879	193,80		
16-18 Age	138	26,86	5,401	175,17		

As shown in the table 6, there was no statistically significant difference between the age groups in terms of kinesthetic intelligence level ( $p>0.05$ ).

**Table 7. Comparison of Kinesthetic Intelligence Levels of The Participants by Gender**

Gender	N	X	Sd	Mean Rank	Sum of Ranks	U	P
Female	185	26,91	6,176	179,57	33221,0	16016,0	,653
Male	178	27,28	5,761	184,52	32845,0		

As shown in the table, there was no statistically significant difference between the genders in terms of kinesthetic intelligence level ( $p>0.05$ ).

**Table 8. The Relationship between Kinesthetic Intelligence Levels and Problem-solving Skills of The Participants**

	Correlation	problem-solvin	approach-avoidance	personal control factors	personal control factors
Kinesthetic intelligence	r	,035	-,090	-,082	-,096
	p	,504	,086	,118	,067
	n	363	363	363	363

As shown in the table 8, there was no statistically significant relationship between kinesthetic intelligence levels and problem-solving, approach-avoidance, personal control factors and problem-solving skill levels of the participants ( $p<0.05$ ).

## CONCLUSIONS

Information regarding physical education and exercise activities is mostly collected through studies designed in class settings or sport settings. Most studies focus on psychosocial and health benefits of sports and physical activities. Playing sports is known to contribute to physical and mental health. In line with this information, the purpose of this study is to investigate the relationship between kinesthetic intelligence levels and problem-solving skills of child and young athletes in the 12-18 age group. In this context, the main purpose of the study is to explore whether there is a correlation between kinesthetic intelligence levels and problem-solving skills of athletes.

It was found that there was no statistically significant difference between the age groups in the problem-solving confidence factor, whereas statistically significant differences were found between the age groups in the approach-avoidance, personal control, and problem-solving skill factors. The difference between the age groups in approach-avoidance and problem-solving skill levels was found to arise from the higher problem-solving skill levels of participants in the 12-13 age group and the 14-15 age group compared to participants in the 16-18 age group. This finding is consistent with D'Zurilla, Maydeu, and Kant's (1998) study which suggests that problem-solving skills of individuals improve as they move from youth to adulthood. The difference between the age groups in the personal control factor was found to arise from the higher scores of participants in the 14-15 age group compared to participants in the 16-18 age group. This finding is in contradiction with D'Zurilla, Maydeu, and Kant's (1998) study which suggests that problem-solving skills of individuals improve as they move from youth to adulthood.

It was found that there was no statistically significant difference between the genders in terms of problem-solving skill levels, whereas statistically significant differences were found between the genders in the problem-solving confidence, approach-avoidance, and personal control factors. Female participants were found to have a higher skill level compared to male participants in the problem-solving confidence factor, whereas male participants were found to have a higher skill level compared to female participants in approach-avoidance and personal control factors. In the light of this information, it can be said that findings obtained by Korkut (2002) support our study. There was no statistically significant difference between the genders in terms of kinesthetic intelligence level. In the light of this information, it can be said that findings obtained by Korkut et al. (2011) in their study with high school students support our findings. There was no statistically significant relationship between kinesthetic intelligence levels and problem-solving, approach-avoidance, personal control factors and problem-solving skill levels of the participants.

In conclusion, we were unable to find a statistically significant relationship between kinesthetic intelligence levels and problem-solving skills of athletes. Within the framework of our study, it can be said that kinesthetic intelligence level does not have a systematic association with problem-solving.

### Authors' Disclosures of Potential Conflicts of Interest

The authors indicated no potential conflicts of interest.

### Footnotes

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# Expected Academic Performance in a Lower Level Undergraduate Structural Course

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## ABSTRACT

The structural field of Civil Engineering is usually considered by undergraduate students as the hardest discipline. In Statics, the first structural course, students show learning problems, discouragement and anxiety to later courses. To improve this situation, it is necessary to identify those students who experience learning issues. This paper analyzes the expected academic performance from students enrolled in Statics. Four semesters of data have been analyzed, correlating the Cumulative Index and the Initial Course Performance with the Final Grade. Results show that Cumulative Index and Initial Course Performance correlate with Final Grade. However, the dispersion levels are not valid enough to make a prediction. Data shows that academic performance could be affected by the semester when the course is offered. Analyzed data shows that by establishing a relation between the Final Grade, the Cumulative Index and the Initial Course Performance, it is possible to group students and categorize their academic performance. This analysis would allow the implementation of more specific actions to enhance the students' academic performance.

## INTRODUCTION

In the Civil Engineering Curriculum, the structural area is usually considered by many undergraduate students as the hardest throughout their major. Statics is the first area course where basic concepts are developed to learn subsequent courses. In this course, the student's experience must be highly positive to avoid generating negative attitude or anxiety, and facilitate true learning for future application. Each semester, a group of students enrolled in Statics at the University of Piura, experience learning issues. To improve this situation, it is necessary to identify those students so they can receive more attention from their professors and achieve satisfactory academic results. This identification requires a prediction.

The academic community has been interested in predicting the student's future academic performance for different purposes and using different mathematical models and predictor variables. Some authors (Touron 1982, Aboma 2009, Sembiring 2011, Dalziel & Peat 1998) are looking to discover the most impacting factors on academic performance to develop predictive models. Another example is Huang & Fang work, 2013, which not only focuses on predictors, but also evaluates a number of models determining the most appropriate for prediction.

On the other hand, unlike previous publications, other authors have used prediction with different purposes: to identify a specific group of students who might have unfavorable academic outcomes and try to improve their situation. Some researchers included in this group are: Snyder, Hackett, Stewart & Smith 2002; Rúa & González 2004; Rodríguez & Coello 2008; Ibarra & Medina 2011; De Winter & Dodou 2011.

This paper is aimed to study the academic performance expected from students enrolled in Statics at the University of Piura, analyzing two performance indicators: one prior to the course start (Cumulative Index) and the other during the early course weeks (Initial Course Performance). The performance study is the initial stage of a larger process looking to improve the student's academic results and avoid the loss of motivation to study and continue their career progress.

## COURSE DESCRIPTION

Statics is a theoretical-practical course aimed to develop the student's ability to simply and logically analyze Engineering problems and the capacity to apply the basic principles of Mechanics, Vector Algebra and Mathematics, in the solution.

The Statics course grading system includes an entry exam (EE), biweekly tests (T), weekly quizzes (Q), one midterm exam (ME), one final exam (FE), and one optional additional exam to replace the lowest grade obtained in two previous exams. In addition, the student's attendance (A) and participation in extracurricular activities (EX) organized by the School of Engineering are also considered. Table 1 shows the final grade (FG) calculation for the semesters under study.

**Table 1.** Formulas for calculating the final grade of Statics.

Semester	Formulas for calculating the final grade
2012-II	$FG = [(EE \times 0.5 + T_1 + T_2 + T_3 + T_4 - T_{\min} + Q + EX + ME \times 3 + FE \times 3) / 9.5] - A$ ; if $EE \geq 11$
2013-II	$FG = [(T_1 + T_2 + T_3 + T_4 - T_{\min} + Q + EX + ME \times 3 + FE \times 3) / 9.0] - A$ ; if $EE < 11$
2013-I	$FG = [(EE \times 0.5 + T_1 + T_2 + T_3 + T_4 + T_5 - T_{\min} + Q + EX + ME \times 3 + FE \times 3) / 10.5] - A$ ; if $EE \geq 11$
2014-I	$FG = [(T_1 + T_2 + T_3 + T_4 + T_5 - T_{\min} + Q + EX + ME \times 3 + FE \times 3) / 10.5] - A$ ; if $EE < 11$

T<sub>i</sub>: grades for the biweekly tests, i = 1, 2, 3, 4, 5. T<sub>min</sub>: lowest grade of all the tests.

The course final grade, entry exam, tests and exams (midterm and final) are rounded to the nearest integer and can take values between 0 and 20, including limits. If the final grade is higher than or equal to 11, the student passes the course. If the final grade is less than 11, the student fails.

Additional points for quizzes (Q) and extracurricular activities (EX) can worth up to 3 points. Deduction for absences (A) can range from 1 to 9 points based on absences in the semester.

This paper analyzed the academic results of 369 students enrolled in the Statics Course during four semesters: 2012-II (93 students), 2013-I (114 students), 2013-II (92 students), and 2014 -I (70 students). The first semesters (2013-I and 2014-I) cover March to July and the second semesters (2012-II and 2013-II) cover August to December.

## ANALYSIS AND RESULTS

### ANALYSIS OF EXPECTED ACADEMIC PERFORMANCE BASED ON CUMULATIVE INDEX

Prior research outcomes (Tourón 1985; Dalziel & Peat 1998; Snyder, Hackett, Stewart & Smith 2002; Rodríguez & Coello 2008; De Winter & Dodou 2011), concluded that the Grade Point Average (GPA), is a prior performance indicator highly correlated to future performance. Based on this, a GPA-Equivalent parameter was used: the Cumulative Index (CI). The CI is an academic index that measures the student performance throughout his career. This represents the weighted grade average obtained in enrolled courses, taking course credits as a weighting factor.

The Cumulative Index - independent variable - was correlated to the Statics Reformulated Final Grade (RFG) achieved before taking the replacement exam - dependent variable. The Reformulated Final Grade (RFG) calculation was based on the Final Grade (NF) calculation formulas shown in Table 1, but without considering neither the extra participation points in extracurricular activities (EX), nor deductions for absences (A). The RFG has been expressed with a 2-decimal digit number for a higher correlation with variables. Students retaking the course were dropped from the sample considering only those taking the course for the first time. Hence, a more homogeneous and reduced data was analyzed.

In previous publications, a number of mathematical models have been used to correlate the students' academic performance starting from the simplest such as the linear regression (Dalziel & Peat 1998, De Winter & Dodou 2011) and multiple regression (Touron 1985; Aboma 2009) to the more complex models, such as logistic regression (Snyder, Hackett, Stewart & Smith 2002, Rúa & González 2004, and Rodríguez & Coello 2008), data mining techniques (Sembiring 2011, Ibarra & Medina 2011), and neuronal networks (Huang & Fang 2013). Research results show that a complex mathematical model does not guarantee high successful rates. Acceptable satisfactory grades can be achieved with simple models.

To analyze the relationship between the Cumulative Index and the Reformulated Final Grade, a mathematical model of simple linear regression was used, due to its low complexity and easy replicability (Angulo 2007). Based on corresponding measurements for the 2012-II, 2013-I, 2013-II and 2014-I semesters; it was determined the highly descriptive linear function of correlation between both variables. Resulting equations for each semester represent the Expected Performance calculation based on Cumulative Index.

The relation between the Cumulative Index (CI) and the Reformulated Final Grade is shown in Figure 1. The regression lines that best fit each semester data represent the Expected Performance based on CI (EP<sub>CI</sub>). A

positive linear correlation between the Cumulative Index and the Expected Performance is observed. The P-values obtained were less than 0.05.

In second semesters' graphs, the regression lines fit data more appropriately; that is, less dispersion compared with the first semesters' graphs.

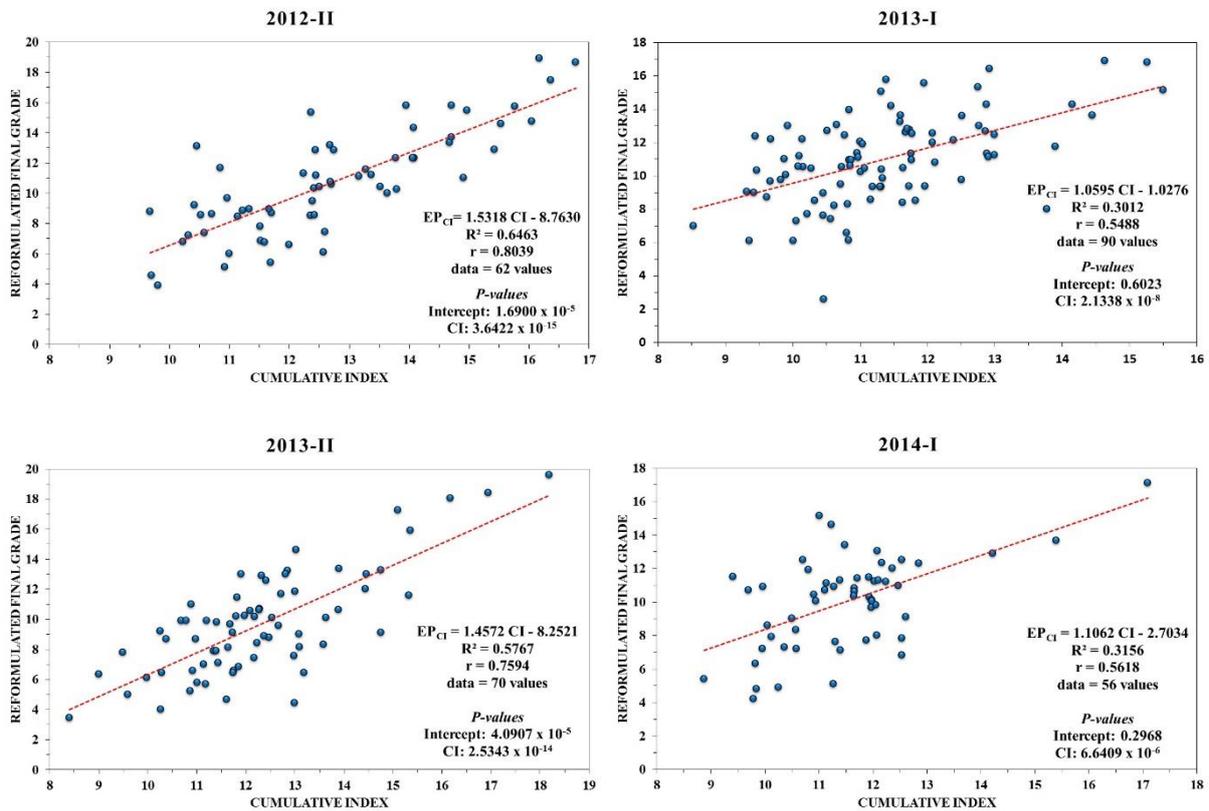


Figure 1. Cumulative Index vs. Reformulated Final Grade of students enrolled in Statics for the first time.

Figure 2 shows the highly fitted simple regression lines, obtained with equations displayed in Figure 1. These equations show the Expected Performance based on the Cumulative Index. There is a similarity between the lines corresponding to the second semesters, as well as the lines corresponding to those of first semesters.

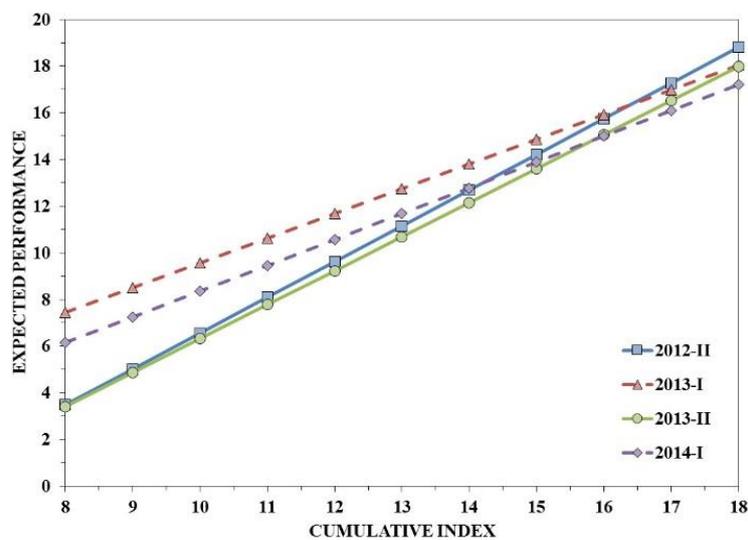


Figure 2. Better fitted simple regression lines expressing Expected Performance based on Cumulative Index.

Figures 1 and 2 show a differential behavior between the semesters both in data dispersion and regression equations. Lines slopes in first semesters are smaller than those in second semesters, which means that the increase of Expected Performance with the increase of Cumulative Index is higher in second semesters. These differences could result from various factors, some associated to the semester under study and others to the student.

The break period before the classes start is not the same for every semester. For the first semesters break lasts approximately 2 months. For second semesters, break period lasts less than one month.

In second semesters, a general inter-school sports activity takes place at the University of Piura. In this event students voluntarily participate in competitions and contests throughout the semester. In first semesters, this kind of activities are not offered.

Students who took Statics for the first time in second semesters, have not had delay issues in their college admission. Students who took the course in first semesters, have had admission issues. The Cumulative Index median in second semesters (12.49) was higher compared to the first semester's median (11.42). This shows that second semester students group presented, on average, a better previous academic performance.

During the first semesters (2013-I and 2014-I) there is a displacement among regression lines, keeping similar slopes (see figure 2). This parallelism in the regression lines could be explained due to the professor that was not the same. In second semesters (2012-II and 2013-II), regression lines are very similar among each other. Unlike the first semesters, this time the course was taught by the same teacher. This behavior confirms the fact that the professor has an influence on the academic results.

Other factors that would affect the expected performance could be: student academic load, classroom comfort associated to seasonal weather conditions, teaching methodologies (based on each professor), family-related issues, non-academic activities (sports, music, and languages), working need to cover tuition, fatigue resulted from psychological issues, and diseases, among others.

The Cumulative Index has shown a relation with the Reformulated Final Grade, but this relationship does not guarantee that the Expected Performance determined by the CI, is close to the actual performance obtained at the end of the semester.

#### **ANALYSIS OF EXPECTED ACADEMIC PERFORMANCE BASED ON COURSE PERFORMANCE**

First examinations' grades measure the student's learning level for the first part of the course. These grades can be measured by an indicator that would represent the student's initial academic performance for the course first units' topics. This indicator called Initial Course Performance has been correlated to the Reformulated Final Grade.

The Initial Course Performance (ICP) is the weighted average of grades obtained in evaluations previous to the midterm (entry exam, tests 1 and 2), eliminating the lower of two tests and rounding the result to two-decimal digits. These evaluations have been used to characterize the student's academic performance in the initial stage of the course.

Quizzes administered throughout semesters have not been considered in the Initial Course Performance calculation due to their low impact on the Final Grade calculation and their poor grade gradualness.

Based on appropriate data measurements for the 2012-II, 2013-I, 2013-II and 2014-I semesters, the linear function that best describes the correlation between the Initial Course Performance and the Reformulated Final Grade has been determined, for those students enrolled in Statics for the first time. The resulting equations, for each semester, represent the Expected Performance determined based on the Initial Course Performance ( $EP_{ICP}$ ).

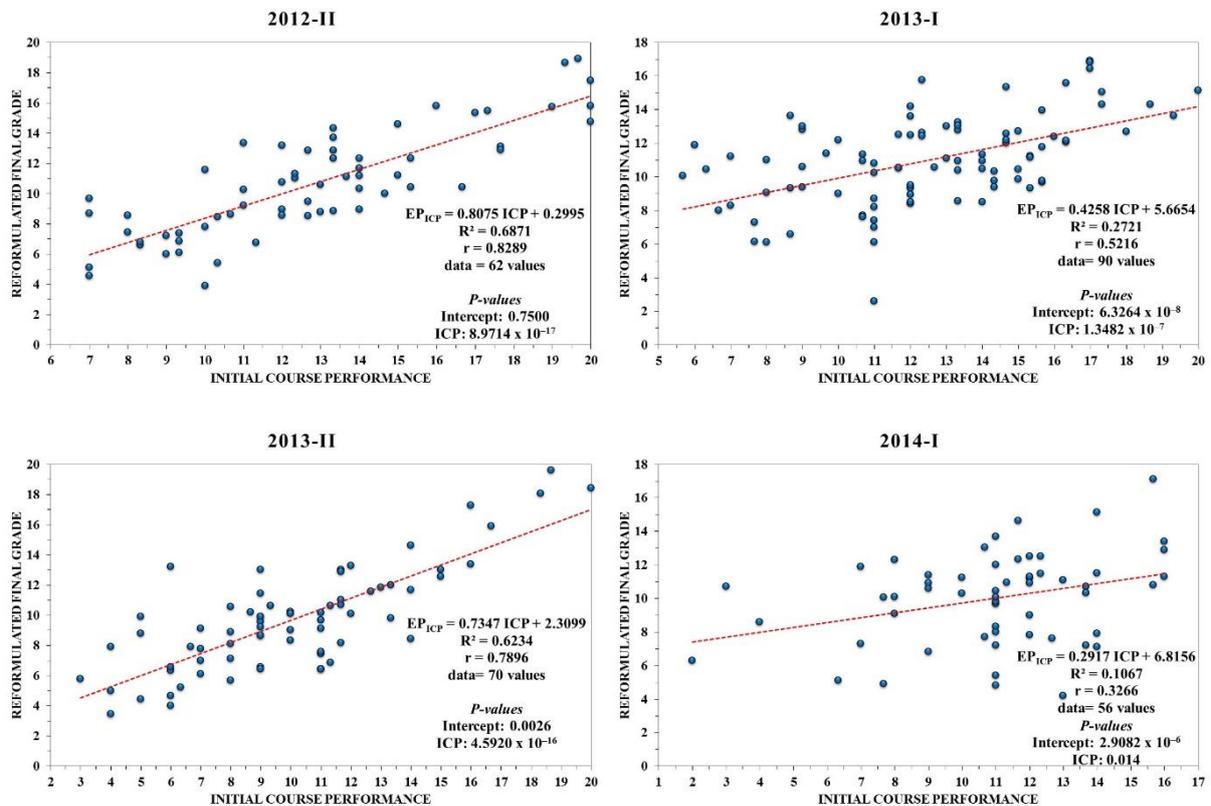
Table 2 shows the statistical parameters of regression lines that relate Cumulative Index with Reformulated Final Grade, and Initial Course Performance with Reformulated Final Grade. Correlation ( $r$ ) and determination coefficients ( $R^2$ ) have been increased in second semesters only. In first semesters, both parameters have decreased when considering the ICP as an indicator of expected performance.

CI shows a greater correlation with the RFG in the first semesters. In second semesters, ICP is the indicator that mostly correlates with the RFG.

Figure 3 shows the relation between Initial Course Performance and Reformulated Final Grade. The regression lines more suitable to each semester data, represent the Expected Performance expressed based on the ICP. A positive linear relation is observed. P-values obtained were less than 0.05.

**Table 2.** Statistical results of linear regressions between Cumulative Index and Reformulated Final Grade and between Initial Course Performance and Reformulated Final Grade.

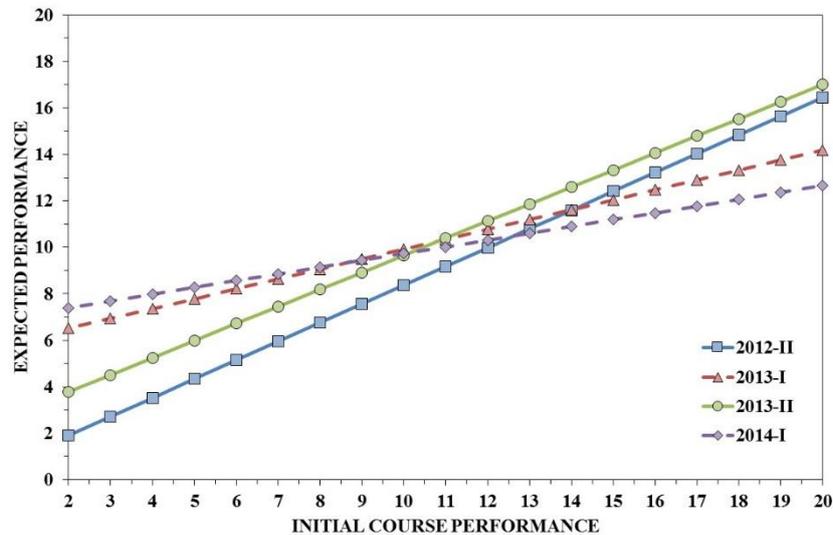
Sem.	Statistical Parameters	Cumulative Index versus Reformulated Final Grade	Initial Course Performance versus Reformulated Final Grade
2012 II	Sample Size	62	62
	Line Equation	$EP_{CI} = 1.5318 CI - 8.7630$	$EP_{ICP} = 0.8075 ICP + 0.2995$
	Determination Coefficient ( $R^2$ )	0.6463	0.6871
	Correlation Coefficient ( $r$ )	0.8039	0.8289
2013 I	Sample Size	90	90
	Line Equation	$EP_{CI} = 1.0595 CI - 1.0276$	$EP_{ICP} = 0.4258 ICP + 5.6654$
	Determination Coefficient ( $R^2$ )	0.3012	0.2721
2013 II	Sample Size	70	70
	Line Equation	$EP_{CI} = 1.4572 CI - 8.2521$	$EP_{ICP} = 0.7347 ICP + 2.3099$
	Determination Coefficient ( $R^2$ )	0.5767	0.6234
2014 I	Sample Size	56	56
	Line Equation	$EP_{CI} = 1.1062 CI - 2.7034$	$EP_{ICP} = 0.2917 ICP + 6.8156$
	Determination Coefficient ( $R^2$ )	0.3156	0.1067
	Correlation Coefficient ( $r$ )	0.5618	0.3266



**Figure 3.** Initial Course Performance vs. Reformulated Final Grade of students enrolled in Statics for the first time.

In second semesters Graphs show a regression line more suitable to the sample points and larger dispersion in first semesters. This behavior is similar to the observed when Cumulative Index is related to Reformulated Final Grade.

Figure 4 shows more suitable simple regression lines obtained from equations included in Figure 3 which presents an Expected Performance based on Initial Course Performance. Lines are not the same, but there is a similarity between the lines corresponding to the first semesters, as well as the lines corresponding to those of second semesters.



**Figure 4.** Simple regression lines show Expected Performance based on Initial Course Performance.

Figure 3 and 4 show a differentiated behavior between semesters not only in data dispersion but also in regression equations. These differences may have resulted by factors that would be affecting the Expected Performance shown based on Cumulative Index: break period before classes' start, university sports activities, college admission delay, average previous academic performance of the class, and professors teaching the course, among others. Moreover, another factor could be added: examinations being administered in first semesters have different behavior than the one in second semesters (see figure 4). Therefore, the academic performance could be affected by the semester when the course is offered.

In figure 4 as well as in figure 2, first semesters' line slopes are smaller than those in second semesters. The increase of Expected Performance with the increase of Initial Course Performance is higher in second semesters.

#### **ANALYSIS OF VARIATIONS BETWEEN REFORMULATED FINAL GRADE AND EXPECTED ACADEMIC PERFORMANCE**

Figure 5 shows variations between Reformulated Final Grade and Expected Performance based on Cumulative Index and variations between Reformulated Final Grade and Expected Performance based on Initial Course Performance. The x axis represents the difference between RFG and  $EP_{CI}$  and the y axis represents the difference between RFG and  $EP_{ICP}$ . These differences measure the precision of the estimation, either using  $EP_{CI}$  or  $EP_{ICP}$ . A positive variation means that RFG is greater than the expected performances, and vice versa. Zones with similar academic behavior have been defined setting boundary lines which correspond to differences equal to  $\pm 1$  (see figure 5). Student percentage for each zone is indicated in figure 5.

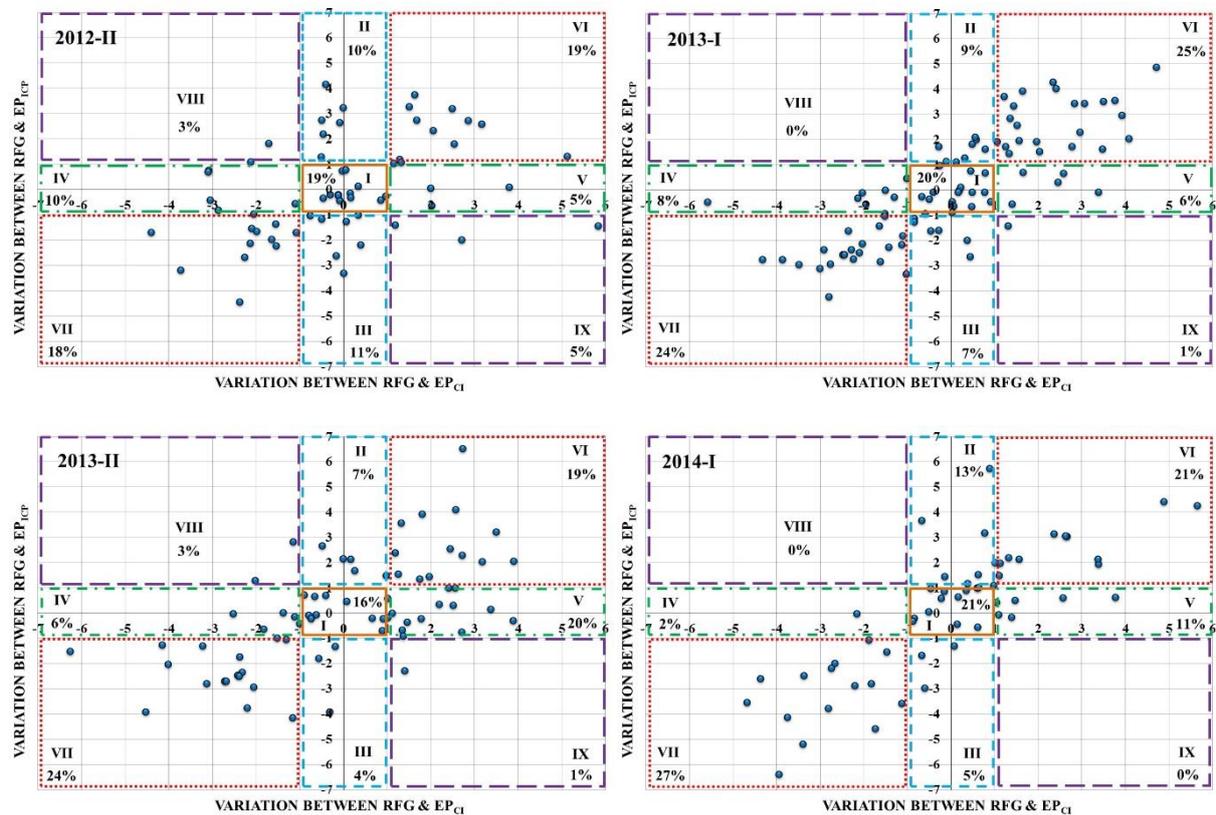
Group 1, in Central Zone I (16% to 21% of sample), assemble students with consistent final grades very close to expected performance, which was determined using Cumulative Index and Initial Course Performance. Both indicators show to be good predictors for these students, since they allow predicting expected performances very close to the final grade.

Group 2, in Zones II and III (4% to 13% of sample), gather students who obtained final grades very similar to ones predicted using Cumulative Index to determine the expected performance. However, the expected final score calculated with the Initial Course Performance are not close enough compared to the final grade (varied by

more than one point). Students in Zone II had initial results that predicted lower expected performances than the final grade. During the semester, however, their performance improved. Students in Zone III had initial results that predicted expected higher performances than the final grade. During the semester, however, the performance declined. In both zones, Cumulative Index proved to be a good predictor.

Group 3, in Zones IV and V (2% to 20% of sample), assemble students who have obtained final grades very similar to ones predicted using Initial Course Performance to determine the expected performance. However, the expected final score calculated with the Cumulative Index are not close enough compared to the final grade (varied by more than one point). Students in Zone IV had cumulative indexes that predicted expected performances higher than the final grade, that is, they are students whose final grades are lower than the expected results based on their CI. Students in Zone V showed cumulative indexes predicting an expected performance lower than the final grade, that is, they are students whose final grades are higher than the expected results for their CI. In both areas, the Initial Course Performance proves to be a good predictor.

Group 4, in Zones VI, VII, VIII, and IX (18% to 27% of sample), gather students who obtained final grades that are not close enough (varied for more than one point) compared to the expected final score which were determined based on Cumulative Index or Initial Course Performance. In Zone VI, both  $EP_{CI}$  and  $EP_{ICP}$ , were smaller than the RFG; and in Zone VII, both performances were higher than the Reformulated Final Grade. Zones VIII and IX show a behavior similar to Zones VI and VII; with the difference that in Zone VIII,  $EP_{CI}$  was higher than RFG while  $EP_{ICP}$  was lower than RFG. Moreover, in Zone IX,  $EP_{CI}$  was lower than RFG while  $EP_{ICP}$  was higher than RFG. Neither of the two indicators prove to be a good predictor.



**Figure 5.** Variation relation between RFG and Expected Performance calculation based on CI & ICP. Student percentage for each zone is shown.

## CONCLUSIONS

The Cumulative Index and the Initial Course Performance are correlated with the Reformulated Final Grade. However, the dispersion levels obtained with the Cumulative Index ( $R^2$  never higher than 31% in first semesters and 61% in second semesters), are not good enough to make a prediction. Similar situation is evidenced with the Initial Course Performance, where the maximum  $R^2$  reached was 19% in first semesters and 66% in second semesters.

Results show a differentiated behavior when comparing first and second semesters. However, during each semester, the expected performance shows similar behaviors. This conclusion is supported on two analyses: using Cumulative Index and Initial Course Performance as performance indicators. Therefore, the academic semester should be considered a variable in the performance prediction.

The analysis of expected academic performance allows to identify common behaviors in students taking the course:

- Group 1 students whose final grade could be predicted based on the Cumulative Index or Initial Course Performance. These students are characterized by presenting a consistent academic performance. That is, the initial performances in the course correspond to its Cumulative Index. This feature is what would be expected to make good predictions and be able to identify students requiring assistance. However, this group does not exceed a quarter of the sample in each semester. Eventually, these students could be identified as those whose correlation between the Cumulative Index and the Initial Course Performance is high.
- Group 2 students who's Cumulative Index predict performances close to the final grade. However, initial results don't establish performances close to the final grades. These are students whose initial performances in the course do not correspond to what is expected of them based on the Cumulative Index. Their initially expected performance is affected by some factors that act on a temporary basis, but then stop to influence their academic performance. These are students whose final grades are consistent with the Cumulative Index, regardless of what their initial performance is.
- Group 3 students who's Cumulative Index does not predict performances close to the final grade, but initial results establish performances close to the final grades. If the final grade is higher than the expected performance based on Cumulative Index, those would be students with good academic status who not necessarily always obtain good grades in previous courses; or students who have taken actions (continuing teacher meetings, more individual study hours, group study, and private lessons) to achieve favorable academic results. If final grade is lower than the expected performance based on Cumulative Index, those would be students who have obtained good grades in courses that do not develop the competences required for Statics or students who have had personal issues. These are students whose final grades are not the expected based on the Cumulative Index, but are consistent with their initial course performance.
- Group 4 students who are not easy to predict by any of the two performance indicators. This is a significant group: around half of students per semester. This rate would give an idea about the limitation of the prediction, that is, there would not be a significant number of students whose final performance could be reasonably predicted based on analyzed variables. As a consequence, the ability to identify students requiring assistance, would be affected. The academic performance of students in this group would be influenced by non-academic factors such as stress, demotivation, personal issues, and health problems, among others.

Although clustering is only possible at the end of the course, this classification serves to guide a more detailed investigation about the causes that would be the origin of the behavior of each student group. Particularly, group 4 would be interesting to analyze since the performance of this group is sensitive to non-academic factors. This study will help overcome the difficulties in predicting academic performance and, as a consequence, will facilitate the identification of students requiring assistance.

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# Exploring Global Citizenship of Undergraduate Students in A Liberal Arts Course as Cooperative Learning

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## ABSTRACT

This study is to observe global citizenship of undergraduate students in a liberal arts course, Multicultural Society and Coexistence Humanities (MSCH), in 'I' university of Korea. MSCH provides a cooperative learning format to promote global citizenship which is required by multicultural society. Students were divided into teams of five-members and participated together in a role play. And their personal experiences were surveyed with open-ended questions and written in individual journals. Based on qualitative research method, Giorgi's phenomenological analysis, this study explored those students' experiences on global citizenship. As an analysis frame of global citizenship, those contents were extracted from previous studies by seven scholars and institutions. Finally, this study provided the implications for global citizenship education in Korea.

## INTRODUCTION

As a liberal arts course, Multicultural Society and Coexistence Humanities (MSCH) was first opened in 2017 Spring Semester 2017 in 'I' University of Korea. The purpose of MSCH is to cultivate global citizenship for coexistence in multicultural society. As the MSCH accepts the blended and flipped learning format, this course is divided into two parts as follows: One part is a one-and-half hours online classroom, which provides theoretical and individualistic learning through lecture videos, documents, and slides. The other part is a one-and-half hours offline classroom, which provides practical and cooperative learning through team project. Thus, students had participated in three-hours class in a week. The online class' contents consist of the following four themes: conditions of coexistence, contexts of coexistence, width of coexistence, and practice of coexistence. And then, the offline class is designed to make students practice theoretical knowledge in online class by means of team project like ice-breaking, team-building, two kinds of role play. For this study, students formed teams with five members, prepared and performed together role plays. Especially, the first role play was dramatized about the four kinds of social interaction in everyday life, including competition, cooperation, conflict, and exchange. The second role play was about multicultural population in Korea. This study focuses on those students' experiences of the first role play.

Relatively recently, global citizenship (GC) or global citizenship education (GCED) was actively discussed and reflected in national curricula in South-Korea. Based on Merryfield (1998)'s conceptual framework on GCED, Mo and Lim (2014) analyzed the trends and issues of GCED in Korean social studies. The awareness of global issues and interdependence beyond national borderline was slightly reflected in public education since the first national curriculum (1954-1963). However, it is even after the seventh national curriculum (1997-2006) that interdependence in human history, intercultural competence, and prejudice reduction started to receive attention in public education. The reason why global citizenship was tardily reflected in Korean public education is the distinctive contexts of Korea as follows: geographical closure due to North Korea, pure-blood-ism, globalization as means, division of Korea into north and south, lack of human right awareness, and standardized system of education and evaluation (Sung, 2010).

Hence, being aware of the distinctiveness and the late start of GCED, Korean teachers and the Ministry of Education need to be more interested in developing GCED.

This study is expected to contribute to the improvement and development of GCED curriculum in Korea by exploring undergraduate students' global citizenship experiences in a liberal arts course. The research questions of this study are as follows: Q1. What were the global citizenship experienced by students? Q2. What were the meaning of their global citizenship experiences? Q3. What are this research's implications for GCED in Korea?

## **THEORETICAL BACKGROUND**

### **Global Citizenship**

As globalization has been accelerated and impacted on every sphere of society, global citizenship (GC) or global citizenship education (GCED) has received considerable attention in the education field around the world. As an institutional pioneer of GCED, UNESCO defines GC as follows: It is "a sense of belonging to a broader community and common humanity." As well, it emphasizes "political, economic, social, and cultural interdependency and interconnectedness between the local, the national, and the global" (UNESCO, 2015). As well, a Canadian scholar, Brigham defines GC in the three dimensions as follows: First, "a way of understanding how the world works, links between our own lives and those of people throughout the world"; Second, "a way of seeing social justice and equity, other people's reality, diversity, interconnectedness and the way that people can make a difference"; Third, "a way of acting - exercising political rights, critical thinking, and challenging injustice" (Brigham, 2011).

However, the biggest issue in studying GC or GCED is that there is no consensus about the conceptualization of GC or GCED (Maringe & Foskett, 2010; Johnson, 2010). Accordingly, the urgent issue is also to solve the conceptual ambiguity and lack of clarity. This study attempted to narrow down the core contents of GC or GCED in order that those contents will be used as a frame of analysis to discern GC from undergraduate students' experiences in the MSCH class.

In this sense, this study needs to review the primary discussion of GC or GCED from the following seven scholars and institutions around the world in this area. *First*, as an American scholar, Hans Schattle (2005) dealt with GC in public discourse beyond academic debate. Two overarching discourses were suggested as follows: Civic republican discourse considered GC as awareness, responsibility, participation, and cross-cultural empathy. However, libertarian discourse considered GC as international mobility and competitiveness. *Second*, a Dutch scholar, Wiel Veugelers (2011) interviewed school teachers on GCED and distinguished GC between three forms as follows: First, open GC is the knowledge of interdependency and open attitude of cultural diversity. Second, moral GC means diversity, the increasing of opportunity, the taking of responsibility, local component. Third, social-political GC are more interested in equality in relations for changing political power relations. Those teachers preferred moral aspects in GC more than political aspects. *Third* scholars are Morais and Ogden (2011). They developed three-dimensional conceptual model of GC. First dimension is interdependence and social concern to others, to society, and to environment. Its core assumptions are global justice and disparity, altruism and empathy, interconnectedness and personal responsibility. Second dimension is global competence which means the understanding one's own and other's cultural norms and expectation and the leveraging of this knowledge to interact, communicate, and work effectively outside one's environment. Its basic assumptions are self-awareness, intercultural communication, and global knowledge. Third dimension is civic engagement. It means the recognition of local, state, national, and global community issues and the response through actions such as volunteerism, political activism and community participation. It assumes involvement in the civic organization, political voice, and glocal civic activism. *Fourth* are British scholars, Oxley and Morris (2013). They developed a typology, based on two general forms of GC as follows: Cosmopolitan-based and advocacy-based GC. The former GC incorporates four dimensions such as political (democracy), moral (human rights), economic (international development), cultural (globalization on arts, media, languages, science and technologies). The latter GC incorporates the other dimensions like social (global civil society), critical (post-colonial agenda), environmental (sustainable development agenda), and spiritual (caring, loving, spiritual and emotional connections). *Fifth*, Oxfam (2015), as a pioneer institution of GCED in England, specifically suggested GCED curriculum as following three parts: knowledge and understanding (social justice and equity, identity and diversity, globalization and interdependence, sustainable development, peace and conflicts, human rights, power and

governance), skills (critical and creative thinking, empathy, self-awareness and reflection, communication, cooperation and conflict resolution, ability to manage complexity and uncertainty, informed and reflective action), and values and attitudes (sense of identify and self-esteem, commitment to social justice and equity, respect for people and human rights, value diversity, concern for the environment and commitment to sustainable development, commitment to participation and inclusion, belief that people can bring about change). *Sixth*, another pioneering institution of GC, UNESCO (2015) suggested core conceptual dimensions as follows: Cognitive (to acquire knowledge, understanding and critical thinking about global, regional, national and local issues and the interconnectedness and interdependency of different countries and populations), socio-emotional (to have a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity and respect for differences and diversity), and behavioral (to act effectively and responsibly at local, national and global levels for a more peaceful and sustainable world). *Seventh*, a Korean scholar, Hee-Jung Sim (2015) suggested 6 key features of GCED as follows: glocal interdependence and interconnectedness, a perspective of human dignity and peace: rights and responsibilities, cosmopolitanism and harmonizing identities, transformative learning process, diverse democratic decision through dialogue, plans of action to create positive change.

For this study, the aforementioned contents of GC or GCED needs to be narrowed down to common key contents. To this end, this study conducted contents analysis through frequency analysis of the above contents. Consequently, Table 1 shows the 10 most frequently mentioned contents. Those 10 contents will be utilized as the frame of criteria to discern global citizenship from the surveys and journals of students.

**Table 1. Contents Analysis on GC/GCED**

#	Contents	Frequency
1	Interdependence & interconnectedness	8
2	Responsibility	7
3	Human right, humanity, human dignity	6
4	Diversity	5
5	Local	5
6	Empathy	4
7	Equality & equity	4
8	Environmental	4
9	Culture	4
10	Sustainable	4

### Cooperative Learning

Cooperative learning is defined as “the instructional use of small groups so that students work together to maximize their own and each other’s learning” (Johnson & Johnson). Cooperative learning has become a standard educational practice during the past decades. Because it guarantees an exceptional validity and generalizability in social sciences, cooperative learning can be used with considerable level of confidence at every grade and in every area (Johnson & Johnson, 1998). Cooperative learning is based on social interdependence theory. When individuals take action in a classroom, there are only three types of social interdependence: cooperative, competitive, and individualistic. And those types determine interactions between individuals, and outcomes. Consequently, positive (cooperative) interdependence produces three positive outcomes as follows: high effort to achieve, positive relationships, and psychological health. In contrast, negative (competitive) interdependence or absence of interdependence (individualistic action) causes negative outcomes. Basic elements of cooperation are as follows: positive interdependence, promotive interaction, individual accountability, the appropriate use of social skills, and group processing (Johnson & Johnson, 2002). Needless to say, the MSCH class as this study’s field is the cooperative learning, as this course makes students spend half of their class time in doing team project and focuses more on cooperation between team members.

## Global Citizenship and Cooperative Learning

One of the important tasks in GCED is to foster global citizenship by means of experiential and empathic activities (Mo & Lim, 2014; Ok, 2014; Lee, 2014; Sung, 2010). Cooperative learning provides the educational method for GC's experiential practice. As aforementioned, cooperative learning and global citizenship education have such a common denominator as interdependence. In other words, interdependence is a theoretical foundation of cooperative learning as well as a core contents of global citizenship. Thus, cooperative learning is a means to foster global citizenship. In this sense, the liberal course MSCH provides cooperative learning as a format of instruction to foster GC in those students.

## RESEARCH METHOD

### Research Participants

Research participants were 31 undergraduate students who had took the liberal arts course, Multicultural Society and Coexistence Humanities (MSCH) during the Spring semester 2017. As this course was not a required course for a specific major, undergraduate students with a variety of majors registered this course, following their interests in this course. As well, when the 21 students were organized into 4 teams, their diversity was primarily considered. In other words, a team consisted of 5 or 6 members with a variety of age, gender, major, birth place, and so on. Thus, the 21 students in the liberal arts course formed 4 teams. Each team's members had experienced every step of role play like role assignment, script-writing, rehearsal, and real performance. And finally, they reported their own experiences of global citizenship education through survey and journal.

### Qualitative Method

While quantitative research emphasizes statistical validity, overall tendency of events, and relationship between variables, qualitative research can capture individualistic distinctiveness and meanings of a particular phenomenon or situation. This study considers that analysis of meanings of individual experiences is more appropriate and significant for this research's purpose than quantitative measure of their experiences. Based on those students' responses shown in survey and journal, the meanings of their global citizenship experiences were explored and interpreted. Especially, this study follows Giorgi's phenomenological analysis with the following order (Kim et al., 1999): First, significant statements, which are natural meaning units according to Giorgi, were identified in relation to 10 themes, that is to say, the 10 global contents. Second, this study extracted focal meanings, which specify those statements in detail. Third, situated structural description was made by the integration of focal meanings and perspectives of students.

## RESULTS

Over 140 significant statements about global citizenship were extracted from the surveys and journals by undergraduate students. Those statements were classified according to the 10 GC contents. Except for the fifth content (locality), 9 GC contents were found. Each meaning of GC content is as the following Table 1:

**Table 2. Meaning of Global Citizenship**

#	GC Contents	Meaning
1	Interdependence	Interdependence made positive change
2	Responsibility	Self-motivated responsibility due to common goal and role assignment
3	Human dignity	Common ground: We are not different
4	Diversity	Intentional encounter with unfamiliarity
5	Local	N.A.
6	Empathy	Internal attitude: empathy & authenticity
7	Equality	Condition to sustain coexistence
8	Environmental	Coexistence with nature, embedded in Korean tradition
9	Culture	Cultural relativism
10	Sustainable	Long-term relationship

### **Interdependence**

The most noticeable meaning on interdependence is that interdependence made positive change. In other words, students evaluated interdependent experience like role play in this course as positive. They confessed their worries and uncomfortableness before starting the role play as cooperative learning. However, their thoughts were changed at the end of the team play. They considered the role play as rewarding and productive. For example, a student confesses as follows: "I have no longer distrust on team play or worries on members. But now, I have a rewarding feeling, as I achieve a goal with unfamiliar members" (student A3).

### **Responsibility**

Common goal of students was to perform their own role play, and implicitly to get higher grade. Some students considered the cooperative learning itself as meaningful experience. As students agreed with fair assignment of responsibility in the role play, they prepared for his or her own role and task. There was no a free rider in the role play. Interestingly, their role performance was voluntary and self-motivated, as long as students have a common goal and the just assignment of role. Otherwise, that cooperative learning cannot be voluntary or self-motivated. A student says responsibility as follows: "With a common goal in mind, every member played faithfully each role and took care of others for friendly atmosphere" (student D5)

### **Human dignity**

A part of this course material teaches human as a physical or social organism. This course reminded students of humanity or human dignity. Some students considered the understanding of human as an essence for coexistence. Other students looked back on their warm memories of foreign-born friends or housekeeper. Although there is difference between languages or cultures, everyone has a common ground that they are human. As long as they are human, they are worthy of being respected. The recognition of humanity is a means of growth. A student said as follows: "I can be mature, when I see and understand human as he or she is" (student B1).

### **Diversity**

When teams were organized for the role play, diverse background was primarily considered. A team consisted of students with a variety of background in age, gender, major, and birthplace. Thus, some of teams made their own team's name based on their diversity. Most students confessed that they had experienced various opinion in every phase of preparing their own role play. However, without intentional encounter with diversity, they cannot know each other during the semester. Some students were aware that the intentional encounter with unfamiliarity is meaningful to them. Although that encounter may not be a means to achieve other goal or a comfortable experience, itself was valuable to them. Students said as follows: "My focus is not on getting job or upgrading my market value, but on cultivating competency on communication with others" (student A2). "My motto is that I can get synergy from the encounter with unfamiliarity" (student D1).

### **Empathy**

Students mentioned empathy from the role play experience or their past experiences. Empathy can open other's heart. Empathy is a key for coexistence. A student said that his successful role play started from empathy. Empathy accompanies authenticity. Without internal authenticity, there is no empathy. Thus, internal attitude for global citizenship is empathy and authenticity. Related statement is as follows: "The most important attitude of mind is to understand and embrace one another. Especially, it should not be an external gesture, but an authentic understanding" (student A4).

### **Equality**

Role and task of student in the role play is based on equality. Any other element like age and gender cannot surpass than equality. Thus, all of members can contribute to the role play and get the same grade. Furthermore, students connected their experience of equality to their past activities like voluntary service for disabled person, dating, and affinity group. Equality always follows the aforementioned GC contents like diversity and humanity. Without coexistence with others, there is no equality. And, equality is a condition to sustain coexistence. A student said as follows: "The reason why my team can sustain cooperation is equal distribution of grade" (student D6).

### **Environmental**

After this role play, a student recalled his childhood with his grandmother. She often fed wild animal. And she bowed down toward heaven. At that time, this student could not understand her behavior. However, at this time, he can

interpret her behavior in light of coexistence with nature and environment. This is a philosophy, embedded in Korean tradition. The student statement is as follows: “My grandma’s behavior was one of sustainable development education in Korean old version” (student B2).

### **Culture**

Students connected their role play experience to cultural relativism rather than ethnocentrism. Some students already had study-abroad experiences. They knew that people in other cultures have different perspectives, but they are not wrong. A specific culture cannot be absolute, cultures needs to be treated relatively, they said. A related statement is as follows: “We must understand others based on cultural relativism” (student A4).

### **Sustainable**

Students didn’t simply consider the role play as one of assignments or a means of getting their grade. Noticeably, they considered their relationship between members as long-term and sustainable relationship. For example, a team took care of a sick member, and a student thought it as a guide of coexistence in the future. Furthermore, reflecting education system in Korea, a student seriously doubted if universities provide education for sustainable coexistence. A student’s statement is as follows: “We did not make a disposable relationship to solve the assignment alone. We developed sustainable human relationship” (student B3).

## **CONCLUSION & DISCUSSION**

The course, Multicultural Society and Coexistence Humanities, was designed to help undergraduate students learn and practice global citizenship. This attempt is significant in the context of public education in Korea that global citizenship education is still at the early stage. Most of participant students have been taught in the competitive system, focusing only on college entrance examination. Thus, they didn’t yet experience cooperative learning. They didn’t yet think such a theme as global citizenship. In this sense, the course, especially the role play in the course, provided students a fresh and meaningful experience to open their eyes toward others and the world. As a qualitative research, this study shows that their initial worries, prejudice, and uncomfortableness were changed to unity between members, and fresh consideration toward otherness and cultures. Specifically, those students’ experiences were implicitly and explicitly related to the 9 contents of global citizenship among the 10 contents. Thus, this study suggests an example curriculum of GCED as liberal arts course in Korea and moreover the possibility of its positive and productive effect. Based on those statements of participant students, it is expected that GCED’s effect may be limited in theoretical learning format alone. In other words, global citizenship can be effectively cultivated not by theory alone, but by theory and practice. In this sense, blended learning or flipped learning, which was used by this course, is an appropriate format of learning and teaching on global citizenship. However, a variety of learning formats and contents on global citizenship need to be developed in the future. GCED needs to be more deepened & expanded in public education and university education in Korea.

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# Exploring the E-Learning Implementation Among Chinese University Learners of English: Comparison in Hong Kong and Mainland China

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## ABSTRACT

Mainland China and Hong Kong have individual educational systems within independent culture background; therefore, it is meaningful for researchers to compare the differences and similarities about the e-Learning implementation among Chinese university learners of English in Hong Kong and Mainland China with different educational backgrounds. Meanwhile, it is useful for educators to learn the different aspects of e-Learning from those two places. It is also practical for educators to understand the problems of using e-Learning methods. This study aims to explore and compare the e-Learning implementation among Chinese university learners of English in Hong Kong and Mainland China in recent years. Sixty-One Chinese university students of English were involved. The mixed-method approach would be adopted in the research. The study would mainly focus on the usage and Information, Communication and Technology (ICT) knowledge, learning engagement and learning strategies of Chinese learners of English. The findings would help Chinese learners of English to know the general situation of e-Learning implementation in Hong Kong and Mainland China. The purpose of this study is to enhance students' capability of using e-Learning methods to support their lifelong learning.

**Key words:** e-Learning implementation, Chinese university learners of English, comparison in English language education

## INTRODUCTION

As teaching and learning process gradually assisted by the Internet, web-based and computer-assisted learning methods such as MOOCS, Distance Learning and e-Learning began widely popular among the education industries in the world. Based on this general conception of e-Learning development, this research would like to make a clear comparative map about e-Learning implementation in Hong Kong and Mainland China.

English as a global language is an important medium and opportunity to connect the native and non-native English speakers around the world. To get higher scores for English test, Chinese teachers and parents would encourage students to crazily learn English after in-class learning. Chinese students always spent more spare time on going to extra-curricular English tutor center on the weekends and holidays. However, the level of English performance of Chinese learners were not balanced to their work in the reality, for example, Yang (2011) documented the poor

English level of nurses in Mainland China.

The Hong Kong education system was influenced by Western education system especially British education system for more than one hundred years and the policy about bi-literacy and tri-lingualism became popular in recent years, so Biggs (1996, 1998) indicated Chinese students in Hong Kong successfully learnt in Western education systems and outperform their Western peers, therefore it is reasonable for researchers to find the differences and commons about e-Learning implementation in Hong Kong and Mainland China based on policy-making reason. Szeto (2013) found only little empirical case studies about e-Learning development in Asia and only little studies in e-Learning implementation in Mainland China. Meanwhile, very little researches compared the e-Learning implementation in Mainland China and Hong Kong. Some researchers also found Mainland Chinese learners met with more difficulties in online learning process than local Hong Kong students. Based on Li and Lê (2006) research, Mainland China and Hong Kong have the common educational prospect which is education is the most effective way to develop personal growth, career and competitiveness. Different teaching methods would be another factor. In Mainland China, teachers always used didactic methods during traditional in-class teaching process (Wang, et al., 2009; Zhao, McConnell & Jiang, 2009), but teachers would choose a mixed method within didactic and reflective approaches to teach students in Hong Kong (Botelho, et al., 2010; Mcnaught, 2009). Meanwhile, the different curricular design, previous learning experience and learning strategies about English e-Learning course for Chinese university students would be factors to compare e-Learning implementation in Hong Kong and Mainland China.

The purpose of this study is to show the overall e-Learning implementation in Hong Kong and Mainland China and to enhance the capability of using e-Learning methods for Chinese learners of English in Hong Kong and Mainland China in a narrow research scale. The two research questions will be discussed. Firstly, what are the differences of the level of usages and knowledge of ICTs among Chinese learners of English in Hong Kong and Mainland China. Secondly, what are strategies for English e-Learning of Chinese learners in Hong Kong and Mainland China already were extant and would be suggested to apply in the future. The findings would help Chinese university students of English both in Hong Kong and Mainland China to understand their e-Learning capacities for their lifelong learning.

## **LITERATURE REVIEW**

### **THE BASIC STATEMENTS FOR E-LEARNING DEVELOPMENT AND CHINESE LEARNERS**

Reviewing the previous researches, Capper and Potashnik (1998) mentioned e-Learning technologies has been observed which try to cover the educational needs of people worldwide and e-Learning still is a debatable term, but Triaccra et al. (2004) pointed out e-Learning was a type of online learning and both Ellis (2004) and Triaccra et al. (2004) believed that some level of interactivity needs to be included to make the definition of e-Learning truly. Moore. et al. (2011) summarized all forms of e-Learning as applications, programs etc., can eventually provide a learning opportunity for individual. Sandars (2006) also agreed that e-Learning applications have been developed with an extensive usage of electronic media. For instance, Andrewartha and Wilmot (2001) found a significant improvement in students' performance in an online course comparing with an in-class course, but

Bernard et al. (2004) showed that no significant difference in students' performance in online and classroom course. Thompson (2005) investigated Chinese graduate students' experience and attitudes on taking online course in the USA. The findings showed that Chinese learners interestingly using online learning methods although they were not familiar with whole function of the online learning platform. Egan and Gibb (1997) showed e-Learning system can help students to create curiosity and increase motivation to learn while Yalman et al. (2016) mentioned students' attitude had no significant difference to e-Learning management systems. Blackmore (2008) reported that students felt satisfied in an online course as same as a classroom course, which Yalman et al. (2016) also agreed with in their research about Turkey university students' attitude of e-Learning management system that students felt more satisfied when they individually completed e-Learning assignment than group e-Learning assignment. Yi (2013) mentioned Chinese learners in the universities and colleges in the USA preferred online discussion and other learning activities which could help Chinese learners to more contribute on their learning outcomes and to follow the local students. However, Chinese learners would become anxious than before since they would worry about their online learning performance. Thus, the author suggested cultural background is one of the factor which could help researchers to better understand the Chinese learners' online learning performance. Thus, how to find the balance in the traditional classroom learning environment and e-Learning environment for education to help students to get better learning outcomes becomes another vital question for the future studies. To find more evidence to support this study, next section will discuss e-Learning implementation in Hong Kong and Mainland China.

### **E-LEARNING IMPLEMENTATION IN HONG KONG AND MAINLAND CHINA**

Based on the findings from Biggs and Watkins (1996) that Chinese learners can be found in different geographical locations and political systems such as Mainland China and Hong Kong. Considering the review of book titled *Comparative Education Research--Approaches and Methods* edited by Mark et al. (2014), policy makers, international agencies and academics could be the three main groups which would influence the education development. Individual educational policy-makers and decision-makers would be the important role to influence the e-learning policy development. In the Mainland China, based on the research by Jiang and Zhao (2010), only six famous Chinese universities set up the first education network transmission in 1994. By 2008, the number of network centers had reached over 2000 with almost 30 million users. Based on the developments, Chinese colleges and universities moved into new time of e-campus which means e-learning in Chinese universities would delivered by conventional model, blended model and distance model. Distance model is the main model used by Chinese universities and colleges for a long time. Chinese universities and colleges had already constructed the infrastructure for ICT in general. However, leading phenomenon about e-learning methods in the Mainland Chinese universities was didactic teacher-centered methods.

However, Szeto (2013) found the contrasted situation in Hong Kong. The mixed traditional in-class learning and e-learning methods became more and more popular in all Hong Kong educational institutions. Based on Chan's researches (2009), Hong Kong launched the "IT in Education Strategy" in 1998 which could assist students to use ICT methods to learn in various ways. In 2010, Hong Kong official records shown the number of e-learners increased 18%. In Hong Kong, not only higher education, but also primary and secondary school, aimed to enhance

their students' digital literacy by different curriculum designs, workshops and diverse competitions. Jiang and Zhao also believed ICT will play a more important role for students in the future learning and living.

Another relevant example is Kong et al. (2016)'s research about comparison among Singapore, Hong Kong, Taiwan, and Beijing for e-Learning in school education within three stages which includes five years for one stage in a table. Since this study focus on e-Learning in Hong Kong and Mainland China, thus only quoted the content from the table about Hong Kong and Beijing to support this study. The authors found in Hong Kong, all the ICTs plans are territory-wide which indicated that the ICTs plans are valued highly by Hong Kong educational policy-makers which could create a good external environment for Hong Kong students to develop their capabilities of using ICTs. However, the scales in Beijing from 2001 to 2010 only could know policy-makers had these e-Learning plans but could not be figures out if the Beijing Plans could influence inside of Beijing and other places in Mainland China and how deep the level of Beijing Plan is. Authors only indicated that Beijing Plan could be a city-wide strategy from 2011 to 2015 in Beijing which showed the clear distance and different degrees of e-Learning implementation among Hong Kong and Mainland China. In the next section, e-Learning implementation in English language will be illustrated to support a clear picture about the relation between English language learning and e-Learning methods for this study.

## **GENERAL SITUATIONS OF ENGLISH LANGUAGE E-LEARNING IMPLEMENTATION AND CHINESE LEARNERS**

In the recent studies, e-Learning offers the online delivery of information, communication, education and training (Sloman, 2001). Language MOOCs are recent phenomenon, and consequently little rigorous research exists to date (Hockly, 2015). In this section, Australia and three countries and Hong Kong from Asia would be cited as examples to illustrate e-Learning implementation in English language learning.

In Australia, Chen et al. (2008) investigated the adaptation process of two Chinese learners of English in Australia to their online learning. They pointed out that Chinese learners were difficult to adapting a Western learning environment because of culture shock. They discussed the limitations of the research and suggested subjective and objective knowledge should be alternative for each Chinese learner which should not simply communicate the knowledge for online lecture design.

In Asian, Hong Kong, Taiwan and Thailand would be cited as examples to illustrate e-Learning implementation in English language learning. Two examples in Hong Kong would be explained in the following part. Felix and Yvonne (2016) introduced the "Online Learning Platform for University Chinese Grammar" launched by Chinese University of Hong Kong which could help student to independently learn and improve the undergraduates' Chinese language acquisition. Most of feedbacks from the users were positive and the suggestions are the more detailed examples and videos would be designed for future development. Similarly, Tang et al. (2015) did one qualitative study for Chinese nursing students in Hong Kong by group interview, they found after learnt the online clinical English course, Chinese nursing students in Hong Kong liked to learn clinical English knowledge with higher levels of learning motivation. Most of participants agreed online clinical English courses were effective to

support the development of the clinical English knowledge and career development. Meanwhile, they also found course designs, adequacy of support and peer influence were important factors which would influence the students' learning outcomes and their learning motivations. However, the relation among students' proficiency in computers technology, the previous experience with technology and online learning did not clear evidence if they could be factors. In Taiwan, Fang-Chuan et al. (2015) researched how e-learning strategies influence on the second language vocabulary acquisition by eight e-learning strategies within two modes via MYEVA e-Learning software. The authors found mixed-modality e-learning strategies in preference mode for the new words more deeply stimulated students than basic mode strategies. However, it would product same learning outcomes in both modes for the words which were already learnt and knew by students. Banditvilai (2016) illustrated how e-learning programs enhance the language skills for Thailand learners of English in Thailand and results of the research were e-learning programs could increase students' motivation to autonomously learn.

In conclusion, generally language learners had positive attitudes and high motivation towards the online language learning. Similarly, Hockly (2015) also researched the developments in online language learning and indicated economic development has helped online learning to become mainstream and students will happily learn alone though online content. This example could support to help language learners to improve the quality of language e-learning method, it is important to figure out the relation among English e-learning methods, students' attitude for learning and learning motivation (Cinkara & Bagecci 2013; Hotho 2000; Ushida 2005). However, more and longer testing should be performed to give the way for long-term use in sustainable instructional technology design for English e-learning methods in the future (Kenndy & Levy, 2009).

#### **PREVIOUS STUDIES ABOUT E-LEARNING IMPLEMENTATION OF CHINESE UNIVERSITY LEARNERS OF ENGLISH IN HONG KONG AND MAINLAND CHINA**

Shen and Suwanthep (2011) have illustrated significant gains about the English-speaking performance of Chinese learners of English on the English e-Learning courses. Since most of Chinese learners learnt English by Chinese-medium instruction in Mainland China and some areas of Hong Kong, more and more online English learning platform by native-English-medium instruction were provided for Chinese learners of English. As the individual and assisted learning platform, English e-Learning platform developed various tasks and support to different users. Generally, Nicholes (2016) gave the insight about the test performance of Chinese learners of English by impact of language-learning software. He cited Chinese university learners of English learnt more in output aspects which are writing and speaking via language-learning software but for input aspects like vocabulary learning they quickly improved during the freshman and junior periods until senior plateau (Cui & Wang, 2006; Tan, 2006). In his findings, female participants showed significant difference from male participants in main, pretest and posttest scores and average using time of the software out of class during the study. In the contrasts, Nisbet, Tindall and Arroyo (2005) agreed that gender of Chinese university learners of English was not significant difference in English language e-learning strategies research which Yalman et al. (2016) also agreed with gender of Chinese university learners of English was not significant difference in their research about Turkey university students attitude of e-Learning management system.

As for the attitude to Chinese learners of English e-learning methods, Ku and Lohr (2003) explained that Chinese learners would become more confident and greater assertive in online learning environment by stating their views than in a face-to-face learning environment. Thompson and Ku (2005) also agreed that Chinese learners were good participants in online lecture with lower level of absence. Two specific examples from Hong Kong and one specific example from Mainland China would be explained in the following sentences. Yuen et al. (2009) reviewed the ICT implementation in Hong Kong education system and discovered five major problems which were technological problems communal involvement and competition, teachers not being keen, problems of system design and features and efficiency of administration and support, which is very helpful to this study to design the questionnaire and questions for interview. Tang et al. (2016) investigated the online independent vocabulary learning experience of twenty Hong Kong undergraduates from different disciplines by VLearn e-learning platform within two research stages. They found the memory strategies for new words is often used by Chinese university students of English in Hong Kong who were not familiar with all the functions provided by VLearn e-learning platform during their English vocabulary online learning periods.

In Mainland China, English test performance has tight relation with students' learning and future career. Thus, Zhao (2009) evidenced good grades in conjunction with "a National Standard English Certificate" contribute to Mainland Chinese graduated finding the jobs they want and making more money. Wang and Morgan (2009) also reported a competitive job market underscores the importance of higher education and particularly of English test performance in China. Zi-zeng (2011) introduced the research about the perceptions of Chinese learners about collaborative English e-writing course. He found students with higher English e-writing abilities like this collaborative English e-writing course very much which could help them to be more confident, students with lower English e-writing abilities also like this collaborative English e-writing course very much since they could get great progress although they would have lost confidence. He pointed out most tests for e-learners of non-English majors in China still focus on students grammatical and vocabulary abilities which is possible reason to the lower learning quality of Chinese e-learners.

After knowing the detailed development about the e-learning implementation for Chinese learners of English in Hong Kong and Mainland China, the methodology for this study would be discussed in the next section.

## **METHODOLOGY**

### **THEORETICAL MODELS FOR THIS STUDY**

The mixed-method approach would be adopted in the research which includes quantitative research method by questionnaires and qualitative research method by interview. For questionnaire design, two parts will be discussed. On the one hand, the questions in the questionnaire, based on the research about ICT Usage of Pre-service Teachers: Cultural Comparison for Bosnia and Herzegovina and Turkey by DEMIRLI (2013) which was the author utilized

the Likert-type Scale did the quantitative analysis to the research and also analyzed the data by T-test, Correlation analysis and stepwise Regression analysis, in order to know e-Learning implementation of Chinese university learners of English in Hong Kong and Mainland China in this study, the similar method for question design would be utilized. There are 18 questions in total. Three purposes for the question design are illustrated. Firstly, learning the basic ICT usage and knowledge of Chinese university learners of English in Hong Kong and Mainland China. This part includes question 1<sup>st</sup> to 4<sup>th</sup>.

**Table 1.** The Design of Questionnaire (1)



Table 1.html

Secondly, finding out outcome-based e-learning of Chinese university learners of English in Hong Kong and Mainland China.

**Table 2.** The Design of Questionnaire (2)



Table 2.html

Finally, finding the relation between students' habits and students learning outcomes among Chinese university learners of English in Hong Kong and Mainland China.

**Table 3.** The Design of Questionnaire (3)



Table 3.html

On the other hand, selection criteria of the questions in the questionnaire. Based on Bates' ACTION model of e-Learning (1995) within seven aspects, the access, interaction and user-friendliness, organizational issue and speed of course development would be helpful to design the choice of questions. Meanwhile, bases on Alexander's four-level model of e-learning (2001), online presentation and assessment, students how to express their thoughts and interactive learning would be factors to design considerations.

Another theory is utilized for the interview design. The semi-structured interview will be used for this study. Brophy (1998) created one model for questioning environment to support thinking which was called QUEST. Four stages were included in the model. Based on first stage named problem definition, the students' e-learning strategies would be asked to know the difference of thinking structure and problem-solving skills in Chinese university students of English in Hong Kong and Mainland China. Based on the second stage named exploration and the third stage named discovery, how students evaluate the present e-learning methods and platform would be asked to know the Chinese university students' engagement of English e-Learning in the interview. Based on the last stage named reflection and justification, the suggestions and advices of Chinese learners of English via e-learning methods also would be asked in the interview. (See the Appendix)

Table 4. The Design of Interview Script



Table 4.html

## PARTICIPANTS

In this study, sixty-one Chinese university learners of English in Hong Kong and Mainland China would participate. Considering the different cultural and educational background, they will be divided into four different groups which are local Hong Kong students, local Hong Kong students who are studying or have studied in Mainland China, local Mainland Chinese students, and Mainland China students who are studying or have studied in Hong Kong. For the second group and fourth group, participants will describe their learning experience within detailed periods. The major and gender also are considered. For the questionnaire, they need to finish 18 questions about what the difference of the level of usages and knowledge of ICTs among Chinese learners of English in Hong Kong and Mainland China is. To qualitatively know how depth of engagements of Chinese learners of English to English e-Learning courses in Hong Kong and Mainland China is and what strategies for English e-Learning of Chinese learners in Hong Kong and Mainland China already were extant and will be suggested to apply in the future, ten of them would be interviewed.

## FINDINGS AND DISCUSSION

### FINDINGS FROM THE RESULTS OF QUESTIONNAIRES

Generally, e-Learning implementation in English learning among Chinese university students in Hong Kong are widespread than in Mainland China. The difference of the level of usages and knowledge of ICTs among Chinese learners of English in Hong Kong and Mainland China was shown in the Figure 1. The time of staying in Hong Kong would influence Mainland Chinese students' attitude to English e-learning methods. The background of majority of participants were non-English native speaker and female.

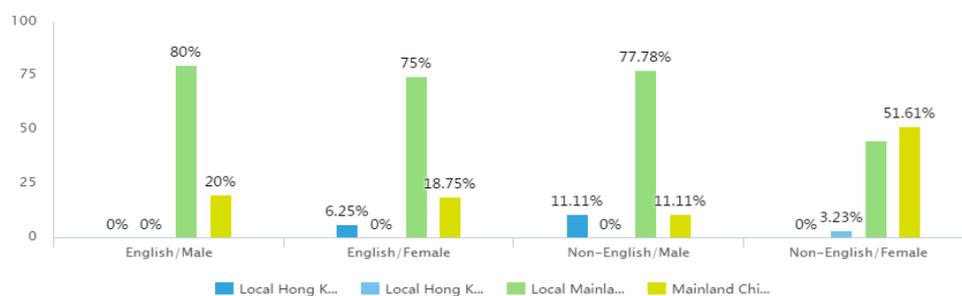
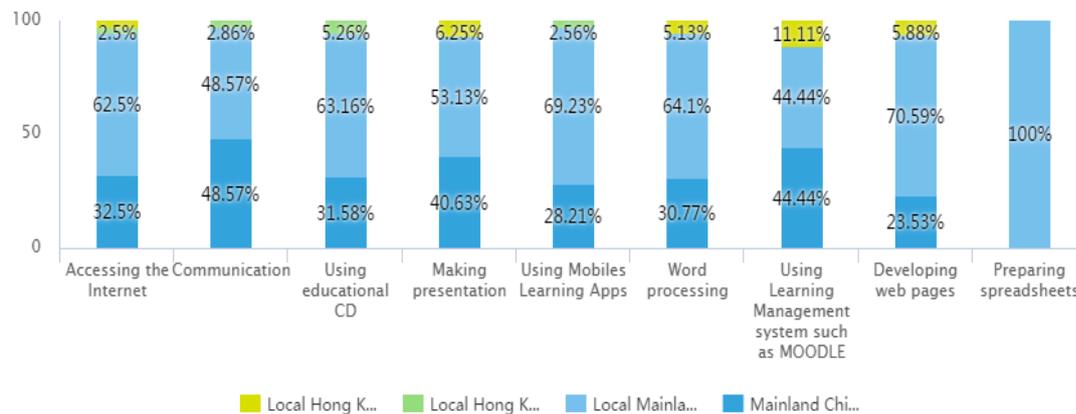


Figure 1. The background of majority of participants

48.57% Chinese learners of English in Hong Kong and Mainland China believed communication is vital skills for the English e-learning methods. However, 62.96% local Mainland Chinese learners of English thought communication by English are relevantly difficult. 69.23% local Mainland Chinese learners of English believed

mobile learning apps are helpful to their English learning. However, over half of all Chinese learners of English in Hong Kong and Mainland China wanted to know more mobile English apps. 46.88% Chinese learners of English in Hong Kong and 53.13% Chinese learners of English in Mainland China always need to make presentation. However, 40.63% Chinese learners of English in Hong Kong and 59.38% Chinese learners of English in Mainland China agreed that they spent more time to prepare English presentation by presentation software. (See Figure 2.)



Four most used ICTs	<ul style="list-style-type: none"> <li>• Accessing,</li> <li>• Word processing,</li> <li>• Using mobiles learning apps (making presentation),</li> <li>• Communication.</li> </ul>
Four least used ICTs	<ul style="list-style-type: none"> <li>• Using educational CD,</li> <li>• Using mobile learning apps (Using learning management system such as MOODLE),</li> <li>• Making presentation,</li> <li>• Communication.</li> </ul>
Four ICTs knowledge are totally familiar with by stakeholders	<ul style="list-style-type: none"> <li>• Internet,</li> <li>• Email,</li> <li>• mobile apps for English learning,</li> <li>• word processing (Presentation software)</li> </ul>
Four ICTs knowledge are totally unfamiliar with by stakeholders	<ul style="list-style-type: none"> <li>• Graphics(Animation),</li> <li>• MOODLE,</li> <li>• Presentation Software,</li> <li>• mobile apps for English learning</li> </ul>

**Figure 2.** The Difference of the Level of Usages and Knowledge of ICTs among Chinese University Learners of English in Hong Kong and Mainland China

Based on the study result, English e-Learning method was more interesting for Chinese learners of English in Hong Kong. Mobile English learning methods were more popular for Chinese learners of English in Hong Kong. For Chinese learners of English in Mainland China, digital literacy should be enhanced for future English learning. They prefer more e-resources provided for their English learning. Multiple English practice including online practice which were not only helpful to the English learning but also to enhance to the digital literacy would be considered for English course design in the future. Gender could influence the English e-Learning methods implementation for Chinese university students in Hong Kong and Mainland China (see Figure 3).

		N	Marginal Percentage
You are	Local Hong Kong Students	2	3.3%
	Local Hong Kong Students studying/studied in Mainland China	1	1.6%
	Local Mainland Chinese Students	37	60.7%
	Mainland China Students studying/studied in Hong Kong	21	34.4%
I always save my files or documents on cloud-based	Strongly Disagree	2	3.3%
	Disagree	8	13.1%
	Neutral	18	29.5%
	Agree	24	39.3%
	Strongly agree	9	14.8%
I always take notes by note-taking apps in the listening lectures than reading lectures	Strongly Disagree	6	9.8%
	Disagree	10	16.4%
	Neutral	24	39.3%
	Agree	15	24.6%
	Strongly agree	6	9.8%
I am not familiar with how to learn English through	Strongly Disagree	6	9.8%
	Disagree	20	32.8%
	Neutral	20	32.8%
	Agree	10	16.4%
	Strongly agree	5	8.2%

I agree that I would more concentrate on my studies	Strongly Disagree	2	3.3%
	Disagree	9	14.8%
	Neutral	19	31.1%
	Agree	22	36.1%
	Strongly agree	9	14.8%
It is convenient and comfortable to me to use table	Strongly Disagree	8	13.1%
	Disagree	12	19.7%
	Neutral	21	34.4%
	Agree	12	19.7%
	Strongly agree	8	13.1%
I would easily and deeply remember more contents	Strongly Disagree	2	3.3%
	Disagree	15	24.6%
	Neutral	24	39.3%
	Agree	14	23.0%
	Strongly agree	6	9.8%

I would practice my oral English with my net friend↕	Strongly Disagree↕	3	4.9%
	Disagree↕	13	21.3%
	Neutral↕	27	44.3%
	Agree↕	9	14.8%
	Strongly agree↕	9	14.8%
I have got a lot of English learning experience ↕	Strongly Disagree↕	3	4.9%
	Disagree↕	10	16.4%
	Neutral↕	20	32.8%
	Agree↕	19	31.1%
	Strongly agree↕	9	14.8%
Digital literacy would be helpful to me to better ↕	Disagree↕	8	13.1%
	Neutral↕	28	45.9%
	Agree↕	19	31.1%
	Strong Agree↕	6	9.8%
It is more interesting for me to attend the English↕	Strongly Disagree↕	5	8.2%
	Disagree↕	9	14.8%
	Neutral↕	15	24.6%
	Agree↕	25	41.0%
	Strongly agree↕	7	11.5%
English e-learning methods would motivate me to spend more time to learn English↕	Strongly Disagree↕	3	4.9%
	Disagree↕	4	6.6%
	Neutral↕	27	44.3%
	Agree↕	20	32.8%
	Strongly agree↕	7	11.5%
Valid↕		61	100.0%
Missing↕		0	
Total↕		61	

Category:	Discussion:
Local Mainland female Chinese Students major in English☆	1. Although students are familiar with mobile English learning devices, they do not agree that social networking service would help them to smoothly communicate with supervisors (Q10 & Q11). ☆
Local Mainland male Chinese Students major in non-EnglishΔ□	2. Mobile learning experience are not significantly different with that learners are not familiar with English learning via mobile device (Q10 & Q15). ☆
Local Mainland female Chinese Students major in non-EnglishΔ○	3. Students used note-taking apps would not influence the memory for English course contents (Q9 & Q13). Δ
Mainland female Chinese students studying/studies in Hong Kong major in non-English☆□○	4. Online English practice are not significantly different with improving the digital literacy for students (Q14 & Q16). □
	5. Students would like to save their files on cloud-based storage not because of their digital literacy (Q8 & Q16). □
	6. Although student are not familiar with mobile learning devices, they do not agree they could practice English online without shyness (Q10 & Q14). ○

**Figure 3.** Learning habits and students e-learning outcomes of Chinese university learners of English in Hong Kong and Mainland China

## FINDINGS FROM THE RESULTS OF INTERVIEWS

Before the formal interview, I did the pilot for interview. I found the fourth, eighth and eleventh questions were different to be understood for interviewees, and thus I revise these three questions. The qualitative analysis would be discussed in the following parts.

## STUDENTS' E-LEARNING STRATEGIES

After coding the results from ten interviewees, students' e-learning strategies would be summarized as following table.

**Table 5.** Students' e-learning Strategies

Questions	Findings	
	In HK	In Mainland China
1 <sup>st</sup> --planning a presentation	Microsoft PowerPoint--common software--67%	
	Google Drive	
2 <sup>nd</sup> & 3 <sup>rd</sup> --Find online resources & search engine	YouTube is best choice for online video records --33%	
	Google--native English resources--global and accurate	BaiDu
6 <sup>th</sup> English learning experience with e-learning method	<ol style="list-style-type: none"> <li>1. Different e-learning methods especially for English listening and vocabulary.</li> <li>2. The charge --one of important factors</li> <li>3. Some assignments would be helpful for improving the English.</li> </ol>	

Interviewees also mentioned one of the popular and creative software for s Prezi. Only the Chinese learners of English from Hong Kong could use the as the cloud storage way to plan the presentation and share the different ideas with other group mates when they have the group assignments. 33% interviewees have no typic software or website to search the online video records and them just when they needed. Chinese learners of English from Mainland China are forbidden to use Google in Mainland China. If they would like to use Google, they need VPN to be the supplementary. Meanwhile, all Chinese learners from Mainland China think it would be better for their academic development if they could use Google in Mainland China.

## ENGAGEMENT AND EVALUATION

The second and third stages would focus on the engagement and evaluation of students English e-learning. The findings would be summarized as following Table.

**Table 6.** The Engagement and Evaluation of Students English e-Learning

Questions	Findings	
	In Hong Kong	In Mainland China
5 <sup>th</sup> --writing English essay by typing		Less opportunities to complete their English writing assignment by typing.
7 <sup>th</sup> --practice your English online	16% interviewees agreed that practicing English online is more helpful since it is convenient for students to review the previous study records.	33% interviewees agree it is more helpful to practice your English online since it is passive and get the feedback immediately
11 <sup>th</sup> --the big three differences for English e-learning	<ol style="list-style-type: none"> <li>1. Applying the theories in the reality and changing students' awareness that how to communicate naturally by English</li> <li>2. Teachers in Hong Kong focus more on interactive with students and teaching materials.</li> </ol>	<ol style="list-style-type: none"> <li>1. Less chance to read the English books or articles in original version.</li> <li>2. Sometimes they felt hard and anxious to express their opinions by English.</li> <li>3. They sometimes felt confused because teachers are overlapping</li> <li>4. Generally, they were not very confidently speaking English unless during the class teacher asked them to speak English.</li> </ol>

90% interviewees do not think it is difficult to use English to analyze the data conducted by the SPSS for the research and they also agree some statistics terms are difficult to understand. Both Chinese university learners of English in Hong Kong and Mainland China agree that writing English essay by typing is easier than by handwriting, since it is easier to correct and keep the paper clear. Interviewees agree that online English has not so much motivation to keep on the learning process. Meanwhile, the issues of internet connection also would influence the students' English learning. Only 17% interviewees from Mainland China were neutral. They believed students were not shy when they utilized the online resources to learn English.

All interviewees support that it is significant for English learners to improve their digital literacy. There are some reasons. Firstly, it is helpful to students to utilize the digital resources to improve their English learning and offer opportunities to practice English. Secondly, it could show how students recognize the link between the digital resources and learning. Thirdly, it could be a good way for students to output the knowledge they learnt. Finally, it could be a method to development the professional knowledge and skills both for students and teachers.

#### SUGGESTIONS AND ADVICES

For the question 8<sup>th</sup> and 9<sup>th</sup>, 84% students believed it is effective e-learning way to learning English when teachers provide some e-resources about English learning and opened online discussion forum. Students think they could learn different ideas from other students and they could point mistakes out for each other. They believed that online discussion forum could help them to save much time on group discussion and assignments. Only 16% students prefer individual consulting chance for English e-learning since they are lazy to download e-resources from the online forum and they think individual consulting will be better to learn from teachers immediately.

For the future English study, students hope there would be some English learning apps with learning reports which could assist their listening and reading practices. As for English writing, students need more detailed guidelines and samples. Chinese students of English from Mainland China hope the issues on internet authority limitations would be solved in the future.

## LIMITATION

After reviewed the previous research, five potential limitations would be discussed. First, compared with aforementioned researches, the sample size in this study is a little small. Second, this study is a single-handed study which means it is a little bit difficult to make each aspects perfect. Third, dividing disciplines without detailed subjects. Participants would be divided into two groups by their majors. One is English, the other is non-English. However, for students whose major are not English, they should have divided again by the certain subjects such as mathematics, Chinese, and physical and so on. Fifth, no region factors will be involved. Since each province has their own educational mode in Mainland China although all of them have one Chinese educational system, when separating the participants into four main groups, the researcher did not consider the different region factors. Finally, costs and time. Considering some participants in Mainland China would take longer time to finish the questionnaire produced by Google Form because of accessing Internet authority limitation, this study utilized the Sojump made in China which could be used in Hong Kong and Mainland China to conduct the research data. However, it is a little bit uncomfortable to adapt the different interface and would take longer time to finish the questionnaire.

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## APPENDIX

### Interviews

Based on QUEST model within four stages, there are some questions would be asked.

➤ **Second aspect: engagement (assessment)**

----- *Based on the second and third stage: Exploration and Discovery*

6. Talking about your English learning experience with e-learning method
7. Do you agree that it is more helpful to practice your English online than face to face why?
8. Which is an effective way for you to solve your English learning problems when teachers provide
  - A. some e-resources about English learning and opened online discussion forum
  - B. individual consulting chance about English learning
9. Based on your English learning experience, what should be enhanced in English Learning with the help of technology in the future studies
10. How do you understand it is significant for English learners to improve their digital literacy?

➤ **Third aspect: strategies (problem-solving & thinking structure)**

-----*Based on the first stage: Problem Definition*

1. How do you plan a presentation slides via the computer?
2. How do you find the online video records about English learning?
3. Which one Search engine is better for your own English Study and why
4. Do you think it is difficult to use English to analyze the data conducted by SPSS for your research?
5. Do you agree that writing English essay by typing is difficult than by handwriting why?

-----*Based on the fourth stage: reflection and justification*

11. What is the big three differences for your English Learning in Hong Kong and Mainland China (e.g.: electronic devices, learning system and methods, problems and anxiety)

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