NESİBE AYDIN EĞİTİM KURUMLARI
EĞİTİM VE GELECEK DERGİSİ

Yıl: 2019 Sayı: 15

NESİBE AYDIN EDUCATION INSTITUTIONS
JOURNAL OF EDUCATION AND FUTURE

Year: 2019 Issue: 15

Ankara - 2019

Eğitim ve Gelecek Dergisi **Journal of Education and Future**

Yıl: 2019 Sayı: 15 **Year: 2019 Issue: 15**

Uluslararası, disiplinlerarası ve yılda 2 kere yayımlanan hakemli bir eğitim dergisidir. Derginin yayın dili İngilizce'dir.

Sahibi:
Nesibe Aydın Eğitim Kurumları adına
Hüsamettin AYDIN

Baş Editör: Prof. Dr. Erten GÖKÇE

Editör Yardımcısı: Dr. Aliye ERDEM

Genel Yayın Koordinatörü: Şemsettin BEŞER

Kapak Tasarımı: Uğurtan DİRİK

Dizgi: Dr. Aliye ERDEM

Basım Tarihi: 25.01.2019

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International, interdisciplinary and biannually published, peer-reviewed journal of education. The language of the journal is English.

Owner:
On behalf of Nesibe Aydın Education Institutions
Hüsamettin AYDIN

Editor-in-Chief: Prof. Dr. Erten GÖKÇE

Editor Assistant: Dr. Aliye ERDEM

Publication Coordinator: Şemsettin BEŞER

Cover Design: Uğurtan DİRİK

Typography: Dr. Aliye ERDEM

Publication Date: 25.01.2019

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Eğitim ve Gelecek Dergisi **Journal of Education and Future**

Yıl: 2019 Sayı: 15 **Year: 2019 Issue: 15**

Dizinlenme / Abstracting and Indexing:

Emerging Sources Citation Index (ESCI)
TUBİTAK ULAKBİM National Index
Ani Journal Index
DOAJ Directory of Open Access Journals
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ProQuest Science Journals
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JOURNAL OF EDUCATION AND FUTURE

Year: 2019 **Issue: 15**

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Mary Jane M. Özkurkudis ve Nilay T. Bümen tarafından hazırlanan ***"Yazma Sınıfının Ters Yüz Edilmesi: Yazmayı Geliştirmek için Dilbilgisi Videolarının Kullanımı"*** başlıklı çalışmanın sonucunda, ters yüz edilmiş sınıf modeli kullanılan deney grubunun başarısının geleneksel yöntemlerle ders işlenen kontrol grubundan anlamlı olarak yüksek olduğu tespit edilmiştir.

Ömer Koçak, Rabia M. Yılmaz, Sevda Küçük ve Yüksel Göktaş tarafından hazırlanan ***"Arttırılmış Gerçekliğin Eğitsel Potansiyeli: Öğretim Tasarımcılarının ve Uygulayıcıların Deneyimleri"*** başlıklı çalışmada içsel durum çalışması deseni kullanılmıştır. Katılımcılar ile yapılan görüşmede arttırılmış gerçekliğin fen eğitimi, sosyal bilgiler ve sağlık eğitimi alanında daha etkili olacağı önerilmiştir. Arttırılmış gerçeklik teknolojisiyle geliştirilen en önemli öğretimsel materyallerin 3 boyutlu materyaller, videolar ve animasyonlar olduğu belirtilmiştir.

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Eğitim ve Gelecek Dergisi olarak gösterdiğiniz ilgi ve değerli katkılarınız için teşekkür ediyorum.

Gelecek sayıda buluşmak üzere…

Prof. Dr. Erten GÖKÇE

Eğitim ve Gelecek Dergisi Baş Editörü

Editorial

Journal of Education and Future published by Nesibe Aydın Education Institutions, meets you with the fifteenth issue. We present the studies in the fifteenth issue of JEF to our valuable readers.

The article titled ***"Flipping the Writing Classroom: Using Grammar Videos to Enhance Writing"***, which is prepared by **Mary Jane M. Özkurkudis and Nilay T. Bümen**, indicate that the achievement of the experimental group, where the flipped classroom method was applied, was significantly higher than the control group.

The article titled ***"The Educational Potential of Augmented Reality Technology: Experiences of Instructional Designers and Practitioners"***, which is prepared by **Ömer Koçak, Rabia M. Yılmaz, Sevda Küçük and Yüksel Göktaş**, conducted with intrinsic case study design. The participants suggested that augmented reality would be more influential in the educational fields of science education, social studies, and health education. Among the most important instructional materials to be developed with augmented reality technology are 3D materials, videos, and animations.

In the article titled ***"Geometric Aspects of Number Line Estimations"***, which is prepared by **Sinan Olkun, Mehmet Hayri Sarı and Glenn Gordon Smith**, it is determined that estimation accuracy of the relative magnitude of numbers on an empty number line has more to do with geometry achievement and diagrammatic reasoning rather than with numerical or arithmetic reasoning.

The article titled ***"The Power of Expectations in School Management: Pygmalion Effect"***, which is prepared by **Seda Gündüzalp and Mukadder Boydak Özan**, conducted with triangulation technique, which is a mixed method design. The results of the study show that high expectations pave the way for teachers' motivation, effort, active working, commitment as well as the growth of their enthusiasm. It is seen that high expectations will generally reveal high performance, while low expectations, due to their negative effects on employees, will cause decrease in motivation as well as unwillingness towards the job being done and therefore, a decline or stability in performance.

In the article titled ***"The Mediator Role of Interaction Anxiety in the Relationship between Social Support Perception and Smartphone Addiction"***, which is prepared by **Necdet Konan and O. Tayyar Çelik**, it is indicated that the preservice teachers' social support perceptions and interaction anxiety significantly predicts their smartphone addiction, that their social support perceptions significantly predict their interaction anxiety, and that their interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction.

In the article titled ***"Interpersonal Communication Predispositions for Lifelong Learning: The Case of First Year Students"***, which is prepared by **Tanju Deveci**, it is revealed that the students' scores were above average, indicating their relatively developed predispositions for interpersonal communication supporting lifelong learning.

In the article titled ***"Effect of Bibliotherapeutic Approach on Problem-Solving Skills of Gifted/Talented Students"***, which is prepared by **Hüseyin Taş**, it is showed that in conclusion of the application, there occurred an increase in problem-solving skill levels of the gifted/talented children in the study group.

The article titled ***"Environmental Literacy: An Assessment and Evaluation on the Students of Landscape Architecture in Turkey"***, which is prepared by **Sevgi Görmüş**, reveal that students have a very limited environmental knowledge and fulfill their environmental responsibilities on an individual basis in a very restricted area.

In the article titled ***"Construction of a Scale for Evaluating Turkish Learning Students' Attitude towards Turkish Language (Tashkent Case Study)"***, which is prepared by **Khabib Akhmadjonov and Mustafa Altun**, it is aimed that constructing a scale for evaluation of foreign students' attitudes towards Turkish language education. The scale, comprising of 73 items was applied to 206 students in Uzbekistan that were learning Turkish, and corresponding validity and reliability studies were conducted.

Thanks for your interest and valuable contributions for *Journal of Education and Future.*

Look forward to meeting in the next issue…

Prof. Dr. Erten GÖKÇE

Editor in Chief of

Journal of Education and Future

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 1-16

Nesibe Aydın JEF

Flipping the Writing Classroom: Using Grammar Videos to Enhance Writing*

Article Type	Received Date	Accepted Date
Research	21.05.2018	20.09.2018

Mary Jane M. Özkurkudis** **Nilay T. Bümen*****

Abstract

An action research study was carried out in the preparatory programme of a foundation university to examine student performance in terms of grammar taught in the writing lessons, and as an alternative method, the flipped classroom model was applied to a group of participants who learned theoretical knowledge through videos on the learning management system. The study lasted seven weeks and during the process, students' performance was noted with the help of a checklist. The experimental design with the pre-test – post-test control group and the semi-structured interview technique was applied. The students (n=30) were asked to write an essay during the pre-test and post-test. These essays were assessed by three different teachers (the G-coefficient was found as .841) who used a pre-prepared rubric by the researchers. Findings indicate that the achievement of the experimental group, where the flipped classroom method was applied, was significantly higher than the control group. Students expressed positive views about the flipped classroom model during the interviews. Education performed using the flipped classroom model was considered time-saving, provided an opportunity for practice, was easily accessible; and distance education through videos was well-received by students.

Keywords: Flipped classroom model, English as a foreign language, English writing skills, grammar skills in writing, action research.

* This study was presented at the 5th International Curriculum and Instruction Congress held at Muğla on 26-28 October, 2017.

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Yazma Sınıfının Ters Yüz Edilmesi: Yazmayı Geliştirmek için Dilbilgisi Videolarının Kullanımı*

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	21.05.2018	20.09.2018

Mary Jane M. Özkurkudis** **Nilay T. Bümen*****

Öz

Bir vakıf üniversitesinin yabancı dil (İngilizce) hazırlık okulunda yazma derslerinde dilbilgisi becerilerindeki performansı geliştirmek üzere bir eylem araştırması yürütülmüş ve derslerin kuramsal kısmını öğrenme yönetim sistemi üzerindeki videolarla öğrenen bir grup öğrenciyle alternatif bir yöntem olarak ters yüz edilmiş sınıf modeli uygulanmıştır. Uygulama yedi hafta sürmüş ve öğrencilerin performansı kontrol listesi kullanılarak her hafta incelenmiştir. Öntest – sontest kontrol gruplu deneysel desen ve yarı yapılandırılmış görüşme tekniğinden yararlanılmıştır. Öntest ve sontestte öğrencilerden (n=30) bir makale yazmaları istenmiş, bu makaleler üç farklı öğretmen (G-katsayısı .841 olarak hesaplanmıştır) tarafından önceden hazırlanmış bir derecelendirilmiş puanlama anahtarı kullanılarak değerlendirilmiştir. Bulgular, ters yüz edilmiş sınıf modeli kullanılan deney grubunun başarısının geleneksel yöntemlerle ders işlenen kontrol grubundan anlamlı olarak yüksek olduğunu göstermektedir. Öğrencilerle yapılan görüşmelerde ters yüz edilmiş sınıf modeli yöntemi kullanılarak yapılan eğitim hakkında olumlu görüşler elde edilmiştir. Ters yüz edilmiş sınıf yöntemiyle yapılan eğitimin zaman kazandırdığı, tekrara olanak sağladığı, ulaşılabilir olduğu vurgulanmış; videolar aracılığıyla uzaktan yapılan eğitimin öğrenciler tarafından daha çok benimsendiği saptanmıştır.

Anahtar Sözcükler: Ters yüz edilmiş sınıf modeli, yabancı dil olarak İngilizce, İngilizce yazma becerileri, yazmada dilbilgisi becerileri, eylem araştırması.

* Bu çalışma, 26-28 Ekim 2017 tarihinde Muğla'da gerçekleştirilen 5. Uluslararası Eğitim Programları ve Öğretim Kongresinde sözlü bildiri olarak sunulmuştur.

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Introduction

In Turkey, in the preparatory schools of universities, it is a quite demanding process to teach English in merely one academic year to students who have not been exposed to this language in their early ages. One of the challenges encountered during this process is the development of English writing skills. In the current Turkish preparatory school educational system, grammar in the writing lessons is either not fully exploited or it is presented using traditional teaching methods, mainly due to time restrictions or the heavy load of the curriculum. The time allocated to productive skills is, unfortunately, limited and the grammar points in these lessons are frequently ignored. Some studies argue that grammar teaching should be done through learners' sentences, paragraphs and essays so that learning can take place and learners can achieve success in writing (i.e. Chin, 2000). Therefore, so as to reduce the number of grammatical problems that appear in the classroom environment and that hinder the development of writing skills, the flipped classroom model stands out as an effective way to provide an opportunity to develop writing skills.

The flipped classroom model enables students to study courses online, out of a real classroom, on their own. The role of the teacher in the lesson shifts from a leader to a facilitator and students have the chance to do more exercises and activities in class (Kara, 2015). Bergmann and Sams (2012) have carried out research on the effects of this model on student performance and achievement, and have listed its advantages on learners and educators. Some of these advantages are; students can study the lesson on their own in case of time restraints in class, more time is allocated to practice during class hours, and students have an opportunity to watch the lessons over and over based on their profile and needs. Thus, all the listed advantages show that this model can be implemented as an alternative to traditional teaching methods to enhance student performance in English writing classes.

Based on the seventeen years of professional experience of the first author (lecturer-researcher), who planned and implemented this study, one of the language skills that English preparatory school students face difficulty in, is developing writing skills. One major problem encountered in developing writing skills- a productive skill- is the teaching of grammar. With the flipped classroom model, as students complete the presentation stage of the lesson at home, it was thought that this would save time to the teachers enabling them to practice more in class. In this way, students would also have the opportunity to use the language they had learned in their essays. Within this context, the aim of this study is to develop an action plan to enhance writing performance in English, which is considered to be challenging by preparatory school students. During the study, answers were sought to the following questions:

1) Will there be any differences in students' performance when grammar is taught using traditional methods or when the flipped classroom model is applied?
2) What are the students' views about learning grammar via the flipped classroom model?

Many studies have been carried out on the impacts of the flipped classroom model on student achievement, motivation and stress level. These were mainly on mathematics, chemistry, statistics and physics (i.e. Aşıksoy & Özdamlı, 2016; Bergmann & Sams, 2012; Clark, 2015; Strayer, 2012). However, not many studies were carried out on foreign language education (Ekmekçi, 2014; Alsowat, 2016; Uyumlu, 2016). As the flipped classroom model has been recently introduced and not a lot of research has been carried out, especially, on its effectiveness in the English language classroom, this study can fulfill this gap.

If the flipped classroom model proved to be efficient based on the results of the research, the institution (foundation university English preparatory school) could utilize it more effectively. As the study was carried out using the action research model, its results cannot be generalized; however, they can serve as a sample to other institutions that face the same problem or are undecisive whether to use this model or not.

Literature Review

The flipped classroom model was first implemented in 2007, in the USA by two high school chemistry teachers. The aim was to enable students, who for any reason missed their classes, to watch the lessons at home. Later, these two teachers (Bergmann & Sams, 2012) noticed that not only the students who had missed the classes watched the lessons but also students who could not understand the lessons also followed them at home. Thus, the concept of a flipped classroom model was born. In this model, as students have the opportunity to watch the lessons at home through videos, more time can be spared for practice and production in class. This will result in increased teacher guidance in class (Bergmann & Sams, 2012; Kara, 2015). It should be noted that the videos should be maximum 10 to 15 minutes long so that students will not lose interest and consequently watch them. Quizzes, that will test student performance, should be added to this method as well (Kara, 2015).

The flipped classroom model provides some advantages for the students. First of all, they have the opportunity to watch the lessons whenever and wherever they want. Slow learners are able to watch the videos many times, take notes and later ask their teachers. As the lesson is covered at home, the time for communication between the teacher and the student increases in class, and therefore; teachers better recognize their students. Apart from all of these, cooperation among students increases as they do more activities and group works in class. Finally, this model increases learner autonomy (Bergmann & Sams, 2012; Evseeva & Solozhenko, 2015; Gençer, Gürbulak & Adıgüzel, 2014; Kara, 2015).

Apart from the model's advantages, its disadvantages also have been identified. It is believed that this model will diminish face-to-face education and that in the future there will be no need for teachers. However, this is not the case because the model applies to only the presentation stage of the lesson as the activities will be done in class by the teacher (Guy & Marquis, 2016). Another disadvantage is that the workload of the teachers will rise as they will have to prepare videos. Not only the teachers but also the students sometimes find traditional education more efficient (Evseeva & Solozhenko, 2015) and resist to watch the videos at home (Sengel, 2016). Moreover, some students face problems during the process because they do not have the chance to ask instant questions and cannot draw connections between the subjects taught (Gençer, et.al, 2014).

Marlowe (2012) studied the effects of the flipped classroom model on student achievement and stress level. There were 19 participants who used traditional methods for two years and the flipped classroom model for a year. Students' grades were analyzed and interviews were performed. Students were asked questions about this process and their stress level during this process. According to the research, the flipped classroom model was found successful and there was an increase in the grades of, especially, slow learners. The feedback received from the classroom was constructive. Similar research was carried out by Aşıksoy and Özdamlı (2016) who studied the effects of the flipped classroom model on student achievement and motivation in a physics class. 66 students, out of whom 30 were from the control group and 36 from the experimental group, took part in the research. Participants were given a pre-test and a post-test, and semi-structured interviews were held. As a result, the experimental group who used the flipped classroom model was noted to be more successful. The views of the students were positive and they stated that this type of education was more effective and entertaining and that this model should be implemented to other courses as well.

Similar research that analyzed the effects of the flipped classroom model on student achievement in secondary education and the student views towards this model was carried out by Yavuz (2016). The research was designed as quasi-experimental and an achievement test was given to the students. At the end of the process, a focus group meeting was held. 14 informatics students participated in the experimental group and 13 in the control group. The process lasted four weeks and a pre-test was given to both groups before the process started. At the end of each week meetings were held with the experimental group and at the end of the process both the experimental group and the control group were given a post-test. The research results showed that the experimental group was more successful and that the model was well-received by the students. One disadvantage noted was that there were technological incompetencies causing the process to be difficult or time-consuming.

Strayer (2012) compared traditional teaching to the flipped classroom model in a statistics class and at the end, he observed that the students were more successful when the flipped classroom model was adopted. Furthermore, Şengel (2016) performed a case study where traditional teaching was compared to the flipped classroom model. 96 participants were chosen by convenience sampling. The process lasted two years. The first year, traditional education was implemented and the second year the flipped classroom model was applied. Both teaching methods had positive impacts on student success but the students who used the flipped classroom model were found to be more successful. It was noted that the students had to be motivated and autonomous in order to be able to adapt to such a model.

Another research carried out by Evseeva and Solozhenko (2015) examined the efficiency of the flipped classroom model for English language education at a technical university. Surveys were used as data collection tools and 85% of the participants stated positive views about this model. In the same way, Clark (2015) examined the effects of the flipped classroom model on mathematics. There were 42 participants who answered surveys and did tests before and after the process. Interviews and focus group meetings were held for data collection. The process lasted seven weeks. Students were more active in the flipped classroom model, education was of more quality, there was cooperation and students expressed content because technology was implemented into the process. Doğan (2015) performed a quantitative research on learner views about the flipped classroom model. The process lasted 14 weeks and the participants were chosen by purposive sampling (n=8). They were observed in class and were interviewed. As a result, students found the flipped classroom model beneficial. Finally, Kurt (2017) reported a study which focused on the implementation of the flipped classroom approach in a higher education institution in Turkey. The participants were 62 preservice teachers in two intact classes, the experimental and the control groups. As a result of the study, a higher level of self-efficacy beliefs and better learning outcomes for the experimental group, flipped classroom, were compared to the control group. The perceptions of the preservice teachers towards the flipped classroom were also noted as positive.

As seen, various studies have been carried out on the impacts of the flipped classroom model on student achievement, motivation and stress level. These were mainly on mathematics, chemistry, statistics and physics (Aşıksoy & Özdamlı, 2016; Bergmann & Sams, 2012; Clark, 2015; Strayer, 2012). Nonetheless, not many studies were carried out on foreign language education. One of these studies which compared the traditional classroom with the flipped classroom in terms of the writing skills in a foreign language preparatory class was carried out by Ekmekçi (2014). Findings showed that the performance of the students in the flipped classroom was higher compared to the ones in the traditional classroom and the attitudes of the students in the flipped classroom were positive. Alsowat (2016) conducted a study which examined the effect of a suggested EFL flipped classroom teaching model on graduate students' English higher-order thinking skills. The participants were 67 graduate female students. As a result of the study, students' satisfaction on the flipped classroom model was high. Recently, a research similar to this one was carried out by Umutlu (2016) which mainly focused on the effects of the flipped classroom model on students' writing. There were 127 participants; one control group and six experimental groups. The participants were given a pre-test and a post-test. Results showed that the students who used the flipped classroom model were more successful. Similarly, Thaichay and Sitthitikul (2016) performed a study to investigate the effects of flipped classroom instruction on language accuracy and active learning environment in Thailand. The findings showed a statistically significant difference in the participants' language accuracy, and their positive attitude toward flipped classroom instruction, particularly in the part of active learning.

It can be seen that, recently, the number of research based on the flipped classroom has increased and positive results were noted in the classrooms that applied this model. However, studies concerning the implementation of the flipped classroom method in foreign language classrooms in Turkey are very limited (Umutlu, 2016). Especially, in terms of developing writing skills, which is a quite complex skill, there is not adequate research database showing at which stage and for which activities the flipped classroom model provides effective results. Therefore, it is thought that more studies are required that show the effects of this method in English teaching.

Method

This study was performed in the form of action research. Action research is carried out to understand the efficiency of education and to be able to find a solution to a problem in an educational institution or a classroom (Johnson, 2015). An action research helps to produce theoretical knowledge, enables the researcher to take part in the process and to see the real picture, gives the chance to directly address and solve the problems as the research takes place in a real context. It also creates a change in individuals and enhances cooperation and collaboration. As the researcher takes place in the process, resistance can be abolished during the implementation of the findings (Aksoy, 2003). Therefore, as the first researcher of this study would take part in the process and would apply the flipped classroom model in her classroom to examine its efficacy and efficiency, this research model was preferred. The first researcher was later expected to share the findings with the institution in order to address the problem.

As the aim of the research was to examine the effects of the flipped classroom model on student performance in terms of grammar education, a pre-test and a post-test were applied to see the effect of the independent variable (flipped classroom model) on the dependent variable (students' grammar skills in writing), and a quasi-experimental research was done with one control group.

During the research, the experimental group learned the grammar points in the writing lesson through the flipped classroom model. Students watched pre-prepared videos about the grammar points and after that, they were asked to do a short quiz consisting of five questions. Practice and production stages were done in class. In contrast, the control group followed the traditional method. The teachers in the experimental group and in the control group were different. Before the intervention, both groups took a pre-test. The independent t-test results fort he pre-test showed that there was no significant difference between the two groups. At the end of the intervention, a post-test was applied to both groups, and students were expected to be successful after the seven-week process. One point to mention here is that, the progress expected to be seen was in students'grammar skills in writing, but not the progress in their writing skills.

Students were allowed a week's time to watch the videos about the grammar points so as to have enough time. The videos were uploaded onto the learning management system and were accessible during the seven-week education period. The students were asked to do a five-question short quiz after they had watched the videos. Later, in class, students questions about the topics were answered and further practice was done. Students' progress was followed by a checklist prepared by the researchers (see Appendix A). The detailed action plan used during the research is given in Table 1.

Table 1
Action Plan

Weeks	Video Grammar Topics
Pre-test	Students in both the experimental group and the control group were given a pre-test where they had to write an essay as a response to the question: '*Should schools have vending machines that sell colas, candy and snacks? Explain the ideas for and against by giving reasons.'* Starting from the first week students were asked to watch a grammar video prepared by the first researcher about the language point in the coursebook they were using. The videos consisted of voice-recorded powerpoint presentations, where students were introduced the rules of the language point in the coursebook with explanations and example sentences. Following that, students were requested to do the short quiz on the learning management system of the school. Students were allowed a week's time before practice was done in class.
Week 1 10/04-14/04/2017	Noun Phrases
Week 2 17/04-21/04/2017	Compare and Contrast Language

Week 3 24/04-28/04/2017	Articles
Week 4 01/05-05/05/2017	Language of Concession
Week 5 08/05-12/05/2017	Cause and Effect Language
Week 6 15/05-19/05/2017	Conditional Language
Week 7 22/05-26/05/2017	Expressing Solutions Using 'it'
Post-test	At the end of the intervention, students in both groups were given a post-test on the same essay question provided in the pre-test.

Participants

In the study, 15 preparatory school students from the first researcher's class were selected to form the experimental group, and 15 students from another teacher's class, in the same school, were chosen to constitute the control group. The students' ages ranged between 17-19. Their English level was upper-intermediate and they had been exposed to English for six months. Apart from a writing lesson, they had an integrated skills lesson, and a reading, listening and speaking lesson. The reading and writing lesson was integrated. As the way of education was based on the cyclical approach, grammar points were taught gradually.

Data Collection Tools

In this research, both qualitative and quantitative data were collected. The students were asked to write an essay during the pre-test and post-test. These essays were assessed by three different teachers who used a pre-prepared rubric (Appendix B) by the researchers. The rubric focused on the grammar competence of students in essay writing. The grade range was from 1-5. Not only general grammar knowledge but also the grammar learned at that level was tested. A student in upper-intermediate level was expected to get a 4 or 5. To determine consistency among the three raters the G-coefficient (generalizability theory analyses) was analyzed. The G-coefficient was found as .841 and was accepted as consistent.

Apart from the rubric, to gather qualitative data, semi-structured interviews (Appendix C) were carried out with seven students from the experimental group. The pre-test and post-test grades of these students were compared and based on criterion sampling, the students who showed the highest, the average and the lowest improvement were selected upon their verbal consent. The semi-structured interviews were based on the research question and problem area and focused on the views of the students about the flipped classroom model. The interviews were recorded after students' approval. Students were informed about the interviews and appointments were made. All the interviews took place on the same day at a different time. They were held individually in a meeting room and they lasted around ten minutes. Students' opinions about learning grammar through videos, the advantages and disadvantages of such a system and their attitudes towards this model were gathered.

Data Analysis

The essays of the participants were assessed by three different teachers using a rubric. An independent samples t-test was applied to the pre-test and post-test results. In order to test whether the pre-test and the post-test results of the students in the experimental and the control group showed normal distribution, the skewness and kurtosis values were analyzed (skewness pre-test -0.17, post-test -0.27; kurtosis pre-test -0.71, post-test -0.66). As these values are between -1 and +1, it can be said that the presumption of normality has been met.

Qualitative data collected from the students was analyzed by descriptive analysis. According to Yıldırım and Şimşek (2017), descriptive analysis is carried out to summarize and to interpret the data collected according to identified themes. After the interviews, the views of the participants were directly quoted. The first researcher, then, categorized the information gathered through the interviews

and coded the sections which were meaningful among themselves. Coding was performed manually. The coding list included the themes; accessibility and retention and use of technology. These themes were identified by the first researcher. Meanwhile, the second researcher analyzed the coding and gave feedback. As the number of the students was low and the duration of the interviews was short, it was found unnecessary for the second researcher to perform a second coding. The analysis of these themes was supported by the direct quotes of the students.

All students (seven) agreed that the flipped classroom model provided increased accessibility and retention, and some students (three) thought it involved the use of technology. The results were found to be relevant to the literature and the literature was considered as a guide when analyzing the findings (Nerguizian, Mhiri, Mounier, Lemieux & Dahmane, 2014). To increase the validity and reliability of the interviews triangulation was used. Triangulation is used to show that two or more methods are used in a study so as to check the results of the same subject (Yıldırım & Şimşek, 2017). Therefore, the findings of the interviews; accessibility, retention, and use of technology were tracked through the learning management system and a checklist was used to note down students' progress. On the learning management system, the statistical data was viewed and it was seen that the students who agreed that this model was easily accessible and that it provided the opportunity for retention had viewed the videos more than once in different intervals. These were noted down to a checklist prepared by the researchers.

Results

RQ 1: Will there be any differences in students' performance when grammar is taught using traditional methods or when the flipped classroom model is applied?

Quantitative data was collected to answer the first sub-question of the study. The aim of the pre-test was to ascertain parallelism between the two groups. Students were asked to write an essay that included the grammar points to be learned during the seven-week process. The pre-test results are given in Table 2.

Table 2

Comparison of the Pre-test Results of the Experimental Group and the Control Group (n=15)

Groups	M	SD	*t*- value
Experimental	2.25	0.77	0.78
Control	2.06	0.57	

As seen in Table 1, the mean scores of the experimental group was 2.25 and it was 2.06 for the control group. The calculated *t*-value was 0.77806 (*p*-value was .2213). As *p* was measured < .05, no significant difference was detected.

After the seven-week process, the experimental group and the control group were requested to write the same essay they had written in the pre-test. At this stage, both groups were expected to use the grammar points they had learned in their writing lessons. 15 participants from each group took the post-test. The results of the test are given in Table 3.

Table 3

Comparison of the Post-test Results of the Experimental Group and the Control Group (n=15)

Groups	M	SD	*t*- value
Experimental	4.2	0.77	5.83*
Control	2.4	0.91	

* $p < .05$

According to Table 2, the mean scores of the experimental group was 4.2 whereas, it was 2,4 for the control group. The calculated *t*-value was 5.83. (*p* value was < .00001). As *p* was < .05, it could be said that there was a significant difference between the two groups (ES= 1.98). The calculated effect size (1.98) value, according to the classification of Cohen, Manion and Morrison (2007) showed a large effect [Cohen, Manion and Morrison, (2007) identified the effect size levels as; between 0.0 and 0.2 weak, between 0.21 and 0.50 modest, between 0.51 and 1.00 moderate, 1.00 and strong effect]. Therefore, the experimental group that used the flipped classroom model was more successful compared to the control group that used the traditional methods when learning grammar in their writing lessons.

RQ 2: What are the students' views about learning grammar via the flipped classroom model?

To answer the second question seven students were chosen from the experimental group using criterion sampling. A semi-structured interview was held with students who showed improvement, students who showed little improvement and students with no improvement at all.

Regarding the answers of the students, this model was found beneficial and was recommended to be widely used. Nearly no disadvantages were stated. The answers of the students were analyzed based on the below themes.

Accessibility and Retention

The flipped classroom model was described as accessible. Students had open access to the videos on the learning management system and they could download them on their computers for further study. The model enabled students to practice whenever and wherever they wanted. In the traditional teaching model, students follow the lessons in class and tend to forget the things they have learned in time. However, this is not the case with the flipped classroom model.

The students' selected views are listed below:

> *'I think it was good. None of my teachers did something like this before. I usually do not take notes in class and ask my friends for their notes. I watched the videos and took notes. It was good for me, I liked it.'* (S1)
>
> *'Very nice. I download the videos. I have the chance to watch them wherever and whenever I want. Effective.'* (S2)
>
> *'Always, everywhere accessible. Can watch them over and over. Permanent.'* (S3)
>
> *'Positive. I took notes. Before the exam, I will study those notes again. It was beneficial for me. I will remember. If not, I will watch again.'* (S1)
>
> *'It is good to watch videos. It helps you remember whenever you want.'* (S4)
>
> *'It is beneficial. When we don't understand something in class, we can watch it at home. We have the chance to practice and this helps us consolidate.'* (S5)
>
> *'I had the chance to learn the subjects before I came to class and I could watch them whenever I wanted.'* (S6)
>
> *'I think learning through videos is beneficial. It is difficult to focus on the subject in a traditional classroom but learning through videos gives us the chance to practice.'* (S7)

Use of Technology

Students, in whose life technology holds a big place, feel themselves better equipped when technology is involved in their learning process. Furthermore, education via the flipped classroom model takes place in a virtual environment resulting in high student interest and increased efficiency in lessons, which students pointed out during the interview.

Some views were as follows:

> *'I think, it can be something good. Students are usually bored in the lesson. They like spending time on the computer and technological devices. With this method, their attention can be drawn.'* (S1)
>
> *'It's a technological environment. There is the possibility of watching again and again. When we forget or want to take notes, we can stop the video.'* (S2)
>
> *'As education takes place via videos, we can stop and watch them again and again.'* (S7)

The qualitative data collected shows students' positive attitude towards the flipped classroom model. Watching the videos at any time and in any place has created a feeling of trust in the students.

One negative aspect mentioned is that it requires studying at home. Therefore, students can forget watching the videos or postpone doing the tasks. Furthermore, students do not have the chance to ask any immediate questions. Another disadvantage mentioned was the speed of the internet which is of course uncontrollable in this context. Some views were as follows:

> *'We need to study at home so if we want to ask a question to the teacher at that moment, we cannot.'* (S1)
>
> *'When students go home, they want to relax. They say, I will do it later, one hour later, tomorrow. They postpone it. It can be forgotten, that's bad.'* (S3)
>
> *'The internet speed may be slow.'* (S5)

Discussion, Conclusion and Recommendations

In this research, the flipped classroom model and traditional education have been compared and contrasted in terms of their impact on student achievement, taking into consideration the use of the grammar points learned in the writing lessons in a foreign language preparatory school. To be able to achieve this, an experimental group and a control group were formed. Both groups completed a pre-test where no significant difference was detected and a post-test where a highly significant difference was measured. An increase of 86.6% was noted between the pre-test and the post-test results of the experimental group. In contrast, the control group showed only a 14.2% difference. The difference noted in the independent samples t-test also proves this outcome.

As discussed in the literature review (Akgün & Atıcı, 2017; Umutlu, 2016; Yavuz, 2016) the flipped classroom model is more effective than traditional education in some studies. When the former is applied, a significant increase in student achievement and performance can be seen. Hence, the findings of this study confirm the results stated by Akgün and Atıcı (2017), Ekmekçi (2014), İyitoğlu and Erişen (2017), Tutal and Yazar (2017), Umutlu (2016), Yavuz (2016). Bösner, Pickert and Stibane (2015), consider the increased success in the flipped classrooms a result of a cooperative environment and learning focused implementation. Moreover, it can also be stated that as this model combines the advantages of individualized teaching (Bishop & Verleger, 2013) and active learning (Bergmann & Sams, 2012), it proves to be effective in increasing success.

Furthermore, quizzes assigned to the students in the experimental group might have increased the student success. Yet, some studies show that quizzes apart from increasing student attendance and success, enable higher order thinking skills (Bruff, 2009; Zhu, 2007). Garver and Roberts (2013), likewise, have stated that quizzes should be implemented in the flipped classroom model as they provide active participation and immediate feedback, reveal the learning deficiencies and help students to feel more comfortable in in-class discussions.

Students' views, as well, confirm the effectiveness of the flipped classroom model (Akgün & Atıcı, 2017; Aşıksoysoy & Özdamlı, 2016; Clark, 2015; Doğan, 2015, Evseeva & Solozhenko, 2015; Karakus & Ceylaner, 2017; Yavuz, 2016). This model enables students to study at any place and at any time and arouses interest as technology is involved. Another term highlighted by the students is 'time'. During the lessons, sometimes, enough time is not allocated to some topics and this causes difficulty in understanding that specific topic. By using this model, students have enough time to

study the topic at home and to practice it in class, where they will have a higher chance to efficiently grasp the subject.

Most learners find the flipped classroom model effective and state that they would prefer this model in their further studies (See & Conry, 2014). The flipped classroom model increases the area knowledge of the learners (Goru Doğan, 2015) and learners' success (Baepler, Walker & Driessen, 2014; Chen, She, Kameda & Ohno, 2014; Chu & Sun, 2015; Ford, 2014; Kong, 2014; Liebert, Lin, Mazer, Berekneyei & Lau, 2015; Mason, et.al., 2013; Mclaughlin & Rhoney, 2015; Turan, 2015). Learners actively take part in the process and their participation to the lessons increases (Chu & Sun, 2015; Kakosimos, 2015; Nicolossi, 2014; Roach, 2014). Therefore, it can be considered that the achievement obtained in the group where the flipped classroom model was implemented, is due to the aforementioned reasons. The increase in the active participation of students in the lesson is reflected favorably on their performance.

The internet and mobile devices provide freedom and flexibility (Nerguizian et.al, 2014), thus, an increase in the learners' motivation is traced (Liebert, Lin, Mazer, Bereknyei & Lau, 2016). According to the findings, students state that they study the lessons on the internet at their own pace. This result shows parallelism with research conducted by Boyraz (2014) and Larsen (2013). Most of the students think that learning via the flipped classroom model does not take up time and the studies conducted by Mason, Shuman and Cook (2013) and Lage and Platt (2010) and Herold (2012) proved that students who learn through the flipped classroom model use their time more efficiently in class (cited in Akgün & Atıcı, 2017)

As seen, most of the studies conducted show favorable results in terms of student satisfaction. Hence, based on the literature review, and in the studies where the flipped classroom model was implemented, it can be said that students' attitude towards this model is mostly positive (Datig & Ruswick, 2013; James, Chin &Williams, 2014; Pinto & Little,2014; Roach, 2014). Moreover, students experiencing this model have found it entertaining (Lemmer, 2013) and rewilling to use it again in their lessons (Rivera, 2014).

One disadvantage of the flipped classroom model, as mentioned above, is that students do not have the chance to ask instant questions. They can ask the parts they have not understood only when they see their teacher. Another disadvantage is that students can resist to watch the videos at home (Sengel, 2016) or can forget to watch them. This also shows the learning habits of the students. Students believe that lessons should be carried out in a class by a teacher because they are educated in this way. Unfortunately, not much significance is given to metacognitive skills like self-criticism, critical thinking, learner autonomy in the Turkish educational system. The duty of an educational institution or a teacher is to educate students about learner autonomy and to impose the necessity of taking responsibility if the flipped classroom model is requested to be implemented. In this research, this problem was overcome in three ways. First of all, every week the teacher gave enough time-at least three days- to students to watch the videos. Students were reminded of the videos every day and were requested to do a short quiz on the learning management system to encourage students to watch the videos and to make them aware of their progress.

As the flipped classroom model gives students more opportunity to practice both at home and in class (Bergmann & Sams, 2012; Kara 2015), it would be beneficial to apply it to other courses. It can, especially, be widely-used in the listening lessons as students hear the target language. In fact, while students watch the videos, their listening skills develop and based on this, their speaking skills improve implicitly. During the intervention, when students were asked questions in class, it was observed that they used the language they had heard in the videos.

This study has strengths, but also some limitations. One limitation was the relatively small number of participants included in the study. As the study included only the number of students enrolled in two classes, only 30 (15 from the experimental group and 15 from the control group) students were actively involved. As a modular mode of education took place in the institution and the classes and instructors of the students changed at the end of the seven-week process, there was no chance to test knowledge retained by the students.

In conclusion, despite its limitations, it can be said that flipped classroom has many advantages both for ELT teachers and the students. According to Başal (2015), this model is flexible; thus, the teachers can modify it depending on the needs of the students and conditions. It is also effective with busy schedules where teachers face time constraints due to the heavy load in the programmes. As pointed out in this study, the flipped classroom model can be implemented in any type of English teaching course where students need more guidance and will be beneficial for cases where more production and increased success is expected. The study is expected to serve as an example for institutions that consider using the flipped classroom model in English teaching.

As the flipped classroom model is newly introduced, research still continues to be carried out on this model. It is suggested to preparatory schools that would like to use this model to be equipped with relevant infrastructure, and teachers and students to be trained to be able to put the flipped classroom model into practice. The videos prepared should be clear, intelligible and maximum 10-15 minutes long, and students should be allowed enough time to watch the videos. It should be kept in mind that videos are used for presentation purposes and that the lesson should be spent only on question and answer, practice and production. As students do not own such a culture, reinforcers should be used to encourage students to watch the videos.

Since this research is in the form of an action research, it is limited to and only valid in the institution that it was carried out. The validity of this model should be tested in other institutions and courses. On the condition that this research is carried out again, the number of participants and the allocated time will be increased and more widespread research will be done. This type of study can be carried out to observe the impacts of the flipped classroom model on other courses and skills, and to measure student performance in other fields.

References

Akgün, M. & Atıcı, B. (2017). Ters-düz sınıfların öğrencilerin akademik başarısı ve görüşlerine etkisi [The effect of the flipped classrooms on students' academic performance and views]. *Kastamonu Eğitim Dergisi [Kastamonu Journal of Education]*, *25*(1), 329-344.

Aksoy, N. (2003). Eylem araştırması: Eğitimsel uygulamaları iyileştirme ve değiştirmede kullanılacak bir yöntem [Action research: A method in improving and changing educational applications]. *Kuram ve Uygulamada Eğitim Yönetimi [Educational Management: Theory and Practice], 36,* 474-489.

Alsowat, H. (2016). An EFL flipped classroom teaching model: effects on English language higher-order thinking skills, student engagement and satisfaction. *Journal of Education and Practice, 7*(9), 108-121.

Aşıksoy, G. & Özdamlı, F. (2016). Flipped classroom adapted to the ARCS model of motivation and applied to a physics course. *Eurasia Journal of Mathematics, Science & Technology Education, 12*(6), 1589-1603.

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education, 78*, 227-236.

Başal, A. (2015). The implementation of a flipped classroom in foreign language teaching. *Turkish Online Journal of Distance Education-TOJDE, 16*(4), 28-37.

Bergmann, J. & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day.* NY: Copublished by ASCD and ISTE.

Bishop, J. L., & Verleger, M. A. (2013). The flipped classroom: A survey of the research. In *Proceedings of the ASEE National Conference June, 23-26 2013*, Atlanta, GA. Retrieved from https://www.asee.org/public/conferences/20/papers/6219/view

Boyraz, S. (2014). *İngilizce öğretiminde tersine eğitim uygulamasının değerlendirilmesi [Evaluation of flipped education in English teaching]*. (Unpublished Master Thesis), Afyon Kocatepe University, Institute of Social Sciences, Afyonkarahisar, Turkey.

Bösner, S., Pickert, J. & Stibane, T. (2015). Teaching differential diagnosis in primary care using an inverted classroom approach: Student satisfaction and gain in skills and knowledge. *BMC Medical Education. 15*(63), 1-7.

Bruff, D. (2009). *Teaching with classroom response systems: Creating active learning environments*. London: Jossey Bass.

Chen, S., She, J., Kameda, H. & Ohno, S. (2014). Implementation and evaluation of flipped classroom in the Chinese language course. In *Proceedings of Multidisciplinary Academic Conference 1-3 September 2014*, (pp.1-8). Prague.

Chin, B. A. (2000). The role of grammar in improving student's writing. *Sadlier Oxford: Language Arts, 6-12*. Retrieved from http://people.uwplatt.edu/~ciesield/graminwriting.htm

Clark, K. R. (2015). The effects of the flipped model of instruction on student engagement and performance in the secondary mathematics classroom. *Journal of Educators Online*, *12*(1), 91-115.

Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education*. (6th edition). New York: Routledge, Taylor and Francis Group.

Chu, L., & Sun, S. H. (2015). The application of the flipped classroom in pediatric physical therapy. *Physiotherapy, 101,* e252.

Datig, I., & Ruswick, C. (2013). Four quick flips. *College & Research Libraries News, 74,* 249–257.

Doğan, T. G. (2015). Sosyal medyanın öğrenme süreçlerinde kullanımı: Ters-yüz edilmiş öğrenme yaklaşımına ilişkin öğrenen görüşleri [The use of social media in educational processes: Learner perceptions of flipped classroom model]. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi [Journal of Open University Implementations and Research]*, *1*(2), 24-48.

Durak Üğüten, S. & Balcı, O. (2017). Flipped learning. *Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Dergisi [Journal of Süleyman Demirel University Institute of Social Sciences]*, *26*, 253-265.

Ekmekçi, E. (2014). *Harmanlanmış öğrenme odaklı tersten yapılandırılmış yazma sınıfı modeli [Blended learning based flipped writing class model]*. (Unpublished Master Thesis), Gazi University, Institute of Educational Sciences, Ankara.

Evseeva, A. & Solozhenko, A. (2015). Use of flipped classroom technology in language learning. *Procedia-Social and Behavioral Sciences, 206,* 205-209. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042815051393

Ford, P. (2014). Flipping a math content course for preservice elementary school teachers. *Primus, 25*(4), 369-380.

Garver, M. S., & Roberts, B. A. (2013). Flipping & clicking your way to higher-order learning. *Marketing Education Review, 23*(1), 17-22.

Gençer, B.G., Gürbulak, N., & Adıgüzel, T. (2014). A new approach in learning and teaching: The Flipped Classroom. In A.C. Ilhan, A. Isman, C. Birol & A. Eskicumali (Eds.). In *Proceedings of International Teacher Education Conference 05-07 February 2014* (pp. 881-888). Sakarya University, Sakarya, Turkey.

Guy, R. & Marquis, G. (2016). The flipped classroom: A comparison of student performance using instructional videos and podcasts versus the lecture-based model of instruction. *Issues in Informing Science and Information Technology, 13,* 1-13. Retrieved from http://iisit.org/Vol13/IISITv13p001-013Guy2605.pdf

Herold, M. J., Lynch, T. D., Ramnath, R. & Ramanathan, J. (2012). Student and instructor experiences in the inverted classroom. In *Proceedings of Frontiers in Education Conference (FIE) 03-06 October 2012* (pp. 1-6). IEEE Computer Society.

İyitoğlu, O. & Erişen, Y. (2017). İngilizceyi yabancı dil olarak öğrenen öğrencilerin akademik performanslarının ters yüz sınıf yöntemi ile geliştirilmesi: Bir karma yöntem çalışması [Improving the academic performance of students of English as a foreign language by using the flipped classroom method: A mixed method study]. In *Proceedings of the 5th Curriculum and Instruction Congress 26-28 October 2017* (pp. 256-257). Muğla, Türkiye.

James, A. J., Chin, C. K., & Williams, B. R. (2014). Using the flipped classroom to improve student engagement and to prepare graduates to meet maritime industry requirements: A focus on maritime education. *WMU Journal of Maritime Affairs, 13*(2), 331-343.

Johnson, A. P. (2015). *Eylem araştırması el kitabı. [Handbook of action research]* (Yıldız Uzuner & Meltem Özten Anay, trans.). Ankara: Anı Publishing.

Kakosimos, K. E. (2015). Example of a micro-adaptive instruction methodology for the improvement of flipped-classrooms and adaptive-learning based on advanced blended-learning tools. *Education for Chemical Engineers, 12,* 1-11.

Kara, C. O. (2016). Ters yüz sınıf [Flipped classroom]. *Tıp Eğitimi Dünyası [Medical Education World]*, *15*(45), 12- 26.

Karakuş, F. & Ceylaner, S.G. (2017). Ters yüz sınıf yönteminin dokuzuncu sınıf İngilizce öğretiminde öğrencilerin öz yönetimli öğrenmeye hazırbulunuşlukları ve İngilizce dersine yönelik tutumlarına etkisi [The effect of the flipped classroom method on the readiness of ninth grade English learning students' self-managed learning and the attitude towards English lessons]. In *Proceedings of the 5th International Curriculum and Instruction Congress 26-28 October 2017* (pp. 352-353), Muğla, Turkey.

Kong, S. C. (2014). Developing information literacy and critical thinking skills through domain knowledge learning in digital classrooms: An experience of practicing flipped classroom strategy. *Computers & Education, 78,* 160-173.

Kurt, G. (2017). Implementing the flipped classroom in teacher education: Evidence from Turkey. *Educational Technology & Society*, *20*(1), 211–221.

Lage, M. J. & Platt, G. (2010). The internet and the inverted classroom. *The Journal of Economic Education, 31*(1), 1-11.

Larsen, A. J. (2013). *Experiencing a Flipped Mathematics Class.* (Unpublished Doctoral Dissertation), Simon Fraser University, Faculty of Education, Canada.

Lemmer, C. A. (2013). A view from the flip side: Using the "inverted classroom" to enhance the legal information literacy of the international LL.M. student. *Law Library Journal, 105,* 461–491.

Liebert, C. A., Lin, D. T., Mazer, L. M., Bereknyei, S. & Lau, J. N. (2016). Effectiveness of the surgery core clerkship flipped classroom: A prospective cohort trial. *The American Journal of Surgery, 211*(2), 451-457.

Marlowe, C. A. (2012). *The effect of the flipped classroom on student achievement and stress*. (Unpublished Master Thesis), Montana State University. Retrieved from http://scholarworks.montana.edu/xmlui/bitstream/handle/1/1790/MarloweC0812.pdf?sequence=1

Mason, G., Shuman, T. R. & Cook, K. E. (2013). Inverting (flipping) classrooms: Advantages and challenges. In *Proceedings of ASEE Annual Conference & Exposition 23-26 June 2013* (pp.1-21). Atlanta, GA.

McLaughlin, J. E. & Rhoney, D. H. (2015). Comparison of an interactive e-learning preparatory tool and a conventional downloadable handout used within a flipped neurologic pharmacotherapy lecture. *Currents in Pharmacy Teaching and Learning, 7*(1), 12-19.

Nerguizian, V., Mhiri, R., Mounier, C., Lemieux, D. & Dahmane, A. O. (2014). Flipping from flipped classroom to multimodal mobile learning. *International Journal of Teaching and Education, 2*(4), 53-66.

Nicolosi, A. (2012). Grammar lessons with the flipped classroom method. In *Proceedings of the 3rd Black Sea ELT Conference 15-17 November 2012* (pp. 13-17). Ondokuz Mayıs University, Samsun, Turkey.

Pinto, C., & Little, G. (2014). Flipped librarians: Assessing our own need to understand our users. *The Journal of Academic Librarianship*, *40*(2), 192-193.

Rivera, E. (2015). Using the flipped classroom model in your library instruction course. *The Reference Librarian*, *56*(1), 34-41.

Roach, T. (2014). Student perceptions toward flipped learning: New methods to increase interaction and active learning in economics. *International Review of Economics Education*, *17*, 74-84.

Strayer, J. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research. 15, 171-193.* Retrieved from http://www.colorado.edu/ftep/sites/default/files/attached-files/strayer_-_inverted_classroom_influences.pdf

See, S. & Conry, J. M. (2014). Flip my class!: A faculty development demonstration of a flipped-classroom. *Currents in Pharmacy Teaching and Learning, 6*(4), 585-588.

Sengel, E. (2016). To flip or not to flip: Comparative case study in higher education in Turkey. *Computers in Human Behavior, 64*, 547-555.

Thaichay, T. & Sitthitikul, P. (2016). Effects of the flipped classroom instruction on language accuracy and learning environment: A case study of Thai EFL upper-secondary school students. *Rangsit Journal of Educational Studies*, *3*(2), 35-64.

Tutal, Ö. & Yazar, T. (2017). Ters-yüz sınıf yaklaşımının akademik başarıya etkisi: Bir meta-analiz çalışması [The effect of the flipped classroom model on academic achievement: A meta-analysis study]. In *Proceedings of the 5th International Curriculum and Instruction Congress26-28 October 2017* (pp. 440-443), Muğla, Turkey.

Umutlu, D. (2016). *Effects of different video modalities on writing achievement in flipped English classes.* (Unpublished Master Thesis). Boğaziçi University, Institute of Social Sciences, İstanbul.

Yavuz, M. (2016). *Ortaöğretim düzeyinde ters yüz sınıf uygulamalarının akademik başarı üzerine etkisi ve öğrenci deneyimlerinin incelenmesi [Effects of the flipped classroom method on academic achievement at secondary school level and the analysis of student experiences]*. (Unpublished Master Thesis). Atatürk University, Institute of Social Sciences, Erzurum, Turkey.

Yıldırım, A. & Şimsek, H. (2017). *Sosyal bilimlerde nitel araştırma yöntemleri [Qualitative research in social sciences]*. Ankara: Nobel Publishing.

Zhu, E. (2007). What do students appreciate most about clickers? Teaching with clickers. Center for research on learning and teaching occasional papers. Retrieved from http://www.crlt.umich.edu/sites/default/files/resource_files/CRLT_no22.pdf

Appendixes

Appendix A

Checklist

Student	Took the Pre-test Yes (√)-No (X)	Watched Videos (√)-Did not watch videos(X)							Did the quiz (√)-Did not do the quiz (X)							Took the Post-test Yes (√)-No (X)
S1																
S2																
S3																
S4																
S5																
S6																
S7																
S8																
S9																
S10																
S11																
S12																
S13																
S14																
S15																

Appendix B

Grammar skills (upper-intermediate level English) rubric

5	The student demonstrates very high command of level appropriate grammatical patterns. Almost no errors in language use. Very occasional grammar and usage errors do not interfere with coherence. The student has attempted to use the structures within the grammar range provided below. And does so with a good range and accuracy.
4	The student demonstrates very good command of level appropriate grammatical patterns. S/he uses language with accuracy. Some minor grammar and usage errors do not interfere with his/her written performance. The student has attempted to use the structures within the grammar range provided below. But does so with limited range and/or accuracy.
3	The student has good control of level appropriate grammatical patterns. S/he uses language with some accuracy. Grammar and usage errors do not seriously impair his/her written performance.
2	The student has basic control of level appropriate grammatical patterns. Grammar and usage errors impair his/her written performance.
1	The student has little or no control of level appropriate grammatical patterns. S/he does not have the necessary language knowledge. A large number of grammar and usage errors impair his/her written performance.
0	No rateable language.

Grammar range: Noun phrases, compare and contrast language, articles, language of concession, cause and effect language, conditional language, expressing solutions using 'it'.

Appendix C

Semi-structured interview questions

1. You have learned the grammar points in your writing lesson via videos. What is your opinion about this method?
   a. What are the advantages of this method compared to the traditional method?
   b. What are the disadvantages of this method compared to the traditional method?
2. Would you like to take other lessons based on this method?
3. Has this method affected your achievement in a positive or negative way? How? and why?

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 17-36

Nesibe Aydın JEF

The Educational Potential of Augmented Reality Technology: Experiences of Instructional Designers and Practitioners[*]

Article Type	Received Date	Accepted Date
Research	21.02.2018	09.01.2019

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Abstract

In this study, the educational potential of the augmented reality (AR) technology was investigated in the context of the instructional designers and practitioners' experiences. Within this scope, intrinsic case study design was used in this study. 42 instructional designers and 10 practitioners participated in the research. The data were collected using open-ended questionnaire from instructional designers. Interviews were held with the practitioners through the semi-structured interview form created from the open-ended questionnaire. The qualitative data were analyzed with the content analysis method, using Nvivo 8.0 software. The participants suggested that AR would be more influential in the educational fields of science education, social studies, and health education. Among the most important instructional materials to be developed with AR technology are 3D materials, videos, and animations. The participants suggested that AR could be useful in the development of special applications for other fields of education. For example, AR could be used to create magic books, 3D demonstrations related to different subjects, and experimental simulations in the field of science education. Moreover, the participants suggested that AR could provide system design enhancements to better attract users' attention, to improve retention, to increase user motivation, and to "concretize" virtually presented information by creating a fuller sense of reality in terms of educational. Lastly, in order to develop an AR application, several points must be considered in the stages of analysis, design, development, and implementation. We present these points for consideration in detail. The results obtained in this study can be used to guide future research studies on AR technology.

Keywords: Media in education; augmented reality; educational potential.

[*] The part of this study was presented at 8th Application of Information of Communication Technologies-AICT 2014.

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Arttırılmış Gerçekliğin Eğitsel Potansiyeli: Öğretim Tasarımcılarının ve Uygulayıcıların Deneyimleri*

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	21.02.2018	09.01.2019

Ömer Koçak** **Rabia M. Yılmaz***** **Sevda Küçük****** **Yüksel Göktaş*******

Öz

Bu çalışmada öğretim tasarımcılarının ve uygulayıcıların deneyimleri bağlamında arttırılmış gerçeklik teknolojisinin eğitsel potansiyeli incelenmiştir. Bu kapsamda içsel durum çalışması deseni tercih edilmiştir. Araştırmaya 42 öğretim tasarımcısı ve 10 uygulayıcı katılmıştır. Veriler öğretim tasarımcılarından açık uçlu anket soruları aracılığıyla toplanmıştır. Açık uçlu anket sorularından oluşturulan yarı yapılandırılmış görüşme formu aracılığıyla da uygulayıcılar ile görüşme gerçekleştirilmiştir. Toplanan nitel veriler Nvivo 8.0 yazılımı kullanılarak içerik analizi yöntemiyle analiz edilmiştir. Katılımcılar ile yapılan görüşme neticesinde AG'nin fen eğitimi, sosyal bilgiler ve sağlık eğitimi alanında daha etkili olacağı önerilmiştir. AG teknolojisiyle geliştirilen en önemli öğretimsel materyallerin 3 boyutlu materyaller, videolar ve animasyonlar olduğu belirtilmiştir. Katılımcılar, AG teknolojisinin eğitimin diğer alanları için geliştirilecek özel uygulamalarla da kullanışlı olabileceğini belirtmişlerdir. Örneğin AG teknolojisi; sihirli kitaplar, farklı içeriklere yönelik 3 boyutlu gösterimler ve fen eğitimi alanındaki deneysel simülasyonlar oluşturmak için kullanılabilir. Ayrıca katılımcılar, AG teknolojisinin kullanıcıların daha fazla dikkatini çekmek, akılda kalıcılığını arttırmak, motivasyonlarını yükseltmek ve eğitsel açıdan daha kapsamlı bir gerçeklik oluşturarak sunulan bilgiyi somutlaştırmak için de sistem tasarlanabileceğini belirtmişlerdir. Son olarak AG uygulaması geliştirmek için analiz, tasarım, geliştirme ve uygulama aşamalarında bazı noktalara dikkat edilmesi gerektiği ifade edilmiştir ve bu noktalar ayrıntılı olarak sunulmuştur. Bu çalışmada elde edilen sonuçlar, AG teknolojisiyle ilgili gelecekte yapılacak olan çalışmalara yönelik bir rehber niteliğindedir.

Anahtar Sözcükler: Eğitimde medya kullanımı; arttırılmış gerçeklik; eğitsel potansiyel.

* Bu çalışmanın bir kısmı 8. Application of Information of Communication Technologies-AICT 2014'te sunulmuştur.

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Introduction

Due to rapid developments in information technologies, people can now access a wide range of information in nearly where and when they want. The existence of this "ubiquitous" information has both greatly influenced and has become a focus within the field of education. The development of information technologies makes possible that to reach information in everywhere at any time, and get many innovations in teaching and learning methods. So this situation pushes education researchers to develop new methods to permit interactions between the real environment and the virtual environment. Augmented Reality (AR), which provides such an interactive learning environment, was consequently developed as a technology that allows interaction between people and information, and impact learning performance (Huang, Chen, & Chou, 2016; Kye & Kim, 2008). AR can be defined as a system that fulfills three basic functions: it combines the real world with virtual worlds, provides real time interaction, and features accurate three dimensional (3D) representations of virtual and real objects (Azuma, 1997).

Augmented Reality Technologies

AR is a software technology that creates 2D or 3D virtual images. It overlaids these images onto the physical, real-world environment, in which the component elements are augmented (or supplemented) by computer-generated sensory inputs, such as graphic, sound, video, or Global Position System [GPS] data. In order to achieve this, imaging devices, portable devices, computers, and input and output devices are used as basic instruments. One type of device that is used to display virtual objects in real environments is known as "Head Mounted Displays". These devices are placed on the head and allow objects to be displayed with the help of optic viewers located over the eyes. In most cases, this can also be achieved with specially adapted eye-glasses. "Handheld Displays" can be viewed with small, hand-held devices. "Spatial Displays" use video projectors, optic elements, and holograms. "Projection Displays" use physical objects that display computer-generated information. Lastly, with the help of special gloves called "Pinch Gloves," virtual objects can be controlled (Kesim & Ozarslan, 2012). Apart from all these imaging devices, a variety of software is now available to develop AR applications. There is software for computers and for portable devices. The complexity varies to suit the users' knowledge of programming and ability to use authoring tools. Among these software programs are Ar-media, ARToolkit, FLARtoolkit, MRToolkit, Studierstube, osgART, DART, ComposAR, BuildAR, FlashLite, Junaio, Metaio, Aurasma, and Layar (DePriest, 2012; Schmalstieg, Langlotz, & Billinghurst, 2011; Wang, Kim, Love, & Kang, 2013). Some of these programs are also available as add-ons in such three-dimensional drawing programs as SketchUP, Autocad, and 3Ds Max (Redondo, Navarro, Sánchez, & Fonseca, 2012). Although AR systems can integrate several software and hardware devices, this integration can be complicated by issues involving interfacing between multiple devices (Klopfer & Squire, 2008; Wu, Lee, Chang, & Liang, 2013). Another challenge encountered by designers is how to allow different interactions to occur easily and inexpensively using free options (Fonseca, Martí, Redondo, Navarro, & Sánchez, 2014). AR systems require programming skills, special software, and hardware, which are typically expensive.

Augmented Reality in Education

The most distinctive characteristic of AR technology compared to the Virtual Reality technology is that it increases the sense of reality in a virtual setting by including virtual information within a real environment. AR technology combines virtual objects or events into the real environments (Kye & Kim, 2008; Tarng, Ou, Yu, Liou, & Liou, 2015). These characteristics make AR potentially useful for education. Because of that, educators use AR technology in every level of schooling (Akçayır, Akçayır, Pektaş, & Ocak, 2016). In educational AR applications, text, symbols and indicators, 2D images/videos, 3D wireframes, 3D data, 3D models, and animations are among the most frequently used materials (Wang et al., 2013). Of all these materials, the 3D learning content in particular facilitates more effective and permanent learning (Arvanitis et al., 2007; Chen, Chi, Hung, & Kang, 2011; Wu et al., 2013). AR applications encourage students to interact actively with models, games, simulations, and virtual objects. They support ubiquitous, collaborative, and situated learning in learning environments. Because of that, AR gives opportunity students promote learning performance,

improve authentic exploration skills and establish constructivist learning environments. AR applications also make it possible for abstract, invisible concepts, and dangerous events these don't observe to be displayed with the help of physical objects, animations, and virtual environments (Akçayır et al., 2016; Arvanitis et al., 2007; Azuma, 1997; Broll et al., 2008; Dunleavy, Dede, & Mitchell, 2009; Huang et al., 2016; Kye & Kim, 2008; Tarng et al., 2015; Wu et al., 2013). AR technology improves learners' motivation, reduces cognitive load, and it can reduce educational costs (Wei, Weng, Liu, & Wang, 2015). In spite of these advantages, educators need to take into consideration some pedagogical challenges when AR systems are implemented. Firstly, implementations of educational innovations in the past might be hindered by constraints imposed by different reasons, so AR is almost a new technology and it could be difficult to integrate in education. Instructional design has a vital role in designing AR learning environments, and the AR integrated learning activities are rather different from traditional learning environments. For example; in some AR systems, fixed flow of instruction is one of the pedagogical challenges associated with this technology. Ideally, teachers could arrange the the flow of instruction according to students' needs and course's instructional objectives (Kerawalla, Luckin, Seljeflot, & Woolard, 2006). There are also both challenges and advantages related to the students and their learning processes. The students encounter a large amount of information, which could lead to cognitive overload in an AR learning environment. Also, they must use multiple technological devices. As a pre-requisite, students should possess proficiency in certain skills, such as spatial navigation, mathematical estimation, problem-solving, usage of technology, and collaboration, (Dunleavy et al., 2009; Wu et al., 2013).

Literature Review

A number of studies have focused on the integration of AR technology into education. AR has been applied at different education levels. AR technology is also frequently used in such fields as geography, mathematics/geometry, chemistry, and biology, as well as in literacy-traing pre-schools, elementary schools, secondary schools, and universities. It is additionally sometimes used in such fields as medicine, engineering, and education for the handicapped. AR applications are used in these fields for such purposes as obtaining information, interacting with virtual objects, displaying invisible events, developing cognitive skills, and increasing motivation. Studies on these uses of AR applications are summarized in Table 1. The specific fields of education, the education levels of the research samples, and the purposes for the use of AR applications are included in this table.

As can be seen in Table 1, AR technologies have positive effects on the learning process across many applications. These effects are especially positive with respect to increasing motivation and activity, making lessons more interesting, facilitating learning, and developing thinking skills (Ifenthaler & Eseryel, 2013).

Table 1

Fields of Education, Education Levels of the Research Samples, and Purposes for the Use of AR Applications

Author(s)	Date	Fields of education	Education Level	Purposes for the use of AR applications
Akçayır, Akçayır, Pektaş, & Ocak	2016	Physics	Undergraduate	Comparing tradational teaching and AR on laboratory skills and attitudes towards laboratories
Aziz, Aziz, Paul, Yusof, & Noor	2012	Special education	Primary	Investigating the learning capacity of individuals with hyperactivity and attention deficit disorder
Balog & Pribeanu	2010	Biology	Primary	Determining the influence of internal and external motivation on technology use
Billinghurst, Kato, & Poupyrev	2001	Literacy	-	Authoring a book that includes AR technology and written texts, pictures, and 3D objects
Carlson & Gagnon	2016	Medical	Undergraduate	AR technology integrated into Simulation

Chen & Wang	2015	Science Education	Secondary	Assesing the effectivenes of AR-embedded instruction
Cheng & Tsai	2016	Reading	Primary & Adults	Examining the interaction of children with parents shared reading with AR picture book
Chien, Chen, & Jeng	2010	Medical/anatomy	Undergraduate	Teaching bone structures, and comparing traditional teaching and AR applications
Dünser	2008	Literacy	Primary	Examining the influence of AR applications on students' reading skills
Dünser & Hornecker	2007	Literacy	Preschool	Evaluating the effectiveness of such a story-listening system
McKenzie & Darnell	2004			
Jan, Noll, Behrends, & Albrecht	2012	Medical/anatomy	Undergraduate	Comparing traditional teaching and AR applications
Kaufmann	2004	Math/Geometry	Secondary	Developing mobile AR application in geometry education
Kim & Lee	2016	Special Education	Primary	Develop AR contents and examining the posibility of applying to science education
Kye & Kim	2008	Biology	Primary	Determining the influence of factors related to AR technologies on learning, and revealing the relationships between these factors
Lee, Chan, & Kwon	2016	Programming	Undergraduate	Comparing the effectiveness of traditional teaching and AR in programming instruction
Liarokapis et al.	2004	Engineering	Undergraduate	Material teaching
Liarokapis, Petridis, Lister, & White	2002	Math/Geometry	-	Establishing interactions with various virtual objects
Lin, Chen, & Chang	2015	Geomety	High School	Comparing traditional teaching and AR assisted learning system in learning solid geometry
Lin, Wang, Duh, Tsai, & Liang	2012	Physics	Undergraduate	Structuring information by developing an elastic impact application
Núñez, Quiros, Núñez, Carda, & Camahort	2008	Chemistry	Undergraduate	Displaying crystal structures in 3D
Park, Beak, Seo, & Lee	2016	Special Education	Undergraduate	Investigating the preservice special education teachers' perceptions about applying AR in special education environment
Schmalstie et al.	2002	Math/Geometry	-	Displaying complex 3D structures
Shelton & Hedley	2002	Geography	Undergraduate	Examining the relationship between the Earth and the Sun
Singhal, Bagga, Goyal, & Saxena	2012	Chemistry	Undergraduate	Examining molecular structures

Sumadio & Rambli	2010	Physics	Secondary	Determining the practicality of AR applications in education
Tarng, Ou, Yu, Liou, & Lio	2015	Biology	Primary	Develop AR contents and examining the effectiveness on students' academic archivement
Thomas, John, & Delieu	2010	Medical/anatomy	Undergraduate	Determining the practicality of AR technologies in anatomy education
Wei, Weng, Liu, & Wang	2015	Creative Design	High School	Examining the effect of AR on students' creativity and motivation
Yeom	2011	Medical/anatomy	Undergraduate	Examining the effects of AR applications on students' learning, and comparing AR technologies with other Technologies
Yoon, Elinich, Wang, Steinmeier, & Tucker	2012	Physics	Primary	Developing a conceptual understanding of scientific phenomena and helping users to acquire cognitive skills
Zhou, Cheok, Pan, & Li	2004	Literacy	-	Designing a system for story-listening that can be opened and closed in cubes, and including hidden stories

The Importance of This Study and Its Rationale

Due to its numerous features, AR technology seems to have many potential uses in the field of education. Education researchers and teachers are interested, as this technology provides an effective learning environment that can be adapted for all education levels, and can especially enrich the contents of non-mathematical courses which normally involve low levels of interaction. AR technology is also believed to be helpful when developing learning environments for different learner profiles. The current availability of a variety of multimedia alternatives supported by AR technology is very helpful when designing for individual differences in learning. But despite all of these benefits, the limited number of comprehensive and explorative studies has been conducted on the educational potentials of AR technology in the literature. Because, AR is a newly developing technology, and so most of the studies are about on its development (Wu et al., 2013). For this reason, to share experiences of the instructional designers and reseachers who apply AR technology in the field of education is important. This study presents the experiences about integration process of AR technology into education. The purpose is to reveal the educational potential of AR technology, based on these experiences. The following questions guided this study:

1) In which education fields and levels can AR technology be used most effectively?

2) What kind of educational applications and materials can be developed via AR technology?

3) What are the opportunities and challenges associated with AR technoloy in education?

4) What are the recommendations of instructional designers and practitioners while developing an effective educational AR application?

   a) What are the recommendations in the stage of analysis?

   b) What are the recommendations in the stages of design and development?

   c) What are the recommendations in the stage of implementation?

Method

Intrinsic case study design was used in this study. Intrinsic case study is a type of case study, and it is an ideal methodology when needed in-depth investigation and better understanding. The intrinsic

case study method was prefered in this study because it can be used to examine in-deep, and describe detailed opinions of the participants (Creswell, 2013; Stake, 1995).

Participants

Participants of the study are 42 instructional desginers (F: 20, M:22; age range: 20-25 years) who have education in instructional design field and 10 practititioners (F: 2, M: 8) who used AR applications in their courses or conducted at least one AR based educational research. The forty-two instructional designers were also pre-service teachers who were last level of undergraduate in the Department of Computer Education and Instructional Technology at Ataturk University. They had taken the course "Project Development and Management". That course was taught by one instructor and two research assistants who are expert in AR based educational research. Students separated to seven groups, and each groupcompleted a final project on "AR in education". Each group focused their projects on different topics and education levels (see Table 2). Also Figure 1 contains sample pictures of the AR implementations by these groups. On the other side, practitioners' implementation field, level, topic and materials are presented in Table 3.

Table 2

Education Levels, Topics, and Educational Applications/ Materials of the Group Projects

Group	Education Levels	Topics	Educational applications/ materials
G1	Elementary (5th grade)	Foreign Language Education	AR Flashcards
G2	Secondary (6th grade)	Science Education	Markers, Mobile Applications, Magic Book
G3	Undergraduate	Smoking Cessation	T-Shirt, Poster, Mobile Applications
G4	Elementary (5th grade)	Creating a Story	AR Flashcards
G5	Elementary (5th grade)	Listening to a Story	Magic Story Book
G6	Elementary (5th grade)	Foreign Language Education	Magic Book
G7	Undergraduate	Anatomy Education	Markers, Mobile Applications

Figure 1. *Examples of the Groups' AR Implementations*

The project groups designed their AR technology metarials and instructional processes in cooperation with the teachers. They used the ADDIE instructional design model to form their projects. In every phase, they presented their studies in the faculty computer laboratory, and their peers and instructors provided feedback to them. In the analysis phase, the students determined a study group, the content, the requirements of this group, and the requirements for the AR application (hardware, software, etc.). In the design phase, Firstly, they designed materials and instructional activities using 2D marker-based AR technology. The 2D marker AR is PC and webcam-based. The marker is in black and white square image. This image is created virtually in front of a webcam to produce a 3D animation, a simulation, or a video. The other type 2D Marker AR is in a mobile device. This sort of phone involves a great deal of real time processing and a great capability (Rice, 2009). In the development phase, the students developed materials using BuildAR, Aurasma, ARMedia, or FlarToolkit software. In the implementation phase, at school, the students implemented the instructional process which they had designed. These educational AR implementations lasted

approximately 4-hours. Finally, the students evaluated their students' learning and opinions, which were recorded by an academic achievement test, questionnaires, and interviews.

Table 3

Education Levels, Topics, and Educational Applications/Materials of the Practitioners' Implementations

Group	Education Levels	Topics	Educational applications/ materials
P1	Secondary (5th grade)	History Education	Magic Book
P2	Secondary (5th grade)	Science Education	Markers
P3	Undergraduate	Orientation Education	Markers
P4	High School (9th grade)	Physics	Markers
P5	Undergraduate	Foreign Language Education	Markers
P6	Secondary (7th grade)	Hardware, Science &Teknology Education	Magic Book
P7	Preschool	Foreign Language Education	Markers
P8	Secondary (6th grade)	Math	Markers
P9	High School (10th grade)	Hardware	Markers
P10	High School (9th grade)	Biology	Markers

The practitioners are designed AR implementations and used in the educational environments in the scope of their research. They conducted AR based educational implementations which include animation, video or 3D materials. They used 2D marker-based AR technology using mobile or PC devices. They preferred various AR softwares such as Aurasma, Voforia, MetaIOCreater, BuildAR, HITLAB-NZ. Some of the practitioners are developped 3D materials using Cinema4D, Unity, Ufuksar, 3DsMax or SketchUp programs as AR content. Their implementation process ranged between one class hour or 5-week class hour according to their research scope.

Data Collection

The data were collected using open-ended questionnaire from instructional designers. This questionnaire was developed by the researchers. And it was based on a literature review and on the study's research questions. After peer-review by two graduate students, two field experts examined the survey. Based upon their feedback, the instrument was revised. It was then checked by a Turkish Language expert for language clarity. Final version of the questionnaire consists 13 open-ended questions. The questionnaire was completed by each participant in class. With the same questions, the semi-structured interviews were conducted with practitioners by face to face or on the phone. All of the participants voluntarily answered the questions based on their learning experiences. To complete the questionnaire had been lasted about three hours each.

Data Analysis

The qualitative data were analyzed with the content analysis method, using Nvivo 8.0 software. Themes were created, which were based on the research questions, and the data was presented with descriptive statistical methods. The frequencies are presented in tables based on opinions of the instructional designers (ID) and practitioners (P).

Results

The data collected from the participants were analyzed with reference to the research questions. The results are presented below, under four headings.

Education Levels and Fields in which AR Technology can be Used Effectively

The instructional designers suggested that AR technology could be more effective in the fields of science, social studies, and health education. The practitioners also empshaised geography and history field. Moreover, they stated that it could be used in each education field when selected suitable

content. The fields of sports education and mathematics teaching were among those least mentioned by the participants. The full findings are shown in Figure 2.

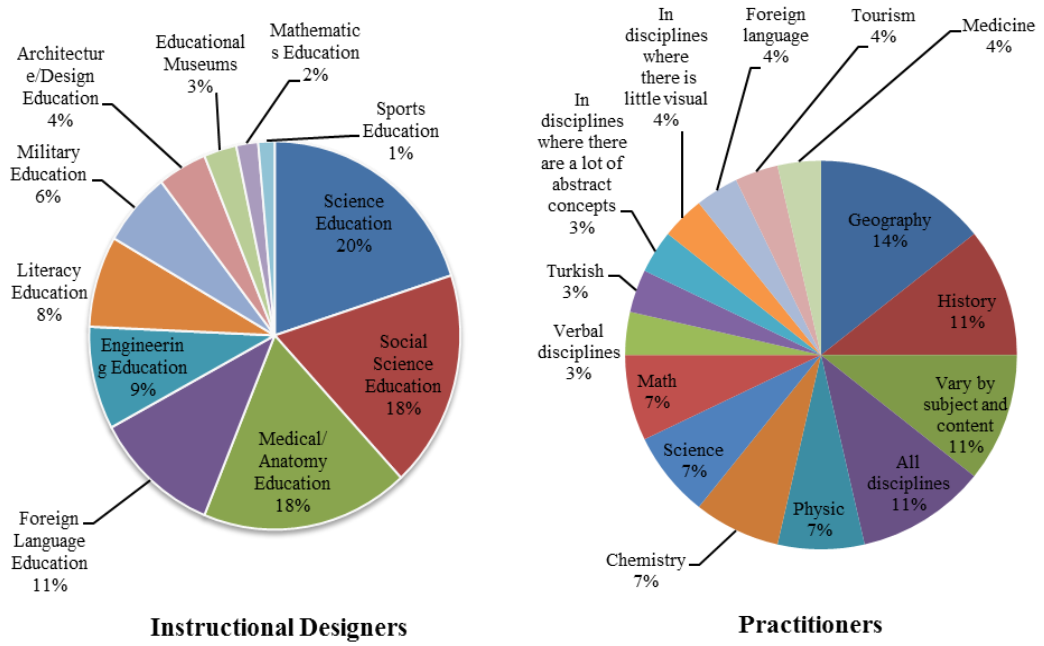

Figure 2. *The Participants' Opinion Education Fields in which AR Technology could be Used*

The instructional designers stated that educational AR applications could be used effectively in almost all education levels. While the the elementary school and university levels were mentioned more by the instructional designers, secondary school and university level were stated more by the practitioners. Moreover, they also mentioned educational AR applications could be effective in special education field and purpose of informal education. The related data regarding this result is shown in detail in Figure 3.

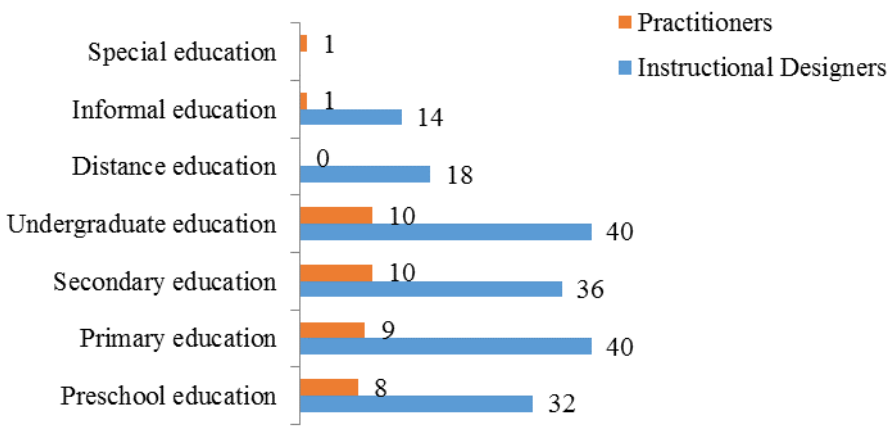

Figure 3. *Education Levels in which Educational AR Applications could be Effective*

Educational Applications and Materials to be Developed with AR Technology

The instructional designers stated that such educational applications and materials as magic books, 3D materials, simulations, games, videos, flash cards, animations, and story books could be

developed with the help of AR technology. The practitioners emphasized video and 3D materials. The data are presented in Table 4.

Table 4

Educational Applications and Materials

Applications and Materials	ID	P
Magic book	23	1
3D materials	19	5
Simulations/Games	19	3
Videos	14	5
Flashcards	12	-
Animations	10	1
Story books	9	-
Poster/booklet	7	-
Audios	7	1
Drill and practice	5	-
Voice dictionary	4	1
T-shirt	4	-

In addition, the instructional designers and practitioners offered suggestions regarding AR technology applications for different fields of education. They suggested that magic books, 3D demonstrations on different subjects, and 3D experimental simulations for the field of science education could be prepared. They offered the opinion that in the field of medicine/health education, difficult and serious surgeries could be simulated; also first-aid applications; and such applications as 3D demonstrations of human anatomy could be produced. Table 5 presents their suggestions for AR applications in different fields of education.

Table 5

AR Applications to be Created for Different Fields of Education

Fields of Education	AR Applications
Science Education	3D demonstrations of chemical bonds and molecules 3D demonstrations of invisible cellular structures of plants and animals Demonstrations of procedural simulations for chemistry experiments Magic Book Similations
Medicine/ Health Education	Simulations of difficult and serious surgeries Simulations of first-aid applications 3D demonstrations of human anatomy Displays of cadaver models Teaching Latin words, and Consciousness raising activities regarding health
Social Sciences	3D models Animating historical events/wars/persons, and demonstrations of geographical formations The Earth's Crust, the Earth, the sun, the moon, and the planets; supporting maps with various multimedia elements Magic Book Videos*
Foreign Language	3D models Teaching vocabulary and pronunciation Magic Book
Engineering Education	3D demonstrations of the designs prepared 3D demonstrations of the present sample designs Introductions to materials, and simulating how a system/machine works

Literacy	Creating stories Story listening Animation/drama Teaching difficult and complex words Reading activities
Military Training	Demonstration and introduction of combat tools Teaching the features of weapons Simulation of shooting practice
Architecture/ Design Education	3D displays of drawings Preparing a 3D prototype
Educational Museums	Introductions to works presented in museums and videos Animations regarding historical events
Mathematics/ Geometry	Displays of complex 3D objects Magic Book
Sports Education	Location based implementations 3D animations of certain sports actions

Opportunities and Challenges for AR in Education

Opportunities for AR in education

The opportunities for AR in education are handled undes students' learning and attitudes, and educational environment themes. The instructional designers stated that AR technology provided such learning opportunities in education as concretizing information, drawing users' attention, improving retention and increasing motivation. The practitioners also emphasized increasing academic achievement especially for relatively lower successful students, maintaining active participation and learning through entertainment opportunities. Moreover, the participants stated that AR technology based educational environment provided conducting applications that are difficult to apply, facilitating class management especially for controlling hyperactive students, increasing interaction and communication. These findings are shown in detail in Table 6.

Table 6

Opportunities for AR in Education

Students' Learning and Attitudes	**ID**	**P**
Concretizing information by developing a sense of reality	36	-
Drawing users' attention	34	6
Improving retention	31	1
Increasing motivation	27	8
Increasing academic achievement	-	5
Maintaining active participation	23	3
Progressing at one's own pace and learning everywhere	19	1
Facilitating learning	16	-
Learning through entertainment	15	4
Increasing creativity	11	-
Positive emotions	-	2
Technology awareness	-	2
Reducing cognitive load	-	1
Maintaining attention	-	1
Reducing anxiety and prejudice toward course	-	1
Eagerness for AR integration with different courses	-	1
Increasing spatial ability	4	-
High-level thinking	3	-
Educational Environment		
Conducting applications that are difficult to apply	21	-
Facilitating class management	-	3
Increasing interactions (content, student, teacher) and	-	3

Saving time	11	2
Addressing more than one sense organ	11	1
Low cost	9	-
Establishing relationships with real life	8	-
Minimizing individual differences	6	1
Increasing class participation	-	1
Reducing teachers' work load	-	1
Reusing when needed	-	1

Challenges for AR in education

According to the instructional designers, difficulties experienced in the educational AR application process occurred due to the facts that AR applications require a certain infrastructure of software and equipment, content development is difficult and time-consuming, and users are supposed to have competency with the technology. The practitioners also emphasized some challenges such as surpassing entertainment and game the instructional purpose, and focusing on the materials instead of content, and some students' boring. This data is presented in detail in Table 7.

Table 7

Challenges for AR in Education

Challenges	**ID**	**P**
AR applications require a certain infrastructure of software and equipment	41	-
Content development is difficult and time consuming	30	-
Requiring users and developers experience	27	-
Difficulty in organizing the physical conditions	22	-
Problems with content-software integration (defining markers, etc.)	22	2
Frequent technical problems (internet, charge, light, etc)	19	4
Failure of the software to support all file extensions	13	-
Difficulty in carrying out applications in crowded classrooms	12	-
Difficult to control the lessons	10	1
Surpassing entertainment and game the instructional purpose	8	1
Difficulty in adapting the environment for individual studies	6	-
The application process is time consuming	3	-
Problems about supporting programmes in some Tablets	-	**3**
Problems about supporting Turkish language in AR programmes	-	1
Lack of number of mobile devices used in implementations.	-	1
Causing distractibility due to technical problems	-	1
Being novice on using Tablet	-	1
Focusing on the materials instead of the content	-	1
Getting bored of some students	-	1
Problems regarding displaying virtual content such as text, images etc.	-	1
Having difficulty to rotate the displayed objects on the marker	-	1

Points to Consider While Developing an Educational AR Application

Points to pay attention to in the process of analysis

Especially, the instructional designers focused on software selection in the process of analysis to develop educational AR applications. Firstly, they reported that the applications should have an interface easy to use the program. Also, multimedia support of the program, the environment where the application will be implemented, and the related devices to be used should be primarily pay attention while selecting the software to develop an educational AR application. On the other side, the practitioners also emphasized the need assessment, selecting an appropriate multimedia theory and literature review. The collected data is presented in detail in Table 8.

Table 8

Points to Consider in the Process of Analysis

Points to consider	ID	P
Easy interfacing of the software (defining, creating the markers, etc.)	20	-
The environment where the application will be implemented, and the related devices to be used	14	1
Multimedia support of the program (pictures, audios, videos, 3D model support)	14	-
The target population addressed by the application	12	1
Recognizing and displaying the markers (duration, number, image quality)	12	-
Software, and equipment necessary to run the software	12	-
The subject related to the application	12	-
Technical difficulties due to the software	11	-
The variety of file extensions supported by the software	9	-
Cost of the software	8	-
Internet support required by the software	7	-
Selecting an appropriate multimedia theory and designing the educational materials to be appropriate for the design principles	4	1
Allowing interactive material development	4	-
Coding information required by the software	4	-
Need assessment	-	**4**
Considering literature review	-	1
Getting support from field experts	-	1
No changing of course flow	-	1
Regarding other course activities of students	-	1
Regarding students preknowledge level	-	1

Points to consider in the process of design and development

The instructional designers reported that during the entire process of designing and developing an educational AR application, it is important to control some points. As shown in Table 9, whether the application is appropriate to the target population, the content, and the aim; to provide the necessary technical infrastructure and the physical environment; to make it realistic and interesting; and to determine the environment and the materials to be used. The practitioners emphasized conducting pilot implementations, cooperation with field experts, and providing the necessary technical infrastructure and the physical environment. The data are presented in detail in Table 9.

Table 9

Points to Consider in the Process of Design and Development

Points to consider	ID	P
Appropriateness for the target population	32	1
Appropriateness for the aim and the content	21	-
Providing the necessary technical infrastructure and the physical environment	14	2
Making it realistic and interesting	13	
Designing the markers (size, color, number) in a way that they will be recognized by the software and by the camera	10	3
Determining the environment and the materials to be used	10	1
Making it easy to use, including providing the necessary guidance	7	-
Designing the materials appropriately for the subject and for the target population	6	1
Including a variety of multimedia elements	6	-
Conducting pilot implementations	5	**4**
Good-planning during the process	5	-
Good-quality audios and images	3	-
Cooperation between the field experts	2	3
Lack of distracting factors	2	-

Providing feedback and reinforcers	2	-
Conducting pilot implementations with similar target population	-	2
Avoiding to present long duration video materials	-	1
Designing interactive materials	-	1
Designing materials with a group	-	1
Designing the materials as 3D	-	1
Designing the materials as user friendly	-	1
Determining not easy content	-	1
Drawing attention of students	-	1
Meeting software and material properties with mobile devices	-	1
Providing Turkish language program interface	-	1
Regarding the teacher's opinions	-	1

Points to consider in the process of implementation

The instructional designers stated that in the implementation process of the educational AR application, it is important to arrange environment. Provide the necessary technical infrastructure and the physical environment, to inform the students (about the program, materials, purpose, gains), and to provide each students equal opportunities for usage. The practitioners emphasized conducting usability tests of the materials before the real implementation, providing enough devices for students, and preventing younger students from regarding the application as a game The data were presented in Table 10.

Table 10

Points to Consider in the Implementation Process

Points to consider	**ID**	**P**
Providing the necessary technical infrastructure and the physical environment (light, audio, class order, etc.)	42	1
Informing the students (about the program, materials, purpose, gains)	18	-
Providing students with equal opportunities for implementation	8	-
Offering education within the framework of the plan	7	-
Conducting usability tests of the materials before the real implementation	5	5
Helping students become active in the process	4	-
Achieving class management	3	1
Adjusting the camera well in webcam applications	3	-
Preventing younger students from regarding the application as a game	2	2
Allocating enough time to the students for the application	2	1
Providing enough devices for students	-	2
Allocating time for enjoyment	-	1
Guiding students for rotating object	-	1
Maintaining students' attention through implementation process	-	1
Meeting AR software capability with connected device number	-	1
Providing reusing opportunity after class	-	1

Discussion

The present study examined the educational potential of AR technology. For this purpose, the experiences of instructional designers and practitioners were analysed to elicit their opinions concerning the education levels and fields in which AR technology can be effectively used, also in which educational materials and applications are most effective, and points to be considered while developing an effective educational AR application.

The results suggest that AR technology would be more effective in the fields of science education, the social sciences, and health education. In the literature, the educational potential of AR technology has only recently been recognized in these fields (Núñez, Quiro, Núñez, Carda, & Camahort, 2008), though AR related studies are increasing in last four years (Akçayır & Akçayır, 2017), many published studies are not very comprehensive in their treatment of such applications (Wu et al., 2013). This situation could be due to the fact that AR technology is a newly-developing technology. But AR applications will likely be commonly used in these fields in future. Our findings indicate that AR applications can be used effectively in almost every education level, but most especially in the elementary school and university levels. Similarly, Akçayır ve Akçayır (2017) stated that AR based educational studies conduct commonly in K12 level. In addition, AR technology is favored in the elementary school level, because it is an attention-grabbing technology (Lamanauskas et al., 2007). In the university level, it can be used in any place at any time (Sandor & Klinker, 2005). AR technology provides such features as 3D graphics and animation, individual study, learning facilitation, and increased engagement (Chen et al., 2011; Lamanauskas et al., 2007; Wu et al., 2013), which makes it widely useful in different education levels.

Among the basic educational materials that should be developed with AR technology are 3D materials, videos, and animations. AR 3D materials are popular among students (Arvanitis et al., 2007; Wu et al., 2013), as this allows viewing of objects from multiple perspectives. The educational applications chiefly include magic books, simulations, and story books. In the literature, the first recorded application produced with AR technology was Magic Book (Billinghurst, Kato, & Poupyrev, 2001). Some studies have also been conducted to develop story books (Dünser & Hornecker, 2007; McKenzie & Darnell, 2004; Saso, Iguchi, & Inakage, 2003; Cheok, Li, Pan, & Zhou, 2004). However, the number of these studies is limited. AR technology could therefore be further utilized to support simulations and story book applications in the future. Although the present study suggests that the use of educational games should be limited, prior studies have shown that educational games can be used more effectively thanks to AR technologies (Wu et al., 2013).

We determined that AR technology can be used to develop special applications for different fields of education. In the field of science education, experimental simulations, 3D displays of different subjects, and magic books can be developed. In the literature, some studies have been conducted on 3D displays of chemical molecular structures (Singhal, Bagga, Goyal, & Saxena, 2012) as well as on displays of crystal structures (Núñez et al., 2008). In the field of Medicine/Health Education, our participants suggested that applications such as simulations of difficult and serious surgeries, simulations of first-aid applications, and 3D depictions of human anatomy could be created. In the literature, several studies have focused on AR applications for anatomy instruction (Chien, Chen, & Jeng, 2010; Jan, Noll, Behrends, & Albrecht, 2012; Nicholson, Chalk, Funnell, & Daniel, 2006). In the field of medicine, applications to facilitate difficult and serious surgical interventions have also been developed (Fischer, Neff, Freudenstein, & Bartz, 2004; Hamza-Lup, Rolland, & Hughes, 2004). In the field of the social sciences, various applications could be designed, such as to animate historical events, to teach vocabulary and pronunciation in foreign language education, to create 3D displays of designs in engineering education, to facilitate story building and listening in literacy education, to create war simulations in military training, to generate 3D displays of drawings in architecture, to portray historical artifacts in educational museums, to depict complex 3D objects in mathematics teaching, and to create educational games that are based on cooperation.

Our participants further suggested that AR technology could be useful for concretizing information, drawing users' attention, improving retention, and increasing motivation by creating a sense of reality in the virtual environment. Though other technologies can also be used for these purposes, it is the most distinguishing characteristic of AR technology which visualizes virtual object to real world, thus it supports interactions between the real and virtual environments by including virtual information within a real environment (Huang et al., 2016; Kye & Kim, 2008). Moreover, parallel with the literature, the practitioners reported that AR technology based learning environments increase motivation and academic success (Akçayır & Akçayır, 2017). Encouraging interactions and generating a sense of reality depends on the use of 3D materials and animations. However, several difficulties are likely to be experienced in the process of educational AR application. Among these

difficulties are the factors that AR applications require a certain infrastructure of software and equipment, content development is difficult and time-consuming, and AR technology users must possess technological competency. The difficulty of maintaining the necessary infrastructure is likely due to the fact that it is a newly-developing technology. Although the opportunities and difficulties associated with AR technology have been mentioned in the literature, this study provides a larger framework and more data to examine this subject.

The stages of analysis, design, development, and implementation were investigated to develop an effective educational AR application. In the analysis of stage, designers should pay attention when selecting software. This software should have easy interfacing, multimedia support. And related devices in physical environment should be prepared for the application. About the selection software, the most advantageous technologies should be choosen to develop an effective educational application by designers (Kozma, 1994). Whereas Clark suggested that designers should consider pedagogy as a primary factor rather than technology (Clark, 1983),

AR technology is a relatively newly-developing, so it is inevitable that there will be certain limitations caused by current software. There have been recently developed softwares. Therefore, software selection is important. Studies have been conducted to compare these softwares (Schmalstieg et al., 2011; Wang et al., 2013). Other important points when designing and developing the materials that designers should pay attention to be appropriate for the students' levels, for the subject content, and for the purpose; providing the necessary technical infrastructure and physical environment; and attracting students' interest; and making the environment realistic. Designers should consider all of these points to make an effective learning environment. Besides designers should prepare and chooseappropriate environment and materials to be used with the AR technology. Because it is also important that the software and the camera should recognize the makers (size, position, color, and number). As is reported in literature, students will feel discomfort if the learning environment is not -designed as stated. This situation could cause low engagement and detrimentally affect learning (Kerawalla et al., 2006). Developers should consider that providing the necessary technical infrastructure and physical environment in the implementation process. To implement educational AR metarials in an effective way, special physical conditions, equipment, and software are required. In addition, before application, informing the studens about the application (gains, materials, purpose, and software) is also important. After then, it is important to provide students equal usage opportunities. Moreover, conducting usability tests of the materials before the real implementation and allocating enough time are extremely important in terms of preventing technical problems (Akçayır & Akçayır, 2017). Designers of educational AR environments need to provide support to help teachers and students (Wu et al., 2013). Moreover, students must be able to use multiple technological devices in AR learning environments. Because of this, they should possess some essential skills, such as spatial navigation, collaboration, problem-solving, technology manipulation, and mathematical estimation (Dunleavy et al., 2009; Wu et al., 2013). As with all new technologies, the use of AR technology draws students' attention. Students therefore may be willing to use educational AR applications. Thus, it is important to provide students equal usage opportunities. In the literature, most of the implemented AR systems are single user-based. More attention should be paid to collaborative systems (Wang et al., 2013).

Conclusion and Recommendations

To conclude, this study provides a wide range of in-depth information on the educational potentials of AR technology. The results can provide guidance for the design, development, and implementation of future studies in the field. However, the limitations of this study are that it included only marker-based AR applications, and our findings are based upon the opinions of 42 instructional designers and 10 practitioners. The following suggestions are offered, based upon our results:

- In different fields of education, researchers should integrate this technology into their own fields, and conduct applications and studies with different research sample groups.

- Educational magic books, simulations, and story books to be developed with AR technology could be enriched with 3D models, videos, animations, and audios.

- Location based AR technology should be integrated with appropriate contents.
- Using the findings from the study, specific applications could be carried out in different fields of education (See Table 3).
- In cases where a sense of reality is hard to create, AR technology can be effectively used in education.
- AR applications can also be used effectively in applications based on individual study.
- In order to draw users' attention, to increase motivation, and to improve retention and active participation, AR technologies can be used especially in non-mathematical courses that include the presentation of complex information.
- With the help of AR technologies, activities could be designed to increase students' creativity and to develop their high-level thinking skills, as well as their spatial ability.
- AR based educational materials should be designed based on an appropriate multimedia theory.
- Educational activities should be designed with AR technologies only after first considering the difficulties likely to be experienced when using these technologies.
- While designing educational applications with AR technologies, it is important to select appropriate software and to establish the necessary technical infrastructure.
- Interdisciplinary studies conducted by field experts could help to overcome the difficulties experienced in the processes of content development, material design, and application.
- In order to avoid any problems, especially while designing and displaying the markers, it is important to provide appropriate physical conditions and to use technical tools with efficient equipment.
- For the purpose of providing students with equal application opportunities, educational applications could be conducted in uncrowded classrooms.
- To deal with the spread of this technology in the field of education, schools should be provided with the necessary technical infrastructure support, and in-service training should be organized for teachers.
- The introduction of effective educational materials and applications developed with AR technology to teachers as well as to students will accelerate the spread of this technology.

References

Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, *20*, 1-11.

Akçayır, M., Akçayır, G., Pektaş, H. M., & Ocak, M. A. (2016). Augmented reality in science laboratories: The effects of augmented reality on university students' laboratory skills and attitudes toward science laboratories. *Computers in Human Behavior*, *57*, 334-342.

Arvanitis, T. N., Petrou, A., Knight, J. F., Savas, S., Sotiriou, S., Gargalakos, M., et al. (2007). Human factors and qualitative pedagogical evaluation of a mobile augmented reality system for science education used by learners with physical disabilities. *Personal and Ubiquitous Computing, 13*(3), 243–250.

Aziz, N. A. A., Aziz, K. A., Paul, A., Yusof A. M., & Noor, N. S. M. (2012). *Providing augmented reality based education for students with attention deficit hyperactive disorder via cloud computing: Its advantages.* Advanced Communication Technology (ICACT) pp.577-581.

Azuma, R.T., (1997). A survey of augmented reality. *Presence: Teleoperators and Virtual Environments, 6*(4), 355-385.

Balog, A., & Pribeanu, C. (2010). The role of perceived enjoyment in the students' acceptance of an augmented reality teaching platform: a structural equation modelling approach. *Studies in Informatics and Control, 19*(3), 319-330.

Billinghurst, M., Kato, H., & Poupyrev, I. (2001). The Magic Book-Moving seamlessly between reality and virtuality. *IEEE Computer Graphics and Application, 21*(3), 6-8.

Broll, W., Lindt, I., Herbst, I., Ohlenburg, J., Braun, A. K., & Wetzel, R. (2008). Toward next-gen mobile AR games. *Computer Graphics and Applications, IEEE, 28*(4), 40-48.

Carlson, K. J., & Gagnon, D. J. (2016). Augmented Reality Integrated Simulation Education in Health Care. *Clinical Simulation in Nursing, 12*(4), 123-127.

Chen, Y.C., Chi, H.L., Hung, W.H., & Kang, S.C. (2011). Use of tangible and augmented reality models in engineering graphics courses. *Journal of Professional Issues in Engineering Education and Practice, 137*(4), 267–276.

Chen, C. P., & Wang, C. H. (2015). Employing Augmented-Reality-Embedded Instruction to Disperse the Imparities of Individual Differences in Earth Science Learning. *Journal of Science Education and Technology, 24*(6), 835-847.

Cheng, K. H., & Tsai, C. C. (2014). The interaction of child–parent shared reading with an augmented reality (AR) picture book and parents' conceptions of AR learning. *British Journal of Educational Technology, 47*(1), 203-222.

Cheok, A. D., Li, Y., Pan, J., & Zhou, Z. (2004). *Magic story cube: an interactive tangible interface for storytelling.* Proceedings of the 2004 ACM SIGCHI International Conference on Advances in computer entertainment technology (pp. 364-365). Singapore.

Chien, C.H., Chen, C.H., & Jeng, T.S. (2010). *An interactive augmented reality system for learning anatomy structure.* Proceedings of International Conference of Engineers and Computer Scientists (pp. 370-375). Hong Kong.

Clark, R.E. (1983). Reconsidering research on learning from media. *Review of Educational Research, 53*, 445-459.

Creswell, J. W. (2013). Qualitative inquiry & research design: Choosing among five approaches. Lincoln: Sage Publications.

DePriest, D. (2012). *The fifth dimension: how augmented reality is launching worlds within our world*. In Proceedings of TCC - Teaching Colleges and Community Worldwide Online Conference 2012 (pp. 6-13).

Dunleavy, M., Dede, C., & Mitchell, R. (2009). Affordances and limitations of immersive participatory augmented reality simulations for teaching and learning. *Journal of Science Education and Technology, 18*(1), 7–22.

Dünser, A. (2008). Supporting low ability readers with interactive augmented reality. *Annual Review of CyberTherapy and Telemedicine: Changing the Face of Healthcare, 6*, 41-48.

Dünser, A., & Hornecker, E. (2007). *An observational study of children interacting with an augmented story book*. In 2nd International Conference of E-Learning and Games (Edutainment 2007) (pp. 305-315).

Farias, L., & Dantas, R.R. (2011, September). *Edu-AR: A tool for assist the creation of augmented reality content for education*. IEEE International Conference on Virtual Environments, Human-Computer Interfaces and Measurement Systems, Natal, Brazil.

Fischer, J., Neff, M., Freudenstein, D., & Bartz, D. (2004, June). *Medical Augmented Reality based on Commercial Image Guided Surgery.* In Eurographics Symposium on Virtual Environments (EGVE).

Fonseca, D., Martí, N., Redondo, E., Navarro, I., & Sánchez, A. (2014). Relationship between student profile, tool use, participation, and academic performance with the use of Augmented Reality technology for visualized architecture models. *Computers in Human Behavior, 31*, 434-445.

Hamza-Lup, F. G., Rolland, J.P., & Hughes, C. (2004). *A Distributed Augmented Reality System for Medical Training and Simulation*. Energy, Simulation-Training, Ocean Engineering and Instrumentation: Research Papers of the Link Foundation Fellows (pp. 213–35).

Huang, T. C., Chen, C. C., & Chou, Y. W. (2016). Animating eco-education: To see, feel, and discover in an augmented reality-based experiential learning environment. *Computers & Education, 96*, 72-82.

Ifenthaler, D., & Eseryel, D. (2013). Facilitating complex learning by mobile augmented reality learning environments. In R. Huang, J. M. Spector & Kinshuk (Eds.), *Reshaping learning: The frontiers of learning technologies in a global context* (pp. 415-438). New York: Springer.

Jan, U., Noll, C., Behrends, M., & Albrecht, U.V. (2012). mARble – Augmented reality in medical education. *Biomedical Engineering/ Biomedizinische Technik, 57*(1), 67-70.

Kaufmann, H. (2004). Geometry Education with Augmented Reality, Unpublished doctoral dissertation, Vienna University of Technology, Austria.

Kerawalla, L., Luckin, R., Seljeflot, S., & Woolard, A. (2006). Making it real: exploring the potential of augmented reality for teaching primary school science. *Virtual Reality, 10* (3-4), 163-174.

Kesim, M., & Ozarslan, Y. (2012). Augmented reality in education: current technologies and the potential for education. *Procedia - Social and Behavioral Sciences, 47,* 297- 302.

Kim, J. S., & Lee, T. S. (2016). Designing and exploring the possibility science contents based on augmented reality for students with intellectual disability. *The Journal of the Korea Contents Association, 16*(1), 720-733.

Klopfer, E., & Squire, K. (2008). Environmental detectives: the development of an augmented reality platform for environmental simulations. *Educational Technology Research and Development, 56*(2), 203–228.

Kozma, R. B. (1994). Will media influence learning? Reframing the debate. *Educational Technology Research and Development, 42*(2), 7-19.

Kye, B., & Kim, Y. (2008). Investigation of the relationships between media characteristics, presence, flow, and learning effects in augmented reality based learning. *International Journal for Education Media and Technology, 2*(1), 4-14.

Lamanauskas, V., Pribeanu, C., Vilkonis, R., Balog, A., Iordache, D., & Klangauskas, A. (2007, July). *Evaluating the educational value and usability of an augmented reality platform for school environments: some preliminary results.* Proceedings of 4th WSEAS/IASME International Conference on Engineering Education, Agios Nikolaos, Crete Island, Greece.

Lee, H., Cha, S. A., & Kwon, H. N. (2016). Study on the effect of augmented reality contents-based instruction for adult learners on academic achievement, interest and flow. *The Journal of the Korea Contents Association, 16*(1), 424-437.

Liarokapis, F., Petridis, P., Lister, P. F., & White, M. (2002). Multimedia augmented reality interface for e-learning (MARIE). *World Transactions on Engineering and Technology Education, 1*(2), 173-176.

Liarokapis, F., Mourkoussis, N., White, M., Darcy, J., Sifniotis, M., Petridis, P., Basu, A., & Lister, P. F. (2004). Web 3D and augmented reality to support engineering education. *World Transactions on Engineering and Technology Education, 3*(1), 1-4.

Lin, H. C. K., Chen, M. C., & Chang, C. K. (2015). Assessing the effectiveness of learning solid geometry by using an augmented reality-assisted learning system. *Interactive Learning Environments*, *23*(6), 799-810.

Lin, T. J., Wang, H. Y., Duh, H. B. L., Tsai, C. C., & Liang, J. C. (2012, July). *Behavioral Patterns and Learning Performance of Collaborative Knowledge Construction on an Augmented Reality System.*), 12th International Conference on Advanced Learning Technologies (ICALT), Rome.

McKenzie, J., & Darnell, D. (2004). The eyeMagic book. A report into augmented reality storytelling in the context of a children's workshop 2003. New Zealand Centre for Children's Literature and Christchurch College of Education, Christchurch.

Nicholson, D.T., Chalk, C., Funnell, W. R. J., & Daniel, S. J. (2006). Can virtual reality improve anatomy education? A randomised controlled study of a computer-generated three-dimensional anatomical ear model. *Medical Education, 40* (11), 1081-1087.

Núñez, M., Quiros, R., Núñez, I., Carda, J. B., Camahort, E. (2008). *Collaborative augmented reality for inorganic chemistry education*. Proceedings of the 5th WSEAS/IASME International Conference on Engineering Education (pp.271-277).

Park, K. O., Baek, J., Seo, S., & Lee (2016). Investigating preservice special education teachers' perceptions on applying augmented reality (AR) to special education and its presence factors affecting AR. *The Journal of Special Education: Theory and Practice, 17*(1), 189-207.

Redondo, E., Navarro, I., Sánchez Riera, A., Fonseca, D. (2012). Augmented reality on architectural and building engineering learning processes. Two Study Cases. *Special Issue on Visual Interfaces and User Experience: New approaches*, 1269–1279.

Rice, R. (2009). *The augmented reality hype cycle*. Retrieved from http://www.sprxmobile.com/the-augmented-reality-hype-cycle/

Sandor, C. & Klinker, G. (2005). A rapid prototyping software infrastructure for user interfaces in ubiquitous augmented reality. *Pers Ubiquit Comput, 9*, 169-185.

Saso, T., Iguchi, K., & Inakage, M. (2003). *Little red: storytelling in mixed reality*. SIGGRAPH Sketches and Applications, New York, USA.

Schmalstieg, D., Fuhrmann, A., Hesina, G., Szalavári, Z., Encarnaçäo, L. M., Gervautz, M., & Purgathofer, W. (2002). The studierstube augmented reality Project. *Presence: Teleoperators and Virtual Environments, 11*(1), 33-54.

Schmalstieg, D., Langlotz, T. and Billinghurst, M. (2011). *Augmented Reality 2.0*. Dagstuhl, Germany: Virtual Reality (pp. 13-37).

Shelton, B. E., & Hedley, N. R. (2002, September). *Using augmented reality for teaching earth-sun relationships to undergraduate geography students*. Paper presented at The First IEEE International Augmented Reality Toolkit Workshop, Darmstadt, Germany.

Singhal, S., Bagga, S., Goyal, P., & Saxena, V. (2012). Augmented chemistry: Interactive education system. *International Journal of Computer Applications, 49*(15), 1-5.

Stake, R. (1995). *The art of case stud research*. Thousand Oaks, CA: Sage Publishing.

Sumadio, D. D. & Rambli, D. R. A. (2010). *Preliminary evaluation on user acceptance of the augmented reality use for education*. Second IEEE International Conference on Computer Engineering and Applications (pp. 461-465).

Tarng, W., Ou, K. L., Yu, C. S., Liou, F. L., & Liou, H. H. (2015). Development of a virtual butterfly ecological system based on augmented reality and mobile learning technologies. *Virtual Reality, 19*(3-4), 253-266.

Thomas, R. G., John, N. W., & Delieu, J. M. (2010). Augmented reality for anatomical education. *Journal of Visual Communication in Medicine, 33* (1), 6-15.

Wang, X., Kim, M. J., Love, P.E.D., Kang, S. C. (2013). Augmented Reality in built environment: Classification and implications for future research. *Automation in Construction, 32*, 1–13.

Wei, X., Weng, D., Liu, Y., & Wang, Y. (2015). Teaching based on augmented reality for a technical creative design course. *Computers & Education, 81*, 221-234.

Wu, H.-K., Lee, S.W.-Y., Chang, H.-Y., Liang, J.-C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education, 62*, 41–49.

Yeom, S. J. (2011, December). *Augmented reality for learning anatomy*. Proceedings Changing Demands, Changing Directions (pp. 1377-1383). Hobart, Tasmania,

Yoon, S. A., Elinich, K., Wang, J., Steinmeier, C., & Tucker, S. (2012). Using augmented reality and knowledge-building scaffolds to improve learning in a science museum. *International Journal of Computer-Supported Collaborative Learning, 7*(4), 519-541.

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 37-46

Nesibe Aydın JEF

Geometric Aspects of Number Line Estimations*

Article Type	Received Date	Accepted Date
Research	15.09.2018	29.12.2018

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Abstract

Number lines are implicitly embedded in nature. Yet researchers use them for measuring number sense as if they are processed purely through numerical reasoning. We argue that number line estimation tasks are done both by numerical and geometric reasoning. The purpose of this research was to investigate the relationships among mathematics achievement, geometry achievement, spatial skills, and number line estimations. A total of 142 fourth graders were administered 5 different tests: 2 curriculum-based math achievement tests, a spatial visualization test, a number line estimation test, and the Raven Standard Progresive Matrices test. Results showed; estimation accuracy of the relative magnitude of numbers on an empty number line has more to do with geometry achievement and diagrammatic reasoning rather than with numerical or arithmetic reasoning. It seems that number line estimation tasks may constitute an interplay between number and shape. Therefore, we conclude that using multiple external representations of numbers, such as spatial, symbolic, and verbal could be useful in developing a more robust number sense.

Keywords: Number line estimations, numerical reasoning, geometric reasoning, number sense.

* An earlier version of this paper has been presented in 13th International Congress on Mathematical Education, July 24-31 2016, Hamburg, Germany.

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Sayı Doğrusu Tahmin Becerisinin Geometrik Yönü[*]

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	15.09.2018	29.12.2018

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Öz

Sayı doğrusu doğal ortamlarda kendiliğinden vardır. Fakat araştırmacılar sayı doğrusu tahmin görevlerini genellikle saf sayısal becerileri ölçmek amacıyla kullanmaktadırlar. Biz ise sayı doğrusunda tahmin görevlerinin hem sayısal hem de geometrik akıl yürütme gerektirdiğini savunmaktayız. Bu araştırmanın amacı matematik başarısı, geometri başarısı, uzamsal beceriler ve sayı doğrusu tahminleri arasındaki ilişkiyi incelemektir. Toplam 142 dördüncü sınıf öğrencisine 5 farklı test uygulanmıştır: Bunların ikisi müfredata dayalı matematik başarı testidir. Ayrıca uzamsal görselleştirme testi, sayı doğrusu tahmin testi ve Raven Progresif Matrisler testi araştırmanın veri toplama araçlarını oluşturmaktadır. Verilerin analizinde Pearson korelasyon katsayısı, regresyon analizi ve bağımsız örneklemler t-testi analizi kullanılmıştır. Elde edilen bulgulara göre; boş bir sayı doğrusunda sayıların göreceli büyüklüğünün tahmin doğruluğu, aritmetikten ziyade geometri başarısı ve şematik akıl yürütme ile daha fazla ilgili olduğu ortaya konulmuştur. Sayı doğrusunda tahmin görevleri şekil ve sayı kavramları için ortak bir alan oluşturmaktadır. Bu nedenle, uzamsal, sembolik ve sözel gibi sayıların çoklu temsilini kullanmak daha sağlam bir sayı hissinin geliştirilmesinde yararlı olabilir.

Anahtar Sözcükler: Sayı doğrusu tahmini, sayısal akıl yürütme, geometrik akıl yürütme, sayı hissi.

[*] Bu çalışma 24-31 Temmuz 2016 tarihlerinde Hamburg'da düzenlenen 13. Uluslararası Matematik Eğitimi Kongresinde sözlü bildiri olarak sunulmuştur.

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Introduction

Measuring students' mathematical abilities are important and valuable task both psychologically and educationally. Yet instead of focusing on complex mathematical tasks, recent research has focused on very simple tasks to measure core abilities that seem to be closely related to mathematics learning and achievement. The results are very promising in showing that efficiencies in these simple tasks predict an important portion of mathematics scores as well as future mathematics achievement.

The motivation behind these approaches is the theory that human cognition consists of a small number of separable units for processing knowledge (Spelke & Kinzler, 2007). These units are objects, actions, numbers, space, and possibly social partners. Some evidence from brain research also supports this position (Dehaene, Molko, Cohen, & Wilson, 2004). This paper focuses on the relationship between number systems and spatial processing.

Some researchers (Spelke & Kinzler, 2007) believe that, in the human brain, there are two separate modules for number and space residing in different areas of the brain, but interacting with each other (Olkun & Denizli, 2015; Verdine, Golinkoff, Hirsh-Pasek, & Newcombe, 2014). Up to now, four subsystems or aspects of the number module have been claimed (Butterworth, 2010; Feigenson, Dehaene, & Spelke, 2004; Izard, Pica, Spelke, & Dehaene, 2008; Olkun, Altun, & Göçer Şahin, 2015). Tasks used to measure the function of these subsystems have also been developed and used in research studies to investigate their relationships with mathematics achievement.

The first subsystem in the number module is the Exact Number System (ENS) (Izard et al., 2008). Subitizing and exact calculations are supposed to be based on ENS. There is ample evidence that infants can make numerical judgments starting a few days after birth (Antell & Keating, 1983) through an object-based quantifier system, called subitizing, a rapid enumeration of quantities up to 3 or 4. The functioning of this system is measured through dot enumeration paradigms. Subjects are shown a number of dots and asked to immediately say their number as quickly as possible. The learning of counting and calculation is related to ENS.

The second system, Access to Symbols (ATS), is used to associate symbols to quantities and vice versa. The numerical Stroop tasks or symbolic number comparison tasks are used in measuring the functioning of this subsystem (Girelli, Lucangeli, & Butterworth, 2000), but symbols such as Arabic numerals, are also used in many of the tasks designed for measuring numerical abilities. Although, these subsystems may not be completely dissociable through behavioral tasks, the patterns of efficiency might be an indicator for the independent functioning of certain subsystems.

The third system, numerosity coding (Butterworth, 2010; Olkun, Altun, & Göçer Şahin, 2015), is an inherited system for sets of objects and operations on them, on which arithmetic is built. Any dysfunction in numerosity coding, not in the approximate number system or the small number system, results in dyscalculia (Butterworth, 2010). However, this system seems to be built on the Exact Number System, possibly with some input from the Approximate Number System.

The fourth subsystem, assumed to be present in human brain is the Approximate Number System (ANS). This is an evolutionary ancient system for processing approximate quantities that human beings share with other animals. Other mathematical abilities are built on the Approximate Number System (Dehaene, 2009). Some researchers claim that the ANS is the only core system and all the other arithmetical abilities are built on this system. The functioning of ANS is measured through estimation (Siegler & Booth, 2005) or quantity comparison (Lemer, Dehaene, Spelke, & Cohen, 2003) tasks.

Estimation or reasoning with approximate quantities is an important process in mathematics education. According to Siegler and Booth (2005) many types of estimations require going beyond the rote application of procedures and applying mathematical knowledge in flexible ways. In contrast to exact calculations, estimation enables people to get a quicker and more informed answer. Siegler and Booth (2005) defined estimation "as a process of translating between alternative quantitative representations, at least one of which is inexact" (p.198) and listed several estimation types one of which is number line estimation.

Number line estimations involve the evaluation of spatial representations of numerical magnitudes. Number line estimations involve for instance finding the relative position of an Arabic number on a number line, or plotting a number on a number line. Typically, a number line shows zero on the left and 10-100 or 1000 on the right. Accuracy in spatial representation of number magnitude is a reliable predictor of current and future arithmetic abilities (Booth & Siegler, 2006; Link, Moeller, Huber, Fischer, & Nuerk, 2013; Siegler & Booth, 2004). Therefore, number line estimation is considered a basic skill that lays the foundations for broader mathematical abilities (Sasanguie, Gobel, Moll, Smets, & Reynvoet, 2013).

It has been shown, especially in the last ten years, that the ability to accurately estimate the relative location of numbers on a number line is strongly related to important skills in mathematics, such as estimation, computational estimation as well as performance on standard mathematics achievement tests (Lefevre et al., 2013). Accuracy in number line estimations is related to arithmetic, number comparisons, and individual differences in general mathematics achievement (Booth & Siegler, 2006; Laski & Siegler, 2007; Sasanguie, Smedt, Defever, & Reynvoet, 2011; Sasanguie et al., 2013), as well as spatial skills (Lefevre et al., 2013). Which process or processes mediate to these relationships remains an important question to answer. This research can inform the teaching of number sense to children, and help them to be more efficient mathematics learners (Schneider, Grabner, & Paetsch, 2009).

Conversely, a major requirement for performing number line tasks is some spatial ability and spatial skill (Gunderson, Ramirez, Beilock & Levine, 2012). In other words, spatial skills can help students make better number line estimations especially in the early years of formal schooling (Gunderson et al., 2012).

In sum, it seems that number line estimations are strong predictors of basic mathematical performance. On the other hand, it also seems that accuracy in estimations might be supported by one's spatial skills. This study will investigate the relationships between: (1) the geometric performance and (2) arithmetic performance and, (3) accuracy in number line estimations.

Method

Research Design

This study used a relational survey design. The relationships between students' number line estimations, and their spatial skills, geometry, arithmetic and mathematics achievement scores were investigated.

Study Group

To achieve maximum diversity within our sample including a wide range of socioeconomic strata (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2008), 142 fourth graders were selected from a school that accommodates a wide range of sociocultural backgrounds. The mean age of the participants was 9.5 years. There were approximately an equal numbers of boys (n=68) and girls (n=74) in the study, with quite similar mean ages (9.2 for boys and 9.6 for girls).

Research Instruments and Procedures

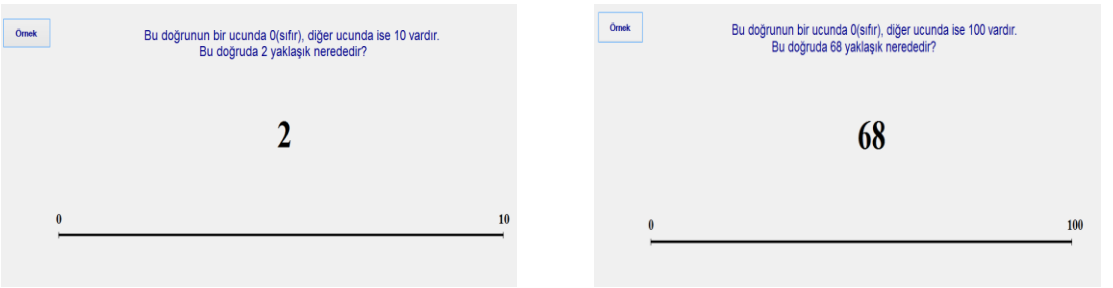
Participants took five different tests: two curriculum-based math achievement tests, one focusing on numbers called Mathematics Achievement Test (MAT) and the other involving geometry tasks called Geometry Achievement Test (GAT), a spatial visualization test (SVT), the Number Line estimation Test (NLT), and a test on discerning visual patterns, the Raven Standard Progressive Matrices Test (RSPMT).

Mathematics Achievement Test: The Mathematics Achievement Test (MAT) was developed by Fidan (2013) for grades 1-4, based on the number domain section of the Turkish National Education math curriculum. It includes numbers, counting, number patterns, four arithmetic operations, and fractions. The KR-20 coefficients of the MAT test were .80 for first graders, .92 for second graders, .93 for third graders, and .96 for the fourth graders. The administration of the test took one hour of class time.

The Geometry Achievement Test (GAT) was developed by Olkun, Akkurt-Denizli, Kozan, and Ayyıldız (2013) based on math curriculum and includes questions from geometry and measurement domains of the Turkish National Curriculum (MEB, 2004). There are questions related to naming and measuring some aspects of two- and three-dimensional geometric shapes. The internal consistency of the test was 0.91 as measured by KR-20. The suggested time for the test is 40 minutes.

The Spatial Visualization Test (SVT) was developed by Olkun (2003). The test has 29 items in 4 sections: spatial, spatio-numeric, mental rotation, and informal area measurement. The internal consistency of the test was 0.78 as measured by KR-20 test. As suggested by the authors of the test, students were given 40 minutes to complete the test.

In the Mental Number Line (MNL) test, developed by Olkun, Altun, Göçer Şahin, & Akkurt Denizli (2015), students place numbers shown one at a time on the number line by drawing a hash mark on the number line (see Figure 1 a & b). No timing is recorded for this test. Only the absolute values of the differences between the student estimations and the actual correct positions of numbers are recorded. There were a total of 58 items in MNL tests, 18 items in MNL 1, and 40 items in MNL 2. The numbers used for the MNL 1 (0-10) were: 4, 2, 8, 1, 7, 3, 2, 5, 9, 7, 4, 9, 6, 3, 5, 8, 6, 1, and for the MNL 2 (0-100) 81, 50, 66, 90, 96, 30, 8, 40, 14, 50, 35, 59, 72, 33, 21, 79, 24, 84, 4, 75, 3, 57, 48, 12, 6, 17, 25, 80, 61, 20, 75, 25, 52, 88, 10, 70, 39, 60, 42, 97. There were 2 practice items, one before each of the actual test (2 for MNL1, and 68 for MNL 2).



(a) **(b)**

Figure 1. *Sample items from the MNL 1 and MNL 2*

In the Raven Standard Progressive Matrices Test (RSPMT), participants view a short sequence of shapes, and pick a shape to fill in a missing part of the sequence. RSPMT has 5 subtests each of which has 12 items.

Data Analysis

The row scores (i.e. the number of correct answers) were used for the tests, MAT, GAT, SVT, and RAVEN. The total absolute error (TAE) scores were calculated for the MNL 1 and 2 tests by using the formula "Estimations – to be estimated number)/scale" as suggested by Siegler and Booth (2004). Multiple regression analyses (stepwise method) were carried out in order to determine the explanatory power of spatial, geometric, arithmetic and mathematics skills on number line estimation accuracies. Correlations among the test scores were also calculated before the regression analysis. We also compared male and female students' scores on MAT, GAT, SVT, and RSPMT test through Independent-Samples T-tests.

Results

Before analyzing the explanatory power of the tests used in this study on number line estimations, we calculated the correlations among the tests. Results are depicted in Table 1.

Table 1

Correlations among the Tests Used in the Study

	RSPMT	ST	SNT	MRT	SMT	SVT	MNL1	MNL2
GAT	.621(**)	.387(**)	.413(**)	.179(*)	.503(**)	.544(**)	-.450(**)	-.537(**)
MAT	.528(**)	.342(**)	.353(**)	.059	.499(**)	.465(**)	-.317(**)	-.476(**)

GAT: Geometry Achievement Test, MAT: Mathematics Achievement Test, RSPMT: Raven Standard Progressive Matrices Test, ST: Spatial Test, SNT: Spatio-Numeric Test, MRT: Mental Rotation Test, SMT: Spatio-Measurement Test, SVT: Spatial Visualization Test, MNL1: Mental Number Line 0-10, MNL2: Mental Number Line 0-100.

There were statistically significant correlations among all the tests used for the study, except the MRT subset of SVT and MAT. As seen from Table 1, the tests including RSPMT, MNL1 and MNL2, have stronger correlations with GAT than MAT. That means that the type of reasoning required for these tests (RSPMT visual pattern comprehension, and MNL1 and MNL2 involving number lines) had more to do with elementary geometry than with arithmetic or word problem solving.

To determine the explanatory power of spatial skills, geometry achievement (GAT), mathematics achievement (MAT), and visual pattern comprehension (RSPMT) on the accuracy of number line estimations, multiple regression analyses (stepwise method) were carried out. Table 2 depicts the summary of regression results for MNL1, RSPMT, and GAT.

Table 2

Summary of Regression Results for MNL1 with RSPMT and GAT

Model	Variables	R	R^2	F	β	t	p
1	RSPMT	.465(a)	.216	38.58	-.465	-6.21	.000
2	RSPMT GAT	.508(b)	.258	24.18	-.302 -.262	-3.24 -2.80	.001 .006

a Predictors: (Constant), RPMT (Raven Progressive Matris Test)

b Predictors: (Constant), RPMT, GAT (Raven Progressive Matrices & Geometry Achievement Test)

When MAT, SVT, GAT and RSPMT were entered stepwise in the regression, we saw that only GAT and RSPMT had significant explanatory power on the MNL1. As seen in Table 2, RSPMT alone accounted for (R^2) 22% of the variance in the MNL1 test. Total accounted for variance reached 26% when we added the GAT into the analysis. It is worth noting that all the tasks in the RSPMT test have figures that require nonverbal visual reasoning.

Table 3

Summary of Regression Results for MNL1 with GAT and SVT

Model	Variables	R	R^2	F	β	t	p
1	GAT	.450(a)	.202	35.46	-.450	-5.95	.000
2	GAT SVT	.474(b)	.225	20.15	-.352 -.179	-3.96 -2.01	.000 .046

a Predictors: (Constant), GAT (Geometry Achievement Test)

b Predictors: (Constant), GAT, SVT (Geometry Achievement Test & Spatial Visualization Test)

As presented in Table 3, GAT and SVT had significant explanatory power for the MNL1 test. GAT alone accounted for 20% of the variance in the MNL1 test. The total accounted variance reached 22%, when we added the SVT into the analysis. The results also show that when we exclude GAT from the analysis, SVT alone accounted for 14% of the variance in the MNL1 test. When we add SVT and MAT stepwise into the regression, while SVT alone accounted for 14% of the variance in MNL1, total accounted variance reached 16% when we added the MAT into the analysis. MAT contributed

only %2 to the variance (see Table 4). On the other hand, when we add GAT and MAT stepwise into the analysis, there was no change in the variance in MNL 1. In other words, MAT has no contribution to MNL1.

Table 4

Summary of Regression Results for MNL1 with SVT and MBT

Model	Variables	R	R^2	F	β	t	p
1	SVT	.371(a)	.137	22.31	-.371	-4.72	.000
2	SVT MAT	.405(b)	.164	13.64	-.285 -.184	-3.25 -2.10	.000 .037

a Predictors: (Constant), SVT (Spatial Visualization Test)
b Predictors: (Constant), SVT, MAT (Spatial Visualization Test & Mathematics Achievement Test)

If we look at the findings in Table 2, Table 3, and Table 4 altogether, we can see that GAT and the other spatial tests have more explanatory power on number line estimations. When the four tests were included in regression analysis, only RSPMT and GAT had significant explanatory power on MNL1 test. RSPMT is a purely visual test. GAT also has more visual content than MAT. MAT, which focuses more on non-visual arithmetic skills, had relatively less contribution to MNL1.

We also ran a stepwise regression analysis for determining the explanatory power of RSPMT, GAT, MAT, and SVT on MNL2. Summary of the findings are depicted in Table 5.

Table 5

Summary of Regression Results for MNL2 with RSPMT and GAT

Model	Variables	R	R^2	F	β	t	p
1	GAT	.537(a)	.288	56.62	-.537	-7.52	.000
2	GAT RSPMT	.580(b)	.336	35.17	-.363 -.280	-4.11 -3.17	.000 .002

a Predictors: (Constant), GAT (Geometry Achievement Test)
b Predictors: (Constant), GAT, RSPMT (Geometry Achievement Test & Raven Standard Progressive Matrices)

In all of the tests, only GAT and RSPMT had significant explanatory power on MNL2. The results showed that GAT alone explained 29% of the variance in MNL2 tests scores. When we added the RSPMT into the analysis, the accounted variance reached 34%. When we put GAT and MAT into the regression equation, we see that MAT has no contribution to MNL estimations in 0-100 number line.

We also investigated whether any gender differences existed. As seen in Table 6, there are gender differences in the spatial tests favoring boys. Boys consistently did better in both spatial tests, as well as in estimating the relative magnitude of numbers on an external number line.

Table 6

Gender Differences

	N	ST Mean	MRT Mean	SVT Mean	0-10 NL TAE	0-100 NL TAE
Boys	68	5.74	3.43	13.88	24.60	318.42
Girls	74	4.87	1.68	11.70	30.13	412.49
	p	(.005)	(.035)	(.011)	(.055)	(.28)

ST: Spatial Test, MRT: Mental Rotation Test, SVT: Spatial Visualization Test, NL: Number Line

Discussion, Conclusion and Recommendations

Many studies in the research literature have showed that number line estimations are strong predictor of mathematics achievement. However, we still do not understand how number line estimations relate to mathematics achievement. We hypothesize that, at least initially, number line estimations involve more spatial reasoning than numerical reasoning. For example, magnitudes are perceived as spatial magnitudes. In order to shed more light on this issue, we administered a geometry achievement test, a mathematics achievement test, two number line estimation tests and the Raven Standard Progressive Matrices Test to 142 students at the beginning of fourth grade. Analysis of the data revealed four main results:

First of all, spatial tests such as geometry (GAT) and spatial visualization (SVT) correlated more strongly with the number line estimation tasks than the other tests did. Secondly, boys did significantly better than girls did on all of the spatial tests. Third, boys also did better, made more accurate number line estimations, than did girls. Fourth, tests with relatively more spatial content have more explanatory power on number line estimation tasks. Taken together, all these results suggest that number line estimation tasks have more to do with spatial skills rather than with numerical skills. The ability to estimate the relative magnitude of numbers on an external number line may still show the power of one's number sense; however, it should be noted that these numerical skills, associated with number lines, are built on spatial processes.

These findings are consistent with Lefevre et al. (2013) and Gunderson, Ramirez, Beilock, & Levine (2012). Lefevre et al. (2013) hypothesized that spatial skills play an important and critical role in the development of sound numerical reasoning by helping children create a spatially meaningful, powerful numerical representation, i.e., the linear number line. A strong linear number representation, in turn, improves the learning of other aspects of numerical knowledge such as arithmetic and estimation (Lefevre et al., 2013). Similarly, Gunderson et al. (2012) claimed that spatial skills help children develop the linearity in their number line estimations so that they have a better number sense. In other words, spatial skills are useful in developing a more robust number representation. Therefore, number line activities are considered very basic mathematical tools in helping children represent numbers in coordinate planes in geometry, algebra, and in many other domains of mathematics (Geary, Hoard, Nugent, & Byrd-Craven, 2008).

Cipora, Patro, and Nuerk (2015) discussed in depth the role of spatial/numerical skills in learning arithmetic and claimed that correlations between arithmetic and spatial numerical associations are rather weak. However, they asserted that space-based interventions involving numbers might never-the-less be helpful, since space is a powerful tool for understanding certain arithmetic concepts such as quantity and increases in quantities, etc. In fact, it seems that humans' internal as well as external representations of numbers are both spatial in nature (Gunderson et al., 2012). Similarly, Ansari et al. (2003) observed that visuospatial ability plays a greater role than language ability in the development of the understanding of cardinality in typically developing children. However, the opposite is true for the clinical group. This means that children with MLD may use different brain mechanisms for dealing with numerical situations than do typical children. They may lack the spatial thinking tools to contribute to their numerical understanding.

These findings suggest that number and space systems interact with each other as fourth graders perform mathematical tasks. In other words, the most important factor in Number Line estimations seems to be geometric skills. Further research, especially brain-based research, is needed to confirm this finding. Number line tasks are widely used in measuring number sense. Considering the spatial aspects of number sense, we recommend that spatial representations of number magnitudes can and should be used in developing a more functional number sense in children. Instructionally, using multiple, external representations of numbers, such as spatial, symbolic, and verbal, seems useful in developing more robust number sense in children.

References

Ansari, D., Donlan, C., Thomas, M. S. C., Ewing, S. A., Peen, T., & Karmiloff-Smith, A. (2003). What makes counting count? Verbal and visuo-spatial contributions to typical and atypical number development. *Journal of Experimental Child Psychology, 85*(1), 50-62. doi:10.1016/s0022-0965(03)00026-2

Antell, S. E., & Keating, D. P. (1983). Perceptions of numerical invariance in neonates. *Child Development (54),* 695-701.

Booth, J. L., & Siegler, R. S. (2006). Developmental and individual differences in pure numerical estimation. *Dev Psychol, 42*(1), 189-201. doi:10.1037/0012-1649.41.6.189

Butterworth, B. (2010). Foundational numerical capacities and the origins of dyscalculia. *Trends in Cognitive Sciences, 14*(12), 534-541. doi:10.1016/j.tics.2010.09.007

Büyüköztürk, Ş., Çakmak, E.K., Akgün, Ö.E., Karadeniz, Ş., & Demirel, F. (2008). *Bilimsel araştırma yöntemleri* (4. bs.) *[Scientific research methods]*. (4th ed.) Ankara: Pegem A Publishing.

Cipora, K., Patro, K., & Nuerk, H.-C. (2015). Are spatial-numerical associations a cornerstone for arithmetic learning? The lack of genuine correlations suggests no. *Mind Brain and Education, 9*(4), 190-206.

Dehaene, S. (2009). Origins of mathematical intuitions. *Annals of the New York Academy of Sciences, 1156*(1), 232-259. doi:10.1111/j.1749-6632.2009.04469.x

Dehaene, S., Molko, N., Cohen, L., & Wilson, A. J. (2004). Arithmetic and the brain. *Current Opinion in Neurobiology, 14*(2), 218-224. doi:10.1016/j.conb.2004.03.008

Feigenson, L., Dehaene, S., & Spelke, E. (2004). Core systems of number. *Trends in Cognitive Sciences, 8*(7), 307-314. doi:10.1016/j.tics.2004.05.002

Fidan, E. (2013). *İlkokul öğrencileri için matematik dersi sayılar öğrenme alanında başarı testi geliştirilmesi [Development of achievement tests in the number domain of mathematics course for elementary school students]*. (Unpublished Master Thesis), Ankara University, Institute of Educational Sciences, Ankara.

Geary, D. C., Hoard, M. K., Nugent, L., & Byrd-Craven, J. (2008). Development of number line representations in children with mathematical learning disability. *Developmental Neuropsychology, 33*(3), 277-299. doi:10.1080/87565640801982361

Girelli, L., Lucangeli, D., & Butterworth, B. (2000). The development of automaticity in accessing number magnitude. *J Exp Child Psychol, 76*(2), 104-122. doi:10.1006/jecp.2000.2564

Gunderson, E. A., Ramirez, G., Beilock, S. L., & Levine, S. C. (2012). The relation between spatial skill and early number knowledge. *Developmental Psychology, 48*(5), 1229-1241.

Izard, V., Pica, P., Spelke, E., & Dehaene, S. (2008). Exact equality and successor function: two key concepts on the path towards understanding exact numbers. *Philosophical Psychology, 21*(4), 491-505. doi:10.1080/09515080802285354

Laski, E. V., & Siegler, R. S. (2007). Is 27 a big number? Correlational and causal connections among numerical categorization, number line estimation, and numerical magnitude comparison. *Child Development, 78*(6), 1723 - 1743.

Lefevre, J. A., Jimenez Lira, C., Sowinski, C., Cankaya, O., Kamawar, D., & Skwarchuk, S. L. (2013). Charting the role of the number line in mathematical development. *Front Psychol, 4*, 641. doi:10.3389/fpsyg.2013.00641

Lemer, C., Dehaene, S., Spelke, E., & Cohen, L. (2003). Approximate quantities and exact number words: dissociable systems. *Neuropsychologia, 41*(14), 1942-1958. doi:10.1016/s0028-3932(03)00123-4

Link, T., Moeller, K., Huber, S., Fischer, U., & Nuerk, H.-C. (2013). Walk the number line – An embodied training of numerical concepts. *Trends in Neuroscience and Education, 2*(2), 74-84. doi:10.1016/j.tine.2013.06.005

MEB. (2004). *İlköğretim matematik dersi öğretim programı [Elementary mathematics curriculum]*. Ankara: Milli Eğitim Basımevi.

Olkun, S. (2003). Comparing computer versus concrete manipulatives. *Jl. of Computers in Mathematics and Science Teaching, 22*(1), 43-56.

Olkun, S., Akkurt-Denizli, Z., Kozan, S., & Ayyıldız, N. (2013). İlkokul öğrencileri için matematik dersi geometri ve ölçme öğrenme alanlarında başarı testi geliştirilmesi [Development of achievement test in geometry and measurement learning fields for primary school students]. In *XII. National Classroom Education Education Symposium, 23-25 May 2013*. Adnan Menderes University, Aydın.

Olkun, S., Altun, A., & Göçer Şahin, S. (2015). Beyond subitizing: symbolic manipulations of numbers. *International Journal of Learning, Teaching and Educational Research, 10*(1), 93-103.

Olkun, S., Altun, A., Göçer Şahin, S., & Akkurt Denizli, Z. (2015). Deficits in basic number competencies may cause low numeracy in primary school children. *Education and Science, 40*(177). doi:10.15390/eb.2015.3287

Olkun, S., & Denizli, Z. A. (2015). Using basic number processing tasks in determining students with mathematics disorder risk. *Dusunen Adam: The Journal of Psychiatry and Neurological Sciences, 28*, 47-57. doi:10.5350/dajpn2015280105

Sasanguie, D., De Smedt, B., Defever, E., & Reynvoet, B. (2011). Association between basic numerical abilities and mathematics achievement. *British Journal of Developmental Psychology, no-no*. doi:10.1111/j.2044-835X.2011.02048.x

Sasanguie, D., Gobel, S. M., Moll, K., Smets, K., & Reynvoet, B. (2013). Approximate number sense, symbolic number processing, or number-space mappings: what underlies mathematics achievement? *J Exp Child Psychol, 114*(3), 418-431. doi:10.1016/j.jecp.2012.10.012

Schneider, M., Grabner, R. H., & Paetsch, J. (2009). Mental number line, number line estimation, and mathematical achievement: Their interrelations in grades 5 and 6. *Journal of Educational Psychology, 101*(2), 359-372. doi:10.1037/a0013840

Siegler, R. S., & Booth, J. L. (2004). Development of numerical estimation in young children. *Child Dev, 75*(2), 428-444. doi:10.1111/j.1467-8624.2004.00684.x

Siegler, R. S., & Booth, L. (2005). Development of numerical estimation: A review. In J. I. D. Campbell (Ed.), *Handbook of mathematical cognition* (pp. 197-212). New York: Psychology Press.

Spelke, E. S., & Kinzler, K. D. (2007). Core knowledge. *Developmental Science, 10*(1), 89-96. doi:10.1111/j.1467-7687.2007.00569.x

Verdine, B. N., Golinkoff, R. M., Hirsh-Pasek, K., & Newcombe, N. S. (2014). Finding the missing piece: Blocks, puzzles, and shapes fuel school readiness. *Trends in Neuroscience and Education, 3*(1), 7-13. doi:10.1016/j.tine.2014.02.005

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 47-62

Nesibe Aydın JEF

The Power of Expectations in School Management: Pygmalion Effect

Article Type	Received Date	Accepted Date
Research	05.04.2018	29.01.2019

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Abstract

This study aims to discover the pygmalion effect, which suggests to affect a person's expectations from other people on the actions of those people, by taking the opinions of primary school teachers. In order for the study to reach its goal, triangulation technique, which is a mixed method design, has been used. A likert-type five-point scale made up of 18 items and a semi-structured interview form comprising two open-ended questions have been used to acquire data. The scale has applied to take the opinions of teachers working at the schools administered by 25 managers mastering in a postgraduate program without thesis at the Education Management Inspection Planning and Economy Department of Fırat University Institute of Education Sciences. The quantitative and qualitative data acquired have been analyzed by means of statistical softwares. It has been concluded from the findings acquired from teachers' views reveal the reality and accuracy of pygmalion effect in the field of education, and show that high expectations pave the way for teachers' motivation, effort, active working, commitment as well as the growth of their enthusiasm. It is seen that high expectations will generally reveal high performance, while low expectations, due to their negative effects on employees, will cause decrease in motivation as well as unwillingness towards the job being done and therefore, a decline or stability in performance.

Keywords: Pygmalion effect, expectation, school, management, triangulation.

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Okul Yönetiminde Beklentilerin Gücü: Pygmalion Etkisi

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	05.04.2018	29.01.2019

Seda GÜNDÜZALP* **Mukadder BOYDAK ÖZAN****

Öz

Bu çalışma ile bireylerin çevresindekilere ilişkin oluşturdukları beklenti ve düşüncelerinin onların davranışlarını etkilediği görüşüyle ortaya çıkan pygmalion etkisinin, ilköğretim okullarında görev yapan öğretmenlerin görüşleri alınarak okul ortamındaki yansımasını tespit etmek amaçlanmıştır. Araştırmanın amacına ulaşılabilmesi için karma yöntem tasarımlarından üçgenleme (triangulation) tekniği kullanılmıştır. Verileri elde etmek amacıyla likert tarzında 18 maddeden oluşan beşli derecelendirme şeklinde hazırlanmış bir ölçek ve iki açık uçlu sorudan oluşan yarı yapılandırılmış bir görüşme formu kullanılmıştır. Ölçek Fırat Üniversitesi Eğitim Bilimleri Enstitüsü Eğitim Yönetimi Teftişi Planlaması ve Ekonomisi Anabilimdalı'nda tezsiz yüksek lisans öğrenimi gören 25 yöneticinin görev yaptıkları okullarda çalışan öğretmenlerin görüşleri alınmak üzere uygulanmıştır. Elde edilen nicel veriler ve nitel veriler istatistik programları kullanılarak analiz edilmiştir. Yapılan analizler sonucu elde edilen bulgular eğitim alanında da pygmalion etkisinin gerçekliği ve doğruluğunu açığa çıkarmakta, yüksek beklentinin öğretmelerin motivasyon, çaba, etkin çalışma ve işlerine olan bağlılıklarının yanı sıra işe karşı duydukları isteklerinin artmasına ortam hazırlayacağı; yüksek beklentinin genelde yüksek performansı ortaya çıkaracağı, düşük beklentilerin ise, çalışanlar üzerinde bıraktığı olumsuz etki sebebiyle motivasyonda azalma, yapılan işe karşı isteksizlik ve bunun sonucunda performansta düşüklük veya stabilite gözlemlenebileceğini göstermektedir.

Anahtar Sözcükler: Pygmalion etkisi, beklenti, okul, yönetim, üçgenleme

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Introduction

We have expectations about when, where and how someone will behave. While expectations are about "behavioral inclination" sometimes, they can also be about a specific individual at other times. We expect an individual who has behaved aggressively before to behave in the same way in a similar situation. Behind these types of expectations lie our learnings that a past behavior will recur under similar conditions (Demirtaş, 2004). The beliefs and thoughts of a person create a situation which causes the expected behavior to occur. A person expected to be highly successful will probably show a great performance. "I know that you will do the best" or "This may be difficult for you." Such clues pave the way for the behaviors expected. The expectations and thoughts of someone regarding another person may influence the behaviors of that person in the long run (Loftus, 1995).

The effect of expectations has attracted the attention of scientists and brought along the studies on this subject. The effect of expectations is called the "Pygmalion effect" in psychology, and this term goes back to Greek mythology. Pygmalion was the prince of Cyprus who hated women and thought he would never get married. The prince of Cyprus, sculptor Pygmalion, thought that all women were defective and tried to sculpture the ideal woman. This art piece, given the name Galatea by him, was so beautiful that Pygmalion hopelessly fell in love with his own work. He invoked Venus, asking her to make Galatea come to life. Venus fulfilled this wish, and the couple lived happily thereafter (Şenlen, 2008). The psychological studies on this ending define the effect of expectations as the pygmalion effect (Wang, 2000). Taking this effect into consideration, George Bernard Shaw wrote the musical named "My Fair Lady." This musical was demonstrated in 1914 for the first time in London (Shaw, 2004, Prasad, 2013). In George Bernard Shaw's Pygmalion, Eliza Doolittle says the following: “The difference between a lady and a flower girl (except for those things which can be gained by anyone like clothes and speech manners) is not how she behaves, but how she’s treated. I shall always be a flower girl to Professor Higgins, because he always treats me as a flower girl, and always will, but I know I can be a lady to you, because you always treat me as a lady” (Murphy et al., 1999). Pygmalion effect is the result of a prophecy that essentially fulfills itself. This effect is not a reaction occurring during a moment of expectation; rather, it is a process made up of self-sufficiency, motivation and reference (Wang, 2000).

Pygmalion effect has been addressed for the first time by Robert Merton (1948), a sociologist, and named 'self fulfilling prophecy' by him. To him, definitions related to a specific phenomenon (prophecies or expectations) become an integral part of that phenomenon after a while, and this affects subsequent developments. The Pygmalion effect takes place in literature also as "basic expectation effect" and "self fulfilling prophecy." This term may be explained with someone demonstrating behaviors in line with other people's (especially those he/she feels inferior to) expectations from him/her after a while (Reynolds, 2007). While the pygmalion effect is an incorrect definition of a situation that brings along a new behavior, in the end it turns a situation which is essentially incorrect into reality (Madran, 2012). It is agreed that the term involves both positive and negative expectations (Chang, 2011). The Pygmalion effect is not only an argument between psychologists and sociologists, but also a term in which pedagogues are interested in (Spitz, 1999). This term may also be explained as follows: when we expect something to happen in a specific way, our expectation will be inclined to ensure that (Rosenthal et al. 1966). Here, it is probable that the expected behavior will be in line with believes and thoughts (Loftus, 1999).

Figure 1. *The Pygmalion Effect (Kashen, 2011)*

In mid 1960s (when Skinner's behaviorism was popular), Rosenthal and Lenore Jacobson conducted an experimental study on 18 teachers and the students educated by them; they chose equal number of students from each class, and told teachers that these students might improve significantly during the year in terms of intellectuality. They applied an IQ test to students. It was stated that these students, who were in the first ten, were inclined to improve in terms of intelligence level. The same IQ test was applied again at the end of the year. It was seen that the general IQ points of this group of students increased. According to Rosenthal and Jacobson (1968), how and when the teachers said something, their facial expression, body language and even their touch might have conveyed the message to students that the teachers expected high performance from them. Such a communication, together with possible amendments in education techniques, might have helped students learn by changing their self-concepts, their expectations from themselves, their motivations as well as their perception style and talents. There were no difference between the amounts of time spent by teachers on each student; however, it was observed that the quality of relationships was different. There was an improvement in the intelligence levels of the students who were expected to improve thanks to their teachers' expectations in this way. Teachers have high expectations from the students who have high academic levels according to them; therefore, such students achieve academic success. The effect of expectations has been examined within the scope of this study, and it has been concluded that expectations influence success and performance. The effect of teachers' expectations on students is similar to that of leaders' on employees in organizations (Bezuijen et al. 2009). Immediately after the introduction of its effect in classroom environment, the effect of pygmalion has been tested also in organizational environments and recorded in the literature. Since Livingston published a study in which he researched the effect of Pygmalion on management along with some sample cases in the year 1969, Pygmalion effect has become generalizable in fields beyond typical classroom environment (Locke and White, 2000). To him, productivity would be excellent if managers had high expectations. Similarly, if their expectations were low, the productivity would be insufficient. Since the elements of an organization are individuals and groups, it is impossible to ignore the phenomenon of expectation in an organization. The performance managers expect from their inferiors as well as how they treat and communicate the people they are working with substantially affect the performance and career development of such people positively or negatively.

Pygmalion effect in the field of management may be explained majorly with two phenomena. These are leadership behaviors and individual's own expectations from himself/herself. The term pygmalion has an obvious connection with leadership and motivation theories (Locke and White, 2000). How managers treat their inferiors affects their performance. If a manager is stern, rude and inconsiderate, his/her inferiors will be demotivated and this demotivation will cause low performance. On the contrary, if he/she is too indifferent, tolerant and indulgent, his/her inferiors will not try to improve their performance. Both employees and the organization they are working for will suffer in either situation. If the manager is considerate and tolerant where necessary, and if he/she is stern, authoritative but kind when required, motivation and therefore performance will be high. This will be in favor of both the employees and the organization (Bridge, 2003). The employees who are expected to deliver high performance are more motivated to improve themselves than those whose leaders have low expectations from them (Bezuijen et al., 2009).

In fact, managers generally convey a lot when they think that they are conveying just too little. For example, when they behave secretively and do not say anything, they convey the message that one of the employees has annoyed him/her, or he/she finds one of the employees unsatisfactory. Sometimes, keeping quite conveys negative feelings much more effectively than direct criticism. Indifferent and unclear behaviors usually represent low expectations, and cause low performance. Before they convert into performance, the expectations of management should pass the reality exam. If the inferiors of a manager find his/her expectations unrealistic, they will not be motivated to reach high productivity levels. If they are encouraged to make an effort to attain unreachable goals, they will give up trying in the end, and accept much lower targets than they can really achieve. Managers cannot get rid of the depressing cycle of events caused by low expectations only by hiding their feelings from their inferiors. If managers believe that the performance of their inferiors will be inadequate, it will be almost impossible for them to hide their feelings since the message is generally conveyed without any deliberate action (Livingston, 1969). Successful managers who are aware of this fact try to use their effect on their inferiors' performance positively, and trust both themselves and those around them (Chirayath et al., 2009). These managers expect high performance from people they are working with. There is a linear relation between what is expected from someone and the effort he/she makes to achieve. Therefore, if a manager expects high performance, the performance of those reporting to him/her will be influenced positively. Both employees and the organization they are working for derive benefit out of this, improve, and achieve the best. Less efficient managers do not expect much from their inferiors; therefore, the productivity of their inferiors is generally inclined to decrease. In such cases, both employees cannot advance in their career, and the organization they are working for suffer from low performance (Bridge, 2003). Leaders with high expectations create a supportive environment, and know that the success of employees depend on internal processes, stability and their behaviors (Eden et al., 2000).

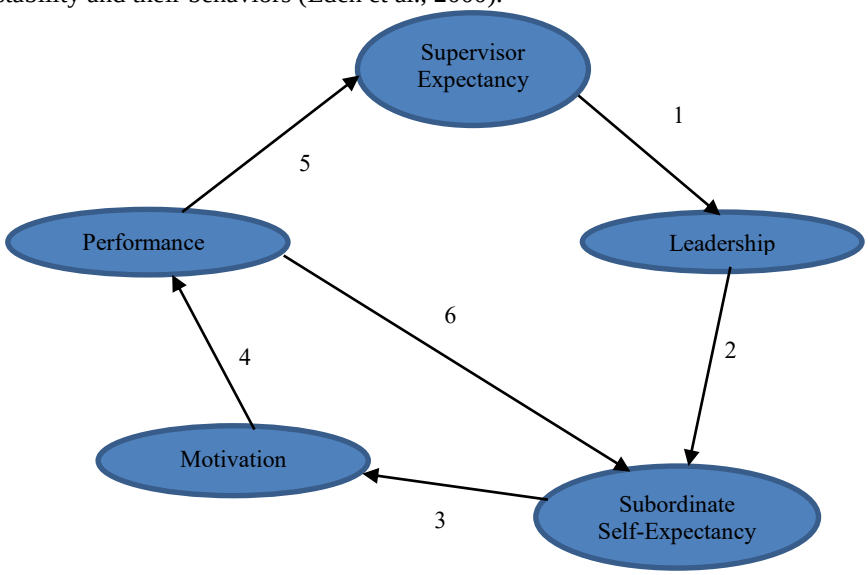

Figure 2. *A Model of the Self-Fulfilling Prophecy at Work (Eden, 1984)*

In business life, there is a relation between the expectations of managers, leadership, the expectations of employees, motivation and performance. Livingston (1969) put forward the following phenomena after a series of case studies:

- What managers expect from their inferiors and how they treat them influence the performance of and progress of inferiors to a large extent.
- One of the distinctive qualities of successful and effective managers is that they establish high expectations which can be met by their inferiors.
- Ineffective managers cannot create such expectations and therefore, the productivity of their inferiors suffers from this.
- Inferiors usually act in line with what they think is expected from them.

There is a linear relationship between the expectations of a leader from his/her inferiors and the talents of the inferiors. Leaders with high expectations can distribute authority, and assign their duties (Whiteley et al., 2012). Both in business environments and in educational organizations, one of the key ways to ensure efficiency and productivity is to have positive opinions about personnel and students. In any organization, where manager has hard-working, productive and successful believes about the personnel and reflect the same on them, the personnel will also be productive. The vice versa is also correct. When a person is thought to be unsuccessful and lazy, and treated accordingly, it can be seen that the person in question will not perform effectively (qn. Aydoğan, 2003).

The difference between the employees who perform efficiently and those who perform inadequately is not how much they are paid, but how they are treated. All managers may learn how to treat their inferiors to create mutual expectation of high performance. The major principle within the pygmalion process is that the performance expectations of managers influence the performance of employees. Expectations are an important factor to influence the creativity of employees, and have a motivational impact that defines the direction and power of behaviors (Tierney and Farmer, 2004)

When foreign studies on the pygmalion effect are reviewed, although the studies addressing the effect of teacher's expectations on students in classroom environment as well as the studies aiming to define the pygmalion effect in businesses may be seen (e.g. Berlew & Hall, 1966; Rosenthal & Jacobson, 1968; Livingston, 1969; King, 1971; Korman, 1971; Spitz, 1999; Clemente, 2008; Jenner, 1990; Eden, 1982; jenner, 1982; Howe, 1975; Zanna et al., 1975; Chang, 2011) there is no domestic study carried out in the fields of business management and education. It is seen that the pygmalion effect, the importance of which has been proven by foreign studies, has not been studied in our country yet. Therefore, this is an important study as it is the first study conducted on Pygmalion effect in Turkey, and it will light the way for the studies on the same subject.

This study aims to identify the expectations of managers perceived by primary school teachers and how these expectations influenced them. Therefore, answers for the following questions have been searched:

1) Do the ideas of teachers on the pygmalion effect vary depending on such variants as gender, specialty and assignment?
2) Is there a relationship between expectations of school managers and teachers' perceptions of career and career ideas?
3) What do teachers think about the feelings they have when their managers have high expectations concerning their abilities and how this influences their work?
4) What do teachers think about the feelings they have when their managers have low expectations concerning their abilities and how this influences their work?

Method

Research Model

In this study, a mixed method using both qualitative and quantitative data has been applied. Johnson and Onwuegbuzie (2004) define mixed method studies as the combination of qualitative and quantitative research techniques, methods and approaches in a research. One of the major reasons for preferring a mixed method is that the deficiencies and weaknesses of a single method are resolved by other methods. The triangulation technique, which is a mixed method design, has been used. In this design, qualitative and quantitative data are combined, and analyzed at the same time. Data analysis is usually carried out separately, and the data are combined during the interpretation stage. The term combination, meaning the triangulation of the data, may be explained as the constitution of methods applied to discuss the connection of the data, identify whether they support each other, and examine some phenomena. Investigators prefer the mixed method in order to gather different types of data which relate to the same phenomenon, and increase the accuracy level of their judgment (Denzin, 1978; Mitchell, 1986; Jick, 1989; Patton, 1990; Creswell, 2003; Baki and Gökçek, 2012). The purpose is to ensure a diversification by applying more than one data collection method and analysis method,

thus increasing the persuasiveness of results. In the quantitative part of the study, descriptive research method has been used, while in the qualitative part of the study, interview method has been applied.

Study Group

Easily accessible case sampling, which is one of the purposeful samplings ranking among the probability based sampling methods has been used in the process of determining the study group. In purposeful (judgmental) sampling, investigator decides who will be selected at his/her own discretion, and includes those who fit the purpose of study in the sampling. Through the method of easily accessible case sampling, the investigator gains speed and practicality. Because, he/she chooses a close and easily accessible case in this method (Şimşek and Yıldırım, 2011; Balcı, 2005).

The study group has been made up of teachers working at the schools administered by 25 managers mastering in a postgraduate program without thesis at the Education Management Inspection Planning and Economy Department of Fırat University Institute of Education Sciences. 9 of the school managers work at primary schools, 12 of them at secondary schools, and 4 at state high schools. The scale has been applied to receive the opinions of 215 teachers working at the schools administered by these managers in 2013 - 2014 school year; while all of the 215 teachers have stated their opinions about the items in the scale, the two open-ended questions in the interview form have been answered only by 113 teachers. The demographic information of the teachers constituting the study group is presented in Table 1.

Table 1

The Demographic Information of Teachers

Variants		**f**	**%**
Gender	Male	107	49,8
	Female	108	50,2
Duty	Class teacher	74	34,4
	Branch teachers	141	65,6
Seniority	0-5 year	75	34,9
	6-10 year	60	27,9
	11-15 year	51	23,7
	15-20 year	22	10,2
	21 year and above	7	3,3

Data Collection and Analysis

A likert-type five-point scale made up of 18 items was used by Priyabhashini and This (2005) in their own study. According to the validity and reliability analysis of the scale, Cronbach's Alpha coefficient was 0.86, KMO value was 0.889 ($p<0.001$), and the rate of total variance defined was 43.68%. Descriptive analysis method was used for the analysis of the quantitative data. The analyses of frequency, percentage, standard deviation, arithmetic mean, t-test and one way variance were carried out during the descriptive analysis. Apart from this, a regression analysis was applied in order to identify the relation between the first 4 items of the scale which aimed to define the effect and thoughts of managers on teachers and the latter 14 items that aimed to define the thoughts of employees on their occupations, performances and careers. The significance level was set as 0.05.

In order to collect qualitative data, a semi-structured interview form comprising the questions "How would you feel if your manager had high expectations related to your talents? How would this influence your job?" and "How would you feel if your manager had low expectations from you? How would this influence your job?" were presented to the teachers. In the process of processing the qualitative data, the phenomenology design is used. It is aimed to acquire in-depth knowledge about cases where we are aware but have no in-depth knowledge (Doğan et al., 2013).

Content analysis was applied to the qualitative data. The basic process in the content analysis is the combination of similar data within the scope of specific concepts and themes, as well as the organization and interpretation of such data in a way that can be understood by readers. The main purpose of the content analysis is to reach the concepts and relations which can explain the data

collected. In this way, it is tried to identify the data in hand, and discover the facts that may be embedded in the data (Yıldırım and Şimşek, 2011). All the answers given for the two open-ended questions were considered valid, and analyzed. These answers which took place in 113 interview forms were transferred to computer environment, and put through necessary statistical processes by means of a quantitative data analysis software. Themes were created in consideration of the answers given during the analysis, and common or similar opinions were included in these themes. Each theme was written as a clause of a common opinion. The following formula developed by Miles and Heberman (1994) was used in order to measure the reliability of the study: Agreement Percentage (P) = Consensus (Na) / [Consensus (Na) + Dissidence (Nd)] x 100. In qualitative studies, reliability is considered to be ensured if the agreement percentage between the reviews of expert and the reviews of investigator is above 90%. The consulted expert put only seven expressions into a category different from the investigators' choice. The reliability of the study was calculated as P = 289 / (289 + 11) x 100 = 96%. In order to indicate the recurrence frequency of the expressions themed during the content analysis, the frequency as well as percentage values of the expressions were calculated.

Results

Independent groups t test was applied in order to take the opinions of the teachers about the pygmalion effect on them caused by their managers depending on the gender variant. The results are presented in Table 2.

Table 2

The T Test Results of the Opinions about Pygmalion of Teachers in Terms of Gender Variable

Groups	N	$\overline{X}$	sd	df	Levene	Sig. Level	t	Sig. Level
Male	108	3,87	,79	213	8,971	,003	,445	,657
Female	107	3,92	,54					

p<.05*

According to the independent groups t-test carried out in relation to the items similar to the views including managers' expectations from teachers such as "My manager feels sure about my competency to perform my duties, My manager thinks that I have the competency to carry out teaching activities, My manager thinks that I have the necessary talents and skills for my work, My manager thinks that the personal features and skills that I have are important for our school." as well as the views including teachers' opinions about their own careers such as "I think I have the necessary talents and skills to progress in my career, I feel ready to undertake new tasks and responsibilities, I feel that I would be successful in my job and fit well" the female teachers presented positive opinion with =3.87 arithmetic mean, while the male teachers presented positive mean with =3.92 arithmetic mean. According to this result, it may be concluded that both male and female teachers think the expectations and thoughts of their managers had significant effect on their behaviors and performance.

Independent groups t-test was applied in order to define the teachers' opinions about the pygmalion effect in consideration of the duty variant. The results are presented in Table 3.

Table 3

The T Test Results of the Opinions about Pygmalion of Teachers in Terms of Duty Variable

Groups	N	$\overline{X}$	sd	df	Levene	Sig. Level	t	Sig. Level
Class teacher	74	4,01	,71	213	0,80	,17	,102	,78
Branch teachers	141	3,85	,66					

p<.05*

No significant difference was observed in the independent groups t-test carried out in consideration of the duty variant. When the arithmetic means were reviewed, it was seen that the

teachers busy with primary teaching agreed 4.01 with these ideas, while the in-field-teachers agreed 3.85. Although there was no significant difference, the opinions of the in-field-teachers gave a lower result. Concerning this result, the effect of school managers on the primary school teachers can be explained with the fact that these teachers spend more time with their managers in the school environment compared to in-field-teachers.

A variance analysis was carried out in order to take the opinions of teachers in consideration of the length of service variant (Table 4).

Table 4

The Anova Test Results of the Opinions About Pygmalion of Teachers in Terms of Seniority Variable

Seniority	**N**	$\overline{X}$	**sd**	**Source of Variance**	**Sum of Squares**	**df**	**MS**	**F**	**p**
0-5 year	75	3,903	,558	Between Groups.	1,351	4	,338		
6-10 year	60	3,835	,721	Within Groups	98,092	210	,467		
11-15 year	51	3,976	,839	Total	99,443	214		,723	,577
16-20 year	22	3,962	,401						
21 + year	7	3,579	,971						
Levene= 2,642			p= 0,035*						

*p< .05

No significant difference was found between the opinions of teachers on the pygmalion effect in conclusion of the statistical analyses carried out concerning the length of service variant. When the arithmetic means were reviewed, it was seen that the teachers with 16-20 years of service length had the highest value (=3,96), while the teachers with over 21 years of service length had the lowest value (=3,58). With this result, it can be said that all the teachers having participated in the study think that their managers' thoughts and expectations from them affect their performances.

A regression analysis was carried out to identify whether the expectations of the school managers from the teachers had any effect on the performance and thoughts of those teachers regarding their own careers. The first 4 items of the scale aim to define the effect and thoughts of managers on teachers and the latter 14 items aim to define the thoughts of employees on their profession, performance and careers. The results of the regression analysis performed to define the relation between the responses of the teachers to the first 4 items and the following 14 items are given in Table 5.

Table 5

The effect of Manager Exceptations on the Teachers' Thoughts of Job and Career

Predictor Variables	**B**	**R**	ΔR^2	**β**	**t**	**p**
Manager expectations	.560	.519	.269	.519	8.863	.000*
Dependent Variable: The Thoughts of Job and Career						
R^2 = .269 F= 78,561 df= 1;213 p= 0.000*						

*p< .05

It is understood that the manager's expectations are a significant predictor of the teachers' perception of their profession and career and that it explains 51,9% of the overall variance (Table 5). It is observed that there is a significant and linear relation between the manager's expectations of their employees and the employees' performances and thoughts on their careers (F=78,561, p=0,000). It is further observed that the increase of the employees' performance and their career development depend on the expectations of their managers. The relation between the manager's expectations of his employees and employees' performance and their opinions on their careers is significant (t=8,863, p=0,000). This relation demonstrates how the manager's expectations of their employees affect the

employees' performance. In other words, teachers' feeling their manager's trust in them and in their performance helps the teachers to form positive opinions and emotions about their careers. This could mean that the manager's expectations can be a predictor of the teacher's performance.

The qualitative analysis which is the second step of the triangulation technique was carried out with the method of content analysis concerning the open-ended questions prepared to obtain teachers' opinion. The statements of the teachers were classified by the themes to determine whether the manager's expectations of them affect them or not and if so, how and in which way they were affected. The opinions of the teachers about how their manager's low expectations related to their talents would reflect on their job given as a response to the questions "How would you feel if your manager had high expectations of you? How would that affect your job?" are listed in Table 6.

Table 6

The Opinions of the Teachers about Their Manager's High Expectations

Effect	f	%
High expectations would affect positively	94	83,19
High expectations would affect negatively	17	15,04
High expectations not would affect	2	1,77

It is demonstrated in Table 6 that some participants stated that high expectations of my manager would affect me positively (f=94), some stated that it would affect them negatively (f=17) and some stated that they would not be affected at all (2).

The majority of teachers (83,19%) indicated that their managers' high expectations affected them significantly in a positive way. Such a high ratio as well as the low proportion of those who said that high expectations had negative effects (15,04%) put forth the importance as well as the reality of the effect of high expectations.

The expressions of the teachers stating that "my manager's high expectations of me would affect me positively" and the frequency of these expressions are listed in Table 7.

Table 7

The Expressions of the Teachers Stating that "My Manager's High Expectations of Me would Affect Me Positively"

High expectations would affect positively	f	%
It would leave a positive effect on me	31	21,53
I would like it and be happy	18	12,50
I would work harder	17	11,81
It would increase my motivation	15	10,41
I would work more eagerly and attentively	14	9,72
It would affect me positively if exceptations were as much as I could do	12	8,33
I would try to do as much as I can	9	6,25
The exceptations appropriate for education and training affect me positively	8	5,55
It would encourage me	7	4,86
It would show my manager trusts me	6	4,16
I would feel more responsible	5	3,47
I would be more successful	2	1,39

There were 144 positive statements in total in the responses. Teachers tried to express their manager's having a high expectation of them through sentences such as "It would affect me positively" (f=31), "I would like it and be happy" (f=18), "I would work harder" (f=17), "It would increase my motivation" (f=15). The phrase "I would be more successful" by the high expectations is given only by f=2, but this does not mean that high expectations would not increase the rate of success; it is because the study data consists of the exact phrases of the teachers. When the essence

and the meaning are reviewed, it is clear that the phrases consist of positive opinions including the expressions of being more successful, hard working, productive and happy individuals.

It is observed that the manager's high expectations of his employees are generally perceived positively by the teachers, high expectations make the employees feel better and trigger them to do their job better and to be more successful. Such expressions as "I will work more eagerly and harder" indicate that people's commitment and motivation have increased, so productivity and performance may build up, while expressions like "it has a positive effect, I would be happy" show that employees' feelings have been positively influenced, which will help them become self-confident, happy individuals.

The phrases of the teachers saying that "my manager's high expectations would affect me negatively" and the frequency of these phrases are listed in Table 8.

Table 8

The Expressions of the Teachers Stating that "My Manager's High Expectations of Me would Affect Me Negatively "

High expectantions would affect me negatively	**f**	**%**
It would create uneasiness and anxiety	6	26,08
I would feel stress	5	21,73
It would affect me negatively	4	17,39
I would feel incompetent	3	13,04
I would feel under pressure	3	13,04
I would feel restless	2	8,69

There are 23 negative phrases in the responses of those stating “My manager's high expectation of me would affect me negatively". Participants also stated that “It would create uneasiness and anxiety (6)”, “I would feel stress (5)”, “I would feel under pressure” (3), “I would feel incompetent” (3) and “I would feel restless” (2).

The fact that phrases such as uneasiness, stress, pressure and inability are used is caused by the teacher's worries that they may not meet high expectations. The individual asks himself/herself the question "I wonder if...," does not find himself adequate in this subject. Here, the personal characteristics and occupational background of the individual step in, which indicate that the individual has some problems with his/her self-confidence.

The teachers' opinions on how their manager's lower expectations about their talent would reflect on their performance, concerning the questions How would you feel if your Principal had low expectations related to your talents? How would this affect your job? are listed in Table 9.

Table 9

The Opinions of the Teachers about Their Manager's Low Expectations

Effect	**f**	**%**
Low expectations would affect positively	18	15,93
Low expectations would affect negatively	70	61,94
Low expectations not would affect	25	22,13

The opinion that “My manager's having a low expectation of me would affect me negatively” (f=70) was more frequent among the teachers. 25 participant said that "My manager's having low expectation of me would not affect me". 18 among the teachers said "My manager's having low expectation of me would affect me positively."

It is demonstrated in Table 9 that the rate of those who stated their opinion as "low expectation would affect me negatively" is higher (70%). The significant point here is that only 2 teachers responded as "high expectation would not affect me" (see Table 7), and yet those stating "low

expectation would not affect me" is higher in number (f=25) (see Table 10). This means that there is a difference between participants' reactions to high expectations and low expectations. It is safe to say that participants are more affected by the high expectation.

The statements of those saying "my manager's low expectation would affect me positively" and the frequency of those statements are listed in Table 10.

Table 10

The Expressions of the Teachers Stating that "My Manager's Low Expectations of Me would Affect Me Positively"

Low expectantions would affect positively	f	%
I would work harder	1	77,78
Low expections would make me more ambitious	4	16,67
I would get help from a more experienced teacher to develop myself	3	5,55

Among those saying “My manager's having a low expectation of me would affect me positively", 14 employees mentioned that "they would work harder". 3 employees said that low expectation "would make me more ambitious” and 1 employee said that "I would get help from a more experienced teacher to develop myself". Teachers stated that low expectations would trigger their ambition and thereby affect them positively, that they would try to challenge and refute such lower expectations, that they would be inclined to work harder to prove themselves.

The statements of those saying "My manager's low expectations would affect me negatively" and the frequency of these statements were listed in Table 11.

Table 11

The Expressions of the Teachers Stating that "My Manager's Low Expectations of Me would Affect Me Negatively"

Low expectantions would affect negatively	f	%
I would feel bad, it would affect me negatively	25	24,03
They would fail	12	11,50
I would take a dislike to my job	9	8,65
My motivation would weaken	9	8,65
My performance would weaken	9	8,65
I would feel incompetent and incapable	7	6,73
My self-confidence would decrease	6	5,76
I would abandon trying	6	5,76
I would question myself	5	4,80
I would be unhappy	4	3,84
I would feel worthless	3	2,88
I would think he does not need to me	3	2,88
I would trust my manager less	2	1,92
I would ask to be reassigned	2	1,92
I would get angry	1	0,96
I would feel belittled	1	0,96

104 negative statements were found in the statements of the teachers saying “My manager's low expectations of me would affect me negatively". 25 participants used the phrases “I would feel bad, it would affect me negatively”, and 12 participants said that “They would fail”. Teachers used negative phrases such as “I would take a dislike to my job", "My motivation would weaken", "I would feel incompetent and incapable", "I would abandon trying", "I would question myself", "I would be unhappy", "I would feel worthless", "I would trust my manager less", as to confirm the negative effect of low expectations.

The negative aspects in the statements of those saying "low expectation would affect negatively" is significant. Teachers mentioned that they would experience challenges both in fulfilling their duties

and at a more personal level. Phrases such as "I would feel belittled, I would feel bad, I would get angry" show that they would be affected negatively in a more personal level and phrases such as "I would fail, I would take a dislike at my job, I would abandon trying, and my performance and motivation would weaken" show that they would be affected in a professional level by the low expectations. Given the phrases such as "I would question myself, I would feel incompetent and untalented", we can say that employees start to suspect themselves and their professional performance when faced with low expectations. It even comes to mind that low expectations would cause them to feel themselves worthless and incompetent and thereby abandon trying to do better both in professional and personal terms. The use of the phrase "I would ask to be reassigned" leads us to believe that low expectations may affect the person so much that they consider changing their workplace.

Discussion, Conclusion and Recommendations

Every manager creates some expectations about employees. They convey these expectations to employees through verbal or non-verbal communication. Employees then, show a tendency to react and behave in line with these expectations that are expected from them. This study was performed with the aim of identifying the effects of manager expectations on employees in educational institutions; a scale and an interview form questioning the pygmalion effect were applied to teachers. According to the quantitative findings acquired as a result of the analyses carried out, it was confirmed that gender, assignment and seniority did not have any effect on teachers' opinions towards the pygmalion effect. Regardless of their gender, assignment and period of service, it was concluded that the participants think the expectations and thoughts of their managers had significant effect on their behaviors and performance. Besides, it was confirmed that managers' thoughts and expectations towards employees had positive effects on teachers' opinions about their profession, duty and career, and it became evident that teachers thought high expectations would bring forth an increase in their performance. In parallel to this conclusion, Korman (1971) carried out an experimental research named "Expectancies as Determinants of Performance" find an answer to the question "Are high expectations effective in enhancing the performance of underperforming groups?" and he discovered that high expectations enhanced performance. In their studies, Stedry and Kay (1966) found a relation between the expectations of managers and the performance of employees. For them, it was probable that managers' positive expectations would have positive effects, and negative expectations would have negative effects. Moreover, Eden and his students (1982) conducted studies in two different fields of Israel Defense Forces, and they observed improvements in the performances of the study groups compared to the control groups, concluding that high expectations resulted in higher performance (Eden & Ravid, 1982; Eden & Shani, 1982).

According to the findings acquired from the answers given by the teachers for two open-ended questions which were asked to them in the qualitative part of the study, employees stated that their managers' high expectations affected them positively to a large extent. The teachers indicated that their managers' high expectations affected them significantly in a positive way. Such a high ratio as well as the low proportion of those who said that high expectations had negative effects put forth the importance as well as the reality of the level of high expectations. It was seen that high expectations made individuals feel good and at the same time, prompted them to do their jobs better, and succeed. Such expressions as "I will work more eagerly and harder" indicate that people's commitment and motivation have increased, so productivity and performance may build up, while expressions like "it has a positive effect, I would be happy" show that employees' feelings have been positively influenced, which will help them become self-confident, happy individuals. In their article "A Teacher Expectation Intervention: Modelling The Practices of High Expectation Teachers" which supported these results revealing the presence of pygmalion effect, Rubie-Davies and her friends (2014) determined that teachers' high expectations from their students caused an increase in students' math scores. They confirmed that the success rate of students in the control group increased by 28% within one academic year. Apart from this, with the aim of determining how the expectations of students affect teacher performance, Feldman and Prohaska (1979) conducted an experimental study named "The Student as Pygmalion: Effect of Student Expectation on the Teacher." This experiment showed that students' expectations from a sufficient teacher rather than an insufficient teacher resulted in more

positive behaviors, and affected high performance. This study indicates that, students' expectations from their teachers are influential.

The phrases like uneasiness, stress, pressure and inability used by the teachers as an emotional reflection of the managers' high expectations from them are caused by the teachers' worries that they may not meet high expectations. The individual asks himself/herself the question "I wonder if...," does not find himself adequate in this subject. Here, the personal characteristics and occupational background of the individual step in, which indicate that the individual has some problems with his/her self-confidence.

It was seen that the proportion of the individuals stating that low expectations had negative effects was higher. What is remarkable at this point is that individuals indicating high expectations do not have any effect on them are few in number; however, there are many individuals who state that low expectations do not have any effect on them. It is understood from this that there is a difference between employees' reactions to high expectations and low expectations. Supportively, McNatt (2000) concluded from his meta-analysis of 17 studies about pygmalion effect that the negative effects of pygmalion, meaning the effect of negative expectations and also defined as the golem effect, were more powerful when compared to the effects of positive expectations. Besides, this study has also demonstrated that men are more easily manipulated by expectations compared to women.

The negative aspects in the statements of those saying "low expectation would affect negatively" is significant. Teachers mentioned that they would experience challenges both in fulfilling their duties and at a more personal level. Expressions such as "I would feel belittled, I would feel bad, I would get angry" show that they would be affected negatively in a more personal level and expressions such as "I would fail, I would take a dislike at my job, I would abandon trying, and my performance and motivation would weaken" show that they would be affected in a professional level by low expectations. Given the phrases such as "I would question myself, I would feel incompetent and untalented," we can say that employees start to suspect themselves and their professional performance, which may cause them to accept everything as they come, and stop trying. The use of the phrase "I would ask to be reassigned" leads us to believe that low expectations may affect the person so much that they consider changing their workplace.

There were also those who stated that low expectations would trigger their ambition and thereby affect them positively, that they would try to challenge and refute such lower expectations, and that they would be inclined to work harder to prove themselves.

These findings acquired from teachers' views reveal the reality and accuracy of pygmalion effect in the field of education, and show that high expectations pave the way for teachers' motivation, effort, active working, commitment as well as the growth of their enthusiasm. It is seen that high expectations will generally reveal high performance, while low expectations, due to their negative effects on employees, will cause decrease in motivation as well as unwillingness towards the job being done and therefore, a decline or stability in performance.

References

Aydoğan, İ. (2003). Öğretim Ortamında Düşüncenin Gücü [The Power of Thought in Teaching Environment]. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Enstitüsü Dergisi [Afyon Kocatepe University Journal of the Institute of Social Sciences], 5*(1), 200-222.

Balcı, A. (2005). *Sosyal Bilimlerde Araştırma [Research in Social Sciences]*. Ankara: Pegem A Publishing.

Baki, A. & Gökçek, T. (2012). Karma Yöntem Araştırmalarına Genel Bir Bakış [An Overview of Mixed Method Research]. *Elektronik Sosyal Bilimler Dergisi [Journal of Electronic Social Sciences]*, 11(42), 001-021.

Bezuijen, X.M., Ber, P.T., Dam, K. & Thierry, H. (2009). Pygmalion and Employee Learning: The Role of Leader Behaviors. *Journal of Management*, *35*(5), 1248-1267.

Berlew, D.E & Hall, D.T. (1966). The Socialization of Managers: Effects of Expectations on Performance. *Administrative Science Quarterly*, *11*(2), 207-223.

Bridge, B. (2003). *Eğitimde Vizyoner Liderlik ve Etkin Yöneticilik.* İstanbul: Beyaz Publishing.

Chang, J. (2011). A Case Study of the "Pygmalion Effect: Teacher Expectations and Student Achievement". *International Education Studies, 4*(1), February.

Chirayath, S. Lalgem E. M. & George, S.B. (2009). Expectations Come True: A Study of Pygmalion Effect on the Performance of Employees. *Management and Labour Studıes, 34*(1), February.

Clemente, F. J. (2008). Effects of Teacher Expectations on the Development of Verbal Creativity in Childhood Education. *Revista Electrónica Actualidades Investigativas en Educación*, *8*(3), 1-14.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Demirtaş, H. A. (2004). Sosyal sınıflandırma, kişilerarası beklentiler ve kendini doğrulayan kehanet [Social classification, interpersonal expectations and self-verification prophecy]. *İletişim Araştırmaları [Communication Research], 2*(2), 33-53.

Denzin, N. (1978). *The research act: a theoretical introduction to sociological methods*. 2nd Edn. New York: McGraw-Hill

Doğan, S., Uğurlu, C.T., Yıldırım, T. & Karabulut, E. (2013). Examining the communication process between school administrators and teachers according to the opinions of teachers. *Turkish Journal of Education, 3*(1), 34-47.

Eden, D. (1984). Self-fulfilling prophecy as a management tool: harnessing pygmalion. *The Academy of Management Review, 9*(1), 64-73.

Eden, D., & Ravid, G. (1982). Pygmalion vs. self-expectancy: Effects of instructorand self-expectancy on trainee performance. *Organizational Behavior and Human Performance*, *30*(3), 351-364.

Eden, D., & Shani, A. B. (1982). Pygmalion goes to boot camp: Expectance, leadership, and trainee performance. *Journal of Applied Psychology*, *67*(2), 194-199.

Eden, D., Geller, D., Gewirtz, A., Gordon-Terner, R., Inbar, I., Liberman, M., Pass, Y., Salomon-Segev, I. and Shalit, M. (2000). Implanting pygmalıon leadershıp style through workshop traınıng: seven fıeld experıments. *Leadership Quarterly*, *11*(2), 171–210.

Feldman, R. S., and Prohaska, T. (1979). The student as Pygmalion: Effect of student expectation on the teacher. *Journal of Educational Psychology, 71*(4), 485-493.

George, A.S. (1982). Beyond pygmalion: Developments and directions in teacher expectations. *Research South Pacific Journal of Teacher Education*, *10*(2), 41-49.

Howe, M.J.A. (1975). Pygmalion and after new research into teachers' expectations. *Education 3-13: International Journal of Primary, Elementary and Early Years Education, 3*(1), 46-49.

Jenner, H. (1990). The Pygmalion effect: the importance of expectancies. *Alcoholism Treatment Quarterly, 7*(2), 127-133.

Jick, T. D. (1989). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, *24*(4), 602-611.

Johnson, R. B., & Onwuegbuzıe, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Research: Quantitative, Qualitative, and Mixed Approaches, 33*(7), 14-26.

Kashen, D. (2011). Use the pygmalion effect to create a high performing team. http://awesomeculture.com/2011/10/03/use-the-pygmalion-effect-to-create-a-high-performing-team/. Downlanded at 02.01.2014.

King, S. S. (1971). Self-fulfilling prophecies in training the hard-core supervisors' expectations and the underprivileged worker's performance. *Social Science Quarterly, 52*(2), 369-378.

Korman, A. K. (1971). Expectancies as determinants of performance. *Journal of Applied Psychology*, *55*(3), 218-222.

Şenlen, S. (2008). Bernard Shaw'in pygmalion adlı oyununda dil, eğitim ve toplumsal sınıf ilişkisi [Language, education and social class in bernard shaw's "pygmalion"]. *Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi [Journal of Ankara University, Faculty of Languages, History and Geography], 48*(2), 29-41.

Livingston, S. J. (1969). *Pygmalion in Management.* Harvard Business Review.

Locke, A.E. & White, S. (200). Problems wıth the pygmalıon effect and some proposed solutıons. *Leadership Quarterly, 11*(3), 389–415.

Loftus, P. (1995). The Pygmalion effect. *Industrial and Commercial Training,* 27 (4), 17–20

Madran, H. A. D. (2012). Temel Beklenti Etkisi: Kendini Gerçekleştiren Kehanet [Basic Expectation Effect: Self-fulfilling prophecies]. *İstanbul Bilgi Üniversitesi Yayınları [İstanbul Bilgi University Publications]*, 29-40.

McNatt, D. B. (2000). Ancient Pygmalion joins contemporary management: A metaanalysis of the result. *Journal of Applied Psychology, 85*(2), 314-322.

Merton, R.K. (1948). The self-fulfilling prophecy. *Antioch Review, 8*(2), 193-210.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: an expanded sourcebook. Thousand* Oaks, California: SAGE. Morahan- Martin.

Mitchell, E.S. (1986). Multiple triangulation: A methodology for nursing science. *Advances in Nursing Science, 8*(3), 18-26.

Murphy, A., Campbell, C. & Garavan, T.N. (1999). The Pygmalion effect reconsidered: its implications for education, training and workplace learning. *Journal of European Industrial Training, 23*(4), 238-250.

Patton, M. Q. (1990). *Qualitative evaluation and research methods.* (2nd ed.). Newbury Park, CA: Sage.

Prasad, D. (2013). *The central theme of education in shaw's pygmalion*. The Criterion an International Journal in English, ISSN 0976-8165.

Priyabhashini A, & This V.R. (2005). Transformatıonal leadershıp and follower's career advancement: role of pygmalıon effect. *Indian Journal of Industrial Relations*, *40*(4), 482-499.

Reynolds, D. (2007) Restraining golem and harnessing pygmalion in the classroom: a laboratory study of managerial expectations and task design. *Academy of Management Learning & Education, 6*(4), 475–483.

Rosenthal R. & Jacobson L. (1968). *Pygmalion in the classroom: teacher expectation and pupils' intellectual development.* New York: Holt, Rinehart & Winston, 1968. Pp. 240. [Harvard Univ., Boston, MA and South San Francisco Unified Sch. District, SanFrancisco, CA]

Rosenthal, R. and SL Jacobson, L. (1966). Teachers' expectancies: Determinates of pupils' IQ gains. *Psychological Reports, 19,* 115-118.

Rubie-Davies, C., Peterson, E.R., Sibley, C.G. & Rosenthal, R. (2014). A teacher expectation intervention: Modelling the practices of high expectation teachers. *Contemporary Educational Psychology, 40,* 72-85.

Shaw, B. (2004). *Pygmalion.* Contaıns Ontarıo Currıculum Support Materıal. Study Guıde. Londra

Spitz, H.H. (1999). Beleaguered pygmalion: a history of the controversy over claims that teacher expectancy raises intelligence. *Intelligence 27(3),* 199-234 Princeton, NJ, USA.

Stedry, A. C. & Kay, E. (1966). The effects of goal difficulty on performance. *Behavioral Science, 11*(6), 459-470.

Tierney, P. & Farmer, S.M. (2004). The pygmalion process and employee creativity. *Journal of Management, 30*(3), 413–432.

Wang, L. (2000). *The upward pygmalion effect in the organization.* Masters Theses & Specialist Projects. Western Kentucky University, Paper 707.

Whiteley, P., Sy, T. & Johnson, S.K. (2012). Leaders' Conceptions of Followers: Implications for Naturally Occurring Pygmalion Effects. *The Leadership Quarterly, 23*(5), 822–834.

Yıldırım, A. & Şimşek, H. (2011). *Sosyal bilimlerde nitel araştırma yöntemleri [Qualitative research methods in the social sciences]*, (8. Press). Ankara: Seçkin Publishing.

Zanna, M.P., Sheras, P.L. & Cooper, J. (1975). Pygmalion and galatea: the interactive effect of teacher and student expectancies, *Journal of Experimental Social Psychology, 11*(3), 279-287.

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 63-75

Nesibe Aydın JEF

The Mediator Role of Interaction Anxiety in the Relationship between Social Support Perception and Smartphone Addiction*

Article Type	Received Date	Accepted Date
Research	21.02.2018	05.09.2018

Necdet Konan** **O. Tayyar Çelik*****

Abstract

Preservice teachers prepare for a profession that requires intense communication and interaction. They are expected to gain competencies in their profession in this process. These competencies include the technical knowledge particular to the profession, and communication and social skills. It is thus important to investigate the factors that affect the academic and social interaction, the learning environment and the psycho-social development of university students, and in particular, preservice teachers. This study aims to investigate the relationship among preservice teachers' social support perceptions, interaction anxiety and smartphone addiction. The students from the faculty of education and the students with the pedagogical formation training in İnönü University during the 2017-2018 academic year constituted the population of the study and the participants were 496 preservice teachers who were selected from this population using the random sampling technique. Hypotheses were developed to investigate the relationship among the research variables. After testing the hypotheses, the results indicated that the preservice teachers' social support perceptions and interaction anxiety significantly predicts their smartphone addiction, that their social support perceptions significantly predict their interaction anxiety, and that their interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction.

Keywords: Social support perception, interaction anxiety, smartphone addiction, preservice teachers.

* This study was partly presented at the 9th IX International Congress of Education Supervision in Antalya. Turkey, 01-03 November, 2017.

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Sosyal Destek Algısı ve Akıllı Telefon Bağımlılığı İlişkisinde Etkileşim Kaygısının Aracılık Rolü*

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	21.02.2018	05.09.2018

Necdet Konan** **O. Tayyar Çelik*****

Öz

İletişim ve etkileşimin yoğun olduğu bir mesleğe hazırlanan öğretmen adaylarından, bu süreç içerisinde meslekleriyle ilgili yeterlikleri kazanmaları beklenmektedir. Bu yeterlikler içerisinde, mesleğe ve alanlarına özgü teknik bilgilerin yanında iletişim ve sosyal becerileriler de yer almaktadır. Bu kapsamda üniversite öğrencilerinin, özelde ise öğretmen adaylarının akademik ve sosyal entegrasyonunu, öğrenme çevrelerini ve piko-sosyal gelişimlerini etkileyen çeşitli faktörlerin araştırılması önem kazanmaktadır. Bu araştırmada, öğretmen adaylarının sosyal destek algılarıyla etkileşim kaygıları ve akıllı telefon bağımlılıkları arasındaki ilişkiyi incelemek amaçlanmıştır. Araştırmanın evrenini 2017-2018 eğitim-öğretim yılında İnönü Üniversitesinde eğitim görmekte olan eğitim fakültesi öğrencileri ve pedagojik formasyon eğitimi alan öğrenciler, örneklemini ise bu evrenden seçkisiz örnekleme yöntemiyle belirlenen 496 öğretmen adayı oluşturmaktadır. Araştırma değişkenleri arasındaki ilişkilere yönelik denenceler oluşturulmuştur. Denencelerin sınanması sonucunda öğretmen adaylarının sosyal destek algılarının ve etkileşim kaygılarının akıllı telefon bağımlılıklarını anlamlı bir şekilde yordadığı, sosyal destek algılarının etkileşim kaygılarını anlamlı bir şekilde yordadığı, sosyal destek algılarıyla akıllı telefon bağımlılıkları arasındaki ilişkide etkileşim kaygılarının aracılık etkisi olduğu sonuçlarına ulaşılmıştır.

Anahtar Sözcükler: Sosyal destek algısı, etkileşim kaygısı, akıllı telefon bağımlılığı, öğretmen adayı.

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* Bu çalışma, 01-03 Kasım 2017 tarihinde Antalya/Türkiye'de gerçekleştirilen IX. Uluslararası Eğitim Denetimi Kongresinde sözlü bildiri olarak sunulmuştur.

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Introduction

One of the most important characteristics that separate humankind with skills of foreseeing the future and making plans for the future from other living things is their ability to transform their information into technologies that facilitate their lives. Artificial intelligence has been discussed today where rapid changes in technology have been experienced and it is predicted that artificial intelligence will take place in several areas of our lives in near future. In fact, we have already begun to describe many of the technological tools we use as "smart." The advancements in the information and communication technologies underlie the technological advancements. Constantly and rapidly updated, information and communication technologies have considerably changed our lifestyles and become an inseparable part of our lives (Salehan & Nagehban, 2013).

As technologies have changed rapidly, they have become more practical and smaller. Smartphones have become an indispensable part of the lives of people in all age groups (Takao, Takahashi & Kitamura, 2009). Smartphones not only take the place of phones, but also personal computers and other tools to some extent (Salehan & Nagehban, 2013; Samaha & Hawi, 2016). Beyond having the features of making phone calls and sending messages, smartphones can be used to access the internet, send e-mails, provide navigation services, share pictures and videos, play music, watch films, download games, participate in social media, shop and manage finances (Gökçearslan, Mumcu, Haşlaman & Çevik, 2016; Kuyucu; 2017; Sapacz, Rockman & Clark, 2016).

As well as the advantages of being lightweight and compact enough to fit easily into a bag or pocket (Elhai, Dvorak, Levine & Hall, 2017), smartphones also have disadvantages (Çakır & Oğuz, 2017; Park, 2005). In particular, their gradual elimination of temporal and spatial limitations and the uncontrolled increase in obsessive use of them have led to coining the term, smartphone addiction (Al-Barashdil, Bouazza & Jabur, 2015; Hong, Chiu & Huang, 2012; Lepp, Barkley & Karpinski, 2014; Park, 2005; Park & Lee, 2012; Samaha & Hawi, 2016). Even though smartphone addiction is described in different ways such as problematic mobile phone use, excessive use and obsessive use (Kardefelt & Winther, 2014; Kim & Byrne, 2011), all these descriptions indicate a form of overuse that causes individuals to neglect other areas of life (Barashdil et al., 2015).

Smartphone addiction refers to obsessive smartphone use that is difficult to control and negatively affects other areas of life (Park & Lee, 2012). Many researchers considered the smartphone addiction as a behavioral addiction in the context of obsessively exhibiting a behavior (Lemon, 2002; Takao et al., 2009). Smartphone addicts are likely to exhibit these behaviors (Lee, Chang, Lin & Cheng, 2014):

1) Always being busy with the phone,

2) Increasing phone use to get satisfaction from the phone,

3) Failing to stop, pause or attempt to control using the phone,

4) Feeling discomfort about attempts to reduce phone use,

5) Jeopardizing important relationships, and education and career opportunities due to the phone use,

6) Using the smartphone as a tool to alleviate hearing problems, depression, anxiety and, hopelessness.

Addiction can cause great harm to society and individuals by affecting work and learning (Park, 2005). The fact that smartphones are always accessible distinguishes this addiction from other addiction types, and this addiction is a threat to individuals and society (Kahyaoğlu-Süt, Kurt, Uzal & Özdilek, 2016). Such behavioral addictions have not only side effects (Yen et al., 2009), but also psychological and physical effects such as hand and neck pain, sleep problems and visual disorders (Kuyucu, 2017). Studies of adolescents and university students' smartphone addiction have reported: that problematic phone use is a function of an extrovert personality type (Salehan & Nagehban, 2013), that there are significant relationships between smartphone addiction and negative emotions (Chen et al., 2016), that social extroversion and anxiety increase smartphone addiction (Hong et al., 2012), that

smartphone addiction negatively affects academic performance (Jacobsen & Forste, 2011; Samaha & Hawi, 2016; Seo, Park, Kim & Park, 2016), and that smartphone addiction can cause depression and anxiety, which in turn can result in sleep disorders (Demirci, Akgönül & Akpınar, 2015).

These results indicate that smartphone addiction negatively affects individuals' personal and social lives. Therefore, it is of critical importance to investigate smartphone use, which is particularly common among university students, with the risk of turning into an addiction that can negatively affect their social, professional and academic performance and to examine the factors that affect their smartphone use. This study investigated the relationship of preservice teachers' smartphone addiction, which was reported to affect university students' personal, social, and academic development, with their social support perception and interaction anxiety.

Relationship between Social Support Perception and Smartphone Addiction

Social support is defined as the social support behaviors that individuals receive from other individuals and social networks (Heller, Swindle & Dusenbury, 1986). Yıldırım (1997) defined social support as the social and psychological support individuals obtain from their environment. The accessibility of supporting individuals and the personal satisfaction obtained from real support are two important dimensions of perceived social support (Kitamura, Watanabe Takezaki & Tanaka, 1999), and the satisfaction obtained from a social support rather than its quantity is determinative for individuals.

Social support perception has mental and physical benefits (Cohen & Wills, 1985). Social support is a human need because people are social beings. The perception of this need being met has positive effects on individuals. Stress, anxiety and addictive behaviors are more common for people who lack support and feel lonely. Studies have reported a significant relationship between smartphone addiction, which is considered a behavioral addiction, and loneliness (Caplan, 2006; Çakır & Oğuz, 2017; Şar, 2013; Tan, Pamuk & Döner, 2013). Social isolation, which is closely related to social support perception, stems from inadequate relationships in social networks or the inability to become a member of a social network in which similar interests or activities are shared. This problem can be eliminated by accessing an environment where individuals can reach satisfaction (Çakır & Oğuz, 2017). Social isolation causes behavioral addictions such as internet and smartphone addiction. A relationship that is similar to the one between loneliness and the smartphone addiction is thought to be present between social support perception and smartphone addiction. The lack of support is one of the sources of individuals' sense of loneliness. Based on the relevant theoretical information and the results of studies, this study's hypothesis is that preservice teachers' social support perceptions significantly predict their smartphone addiction in a negative way.

The Relationship between Social Support Perception and Interaction Anxiety

Social anxiety is the behavioral tendency to withdraw from social interactions due to internal conflict or excessive fear (Rubin, Coplan & Bowker, 2009). In DSM 5, social anxiety disorder is defined as evident persistent fear that emerges in social settings, situations requiring a performance, or in front of unknown people (American Psychiatry Association, 2013).

Studies investigating the relationship between the social support perception and interaction anxiety (Baltacı, 2010; Baltacı, İşleyen & Özdemir, 2012; Huber, 2016) reported that individuals' social anxiety level increases as their support perception decreases. It was also put forward that the social support perception has mental and physical benefits (Cohen & Wills, 1985). Therefore, it can be asserted that individuals receiving enough support from their social environment can establish meaningful relationships, less experience psychological problems, or are able to overcome such problems more quickly. Individuals' social support sources can be investigated in order to reveal the relationship between the social support perception and interaction anxiety.

Based on the relevant theoretical information and the results of studies, this study's hypothesis is that preservice teachers' social support perceptions significantly predict their interaction anxiety in a negative way.

The Relationship between Interaction Anxiety and Smartphone Addiction

According to Lee et al. (2014), social interaction anxiety and the need for interaction increase the need for phone use and the pressure to use. This relationship also increases trust in smartphones. In other words, smartphones can be used a tool to meet individuals' need for interaction. Interaction with smartphones is less sincere than face-to-face interaction. This difference can decrease anxiety during interaction with others since it enables people to think more about every reply in a conservation. King et al. (2013) found that smartphones can make individuals with social anxiety to feel safe in social settings. Individuals use smartphones to interact with others due to lack of trust and shyness in face-to-face communication (Walsh, White & Young, 2007). Barashdil et al. (2015) found that smartphones with various features can serve as an effective way for shy students to communicate with others.

Many studies of this issue have highlighted a significant relationship between social anxiety and smartphone addiction (Bianchi & Phillips, 2005; Elhai et al., 2017; Lepp et al., 2014; Sapacz et al., 2016; Yılmaz, Car & Şivan, 2015). On the other hand, some studies found no significant relationship between these variables (Harwood, Dooley, Scott & Joiner, 2014; Whiteside & Lynam, 2001).

Based on the relevant theoretical information and the results of studies, this study's hypothesis is that preservice teachers' interaction anxiety significantly predicts their smartphone addiction in a positive way.

The Mediator Effect of Interaction Anxiety

The previous sections discussed the relationship among the research variables and indicated a strong relationship between interaction anxiety and smartphone addiction. The results of this study suggest that interaction anxiety has a mediator effect, which is also closely related to social support perception and smartphone addiction. Many studies have indicated that social support perception can serve as a buffer to prevent the development of anxiety, depression and loneliness (Rubin et al., 2006; Terzi, 2008). Behaviors that can be described as addiction are particularly common in individuals with psychological problems.

Based on relevant theoretical information and the results of studies, this study's hypothesis is that preservice teachers' interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction.

The Purpose and Importance of the Study

Studies have shown that the smartphone addiction has important effects on university students' academic achievement, personal lives and social interactions. High-level smartphone addiction has been reported to decrease university students' level of self-regulation in learning, to influence their study flow negatively, to prevent their academic studies, to cause them to be busy with other activities while studying and to decrease their academic performance (Lee, Cho, Kim & Noh, 2015).

Preservice teachers prepare for a profession that requires intense communication and interaction. They are expected to gain competencies in their profession in this process. These competencies include the technical knowledge particular to the profession, and communication and social skills. It is thus important to investigate the factors that affect the academic and social interaction, the learning environment and the psycho-social development of university students, and in particular, preservice teachers. This study aimed to investigate the relationships among preservice teachers' social support perception, interaction anxiety and smartphone addiction.

Method

This study was designed as a relational survey. Relational survey is a research method that aims to investigate the presence and/or the degree of covariance between two or more variables (Cohen, Manion & Morrison, 2007; Fraenkel & Wallen, 2003).

Based on the theoretical knowledge and the results of similar studies, hypotheses about the relationship among the preservice teachers' social support perceptions, interaction anxiety, and smartphone addiction were developed, and a model was proposed. The model is shown in Figure 1.

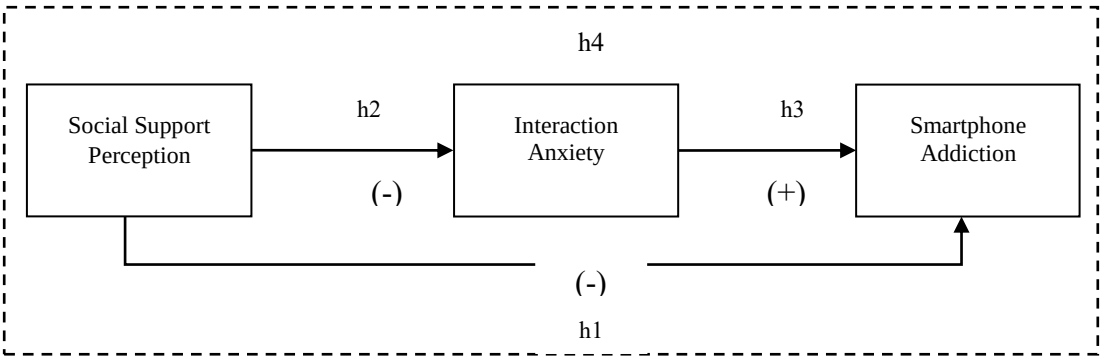

Figure 1. *The Proposed Model*

Hypothesis 1 (h1): Preservice teachers' social support perceptions significantly predict smartphone addiction in a negative way.

Hypothesis 2 (h2): Preservice teachers' social support perceptions significantly predict their interaction anxiety in a negative way.

Hypothesis 3 (h3): Preservice teachers' interaction anxiety significantly predicts their smartphone addiction in a positive way.

Hypothesis 4 (h4): Preservice teachers' interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction.

Research Sample

The students in the faculty of education and pedagogical formation training at İnönü University during the 2017-2018 academic year constituted the population of the study. The participants were 496 preservice teachers who were selected from this population using random sampling.

Of the participants, 75.4% (374) were female, and 24.6% (122) were males. Of them, 23.6% were in the faculty of education, and 76.4% were in pedagogical formation training.

Research Instruments and Procedures

In addition to a personal information form, the following scales were used in the study:

The smartphone addiction scale-short form (SAS-SF)

Developed by Kwon et al., (2013) and adapted into Turkish by Noyan, Enez Darçın, Nurmedov, Yılmaz and Dilbaz (2015), this scale consists of 10 six-point Likert-type items and a single-factor structure. Scores on the scale range from 10 to 60. Higher scores indicate increased the risk of addiction. Noyan et al. (2015) found the Cronbach's alpha coefficient of the scale to be .86. The Cronbach's alpha coefficient of the scale was .91 in this study.

The interaction anxiety Scale (IAS)

The scale was developed by Leary and Kowalski (1993) and adapted into Turkish by Coşkun (2009). It consists of 15 five-point Likert-type items. It has a single-factor structure, and items 2, 3, 6, 10 and 15 are scored reversely. High scores on the scale indicate increased social interaction anxiety. Coşkun (2009) found the Cronbach's alpha coefficient of the scale to be .91. The Cronbach's alpha coefficient of the scale was .88 in this study.

The multidimensional scale of perceived social support (MSPSS)

Developed by Zimet et al. (1988, 1990), and adapted into Turkish by Eker, Arkar, and Yadız (2001), this scale consists of 12 seven-point Likert-type items. Higher scores on the scale indicate

stronger perceived social support. While Eker et al. (2001) found the Cronbach's alpha coefficient of the scale to be .89, it was .85 in this study.

Data Analysis

Descriptive statistics, correlation analysis, simple linear regression analysis, hierarchical regression analysis and the Sobel test were used to analyze the data. Prior to the analyses, the univariate and multivariate normality assumptions were investigated.

Within the scope of the univariate normality assumptions, the skewness and kurtosis coefficients were calculated. Coefficient values between -1 and +1 indicate a normal distribution (Çokluk, Şekercioğlu & Büyüköztürk, 2012). Within the scope of the multivariate normality, the tolerance and VIF values were investigated. A VIF value less than 10 and a tolerance value greater than 0.2 indicated that there was no multiple linear correlation (Field, 2005; Can, 2014). The results of these tests are shown in Table 1.

Table 1

The Skewness, Kurtosis, Tolerance and Vif Values of the Research Variables

Variable	Skewness	Kurtosis	Tolerance	VIF
Social Support Perception	-0,118	0,241	0,47	4,88
Interaction Anxiety	0,262	-0,565	0,51	3,99
Smartphone Addiction	-0,618	-752	0,36	5,72

Table 1 shows that the skewness and kurtosis values were within the range of the limit values (-1, +1), and that no multiple linear correlation was found among the research variables according to the tolerance (>.02) and VIF (<.10) values. The normality assumptions for conducting the analyses were met.

Results

This section presents the results of the descriptive analyses of the preservice teachers' social support perception, interaction anxiety and smartphone addiction, and the results of testing this study's hypotheses.

Results for Descriptive Statistics

Write down the results about the research question without changing the format. Write down the results about the research question without changing the format.

The descriptive statistics results for the preservice teachers' social support perception, interaction anxiety and smartphone addiction are shown in Table 2.

Table 2

Descriptive Statistics Results for the Research Variables

Variable	X	SD	Minimum	Maximum	1	2	3
1. Social Support Perception	63,88	3,46	7	84	-		
2. Interaction Anxiety	41,38	5,12	15	75	-.344**	-	
3. Smartphone addiction	27,98	2,21	10	60	-.136**	.251**	-

**P<.01

Table 2 shows that the preservice teachers had higher than moderate levels of social support perceptions (X=63.88), and that they had moderate levels of interaction anxiety (X=41.38) and smartphone addiction (X=27.98). The results for the relationship among the variables indicated a negative significant relationship between the preservice teachers' social support perceptions and smartphone addiction (r=-.13, p<.01), a negative significant relationship between their social support

perceptions and interaction anxiety (r=-.34, p<.01), and a positive significant relationship between their interaction anxiety and smartphone addiction (r=.25, p<.01).

Results for the Hypotheses of the Study

Simple linear regression analysis was conducted to test the first, second and third hypotheses of the study. Hierarchical regression analysis was used to test the fourth hypothesis about the mediator effect.

Results for the first hypothesis of the study

The first hypothesis of the study was that preservice teachers' social support perceptions significantly predict their smartphone addiction in a negative way. The results of the simple linear regression analysis carried out to test this hypothesis are shown in Table 3.

Table 3

Regression Analysis Results for Social Support Perception's Prediction of Smartphone Addiction

Variable	B	S. Error	β	t	Sig.
Constant	34.818	2.298		15,154	.000
Social Support Perception	-0.107	0.035	-0.136	-3.048	.002
R=.13, R2=.01					
F (1.494)=9.290, P=.002					

Table 3 shows that the preservice teachers' social support perceptions significantly predicted their smartphone addiction in a negative way (β=-.136, p<.05). Based on these results, the first hypothesis of the study was confirmed, and the preservice teachers' social support perception was found to have a significant effect on their smartphone addiction.

Results for the second hypothesis of the study

The second hypothesis of the study was that the preservice teachers' social support perceptions significantly predict their interaction anxiety in a negative way. The results of the simple linear regression analysis carried out to test this hypothesis are shown in Table 4.

Table 4

Regression Analysis Results for Social Support Perception's Prediction of Interaction Anxiety

Variable	B	S. Error	β	t	Sig.
Constant	55.706	1.801		30.93	.000
Social Support Perception	-0.136	0.028	-0.344	-8.142	.000
R=.34, R2=.11					
F(1.494)=66.299, P=.000					

Table 4 shows that the preservice teachers' social support perceptions significantly predicted their interaction anxiety in a negative way (β=-.344, p<.05). Based on these results, the second hypothesis of the study was confirmed, and the preservice teachers' social support perception was found to have a significant effect on their interaction anxiety.

Results for the third hypothesis of the study

The third hypothesis of the study was that preservice teachers' interaction anxiety significantly predicts their smartphone addiction in a positive way. The results of the simple linear regression analysis carried out to test this hypothesis are shown in Table 5.

Table 5

Regression Analysis Results for Interaction Anxiety's Prediction of Smartphone Addiction

Variable	B	S. Error	β	t	Sig.
Constant	15.395	2.23		6.903	.000
Interaction anxiety	0.304	0.053	0.251	5.775	.000
R=.25, R2=.06					
F(1.494)=33.352, P=.000					

As Table 5 shows, the preservice teachers' interaction anxiety significantly predicted their smartphone addiction in a positive way (β=.251, p<.05). Based on these results, the third hypothesis of the study was confirmed, and the preservice teachers' interaction anxiety was found to have a significant effect on their smartphone addiction.

Results for the fourth hypothesis of the study

The fourth hypothesis of the study was that preservice teachers' interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction. In order to mention a mediator effect of a third variable in the relationship between two variables, the following conditions should be met (Baron & Kenny, 1986; Karagöz, 2016):

1) The independent variable should have an effect on the dependent variable.

2) The independent variable should have an effect on the mediator variable.

3) The mediator variable should have an effect on the dependent variable.

4) When the mediator variable is included in the model along with the independent variable, the effect of the independent variable on the dependent variable should decrease, while the effect of the mediator variable on the dependent variable should be significant.

Under these conditions, it was determined that the independent variable (social support perception) had a significant effect on the dependent variable (smartphone addiction) (Table 4), that the independent variable (social support perception) had a significant effect on the mediator variable (interaction anxiety) (Table 5), and that the mediator variable has a significant effect on the dependent variable (Table 6).

Hierarchical regression analysis was conducted to test the fourth condition. The results are shown in Table 6.

Table 6

Hierarchical Regression Analysis Results for Smartphone Addiction

Steps		B	S. Error	β	t	sig.
1. Step	Constant	34.818	2.298		15.154	.000
	Social Support Perception	-0.107	0.035	-0.136	-3.048	.002
2. Step	Constant	19.18	3.845		4.988	.000
	Social Support Perception	-0.04	0.037	-0.06	-1.21	.228
	Interaction Anxiety	0.281	0.056	0.232	5.01	.000

Table 6 shows that when interaction anxiety, the mediator variable, was included in the model in the second step, the standardized regression coefficient of the social support variable decreased significantly (β=-0.6, p>.05), and the effect of social support perception on the smartphone addiction became insignificant. The significance of the decrease in the standardized regression coefficient was investigated using the Sobel test. The results of the test indicated that the mediator effect is significant (Z=4.41891 p<.001). It was also determined that interaction anxiety affected smartphone addiction (β=.232, p<.05). The literature interprets the disappearance of the independent variable's significant effect as a full mediator effect (Baron & Kenny, 1986; Holmbeck, 1997). In this case, the interaction

anxiety played a full mediator role in the relationship between social support perception and smartphone addiction.

These results indicate all the conditions for the mediator effect were met. Therefore, the hypothesis indicating that preservice teachers' interaction anxiety has a mediator effect on the relationship between their social support perceptions and smartphone addiction was confirmed.

Discussion, Conclusion and Recommendations

The results of the study indicated that the preservice teachers had higher than moderate levels of social support perception and moderate levels of interaction anxiety (X=41.38) and smartphone addiction (X=27.98). All of the hypotheses based on theoretical knowledge and the results of similar studies were confirmed.

In the study, the preservice teachers' social support perceptions were found to significantly predict their smartphone addiction in a negative way. Even though there is a limited number of studies in the literature that focus on the relationship between social support perception and smartphone addiction, studies of the relationship between loneliness and smartphone addiction (Çakır & Oğuz, 2017; Öztunç, 2013; Reid, 2007) have highlighted significant relationships between these two variables. Taşdemir (2016) found that students' levels of internet addiction increase as their loneliness levels increase, and that their loneliness levels increase as their levels of social support perception decrease. Low levels of social support perceived by individuals can be regarded as a source of loneliness. Addictive behaviors are more common in individuals with low levels of social support perception, as in the sense of loneliness. This study's results are consistent with those of other studies in the literature.

Another result of the study is related to the relationship between social support perception and their interaction anxiety, and indicated that the preservice teachers' social support perceptions significantly predict their interaction anxiety in a negative way. This result is consistent with those of similar studies (Baltacı, 2010; Baltacı, et al., 2012). Individuals who receive enough support from the social environment have a wider social environment. Individuals social support resources increase as their social environment enlarges. Therefore, it becomes more likely for them to get support when they need it, and the significant effect of social support perception on the interaction anxiety is an expected result.

The results of the study indicated that the preservice teachers' interaction anxiety significantly predicted their smartphone addiction. Various studies have found similar results (Bianchi & Phillips, 2005; Elhai et al., 2017; Lepp et al., 2014; Yılmaz et al., 2015). In particular, shy and socially anxious individuals tend to meet their social needs with mediators. They feel safe in this way, and smartphones become an important tool that fulfills this mediator function. This situation can cause smartphone addiction in individuals with interaction anxiety.

The analyses of the mediator effect found a full mediator role of the preservice teachers' interaction anxiety in the relationship between their social support perceptions and smartphone addiction. It is noteworthy that no studies were found in the literature that investigates the mediator effect of interaction anxiety in the relationship between preservice teachers' social support perception and smartphone addiction.

It is clear that interaction anxiety, which has a significant relationship with both social support perception and smartphone addiction, has a mediator effect, as this study confirmed. This result can be interpreted to mean that the preservice teachers' low social support perceptions affect their interaction anxiety, thereby increasing their smartphone addiction levels. In this case, preservice teachers' smartphone addiction is a result of their interaction anxiety, rather than a result of their social support perceptions.

The teaching profession requires particular knowledge and skills, and preservice teachers are expected to acquire them during their education. However, the results of the study show that physical and mental health as well as smartphone addiction negatively affect their academic performance. It should be considered that the frequency and level of smartphone use of preservice teachers being

trained for a profession that requires excellent communication and social interaction skills may also have the risk of turning into a source of problems in their profession.

Based on the results of this study, the researchers recommend:

1) Providing preservice teachers with seminars regarding self-regulation can be beneficial in smartphone use and time management.

2) Preservice teachers should be informed about the physical and psychological effects of smartphone use.

3) Activities such as anxiolytic or preventive therapy should be held individually or collectively for preservice teachers with interaction anxiety.

4) Preservice teachers should be helped to form supportive environments. When needed, activities such as peer guidance, group activities and orientations should be organized.

5) With activities to be carried out during the learning process, preservice teachers should establish good relationships with their immediate environment (family and relatives) and their social environments (friends and activity groups), and these relationships will reduce their interaction anxiety.

References

Al-Barashdi, H. S., Bouazza, A., & Jabur, N. H. (2015). Smartphone addiction among university undergraduates: a literature review. *Journal of Scientific Research & Reports, 4*(3), 210-225.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C: American Psychiatric Association.

Baltacı, Ö. (2010). *Üniversite öğrencilerinin sosyal kaygı, sosyal destek ve problem çözme yaklaşımları arasındaki ilişkinin incelenmesi*. *[Examining the relationship between university students' social anxiety, social support and problem-solving approach]*. (Unpublished Master Thesis), Selçuk University, Institute of Educational Sciences, Konya.

Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior, 8*(1), 39-51.

Can, A. (2014). *SPSS ile bilimsel araştırma sürecinde veri analizi [Data analysis in scientific research process with SPSS]*. Ankara: Pegem Academy Publishing.

Cohen, S., & Wills, T. A. (1985). Stres, social support and the buffering hypothesis. *Psyhological Bulletin, 98*(2), 310-357.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. New York, NY, US: Routledge/Taylor & Francis Group.

Coşkun, H. (2009). Etkileşim kaygısı ölçeği: geçerlik ve güvenirlik çalışması [Interaction anxiety scale: validity and reliability study]. *Türk Psikoloji Yazıları [Turkish Psychological Articles], 12*(23), 41-49.

Çakır, Ö., & Oğuz, E. (2017). Lise öğrencilerinin yalnızlık düzeyleri ile akıllı telefon bağımlılığı arasındaki ilişki [The correlation between high school students' loneliness levels and smart phone addiction]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi [Mersin University Journal of the Faculty of Education], 31*(1), 418-429.

Çokluk, Ö., Şekercioğlu, G. & Büyüköztürk, Ş. (2012). *Sosyal bilimler için çok değişkenli istatistik SPSS ve LISREL uygulamaları [SPSS and LISREL applications of multivariate statistics for social sciences]*. Ankara: Pegem Academy Publishing.

Demirci, K., Akgönül, M., & Akpinar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of behavioral addictions, 4*(2), 85-92.

Eker, D., Arkar, H. & Yaldız, H. (2001). Çok boyutlu algılanan sosyal destek ölçeğinin gözden geçirilmiş formunun faktör yapısı, geçerlik ve güvenirliği [Factorial structure, validity, and reliability of revised form of the multidimensional scale of perceived social support]. *Türk Psikoloji Yazıları [Turkish Psychological Articles], 12*(1), 17-25.

Elhai, J. D., Dvorak, R. D., Levine, J. C., & Hall, B. J. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *Journal of affective disorders, 207*, 251-259.

Field. A. (2005). *Discovering statistics using SPSS*. Londan: Sage Publications.

Fraenkel, J.R., & Wallen, N.E. (2003). *How to design and evaluate research in education*. New York: McGraw-Hill Companies, Inc.

Gökçearslan, Ş., Mumcu, F. K., Haşlaman, T., & Çevik, Y. D. (2016). Modelling smartphone addiction: The role of smartphone usage, self-regulation, general self-efficacy and cyberloafing in university students. *Computers in Human Behavior, 63*, 639-649.

Harwood, J., Dooley, J. J., Scott, A. J., & Joiner, R. (2014). Constantly connected–The effects of smart-devices on mental health. *Computers in Human Behavior, 34*, 267-272.

Heller, K., Swindle, R. W., & Dusenbury, L. (1986). Component social support processes: Comments and integration. *Journal of Consulting and Clinical Psychology, 54*(4), 466.

Huber, L. (2016). *The role of social support and self-concept in victimization and social anxiety in adolescence*. (Unpublished Master Thesis), Northern Illinois University, Dekalb.

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*(4), 599.

Hong, F. Y., Chiu, S. I., & Huang, D. H. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. *Computers in Human Behavior, 28*(6), 2152-2159.

Jacobsen, W. C., & Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavior, and Social Networking, 14*(5), 275-280.

Kahyaoğlu-Süt, H., Kurt, S., Uzal, Ö., & Özdilek, S. (2016). Efects of smartphone addiction level on social and educational life ın health sciences students. *Euras Journal Fam Med, 5*(1), 13-19.

Kardefelt-Winther, D., 2014. A conceptual and methodological critique of internet addiction research: towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351–354.

Kim, S. J., & Byrne, S. (2011). Conceptualizing personal web usage in work contexts: a preliminary framework. *Computers in Human Behavior, 27*, 2271-2283.

Kuyucu, M. (2017). Gençlerde akıllı telefon kullanımı ve akıllı telefon bağımlılığı sorunsalı: "akıllı telefon (kolik)" üniversite gençliği [Use of smart phone and problematic of smart phone addiction in young people: "smart phone (colic)" university youth]. *Global Media Journal: Turkish Edition, 7*(14), 328-359.

King, A. S., Valença, A. M., Silva, A. O., Baczynski, T., Carvalho, M. R., & Nardi, A. E. (2013). Nomophobia: dependency on virtual environments or social phobia? *Computers in Human Behavior, 29*(1), 140-144.

Kitamura, T., Kijima, N., Watanabe, K., Takezaki, Y., & Tanaka, E. (1999). Precedents of percieved social support: Personality and early life experiences. *Psychiatry and Clinical Neurosciences, 53*, 649-654.

Lee, Y. K., Chang, C. T., Lin, Y., & Cheng, Z. H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior, 31*, 373-383.

Lee, J., Cho, B., Kim, Y., & Noh, J. (2015). Smartphone addiction in university students and its implication for learning. In G. Chen, V. Kumar, Kinshuk, R. Huang, S.C. Kong (Eds), *Emerging issues in smart learning* (pp. 297-305). Berlin: Springer.

Lemon, J. (2002). Can we call behaviours addictive? *Clinical Psychologist, 6*, 44-49.

Noyan, C. O., Enez Darçın, A., Nurmedov, S., Yılmaz, O., & Dilbaz, N. (2015). Akıllı telefon bağımlılığı ölçeğinin kısa formunun üniversite öğrencilerinde Türkçe geçerlilik ve güvenilirlik çalışması [Validity and reliability of the Turkish version of the smartphone addiction scale-short version among university students]. *Anadolu Psikiyatri Dergisi [Anatolian Journal of Psychiatry], 16*(1), 73-81.

Park, W. (2005). Mobile phone addiction. *Mobile Communications, 31*, 253–272.

Park, N., & Lee, H. (2012). Social implications of smartphone use: Korean college students' smartphone use and psychological well-being. *Cyberpsychology, Behavior, and Social Networking, 15*(9), 491-497.

Rubin, K. H., Coplan, R. J., & Bowker, J. C. (2009). Social withdrawal in childhood. *Annual review of psychology, 60*, 141-171.

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior, 29(*6), 2632–2639.

Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior, 57*, 321-325.

Sapacz, M., Rockman, G., & Clark, J. (2016). Are we addicted to our cell phones? *Computers in Human Behavior, 57*, 153-159.

Seo, D. G., Park, Y., Kim, M. K., & Park, J. (2016). Mobile phone dependency and its impacts on adolescents' social and academic behaviors. *Computers in Human Behavior, 63*, 282-292.

Şar, A.H. (2013). Examination of loneliness and mobil phone addiction problem observed in teenagers from some variables. *The Journal of Academic Social Science Studies International Journal of Social Science, 6*(2). 1207-1220.

Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive personality and problematic mobile phone use. *CyberPsychology & Behavior, 12*(5), 501–507.

Tan, Ç., Pamuk, M., & Dönder, A. (2013). Loneliness and mobile phone. *Procedia-Social and Behavioral Sciences, 103*, 606-611.

Terzi, S. (2008). Üniversite öğrencilerinin psikolojik dayanıklılıkları ile algıladıkları sosyal destek arasındaki ilişki [The relationship between psychological hardiness and socıal support of university students]. *Türk Psikolojik Danısma ve Rehberlik Dergisi [Turkish Psycholohical Counseling and Guidance Assocation], 29*, 1-9.

Walsh, S. P., White, K. M., & Young, R. McD. (2007). Young and connected: psychological influences of mobile phone use amongst Australian youth. In G. Goggin and L. Hjorth (Eds.), *Proceedings Mobile Media 2007* (pp. 125-134). University of Sydney.

Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and individual differences, 30*(4), 669-689.

Yen, J. Y., Yen, C. F., Chen, C. S., Tang, T. C., & Ko, C. H. (2009). The association between adult ADHD symptoms and internet addiction among college students: the gender difference. *Cyberpsychology & Behavior, 12*(2), 187-191.

Yıldırım, İ. (1997). Algılanan sosyal destek ölçeğinin geliştirilmesi, güvenirliği ve geçerliği [The development, reliability and validity of the perceived social support scale]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi [Hacettepe UniversityJournal of Education], 13*(13), 81-87.

Yılmaz, G., Şar, A.H., & Şivan, S. (2015). Ergenlerde mobil telefon bağımlığı ile sosyal kaygı arasındaki ilişkinin incelenmesi [Investigation of Adolescent Mobile Phone Addiction by Social Anxiety Effect of Some Variable]. *Online Journal of Technology Addiction & Cyberbullying, 2*(2), 20-37.

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 77-94

Nesibe Aydın JEF

Interpersonal Communication Predispositions for Lifelong Learning: The Case of First Year Students

Article Type	Received Date	Accepted Date
Research	28.10.2017	07.08.2018

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Abstract

The idea that learning continues throughout life, and cannot be confined to a particular age or place is a fact. This has led to the argument that individuals need to be active agents of their own learning. This has caused learning to be viewed as an individual attainment, with little attention to the role of interpersonal communication in advancing lifelong learning skills. With an attempt to bridge this gap, this paper focused on 205 college students' and five professors' thoughts on the interplay between our communication with others and lifelong learning. Considering their views as well as literature on interpersonal communication and lifelong learning, a thirty-item scale with four sub-domains was developed: learning reciprocity, perseverance, engagement with instructors, and motivation. This scale was then used with a total of ninety-two of first year students on two communication courses in the UAE. Results revealed that the students' scores were above average, indicating their relatively developed predispositions for interpersonal communication supporting lifelong learning. The project-based nature of the courses the students were registered in was thought to influence students' scores. Results are discussed, and recommendations are made for both classroom instruction and future research.

Keywords: Interpersonal communication, lifelong learning, first year students, project-based learning.

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Yaşam Boyu Öğrenme için Kişilerarası İletişim Eğilimleri: Birinci Sınıf Öğrencileri Örneği

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	28.10.2017	07.08.2018

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Öz

Öğrenme yaşam boyu sürer ve belirli bir yaş ile sınırlandırılamaz. Bu durum bireylerin öğrenme süreçlerinde aktif bir rol üstlenmesi gerektiğine yönelik görüşlerin ağırlık kazanmasına neden olmuştur. Ancak bu görüş aynı zamanda, öğrenmenin temel olarak bireysel bir girişim olduğu düşüncesine yol açmıştır. Yaşam boyu öğrenme becerilerinin geliştirilmesinde kişilerarası iletişimin rolüne yeterince ilgi gösterilmemiştir. Bu araştırma yaşam boyu öğrenme ve diğer insanlarla iletişimimiz arasındaki ilişkinin doğasını belirlemek üzere yürütülmüştür. Bu amaçla ilgili alanyazın incelenmiş, 205 üniversite öğrencisi ve beş öğretim görevlisinin görüşleri alınarak 30 maddelik bir ölçek geliştirilmiştir. Bu ölçek 'karşılıklı öğrenme', 'sebatkarlık', 'eğitmenlerle etkileşim' ve 'güdülenme' olarak isimlendirilmiş dört alt alandan oluşmuştur. Geliştirilmiş olan ölçek Birleşik Arap Emirlikleri'ndeki bir üniversitede iletişim dersleri alan 92 birinci sınıf öğrencisine uygulanmıştır. Sonuçlar öğrenci puanlarının ortalamanın biraz üzerinde olduğunu göstermiştir. Bu sonuç öğrencilerin yaşam boyu öğrenmelerini destekleyeci türden kişilerarası iletişim eğilimlerinin nispeten gelişmiş olduğuna işaret etmektedir. Öğrencilerin aldıkları iletişim dersinin proje-temelli doğası bunun temel nedeni olarak değerlendirilmektedir. Sonuçlar tartışılmakta ve gerek eğitim gerekse gelecekteki araştırmalara yönelik önerilerde bulunulmaktadır.

Anahtar Sözcükler: Kişilerarası iletişim, yaşam boyu öğrenme, birinci sınıf öğrencileri, proje-temelli öğrenme.

Introduction

Defined as "the development of human potential through a continuously supportive process which stimulates and empowers individuals to *acquire* all the knowledge, values, skills, and understanding they will require throughout their lifetimes and to apply them with confidence, creativity, and enjoyment in all roles, circumstances, and environments" (Longworth & Davies, 2013, p. 22), lifelong learning (LLL) has now become the guiding principle for many education planners, practitioners, and learners. LLL puts individual members of society at the center of attention. To help them meet various needs, individuals are provided with continuous support in the form of specially trained professionals, a welcoming and sympathetic attitude, and an appropriate learning infrastructure (Longworth & Davies, 2013). Its aim is to "provide people of all ages with equal and open access to high-quality learning opportunities and to a variety of learning experiences" both "inside and outside formal education and training systems" (OECD, 2004, p. 126).

The emphasis on the individual learner indicates that "it is the individual who makes the decision, the individual who will make the effort, and the individual who will benefit from the learning process" (Longworth & Davies, 2013, p. 23). Although this view underscores the role of learner-centered approach, it may overlook the social nature of learning that points to communication dynamics playing a significant role in the manifestation of learning needs and how these needs are addressed through interaction with others. A "learner-centered approach" devoid of adequate attention to interpersonal aspects of the learning process may result in the individuals' "alienation within the learning environment from other learners and the reproduction of the alienated relationships within the wider social formation," and "[t]he practices … developed to meet the needs of individuals reinforce the identity of persons as separate from one another" (Edwards, 2001, p. 43). To reduce any likelihood of this, the social context in which the individual learner is situated needs to be taken into consideration with a view towards individuals having an effect on each other's aptitude for lifelong learning.

Despite the spate of interest in learner-centered approaches in lifelong learning, it seems that there is a lack of literature on the role of interpersonal communication in promoting lifelong learning. To this end, this research aims to identify individuals' attitudes towards interpersonal communication in the learning and teaching environment as a key indicator of current and future engagement in lifelong learning. It is essential to understand how a person's engagement in interpersonal communication affects his/her success in lifelong learning. It is also important to identify the ways in which individuals' learning and communication orientations affect others' lifelong learning experiences. Considering this, the impetus for this research comes from a philosophical view of social interaction defined as "the process whereby the overt movements, covert deliberations, and basic physiology of one individual influences those of others, and vice versa" (Turner, 1988, p. 13), and the social constructivist view of learning that "the locus of knowledge [resides not] in the individual but in socially constructed products yielded through the interaction of individuals in their social context" (Devos, 2016, p. 48).

Research Questions

With the importance placed on interpersonal relationships for lifelong learning, in this research I aimed to answer the following questions.

1) What is the level of first year students' interpersonal communication predispositions for lifelong learning?

2) Does gender play a role in their interpersonal communication predispositions for lifelong learning scores?

3) Do the courses students take play a role in their interpersonal communication predispositions for lifelong learning scores?

Literature Review

Lifelong Learning

There are a variety of definitions of lifelong learning; one of which is given above. The definitions are influenced by the philosophical approach adopted. From the existential perspective, Jarvis (2009) defines it as "the process of transforming experience into knowledge and skills, etc., resulting in a changed person–one who has grown and developed as a result of the learning" (p. 11). This definition, according to Jarvis, suggests that learning is essential for the growth and development of a person who is functioning as a useful member of society.

Titmus (1989, p. 548) states the concept of lifelong learning derives;

> … from the concept that education is not a once-for-all experience that is confined to an initial cycle of continuous education commenced in childhood, but a process that should continue throughout life. Life itself is a continuous learning process, but each person needs specific opportunities for continuing, purposive and sequential learning in order that he or she may keep abreast of technical and social change, may equip himself or herself for changes in his or her own circumstances…

Although the term "lifelong learning" has become a catchphrase in European initiatives over the last half a century, its foundations can be found in much earlier times. Gelpi (cited in Matheson & Matheson, 1996, p. 220) warns that "the concept and practice of lifelong learning belongs to the world history of education and cannot be confined only to the culture of one country or a single period of history." Philosophers like Socrates, Plato, and Aristotle, who underscored the importance of cultivating intellectually advanced individuals through efficient use and training of the mind, argued that learning spans our life cycle (Lewis, 1981). On the other hand, Confucius pointed to the significance of such an approach to learning by saying that "[L]ife is limited, while learning is limitless" (Guo-Dong, 1994, p. 272).

In line with Jarvis's definition above, the early foundations of the term emphasized the humanistic approach to learning which underscores the role of learning and education in enhancing personal growth and development, facilitating self-actualization, and supporting the development of those that are open to change and continued learning (Kumar, 2012). However, it is argued that the notion of lifelong learning and lifelong education, in a world that is often defined in economic terms, differs greatly from that of its early supporters (Matheson & Matheson, 1996). The heavy emphasis put on the regulation of employment by organizations such as the World Bank and the Organisation for Economic Co-operation and Development (OECD) encourages individuals and organizations to approach lifelong learning from purely economic perspectives at the expense of personal fulfillment and democratic empowerment (Sayılan, 2015; Edwards & Stimpson, 2003).

Lifelong learning requires learners to acquire certain skills. Approaching the topic from the perspective of information literacy, Gilton (2012) states that "lifelong learners can informally educate themselves through self-teaching or consulting with experts, take advantage of institutions promoting formal learning, … or pursue more formal education" (p.67). Similarly, Duman (2007) sees "knowledge literacy" as a prerequisite for lifelong learning. He states that people with knowledge literacy skills know what knowledge they need and how they can obtain it. They also evaluate the usefulness and accuracy of sources and organize different kinds of information in order to use it purposefully.

For university students to pursue learning as a lifelong endeavor, they are expected to exhibit the following abilities (Dunne, 1999, p. 131):

a) setting realistic and personally meaningful learning goals,

b) identifying and using appropriate resources to help them achieve their goals,

c) having well-developed reading, writing and study strategies,

d) having effective information retrieval and selection skills,

e) using computer and information technology appropriately,

f) plan and monitor learning and adapt strategies if needed,

g) reflecting on and evaluating the outcomes of learning, and

h) recognizing and dealing effectively with obstacles to learning.

On the other hand, Jarvinen (1998) draws attention to the role of lifelong learning inside the workplace and specifies "high-level communication," "team learning," "network learning," "perspective sharing," "knowledge conversion," and "reflective practice" as among key lifelong skills.

Interpersonal Communication

Sarvaiya (2013) notes that humans have both biological and social needs to live in a society where they communicate with others. He points out that the former stems from the necessity of addressing needs like food, safety, and sex which require social cooperation. The latter, on the other hand, is related to our mental growth and psychological need for belongingness, which is only possible through communication with others. This deep-seated need to communicate with others helps with the development of self and contributes to the value of our existence (Hargie, 2016). Together, these point to the role of communication with others, i.e. interpersonal communication, throughout our lives. A simple definition of interpersonal communication is "communication that occurs between people and creates a bond between them" (Solomon & Theiss, 2013, p. 5). This highlights the importance of how it connects people. It also gives an indication of how our actions affect and reflect others' actions and how personal qualities influence interaction dynamics (Solomon & Theiss, 2013). This also shows that interpersonal communication is not simply information transmission between people, but rather the way in which meanings, identity, and relationships are created and negotiated through social interaction (Braithwaite, Schrodt & Carr, 2015).

There are a variety of skills one needs to acquire in order to be a skillful interpersonal communicator. One of these is the skill of self-awareness, which can be defined as "the extent to which [people] accurately know [themselves]" (Alusine & Kanu, 2011, p. 66). It involves awareness and acceptance of our thoughts, beliefs, biases, prejudices, behaviours, and values (Berman, Kozier & Erb, 2015). Those who are not aware of their feelings and reactions cannot communicate them to another person, and those who do not accept their feelings and reactions will try to hide them (Johnson, 1978), which reduces the quality of their interpersonal communication. On the other hand, awareness and acceptance of them will help reinforce positive feelings and thoughts and mitigate negative ones. This will also help one to empathize with others. Self-awareness is facilitated by reflective thinking, which is defined by Dewey (1933) as "the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration" (p. 3). Individuals that are engaged in introspection through reflective thinking become aware of their own as well as others' thoughts, feelings, and beliefs and how these are influenced by their experiences. Reflective thinking encourages people to use higher-order thinking skills and facilitates self-directed learning (Lewittes, 2009).

Effective listening, also known as active listening, is the third interpersonal communication skill. Williams (n.d.) defines effective listening as "actively absorbing the information given to you by a speaker, showing that you are listening and interested, and providing feedback to the speaker so that he or she knows the message was received" (para. 5). Williams also notes that effective listening requires choosing the right words and nonverbal cues when conveying a message so that those involved in communication will interpret it in the way intended. The common understanding created thanks to effective listening motivates both parties and reduces the likelihood of conflicts.

Nonverbal communication is another skill required for effective interpersonal communication. It is estimated that 93% of all meaning is nonverbal (Burgoon, Guerrero & Floyd, 2016). This makes the role of nonverbal communication evident in interpersonal communication. Anderson (2009) identifies a variety of ways in which nonverbal communication can be channeled. One of these is "physical appearance," which includes body type, clothing style, age, height, etc., that create impressions and determine how relationships develop. Another one is "kinesics." This is related to facial expressions,

posture, gestures, and interactional synchrony, the effective use of which facilitates interpersonal communication. "Oculesics," on the other hand, is related to eye contact, which determines the degree to which the listener is involved in the conversation.

Interpersonal communication predispositions have a vital role to play in educational settings. There is empirical evidence indicating that students' academic self-perceptions, school engagement, motivation, and performance are positively correlated with the quality of relationships with their teachers and peers (Furrer, Skinner & Pitzer, 2014). A positive interpersonal relationship between a teacher and student has a favorable effect on a student's academic and non-academic adaptation to school (Martin & Collie, 2016). First year students' well-being has also been identified to be positively affected by the relationship students established through extracurricular activities organized to develop their interpersonal skills by expanding their circle of friends and ways of interaction with faculty (Deveci & Nader, 2017).

On the other hand, effective listening as "the primary channel of instruction at all levels" (Duck & McMahan, 2017), will undoubtedly increase students' understanding of the subject matter. It is also a key factor in developing relationships between students and their instructors and between students and their academic advisors (Duck & McMahan, 2017). Students also need to display social skills to effectively work and cooperate with each other. Attentive listening as a social skill enables them to understand each other's points of view, feelings, and needs (Canter, 2006). Skillful users of nonverbal communication, on the other hand, are better at initiating, developing, and maintaining positive relationships with their classmates as well as their teachers (Davis, 2001). Taken together, these point to the role of interpersonal communication tendencies in determining students' academic success and overall well-being.

Role of Interpersonal Communication in Lifelong Learning

Although the need for interpersonal communication is innate, interpersonal communication skills are acquired and can be enhanced throughout life. In our technology-rich world where constant interaction with people from different backgrounds and cultures has become the norm, this requires a lifelong learning approach to interpersonal communication. Therefore, interpersonal communication and lifelong learning cannot be divorced from each other. That is, interpersonal communication plays multiple roles in facilitating lifelong learning endeavors, which also causes lifelong learners to communicate interpersonally. In the workplace, for instance, there is now more empirical evidence that interpersonal relationships with co-workers and supervisors ease individuals' efforts to keep themselves up-to-date (Head, 2016). In school contexts, students' lifelong learning skills at meta-cognitive level are supported through the use of peer reviews. Students are able to evaluate, monitor, and improve their own work more successfully when they engage in effective analysis of their peers' work and give them feedback (Ambrose, Bridges, Dipetro, Lovett & Norman, 2010). In this way, the unique life experience of each student in the classroom becomes a learning source from which their peers can benefit. Such a student-centered approach to learning avoids instructor-controlled expositions in favor of active learning and allows for individual and team-based activities that incorporate meaningful and relevant, open-ended problems through which students can create, acquire, and connect (Brandt & Dimmitt, 2015). It also allows for active learning opportunities, which help build positive teacher-student relationships, facilitating instructors' attempts to introduce forms of teaching and learning that involve active student participation (Kember & Leung, 2005). Active learning also involves students in learning activities built around communication with others. This gives them the chance to practice a variety of interpersonal communication skills. One of these is the skill of conflict resolution, which they use to persevere in the face of challenges. That is, students need to learn how to best tackle issues that appear when working with others, channeling their energy toward positive outcomes. Successful results will undoubtedly increase everyone's self-confidence and improve relationships in the learning context. Taken together, they will play a positive role in making learning meaningful and long-lasting as well as contribute to the individuals' development of lifelong learning skills.

The role of interpersonal communication is also evident in official documents prepared by international organizations. One of these is the European Commission that identified eight "key competences" in their reference framework for lifelong learning in 2005.

The first competence, communication in the mother tongue, points to the significance of interpersonal communication by noting that individuals need to be able to "interact linguistically in an appropriate way in the full range of societal and cultural contexts — education and training, work, home, and leisure," for which they need to acquire the skill of "communicat[ing] in oral and written forms in a variety of communicative situations and to monitor and adapt their own communication to the requirements of the situation," and "a positive attitude towards… interaction with others" (p. 13). On the other hand, the second competence is related to communication in foreign languages and involves "sharing the main skill dimensions of communication in the mother tongue: it is based on the ability to understand, express and interpret thoughts, feelings, and facts in both oral and written form (listening, speaking, reading, and writing) in an appropriate range of societal contexts — work, home, leisure, education, and training — according to one's wants or needs" (p. 3).

The third competence is related to science and technology and requires individuals to acquire and apply knowledge and methodology to address society's needs, in which they need to act as responsible citizens. The fourth competence concerns digital competence, which is related to interpersonal communication through the use of an individual's skills in communicating and participating in collaborative networks via the Internet.

On the other hand, the fifth competence of learning to learn underscores the importance of interpersonal communication skills since individuals are expected to "organize their own learning … through effective management of time and information, both individually and in groups," which requires them to "share what they have learnt … and to seek advice, information, and support when appropriate" (p. 15). This is a corollary to the sixth competence related to interpersonal, intercultural, and social competences that "cover all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life, and particularly in increasingly diverse societies, and to resolve conflict where necessary" (p. 16). For this to happen, people as lifelong learners need to raise their awareness of the codes of conduct and manners in different contexts. They also need to engage in constructive communication, understand different perspectives, and negotiate effectively through use of empathy.

The sixth competence, entrepreneurship, also points to the role of interpersonal communication by identifying essential project management skills that include communicating, de-briefing, and working collaboratively in teams. Finally, the last competence, cultural expression, highlights the significance of being able to "relate one's own creative and expressive points of views to the opinions of others" (p. 18).

Collectively, it is evident that none of the competences acts in isolation from each other: they are interdependent and support individuals' efforts to become lifelong learners. It is also important to note that knowledge of these competences per se is not sufficient for learning to be meaningful. They need to be put into practice at both individual and interpersonal levels. Considering the social nature of humans, it is essential that individuals relate to others in their pursuit of engaging in learning activities throughout their lives.

My Research Context: Lifelong Learning and Interpersonal Communication in Engineering

This research was conducted in the context of the Petroleum Institute (PI)[1] in Abu Dhabi, which is a university offering degrees in various engineering disciplines such as Petroleum Geosciences, Electrical Engineering, and Mechanical Engineering. Accredited by the Accreditation Board for Engineering and Technology (ABET), the university aims to instill lifelong learning skills in its students. The third ABET criterion entails that engineering students have "recognition of the need for and an ability to engage in lifelong learning" (2014, p. 3). Considering the pace at which technology

[1] PI has recently been merged with two other higher education institutions. The name of the new university is Khalifa University of Science and Technology (KUST).

advances and its effects on engineering students' employability after graduation (Deveci, 2014), the significance of this criterion becomes self-evident. It is important for practicing engineers to "learn to treat their professional skills as a dynamic project that needs continuous upkeep and upgrading" (DiDomenico, 2010). To help achieve this, Bowman (1997) suggests that individual engineers should have a lifelong learning plan reflecting their career aspirations. They should regularly update their plans and engage in interpersonal communication with their employers and colleagues about their plans. He also suggests that educational institutions should establish lifelong learning programs that include courses specifically designed for engineers that graduated ten or more years ago or for those planning career changes.

ABET's third criterion states that engineering students need to have "an ability to communicate effectively" and to "function on multidisciplinary teams" (2014, p. 3), both of which point to the significance of interpersonal communication skills in engineering disciplines. In addition to written communication skills related to technical reports, feasibility studies, and emails, engineers need to be efficient users of oral communication skills which are necessary for face-to-face communication, telephone usage, formal presentations (Tenopir & King, 2004), as well as digital communication venues such as social media (Patil & Eijman, 2012). They also need to have entrepreneurial skills that help them interact with and operate business ventures (Riemer, 2007), which is identified as one of the essential competences for lifelong learning by the European Council (2005).

It has also been noted that engineers in various disciplines such as Materials Design may face cross-category issues that would only be possible to solve through collaboration with engineers in other disciplines (Özturk, Deveci, Günister & Simmons, 2015). Although communication skills like negotiating will be useful in these situations, engineers from different disciplines working on the same project need to be able to "function on multidisciplinary teams" (ABET, 2014). For this to happen, team members need to be open to sharing roles and responsibilities, trust in each other's competencies, and be tolerant and accepting of different perspectives (Roncaglia, 2016). As such, "the success… does not just depend on good designs and architectures, bu[t] also on the socialization of team members across each project/design and interactions between team and team members to communicate lessons learned" (Crowder, Carbone & Demijohn, 2016, p. 31).

Method

There were two phases of data collection for this study. The first phase included the development of the data collection tool, while the second phase included a small-scale study in which the instrument was used to determine the students' level of interpersonal communication predispositions for lifelong learning. Hence, this section is divided into two subsections describing each stage in detail.

Phase 1: Development of the Data Collection Tool

To collect data for the purposes of this study, I developed the Scale of Interpersonal Communication Predispositions for Lifelong Learning (SICP-LLL). This took several stages. First I reviewed the literature on both interpersonal communication and lifelong learning. In doing so, I paid close attention to earlier research that investigated lifelong learning skills (e.g. Erdoğan & Arsal, 2016; Coşkun & Demirel, 2012; Uzunboylu & Hürsen, 2011), and research that investigated interpersonal communication skills (e.g. Korkut-Owen & Bugay, 2014; Bienvenue, 1971). This helped me identify the themes relating to the use of interpersonal communication predispositions for lifelong learning. The accuracy of the themes was checked with two other specialists in the field of lifelong learning and three other scholars specialized in communication studies. The same team of specialists reviewed the pool of 40 statements reflecting the sub-themes for content validity. Out of this number, a total of 35 items were unanimously agreed upon and included in the initial scale. During the pilot study of the scale with a group of 40 students, the number of items was reduced to 30. I also adjusted the wording of certain statements for students' ease of comprehension. (See Appendix).

This new version of the scale was administered to 205 randomly chosen students, comprised of 25 (12%) foundation students, 158 (77%) undergraduate students, and 22 (11%) graduate students. Exploratory factor analysis and was conducted using the SPSSS 20 packet program. The students'

ages varied between 17 and 42, with a mean age of 20. While 76 (37%) of them were male, 129 (63%) of them were female.

In analyzing the data from the above-mentioned student population, I used the rotation method Oblimin with Kaiser Normalization. I also conducted Kaiser-Meyer-Olkin (KMO) and Barlett's test of sphericity (BTS). A KMO value of .812 > .60 together with a BTS value of 1511.29 (df=435, p=.000) indicated that SICP -LLL was suitable for factor analysis. A KMO value above .5 has been established to be acceptable (Kaiser, 1974). Using the data set, I extracted a fixed number of four factors in accordance with the themes identified during the literature review phase. I excluded the factors with low loading (.30 or less), and the factor loading resulted in a total number of 30 items (Learning reciprocity=12; Perseverance=7; Engagement with instructors=5; Motivation=6). Item 15 ("I don't give up easily in the face of a learning problem caused by other people") loaded on both factor 1 and factor 2 (.491 and .302). However, considering the literature on an individual's persistence in pursuing their learning goals when they are faced with difficulties (Deveci, 2013; Coşkun & Demirel, 2012; Rovai, 2003), I decied that this item should be retained under the second factor *perseverance* "with the assumption that it is the latent nature of the variable" (Yong & Pearce, 2013, p. 84). Also, the Cronbach Alpha for the whole scale was found to be .85, and it was .78 for learning reciprocity, .74 for perseverance, .72 for engagement with instructors, and .70 for motivation. Taken together, these indicate that SICP -LLL is a reliable instrument.

The SICP-LLL uses a 5-point Likert-type scale with responses to items ranging from 5, "completely agree," to 1, "completely disagree." Some statements are negatively worded, requiring reverse scoring. The highest, the lowest, and the average scores that can be attained for the whole scale as well as the subscales can be seen in Table 1.

Table 1

SICP - LLL Score Range

	N	Min	Max	$\bar{x}$
Engagement with instructors	5	5	25	12.5
Motivation	6	6	30	15
Perseverance	7	7	35	17.5
Learning reciprocity	12	12	60	30
Scale as a whole	30	30	150	75

Phase 2: Use of SICP-LLL

I used the newly developed SICP-LLL to determine first year students' interpersonal communication predispositions for lifelong learning in the context of the Communication Department at PI. A total of 92 students participated in this phase of the study. The sampling technique was based on the convenience model. Of the students, 27 (29%) were male, and 65 (71%) were female. Their ages ranged from 17 to 23, with a mean age of 19.

Twenty-seven (29%) were from COMM101, and 65 (71%) were from COMM151. Both courses are based on Project-based Learning (PbL). The former is a prerequisite for the latter, and it teaches students the fundamental language and communication skills that are required for successful undergraduate study. Students are assigned project topics related to various communication theories as well as other skill areas such as time-management skills and healthy student life. The latter, on the other hand, builds on knowledge and skills learned in COMM101, and teaches students more advanced academic literacy skills through their engagement in projects centered upon technical topics of general interest. These include topics such as energy consumption, and campus design.

The Cronbach Alpha computed for the scale was found to be .80. Student's t-test was used to determine the statistical significance level when comparing the data sets according to gender and course variables. A p-value of lower than .05 was considered statistically significant.

Results

The first research question aimed to identify first year students' interpersonal communication predispositions for lifelong learning, while the second one concerned the effect of gender on students' scores. The results of the data analysis for these questions can be seen in Table 2.

Table 2

Students' SICP-LLL Scores

	Student scores N=92				Male participants' scores N=27				Female participants' scores N=65					
	Min	Max	x̄	SD	Min	Max	x̄	SD	Min	Max	x̄	SD	t	p
Engagement with instructors	9	23	16	3	13	23	17	2	9	22	14	3	.8609	.1958
Motivation	13	29	21	3	15	29	21	3	13	28	21	3	.3786	.3529
Perseverance	15	32	24	3	19	32	26	4	15	32	25	3	.9014	.1842
Learning reciprocity	31	57	44	5	37	57	46	6	31	57	46	5	.1664	.4341
Scale as a whole	87	134	109	10	90	134	110	11	87	127	108	9	-.7614	.2241

As is seen in Table 2, the students' SICP-LLL scores varied between 87 and 134, with an average score of 109. This is above the mid-range of 75 computed for the scale, and therefore indicates students' moderate interpersonal communications predisposition for lifelong learning. The average score suggests that the students had some predispositions for interpersonal communication for lifelong learning. When the subscales are considered, it is seen that their average score was the highest for learning reciprocity, indicating that they valued the relationships of those whose assistance they can use to learn or of those they can assist in learning. It also suggests that they paid attention to other learners' communication styles when working together. They seemed to have an overall positive attitude towards learning interactions with others. The students' average scores for perseverance and motivation were also higher than the average score computed for the scale. Taken together, these indicate that the students were relatively strong in their aptitude for sustaining motivation and determination for learning when confronted with interpersonal challenges. They also seemed to be somewhat open to dialogue with their peers about their learning. On the other hand, their slightly above average score for engagement with instructors indicates that the students were likely to engage in conversation with their instructors about their learning without compulsion. They were likely to take the initiative to seek knowledge from their instructors in and outside of the classroom. This average score also indicates that they do see the rationale for the instructor's use of pair and group-work activities that lend themselves to use of interpersonal communication skills for lifelong learning.

Table 2 also shows that the male students' overall average score was minimally higher than that of the female students (110 vs. 108); however, the difference was not at a statistically significant level ($p=.2241 > .05$). When the subscales are considered, it is seen that the female and the male students received the same average score for learning reciprocity and motivation. This indicates that gender did not make a difference in terms of the students' skills of sharing and learning with their peers and their interest in working with others in their quest for making learning a lifelong endeavor. However, the male students' score for engagement with instructors was slightly higher than that of the female students (17 vs. 14). Their scores for perseverance, on the other hand, were almost the same (26 vs. 25). This data indicate that the male students might be slightly more skilled in their interaction with instructors on learning-related topics. However, the lack of statistically significant differences between the data sets indicate that these differences were only negligible.

The third research question asked whether the students' scores were affected by the courses they took. The results are seen in Table 3.

Table 3

Students' SICP-LLL Scores according to Courses

Subscales	COMM101 participants' scores N=27				COMM151 participants' scores N=65					
	Min	Max	x̄	SD	Min	Max	x̄	SD	t	p
Engagement with instructors	9	23	17	3	9	22	17	3	-.5496	.2919
Motivation	17	29	21	3	13	28	21	3	-.7885	.2162
Perseverance	19	31	25	4	15	32	25	3	-.3487	.3640
Learning reciprocity	35	57	46	6	31	57	46	5	.3483	.3642
Scale as a whole	91	134	109	11	87	127	108	10	.3179	.3756

It is seen in Table 3 that the COMM101 students' SICP-LLL scores were minimally higher than that of the COMM151 students (109 vs. 108). However, the difference was not at a statistically significant level ($p=.3756 > .05$). Table 4 also shows that the average scores for the subscales were the same, further indicating that the type of course was not a factor affecting students' interpersonal communication predispositions for lifelong learning.

Discussion

My main motivation for this study came from the fact that interpersonal communication is an integral part of learning throughout life, making it an essential skill for individuals to be effective lifelong learners. This study identified four main interpersonal communication domains in which lifelong learning predispositions play a key role. One of these is "learning reciprocity," which includes lifelong learning skills such as displaying a genuine interest in engaging in a dialogue with others concerning learning as well as adapting communication styles according to other learners' characteristics and learning needs. These are particularly important for learning to continue through life. Being receptive to others' contributions to our learning is an important attribute. However, it is equally important to be willing to share with others and support their learning. The main reasons for this are the social nature of humans, who do not live in isolation from each other, and the fact that our learning is often shaped by our exposure to knowledge held by others. Interpersonal communication skills facilitate the process of acquiring information and knowledge and using them constructively at both individual and interpersonal levels. Enhanced relationships with others allow learners to become aware of both their own and others' identities and learning needs as well as learning strengths and weaknesses. This encourages them to take responsibility for each others' learning. It is also important to consider the fact that much of work life in our modern world is based on relationships with others, be it direct or indirect. Considering the observation that employees often consult their co-workers and supervisors in their efforts to keep themselves up-to-date with the ever-changing mandates of occupations (Head, 2016), the role of interpersonal communication skills in learning throughout life becomes more evident. All in all, these point to the interpersonal, intercultural, and social competences that assist "individuals [in] participat[ing] in an effective and constructive way in social and working life, and particularly in increasingly diverse societies" (the European Commission, 2005, p. 16).

The second interpersonal communication domain requiring lifelong learning skills is "perseverance." It includes a variety of skills such as maintaining motivation for learning in the face of challenges with others and aptitude for using different communication methods to acquire the information and knowledge that others have. Considering perseverance skills in relation to learners' communication with others is important since relationships with others can have a determining effect on one's learning aptitude, especially those who have not developed a strong self-efficacy. There is

empirical evidence showing that positive feedback given to learners promotes positive self-perceptions (Burnett, 1999) while negative feedback reduces the chances of improving student behaviors (Weeden & Winter, 1999). Nonetheless, learning experiences throughout life will put individuals in contact with others whose feedback cannot be manipulated. They will have both positive and negative feedback and work with difficult people. In fact, it may be themselves who create challenges for others. In either case, a successful lifelong learner needs to be aware of difficulties and tackle them successfully. This may require them to be mindful of their remarks on others' performances, or be tolerant towards the feedback they receive, and persevere in the face of challenges.

The third interpersonal communication domain identified in this study is related to learners' engagement with their instructors. "The length and quality of the education at schools assume a critical role for the ability and motivation which are targeted at prospective learning situations" which requires "[a] strategy of lifelong learning [during] school years" (Demirel, 2009, p. 1709). Students' interaction with their instructors during the school years have a serious impact on students' lifelong learning skills. Positive relationships established between instructors and students allow for active learning experiences (Kember & Leung, 2005), requiring students to be efficient communicators. This current study has identified that the lifelong learning skills related to interaction with instructors include learners' initiatives to reach out for help and their interest in understanding instructional activities designed by the instructor. In this way, students that possess lifelong interpersonal communication skills increase their metacognition, and engage in dialogue with their instructors. This increases their understanding of content matter and helps them learn new ways of obtaining knowledge. Research shows that students' interaction with their instructors in their roles as an advisor contributes to students' sense of belonging to their institution and increases their problem-solving skills (Deveci & Ayish, 2017).

The final interpersonal communication domain identified in order to determine lifelong learning skills is "motivation." It involves learners' enthusiasm for collaborating with others for learning purposes. Students with this attitude are also interested in learning about how others prefer to learn. This helps them learn about different learning styles and strategies. This is in line with previous research findings indicating that students interacting with each other learn from others, make connections more easily, consolidate new ideas, and view topics from multiple perspectives which increases their critical thinking skills (Hurst, Wallace & Nixon, 2013).

Students' interest in how other students like to learn also allows them to adjust social learning experiences according to the preferences of others. This domain also includes students' motivation to have others' contributions when setting learning goals. Sharing goals with other learners not only increases motivation and accountability, but it also invites assistance from others (Reilly, 2008), which lends credence to the European Commission's (2005) lifelong learning competence of "seeking advice, information, and support when appropriate" (p. 15). Collectively, these skills allow students to generate intrinsic motivation for lifelong learning through relationships with others.

The results of this study related to first year students' interpersonal communication predispositions for lifelong learning are also important. The results showed that the students' average score was 109, with a 34-point difference from the mid-score (75) computed for the scale. Considering the fact that the students were only in their first year of college education, this could be a very promising result. The nature of the project-based courses in the Communication Department provides a strong indication of the reasons for the students' comparatively higher SICP-LLL scores. Both of the courses engage students in continuous teamwork activities, requiring them to use a variety of interpersonal communication skills. These courses' endorsement of independent learning supported by peers is highly likely to impact their SICP-LLL scores. This finding is supported by previous research which investigated the positive effects on interpersonal communication skills of experiential learning through group work (Skinner, Hyde, McPherson & Simpson, 2016). Although this study did not deal with group work learning activities in the given experiential learning environment, it does point to the potential influence of enhanced interpersonal skills on students' lifelong learning propensities. The authors note that experiential learning experience with a focus on interpersonal communication sharpens students' analytical skills, and develops their ability to plan their work, and

therefore increases students' confidence in their independent learning skills. Taken together, these will help them in acquiring the qualities of an efficient lifelong learner. In this way, students will become "better prepared … in terms of self-improvement, critical thinking, and problem-handling" (Skinner et al., 2016, p. 26), which is of great importance when they face challenges in their work and daily lives at and beyond college.

The findings of this research related to the gender variable is also worth noting. The lack of a statistically significant difference between the male and female students suggests that they have a relatively similar aptitude for interpersonal communication for lifelong learning. In another study conducted on students' interpersonal communication propensities in the same institution, the male and female students were found to have similar average scores (Deveci & Ayish, 2018). These findings are particularly important considering the university's plan to switch to co-education. At present, PI students have their education on gender-segregated campuses. However, as of the 2017-2018 academic year, the new intake will receive co-education, and the existing students will be given the option to choose between the two. The finding on students' SICP-LLL scores in this study may indicate a comparatively easier transition if the participants of this study opt for co-education. However, it is also important to note the finding that the male students had slightly higher scores than the female students for the subscale of engagement with instructors. One possible reason for this result may be related to the cultural orientations of the region in which this study was undertaken. That is, the Arab culture normally limits the interaction between males and females. If the female students in this study had male instructors at the time, they may have felt less comfortable in engaging in a dialogue with their instructors outside of class hours. This may have also had a negative impact on their incentive to contribute to class discussions and to ask the instructor questions. Previous research also showed that the male students in the UAE tended to initiate more interactions (Dukmak, 2010).

On the other hand, the lack of a significant difference between the COMM101 and COMM151 student scores is not surprising. The relatively brief time gap between the two courses within the same academic year may have prevented the occurrence of a significant difference. Also, the similar nature of these courses may have prevented COMM151 students from experiencing significantly more enriched learning environments enhancing their interpersonal communication predispositions for lifelong learning. However, their engagement in similar or richer learning experiences in their future university courses is likely to increase their SICP-LLL scores.

Conclusion and Recommendations

In this paper I argued that learning does not take place in isolation from others, but rather requires effective use of interpersonal communication skills. Also, the idea that learning is a lifelong endeavor necessitates special attention to the role of interpersonal communication in making learning efficient, meaningful, and long-lasting. The impetus for this study came from this observation, resulting in a scale developed to identify learners' orientations towards interpersonal communication for lifelong learning. Although it was challenging to identify the domains of such a scale due to the multiple facets of learning and interpersonal communication, literature on lifelong learning and communication together with university professors and students' introspection on the concepts provided four main domains: learning reciprocity, perseverance, engagement with instructors, and motivation. Even though these domains consist of specific skills, they should be seen as interdependent.

The results on first year students' interpersonal communication predispositions for lifelong learning indicated that their skills were above the threshold level. This suggests that given the opportunity, college students can indeed use and develop lifelong learning skills interpersonally. To further reinforce this, instructors may consider identifying and addressing students' learning styles based on social interaction. It is only natural that some students may be avoidant. Collaborative activities in the classroom may challenge such learners at first. However, with support they may be encouraged to interact with other learners and the instructor. This will help them become less dependent on the instructor and others, which is a lifelong learning skill in itself.

I conducted this research in the context of university education, affecting the domains identified for the scale developed. Other researchers may consider investigating student orientations in other

contexts. For example, the characteristics of learners in adult education organizations or K-12 education may result in different and/or additional domains. Researchers may also investigate the development of interpersonal communication for lifelong learning longitudinally, aiming to identify factors at play. Another area of research is the association between the use of these skills and students' academic success.

References

ABET (2014, November). *Criteria for accrediting engineering programs.* Baltimore, MD: Engineering Accreditation Commission. Retrieved from http://www.abet.org/uploadedFiles/Accreditation/Accreditation_Process/Accreditation_Documents/Current/eac-criteria-2012-2013.pdf

Alusine, M., & Kanue, D. A. (2011). *Experiencing interactive interpersonal communication*. The USA: Xlibris.

Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. San Francisco, CA: Jossey Bass.

Anderson, P. (2009). Nonverbal communication. In H. Reis & S. Sprecher (Eds.). *Encyclopedia of human relationships*. New York: Sage Publication, Inc.

Bienvenue, M. J. (1971). An interpersonal communication inventory. *Journal of Communication, 21*(4), 381–388.

Berman, A., Kozier, B., & Erb, G. L. (2015). *Kozier and Erb's fundamentals of nursing*. Melbourne: Pearson.

Bowman, C. W. (1997). Lifelong learning for professional engineers. *Engineering Issues, 6*, 1-2.

Braithwaite, D. O., Schrodt, P., & Carr, K. (2015). Meta-theory and theory in interpersonal communication research. In D. O. Braithwaite & P. Schrodt (Eds.). *Engaging theories in interpersonal communication: Multiple perspectives* (pp. 1-20). California: Sage Publication, Inc.

Brandt, C., & Dimmitt, N. (2015). Transfer of learning in the development of peer tutor competence. *Learning and Teaching in Higher Education: Gulf Perspectives*, *12*(2).

Burgoon, J. K., Guerrero, L. K., & Floyd, K. (2016). *Nonverbal communication*. New York, NY: Routledge.

Burnett, P. C. (1999). Children's self-talk and academic self-concepts. *Educational Psychology in Practice*, *15*(3), 195-199.

Canter, L. (2006). *Lee Canter's classroom management for academic success.* Bloomington, IN: Solution Tree Press.

Commission of the European Communities. (2005). *Proposal for a recommendation of the European Parliament and of the Councils on key competences for lifelong learning*. Brussels Retrieved from http://www.europarl.europa.eu/meetdocs/2004_2009/documents/comcom_com(2005)0548_/com_com(2005)0548_en.pdf

Coşkun, Y. D., & Demirel, M. (2012). Lifelong learning tendencies of university students. *Hacettepe University Journal of Education*, *42*, 108-120.

Crowder, J. A., Carbone, J. N., & Demijohn, R. (2016). *Multidisciplinary systems engineering: Architecting the design process*. London: Springer.

Davis, H. A. (2001). The quality and impact of relationships between elementary school students and teachers. *Contemporary Educational Psychology*, *26*, 431–453.

Demirel, M. (2009). Lifelong learning and schools in the twenty-first century. *Procedia Social and Behavioral Sciences, 1*, 1709-1716.

Deveci, T., & Ayish, N. (2018). Personal responsibility and interpersonal communication skills of freshman students in a project-based course. *International Journal of Social Sciences and Education Research, 4*(1), 1-17.

Deveci, T., & Ayish, N. (2017). Engineering students' well-being experiences: A freshman year experience program. *Transformative Dialogues: Teaching & Learning Journal, 9*(3), 1-20.

Deveci. T. (2014). Lifelong learning orientations of freshman engineering students and faculty members, *Journal of Higher Education, 4*(1), 14-22.

Deveci, T. (2013). Promoting lifelong learning, *The Asian EFL Journal Professional Teaching Articles, 7*, 4-19.

Devos, N. J. (2016). *Peer interactions in new content and language integrated settings*. London and New York: Springer.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking and the educational process.* New York: D.C Heath.

DiDomenico, C. F. (2010). *Lifelong learning, engineering and the community college*. Paper presented at Conference for Industry and Education Collaboration, Palm Springs, California. Retrieved from http://www.indiana.edu/~ciec/Proceedings_2010/ Papers/ ETD/ETD443_ DiDomenico.pdf

Dukmak, S. (2010). Classroom interaction in regular and special education middle primary classrooms in the United Arab Emirates. *British Journal of Special Education, 37*(1), 39-48.

Duck, S., & McMahan D. T. (2017). *Communication in everyday life* (2nd ed). Singapore: Sage Publications, Inc.

Duman, A. (2007). *Yetişkinler eğitimi (2. bs) [Adult education*. (*2nd ed.)]*. Ankara: Utopya.

Dunne, E. (1999). *The learning society: International perspectives on core skills in higher education.* London and New York: Routledge.

Edwards, R. (2001). Meeting individual learner needs: Power, subject, subjection. In C. Paechter, M. Preedy, D. Scott & J. Soler (Eds.). *Knowledge, power and learning* (pp. 37-46). London: Open University.

Edwards, G., & Stimpson, P. (2003). Environmental citizenship education. In M. Williams & G. Humphrys (Eds). *Citizenship education and lifelong learning: Power and place* (pp. 89-99). New York, NY: Nova Science Publisher, Inc.

Erdoğan, D. G., & Arsal, Z. (2016). The development of lifelong learning trends scale. *Sakarya University Journal of Education, 6*(1), 114-122.

Furrer, C. J., Skinner, E. A., & Pitzer, J. R. (2014). The influence of teacher and peer relationships on students' classroom engagement and everyday motivational resilience. *National Society for the Study of Education, 113*(1), 101–123

Gilton, D. L (2012). *Lifelong learning in public libraries: Principles, programs, and people*. Plymouth: The Scarecrow Press, Inc.

Guo-Dong, X. (1994). Lifelong Education in China: New policies and activities. *International Review of Education, 40*(3/5), 271-281.

Hargie, O. (2016). *Skilled interpersonal communication: Research, theory and practice* (Sixth Edition). London and New York: Routledge.

Head, A. J. (2016). *Staying smart: How today's graduates continue to learn once they complete college*. Seattle: University of Washington, Project Information Literacy Research Report. Accessed through http://projectinfolit.org/images/pdfs/2016_lifelonglearning_fullreport.pdf

Jarvinen, A. (1998). Consultative and learning approaches in the context of organizational process and innovations. In C. Griffin, J. Holford, & P. Jarvis (Eds). *International perspectives on lifelong learning* (pp. 291-302). London and New York: Routledge.

Jarvis, P. (2009). Lifelong learning: A social ambiguity. In P. Jarvis (Ed.). *The Routledge international handbook of lifelong learning* (pp. 9-18). London and New York: Routledge.

Johnson, D. W. (1978). The importance of interpersonal skills. In S. L. Tubbs & R. M. Carter (Eds.) *Shared experiences in human communication* (pp. 21- 49). New Jersey, NJ: Hayden Book Company, Inc.

Hurst, B., Wallace, R., & Nixon, S. B. (2013). The impact of social interaction on student learning. *Reading Horizons, 52*(4), 375-398.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 31-36.

Kember, D., & Leung, D. Y. P. (2005). The influence of active learning experiences on the development of graduate capabilities. *Studies in Higher Education, 30*(2), 155-170.

Korkut-Owen, F., & Bugay, A. (2014). Developing a communication skills scale: Validity and reliability studies. *Mersin University Journal of the Faculty of Education, 10(2), 51-64.*

Kumar, A. (2012). *Philosophical background of adult and lifelong learning*. Retrieved from http://www.unesco.org/education/aladin/paldin/pdf/course01/unit_03.pdf

Lewis, R. B. (1981). *The philosophical roots of lifelong learning*. Abstract retrieved from ERIC database, (ED213356).

Lewittes, H. (2009). A critical thinking rubric as the basis of assessment and curriculum. In C. S. Schreiner (Ed). *Handbook of research on assessment technologies, methods, and applications in higher education* (pp. 22-46). Hershey, PA: IGI Global.

Longworth, N., & Davies, W. K. (2013). *Lifelong learning: New vision, ne implications, new roles for people, organizations, nations and communities in the 21st century*. London and New York: Routledge.

Matheson, D., & Matheson, C. (1996). Lifelong Learning and lifelong education: A critique. *Research in Post-Compulsory Education, 1*(2), 219-236.

Martin, A. J., & Collie, R. J. (2016). The role of teacher-student relationships in unlocking students' academic potential: Exploring motivation, engagement, resilience, adaptability, goals, and instruction. In K. R. Wentzel & G. B. Ramani (Eds.) *Handbook of social influences in school contexts: Social engagement, motivation and cognitive outcomes* (pp. 158-177). New York and London: Routledge.

OECD. (2004). *Internalisation and trade in higher education: Opportunities and challenges*. Paris.

Özturk, F., Deveci, T., Günister, E., & Simmons, R. J. (2015). Innovative instructional strategies for teaching materials science in engineering. In H. L. Lim (Ed.) *Handbook of research on recent developments in materials science and corrosion engineering education* (pp. 100-117). PA: IGI Global.

Patil, A., & Eijkman, H. (2012). Megatrends in engineering and technology education: A call for the communicative imagination. In A. Patil, H. Eijkman & E. Bhattacharyya (Eds.). *New media communication skills for engineers and IT professionals: Trans-national and trans-cultural demands* (pp. 1-8). Hershey, PA: Information Science Reference.

Riemer, M. J. (2007). Communication skills for the 21st century engineer. *Global Journal of Engineering Education, 11*(1), 89-100.

Roncaglia, I. (2016). A practitioner's perspective of multidisciplinary teams: analysis of potential barriers and key factors for success, *Psychological Thought, 9*(1), 15-23.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet and Higher Education, 6*, 1-16.

Reilly, S. (2008). *The submissive goal-setting journal*. Fayetteville, NC: DV8 Publishing.

Sarvaiya, M. (2013). *Human communication*. Mumbai: Lulu.

Sayılan, F. (2015). Some critical reflections on lifelong learning policy in Turkey. *Journal for Critical Education Policy Studies*, 12(3), 156-170.

Skinner, K. L., Hyde, S. J., McPherson, K. B. A., & Simpson, M. D. (2016). Improving students' interpersonal skills through experiential small group learning. *Journal of Learning Design,* 9(1), 21-36.

Solomon, D., & Theiss, J. (2013). *Interpersonal communication: Putting theory into practice*. London and New York: Routledge.

Tenopir, C., & King, D. W. (2004). *Communication pattern of engineers*. New York, NY: Wiley Interscience.

Titmus, C. (1989). *Lifelong education for adults: An international handbook*. Oxford: Pergamon Press.

Turner, J. H. (1988). *A theory of social interaction*. Stanford: Stanford University Press.

Uzunboylu, H., & Hürsen, Ç. (2011). Lifelong learning competence scale (LLLCS): The study of validity of reliability. *Hacettepe University Journal of Education, 41*, 449-460.

Weeden, P., & Winter, J. (1999). *The learn project: Learners' expectations of assessment for learning nationally.* Report for the Qualifications and Curriculum Authority, Bristol: University of Bristol, Graduate School of Education.

Williams. S. (n.d.). *Listening effectively*. Retrieved from http://www.wright.edu/~scott.williams/ LeaderLetter/listening.htm

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology, 9*(2), 79-94.

Appendix

The scale of interpersonal communication predispositions for lifelong learning scale (SICP-LLL) Factors and Factor Load Values

Item no	Items	Factor 1	Factor 2	Factor 3	Factor 4
Learning reciprocity					
1	It is important for me to have good relationships with people who can help me learn.	.685			
2	I am open to sharing my knowledge and skills with peers who may benefit from them.	.628			
3	Conversations with friends can help me look at things from different perspectives.	.597			
4	I like to communicate with others because I am interested in what they might have to teach me.	.583			
5	I can change my communication style according to other people's preferences.	.502			
6	I'd like to help people with learning needs like mine.	.452			
7	I am careful with my actions because they may affect my friends' learning.	.450			
8	I can make my friends feel comfortable when we study together.	.443			
9	I inspire my friends to learn.	.420			
10	I seek advice from others when I need to make a difficult decision about learning.	.354			
11	I enjoy talking to other people about learning and development.	.343			

12	I can adjust my way of talking to others according to how much they know about the topic of our conversation.	.327			
Perseverance					
13	I will lose my motivation if I have difficulty using my new knowledge when working with other people.		.743		
14	When working together, my friends' learning difficulties will easily affect my motivation to study.		.699		
15	If I had a problem with a friend, I would never study with him/her again.		.644		
16	I feel a lot of stress when I need to write a formal email to my instructors, so I prefer to avoid it as long as I can.		.619		
17	I have difficulty in cooperating with others when I need to learn new things.		.578		
18	I find it stressful when others comment on my learning.		.490		
19	I don't give up easily in the face of a learning problem caused by other people.		.302		
Engagement with instructors					
20	Asking my instructors questions is not a problem for me when I don't understand something.			.738	
21	I listen to my instructors' advice about how to remain a successful learner after graduation.			.691	
22	I go to my instructor's office to talk about different ways I can improve myself.			.667	
23	My instructors inspire me to learn.			.587	
24	I value my instructors' use of pair and group work activities in the classroom.			.557	
Motivation					
25	I enjoy doing collaborative work with other students.				.693
26	I try to study with others to develop myself without any pressure from others.				.684
27	I like to find out about how my friends learn.				.628
28	When setting learning goals for myself, I like to have others' contribution.				.592
29	I prefer to spend my time with my friends for fun, not for learning new things.				.587
30	I do not like to speak with other people about my education ambitions.				.497

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 95-104

Nesibe Aydın JEF

Effect of Bibliotherapeutic Approach on Problem-Solving Skills of Gifted/Talented Students

Article Type	Received Date	Accepted Date
Research	26.10.2018	17.01.2019

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Abstract

This study determined the effect of children's literature texts addressed through bibliotherapy method on one of the superior thinking skills, the problem solving skill, of the gifted/talented students. Gifted/talented students show different development characteristics compared to their peers. This requires supporting those students and ensuring their improvement. This study aims to introduce the bibliotherapeutic approach, and to transform the children's literature texts selected taking into account the characteristics of gifted/talented students into a model, and to identify the effect of this model on the problem-solving skills of gifted/talented students. Among the quantitative research methods, the study used pretest-posttest uncontrolled semi-experimental model - since there was only one analysis group in the study. The study group consists of Science and Arts Center students diagnosed as gifted/talented. Since this research constitutes an experimental study, a study group was identified rather than a study population and sample. A problem-solving skill scale was used to evaluate the problem solving skills of gifted/talented students. The research findings showed that, in conclusion of the application, there occurred an increase in problem-solving skill levels of the gifted/talented children in the study group.

Keywords: Bibliotherapy, the gifted, the talented, problem-solving skill, education.

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Bibliyoterapi Yönteminin Üstün Zekâlı/Yetenekli Öğrencilerin Problem Çözme Becerisine Etkisi

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	26.10.2018	17.01.2019

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Öz

Üstün zekâlı ve yetenekli öğrenciler yaşıtları ile karşılaştırıldıklarında farklı gelişim özellikleri gösterir. Bu durum onların desteklenmesini ve gelişmelerinin sağlanmasını gerekli kılar. Bu çalışmanın amacı bibliyoterapi yönteminin tanıtılması ve üstün zekâlı/yetenekli öğrencilerin özelliklerini de dikkate alarak seçilecek çocuk edebiyatı metinlerinin bu yöntem ile bir modele dönüştürülmesi ve bu modelin üstün zekâlı/yetenekli öğrencilerin problem çözme becerisi üzerindeki etkisini tespit etmektir. Araştırmada nicel araştırma yöntemlerinden -çalışmada tek analiz grubu yer aldığı için- ön test-son test kontrol grupsuz yarı deneysel model kullanılmıştır. Çalışma gurubu üstün zekâlı/yetenekli tanısı konulmuş Bilim ve Sanat Merkezi öğrencileridir. Bu araştırma deneysel bir çalışma olduğu için evren ve örneklem yerine çalışma grubu belirlenmiştir. Üstün zekâlı/yetenekli öğrencilerin problem çözme becerilerini ölçmek amacıyla problem çözme becerisi ölçeği kullanılmıştır. Araştırma bulgularına göre çalışma grubunda yer alan üstün zekâlı/yetenekli çocukların uygulama sonucunda problem çözme beceri düzeylerinde artış olduğu sonucuna ulaşılmıştır. Araştırma sonunda ortaya çıkan bu sonuçlar değerlendirildiğinde çalışma grubunda yer alan öğrencilerin üstün zekâlı/yetenekli olmaları ve özellikle okuma konusunda istekli olmalarının etkili olduğu söylenebilir. Ayrıca bu çocukların problem çözme ve muhakeme yeteneklerinin bu sonuçları olumlu yönde etkilediği düşünülmektedir.

Anahtar Sözcükler: Bibliyoterapi, üstün zekâlılar, üstün yetenekliler, problem çözme becerisi, eğitim.

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Introduction

Proceeding to training and learning from the moment of birth, the human being learns something at each phase of life. One of the most important experiences in human life is the period of learning how to read and write. Because, with reading and writing skill, man passes from foreign-dependent learning through ability to learn new things in line with his own wishes. Through Books, he learns what happened before him; and in this way, he gets acquainted with the mankind and begins to develop new values regarding life and reality.

According to the child, a book is a world of images which contains sketches, images and colors in itself and is compiled using creative narrative ways. One can say that, in this lively world, the child gets to know better the many individuals and personality traits of heroes in the work as well as all of their communication and relationships with the people around them. This constitutes an indirect life experience for the child (Öner, 2007, p. 133).

Literature is a set of oral and written productions that titivate individuals' feelings and ideas to words, bear a literary and artistic value and inhold no evil and banality. Children's literature, which allows for giving voice to one's feelings and opinions, however addresses the child's pleasures and dream world, and tries to contribute to their development in all aspects (Uçan, 2006, p. 76).

Children's literature is "the fullest extent of oral and written yields addressing children's dreams, feelings, thoughts, talents and tastes and contributing to their fun while training" (Yalçın and Aytaş, 2003, p. 17).

Children's literature is a set of verbal and written productions that are suitable for the bodily and mental development of individuals considered as children, are far from ugliness and vulgarity, and allow the child to understand, comprehend and interpret through listening and reading and to have fun in the educational process (Şimşek, 2005, p. 78).

Advising a child to read books that are suitable for his/her age and in line with his/her ability to understand is the most important factor that increases children's reading rates. It should be noted that, children in each age group have their own unique characteristics, and it can also be argued that these characteristics may vary even among boys and girls (Celkan, 2006, p. 615).

This effect of books in human life requires the combination of mother language courses with other disciplines, particularly the science of psychology. Despite being a subject of psychology, bibliotherapy is a matter that can be considered especially in the field of Turkish education in the process of setting individuals up with children's literature products.

Apparently posing a complex and assertive perception, 'Bibliotherapy' is indeed a word used for a situation that can be considered as a simple process. The fact that bibliotherapy contains the word "therapy" in itself should not suggest that this method is only a clinical approach relating to the field of psychology. It can be said that this approach allows for bringing the right person and the right book together at the right time and thus helps the individual feel comfortable spiritually and mentally (Philpot, 1997) (Ref., Öner, 2007, p. 136).

Besides providing guidance in solving personal problems through directed reading, bibliotherapy is also expressed as assigning such tasks as reading brochures, articles and books to the groups receiving a certain consulting service in order to eliminate false attitudes adopted by the individuals and to transform their weak motivation into a more robust one (McCulliss, 2012, p. 23). (Wolberg, 1967, p. 578).

Given its application areas, bibliotherapy is divided into two groups, namely clinical bibliotherapy and developmental bibliotherapy. Clinical bibliotherapy is performed by an expert and claims to treat individual serious, emotional/behavioral problems. Developmental bibliotherapy, however, is often used in educational institutions and accepts the reading process between the personality of the reader and literature as an interaction (Hebert and Furner, 1997).

Halsted (2002) suggests that one passed through four different stages in the process of bibliotherapy:

Identification: In bibliotherapy, this is the stage where the relationship between the reader and the book heroes begins (İlter, 2015, p. 40). If pre-reading conditions have been fulfilled at this stage, the reader would succeed in empathizing with the real or imaginary character in the book.

Catharsis (Purification): In its sense of "purification", catharsis is defined as cleansing, making the soul free from passions in the Turkish Dictionary of the Turkish Language Association. At this stage, the student is expected to relax by betraying his/her feelings.

Insight: Insight is defined as "the ability to understand one's own feelings, one's self" in the Turkish Dictionary of the Turkish Language Association. At this stage, one observes that the hero in the book solves its problems, and thus realizes that the problems are not permanent. In other words, the individual associates the individual's experience with his/her own experience (Leana-Taşçılar, 2012, p. 122).

Generalization: Some researchers address this stage along with the stage "insight". Nevertheless, Heath, Sheen, Leavy, Young and Money (2005) address it as the stage where the individual can put himself/herself in another's place and realizes that he/she is not the only one who experience that circumstance or problem and that it may happen to others as well (Heath et al., 2005).

The reason why bibliotherapy is effective on the individual is that the students betray certain feelings such as sharing the same feelings with the heroes having traits similar to them —called "identification"—, and thus gain new perspectives and find different and new methods of interaction with their friends and the adults as well. In this way, bibliotherapy shows the individuals the ways in which others are able to solve their problems, and guides the individual in finding new methods to solve their personal problems (Bulut, 2010, p. 19).

Pardeck (1993) sets forth that a good piece of literature readily offers individuals the models necessary to help them to deal with real-life problems. Through bibliotherapy, students would be more inclined to share what they understand, and to reflect their behaviors through a third person or a literary character, a cartoon hero at a safe distance.

"The gifted/talented students who exhibit different traits in many aspects compared to their peers is the group which would show the highest performance in the educational process thanks to their motivation as well as fast and permanent learning abilities. The superior intelligence, one of the major traits of those children, refers to the high-level capacity unveiled in any performance field (Sak, 2013, p. 500)."

Giftedness started to be considered as a scientific concept in 19th Century, and as of this stage, the most apparent sign of superior intelligence was introduced as intelligence tests that measure intelligence in the concept of intelligence. In studies identifying the giftedness through these tests, the gifted/talented are those whose level of intelligence consistently brings a score of 130 or more as a result of the analysis (Ersoy and Avcı, 2004, p. 196).

Gifted/talented students show different development characteristics compared to their peers. This requires supporting those students and ensuring their improvement. This study aims to introduce the bibliotherapeutic approach, and to transform the children's literature texts selected taking into account the qualities of gifted/talented individuals into a model, and to identify the effect of this model on the problem-solving skills of gifted/talented students.

Bibliotherapy is a method that can be applied to students who are interested in reading by bringing them together with literary works in order to allow them to understand their inner worlds. Thanks to bibliotherapy, students become aware of their personality traits as well as their areas of interest, and gain courage in being at peace with the weaker aspects of their personality. Besides the described gain, this method also positively affects the reading skill of the student.

Bibliotherapy can be used to help the gifted/talented who exhibit such traits as early reading, reading more compared to their peers and preferring to read different types of works, etc. to become aware of their personality traits and what distinguishes him/her from his/her peers, and to enable them to create solutions for the problems they face by identifying their experiences with the characters in the books.

Method

Research Model

This study determined the effect of children's literature texts addressed through bibliotherapy method on one of the superior thinking skills, the problem solving skill, of the gifted/talented students.

Among the quantitative research methods, the study used pretest-posttest uncontrolled semi-experimental model —since there was only one analysis group in the study. The pre-test in the study aims to determine the current situation of the groups regarding the research subject before the experimental study. The post-test however intends to find out whether the application was effective or not. The fact that the design of the study involves a pre-test is important in terms of predicting the results of the experimental study. The findings of the experimental study are obtained through the post-test applied to the groups.

Table 1

Research Design

GROUP	PRE-TEST	APPLICATION	POST-TEST
Experimental Group	Problem-Solving Skill Assessment Scale (Pre-Test)	Applications by Children's Literature Texts addressed through Bibliotherapeutic Approach	Problem-Solving Skill Assessment Scale (Post-Test)

Study Group (Through Purposeful Sampling)

The study group consists of Science and Arts Center Grade 6 students, involving 8 females and 4 males, who were diagnosed as gifted/talented. The students included in the study group participated voluntarily in the study without disrupting their on-going educational process, and the necessary consent was obtained from the families of the students using the family consent form. This research is an experimental study. Therefore, a study group was identified rather than a population and sample.

Data Collection Tools

The problem-solving skill scale developed by (Sezgin, 2011) was used to evaluate the problem solving skills of gifted/talented students. In the scale development process, the study group was composed of 262 students who were studying at four, five, six, seven and eighth grades of a private primary school in Izmir in the school year 2010-2011. Expert opinion was obtained for the structural validity of the scale, and the reliability coefficient KR 20 was calculated for its reliability. As a result of statistical calculations made using Excel and SPSS programs, the KR 20 internal consistency coefficient of the scale was found to be .76. Also, the scale's reliability coefficient in terms of consistency predicted using test-retest method was calculated. As a result of this operation, the correlation coefficient was calculated as .94. (Sezgin, 2011, p. 2)."

As a result of the factor analysis performed for structural validity of the scale, the scale was found to have a single-factor structure explaining 58.79% of the total variance for the whole scale.

Data Collection and Analysis

The application process of research was conducted in Science and Art Center where students diagnosed as gifted/talented using various scientific tests study in the spring semester of the school year 2016-2017 in Ankara. The application was completed in 10 weeks, including the application period of pre-test and post-test. Students attend to Science and Art Centers for at least 4 hours a week, outside the formal education school hours. The study was conducted within the 2-hour period when the students were present at the Science and Art Center, and continued uninterruptedly for 10 weeks. The application was carried out with 6th grade students who studied at the step called "Period

Developing Individual Abilities" at the Science and Art Center. Within the research, activities were created with

"Sakız Sardunya", a work written by Elif Safak for children, taking the model created by Leana-Taşcılar (2012) as the basis in line with the principles of bibliotherapy. During the application process, first the activity "creating a Venn diagram about the main hero and other heroes through Venn Diagram Creating activity" was performed in the identification phase whereas the application was continued performing the activities "bag of questions that should not be asked", "reflecting on concepts", "allegory (if I were...)" in the catharsis stage and finally, the activities "I am saving the country ALFABESTAN (ALPHABETLAND)", "write a story about your name" and "my sharing with the grand tree" was performed in the insight and generalization stages.

Findings

Findings from the Problem-Solving Skill Scale

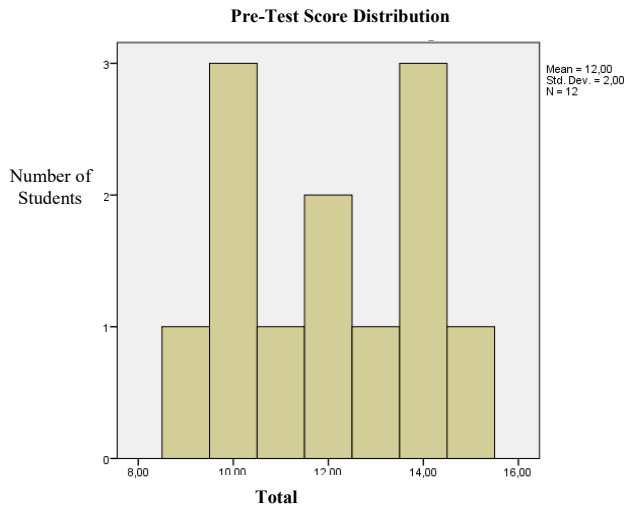
Before applying the activities prepared according to the bibliotherapy technique, the descriptive statistics of the pre-test was analyzed to determine the minimum, maximum and mean score of the study group for the pre-test applied to individuals participating in the study and the standard deviation thereof, and the data obtained was tabulated. The descriptive statistics of the pre-test are given in the Table 2.

Table 2

Descriptive Statistics of the Pre-Test

	Number of Subjects (N)	Minimum	Maximum	Mean (X)	Std. Deviation (SD)
Pre-Test	12	9	15	12	2

As is seen in Table 2, the mean value of the scores obtained by the participants from the pre-test was found to be 12. Based on this, it was concluded that the problem solving skills of the students in the study group were at a "high" level. Also as is shown in the table, the facts that the lowest score of the pre-test is 9 and the highest score is 15 show that the lower limit is at a "low" level whereas the upper limit is at a "high" level.



According to the pre-test score distribution chart, it is seen that the majority of the students in the study group obtained a score of 10 to 14. The number of students who obtained a score of 14 to 16, which was set as the highest level, is 4 according to the chart.

In order to find out the group's minimum, maximum and mean score for the post-test applied to students after the teaching process and the standard deviation thereof, the descriptive statistics of the

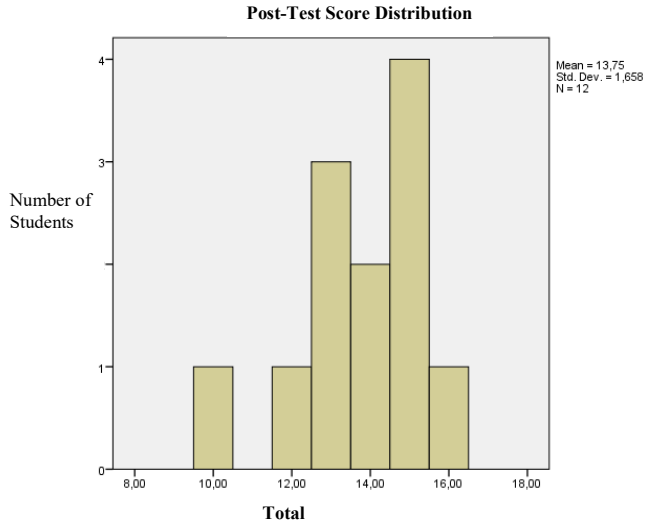
post-test were examined and the data were tabulated. Table 3 presents the findings of the post-test results.

Table 3

Descriptive Statistics of the Post-Test

	Number of Subjects (N)	Minimum	Maximum	Mean (X)	Std. Deviation (SD)
Post-Test	12	*10*	*16*	13.75	1.65

As is seen in Table 3, the average of the scores obtained by the students from the post-test is 13.75. It was thus concluded that the problem solving skills of the study group were high. The fact that the lowest score from the post-test is 10 indicates that the lower limit is at a “moderate" level, whereas the fact that the highest score is 16 shows that the upper limit is at the "highest" level.



According to the post-test score distribution chart, it is seen that the majority of the students in the study group obtained a score of 12 to 16. The number of students who obtained a score of 14 to 16, which was set as the highest level, is 7 according to the chart.

In comparison of the data in the pre-test and post-test graphs, it was seen that the students' score from the post-test on their problem-solving skills showed an increase after the application. The scores obtained from the post-test are in the "high" and "highest" score ranges. Whereas the number of students who obtained a score of 14 to 16, determined as the highest level, is 4 in the pre-test, this number increased to 7 in the post-test.

Comparing the data on Table 1 with those on Table 2, it is concluded that there occurred an increase in the minimum and maximum scores of the study group and the group's mean score for the problem solving skill showed an increase within the "high" level and approached to the "highest" level.

Following the analysis of pre- and post-tests relating to the Problem-Solving Skill Scale, the Wilcoxon Signed Rank Test was applied to the data in order to determine whether the difference between the pre-test and post-test is statistically significant. In cases where the number of subjects in groups is small (usually, when less than 30), nonparametric tests should be used. Because, as the number of subjects decreases, the probability of deterioration of assumptions in parametric tests increases (Sümbüloğlu and Sümbüloğlu, 2007, p. 52-53).

Table 4 shows the results obtained from the Wilcoxon Signed Rank Test.

Table 4

Results from Wilcoxon Signed Rank Test applied to the Significance Level of the Difference between Pre-Test and Post-Test Scores within the Problem-Solving Ability Scale

Score	Ranks	N	Rank Mean		Z	P
Pre-Test Score	Negative Ranks	1	2,00	2,00		
Post-Test Score	Positive Ranks	9	5,89	53,00		
	Equal	2			-2.623	,009
	Total	12				

As can be understood from Table 4, the study group's scores from the pre-test applied prior to activities prepared with bibliotherapy technique was found to be significantly different ($p< 0.05$) from their scores obtained in post-test applied after the activities. ($Z= -2.623$, $p< 0.05$) This difference was in favor of the post-test. The problem-solving skills of the students in the study group showed a positive change.

Discussion, Conclusion and Recommendations

This study aims to introduce the bibliotherapeutic approach, and to transform the children's literature texts selected taking into account the characteristics of gifted/talented students into a model, and to identify the effect of this model on the problem-solving skills of gifted/talented students.

Within the study, certain activities were created based on the Elif Safak's work "Sakız Sardunya" containing a large majority of qualifications that a work to be used in bibliotherapy must contain and the model created by Leana-Taşcılar (2012). In this application model, the stages which students liked most were found to be the stages "Catharsis (Purification)" and "Insight", which rather involves discussing. A long period was assigned to the discussion, which is very important in bibliotherapy. The activities were designed in a way to feature questions to improve problem-solving and creative-thinking skills (the activities "bag of questions that should not be asked", "reflecting on concepts"). At the end of these activities, the students learnt that they are not alone in facing problems, others also have the same problems, there are alternative solutions to the problems we encounter in life and they can feel relieved by realizing and thinking about this.

In the applied model, it was observed that the stage in which the students was bored most was the activities addressing predominantly the writing skills. Also, the students stated that it was more beneficial to read the book prior to attending the class rather than listening to it in the classroom. At the end of all activities, the application was thought to have reached the bibliotherapeutic objectives such as providing information, facilitating positive changes and personal development, encouraging discussion on problems and expressing new values and attitudes (Bryant and Roberts, 1992; Pardeck, 1995).

The research findings showed that, in conclusion of the application, there occurred an increase in problem-solving skill levels of the gifted/talented children in the study group. Comparing the pre-test and post-test statistical data, it is concluded that there occurred an increase in the minimum and maximum scores of the study group and the group's mean score for the problem solving skill showed an increase within the "high" level and approached to the "highest" level. This increase in problem-solving skills were observed not only in the total score but also a statistically significant difference was observed in favor of the post-test in the Wilcoxon Signed Rank Test.

As the results of the study are evaluated, the facts that the students in the study group are gifted/talented and they are disposed, especially to reading may have an effect on the results. Also, it is also thought that the results may be positively affected by the fact that those children have high problem-solving and reasoning skills (Clark, 2015). Besides, one can conclude that bibliotherapy can be used effectively with such a group.

This study contributed to the development of problem solving skills of the children by allowing them to discuss and produce a solution for their own problems through the similar problems

experienced by a fictional hero, by means of this work used as the material of the study. Thus, the effect of bibliotherapy was increased.

In conclusion of this study, it was recognized that it is difficult to find books for bibliotherapy application in Turkey. Therefore, we think that the librarians should be trained in this respect. Book selection constitutes the basis for and the most difficult stage of bibliotherapy. It is also the most time-sink and challenging part of the process. Although the foreign literature offers plenty of book recommendations for various problems and age groups after transferring information about bibliotherapy and even studies with examples for discussion and monitoring activities (Forgan and DeHass, 2004; Heath et al., 2005), the lack of those in the Turkish literature is the most prominent factor in making book selection difficult. It would be beneficial to use this technique, which is not only for therapy purposes but has a high preventive effect, as a preventive in classroom after providing a training for teachers in this regard. As a result of those findings, the bibliotherapy technique was found to affect positively the problem-solving skill in the gifted/talented sample. However, due to the limited number of study group, this study should also be applied to groups larger in number and higher age groups in order for generalizing it.

References

Bryant, J. & Roberts, S. (1992). Bibliotherapy: an adjunct to audiologic counseling. JARA XXV, 51-67.

Bulut, S. (2010). Bibliyoterapi yönteminin okullarda psikolojik danışmanlar ve öğretmenler tarafından kullanılması. [Use of bibliotherapy method in schools by psychological counselors and teachers] *Elektronik Sosyal Bilimler Dergisi, [Journal of Electronic Social Sciences] 9*(34), 17-31.

Celkan, G. (2006). Çocuk edebiyatının dil eğitimi ve öğretimi açısından önemi. [The importance of children's literature in terms of language education and teaching] *II. Ulusal Çocuk ve Gençlik Edebiyatı Sempozyumu Bildiri Kitabı, [II. National Children and Youth Literature Symposium Proceedings Book]* S. 613-620. Ankara Üniversity.

Clark, B. (2015). *Üstün zekalı olarak büyümek. evde ve okulda çocukların potansiyellerini geliştirmek. [Growing up gifted. improve children's potential at home and at school]* İstanbul: Nobel Academic Publishing.

Ersoy, Ö. & Avcı, N. (2004). *Özel eğitim [Special education]* İstanbul: Ya-pa Publishing.

Forgan, J, & DeHass, G. (2004). How to infuse social skills training into literacy instruction. *Teaching Exceptional Children*, 36(6), 24-37.

Halsted, J. W. (2002). *Some of my best friends are books: Guilding gifted readers from preschool to high school*. Scottsdale, AZ: Great Potential Press.

Heath, M. A., Sheen, D., Leavy, D., Young, E. & Money, K. (2005). Biliotherapy: Aresource to facilitate emotional healing and growth. *School Psychology, 26*(5), 563-580.

Hebert, T. & Furner, J. (1997). Helping high ability students overcome maths anxietythrough bibliotherapy. *Journal of Secondary Gifted Education, 8*(4), Sayfa 164-179.

İlter. B. (2015). *Bibliyoterapi tekniğinin üstün yetenekli çocukların mükemmeliyetçiliği düzeylerine etkisi, [The effect of bibliotherapy technique on perfectionism levels of gifted children]* (Unpublished Master Thesis), Fatih Sultan Mehmet Foundation University, Istanbul.

Leana- Taşcılar, M. (2012). Üstün zekâlı ve yetenekli öğrencilerin de bulunduğu sınıflarda bibliyoterapi kullanımı: model önerisi**,** [Use of bibliotherapy in classes with gifted and talented students: model proposal] *Türk Üstün Zekâ ve Eğitim Dergisi, [Turkish Journal of Superior Intelligence and Education] 2*(2), 118-136.

McCulliss, D. (2012). Bibliotherapy: Historical and research perspectives. *Journal of Poetry Therapy*, 25 (1): 23-38.

Öner, U. (2007). Bibliyoterapi, [Bibliotherapy] *Journal of Arts and Sciences*, Sayı 7, Sayfa 133-150

Pardeck, J. T. (1993). Literature and adoptive children with disabilities. *Early Child Development and Care, 91,* 33–39.

Pardeck, J. T. (1995). Bibliotherapy: An innovative approach for helping children. *Early Child Development and Care, 1* (1), 83-88.

Philpot, C. B. (1997). "Interactive story book software: effects on verbal development in kinder garten". *Early Childhood Development and Care, 132,* 33-44.

Sak, U. (2013). *Özel eğitime gereksinimi olan öğrenciler ve özel eğitim. [Special education students who require special education]* Ankara: Pegem Academy.

Sezgin, E. (2011). *Problem çözme becerisi ölçeğinin geliştirilmesi, [Developing the problem solving skill scale]* (Unpublished Master Thesis) Ankara University Institute of Educational Sciences,

Sümbüloğlu, K. & Sümbüloğlu, V. (2007). *Biyoistatistik. [Biostatistics]* Ankara: Hatiboğlu Printing and Publishing.

Uçan, H. (2006). Edebiyat eğitimi, estetik bir hazzın edinimi, okumanın alışkanlığa dönüştürülmesi ve yazınsal kuramlar. [Literature education, acquisition of aesthetic pleasure, transformation of reading into habit and literary theories] *MEB Dergisi, [MEB Journal*] *169,* pp. 25-39.

Yalçın, A. & Aytaş, G. (2003). *Çocuk Edebiyatı. [Children's Literature]* Ankara: Akçağ Publications.

Wolberg, L. R. (1967). "Hypnoanalysis." *The technique of psychotherapy* içinde (pp. 578-582). Vol 2. New York: Grune and Stratton.

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 105-117

Nesibe Aydın JEF

Environmental Literacy: An Assessment and Evaluation on the Students of Landscape Architecture in Turkey

Article Type	Received Date	Accepted Date
Research	12.02.2018	17.09.2018

Sevgi Görmüş*

Abstract

Environmental literacy approach, in recent years, become one of the fundamental requirements proposed for a sustainable future in higher education. Environmental literacy is the total of individual comprehension, ability, attitude and habits which are constantly in progress and it is based on that short and long term attitudes and behaviors are developed by his sustainable communication with other people and biosphere. This study aims to evaluate the environmental consciousness, knowledge and skills of the students of landscape architecture in terms of environmental literacy. As data collection tool was used Environmental Literacy Scale where the knowledge of students about environmental legislation, knowledge and behaviors is questioned. The findings reveal that students have a very limited environmental knowledge and fulfill their environmental responsibilities on an individual basis in a very restricted area. In this regard, the study, based on the research results, makes suggestions for training environmentally literate candidates in professional training of environmental by emphasizing that students of Landscape Architecture would be of low efficiency in finding creative solutions for environmental, societal and spatial problems and producing sustainable landscape since their participation is very limited in societal and mass activities.

Keywords: Environmental literacy, ecological literacy, landscape architecture education, Turkey.

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Çevre Okuryazarlığı: Türkiye'deki Peyzaj Mimarlığı Öğrencileri ile İlgili Bir Değerlendirme

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	12.02.2018	17.09.2018

Sevgi Görmüş*

Öz

Çevre okuryazarlığı yaklaşımı, son yıllarda, sürdürülebilir bir gelecek için yüksek öğretimde önerilen temel gereksinimlerden biri haline gelmiştir. Çevre okuryazarlığı, insanların birbiriyle ve biyosferle olan iletişimlerinin tutum ve davranışlarının kısa ve uzun vadedeki geliştirilmesine dayanan bireysel anlama, yetenek, tutum ve alışkanlıkların sürekliliğinin toplamıdır. Bu çalışma peyzaj mimarlığı öğrencilerinin çevre bilinci, bilgi ve becerilerini "çevre okuryazarlığı açısından değerlendirmeyi amaçlamaktadır. Veri toplama aracı olarak, öğrencilerin çevre mevzuatı, bilgi ve davranışları hakkındaki bilgilerinin sorgulandığı Çevresel Okuryazarlık Ölçeği kullanılmıştır. Veri toplama aracı olarak, öğrencilerin çevresel mevzuat, çevresel bilgi ve çevresel davranışlar konusundaki bilgilerinin sorgulandığı Çevre Okuryazarlığı Ölçeği kullanılmıştır. Elde edilen sonuçlar, öğrencilerin çevresel bilgilerinin düşük, çevresel sorumluluklarını gerçekleştirme biçimlerinin bireysel düzeyde ve çok sınırlı bir alanda gerçekleşmekte olduğunu ortaya koymaktadır. Bu bağlamda çalışma, araştırma sonuçlarına dayanarak, Peyzaj Mimarlığı öğrencilerinin toplumsal ve kitlesel aktivitelere katılımlarının zayıf olması nedeniyle çevresel, toplumsal ve mekânsal sorunlara yaratıcı çözümler bulma ve sürdürülebilir peyzajlar üretme konularında etkin olmalarının zayıf olacağına dikkat çekerek, mesleki çevre eğitiminde çevre okur-yazar adaylar yetiştirme konusunda öneriler getirmektedir.

Anahtar Sözcükler: Çevre okuryazarlık, ekolojik okuryazarlık, peyzaj mimarlığı eğitimi, Türkiye.

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Introduction

The term 'Environmental Literacy' was first put forth by Charles Roth in 1968 (Roth 1968). Roth redefined this term many times by dealing with its various sides. Roth, stating that it is comprised of the individual's knowledge about environment, attitudes and behaviors against it in 1992, defined it later in 2002 as the combination of understanding, knowledge, skills and attitudes that enable individuals to develop very positive connection with their own environments and to do daily and long-term actions with other people and nature by having a sustainable communication in a sustainable environment (Roth 2002). Environmental literacy is basically the capacity to perceive and interpret the health of environmental systems and constitutes the important components of individual's environmental knowledge and consciousness and environmental literacy.

Environmental literacy aiming at raising productive and responsible citizens for protecting the earth and society was brought into agenda in global scale due to environmental problems reaching to global extent in 1960s. In the following years, in Stockholm Conference (1972) as the first international meeting based on environment as a result of environmental consciousness transforming into the environmental movement, environmental literacy was evaluated and the concept of environmental education was defined in the framework of environmental literacy in "Intergovernmental Conference on Environmental Education" organized by UNESCO in cooperation with UNEP and held at ministerial level in Tbilisi in 1977. Environmental education in the Tbilisi Declaration was defined as the process of individuals' education about the subjects concerning environment in order for them to gain awareness, acquire knowledge and skills, increase their motivation and attitudes for positive behaviors against environment and bringing forward ideas for the environmental problems (The Tbilisi Declaration 1977). It is believed, through this declaration, that the environmental problems could be solved through environmental education. Also, IUCN has recently drawn attention to the relationship between environmental problems and environmental education. According to IUCN (2002), the patterns of human thinking, attitudes and their habits play a leading role in generating environmental problems. Environmental literacy should be adopted as an effective approach in transforming such thoughts, attitudes and habits in favor of environment. For that reason, it is considered as the fundamental aim of environmental education (UNESCO-UNEP1989). In addition to reading and writing skills, the term 'literacy' defined as the combination of thinking, evaluation, interaction and speaking skills is today defined as acquiring "extensive knowledge" of related area in different working areas. Literacy is reading and writing skills at a level to connect with other individuals by using written and printed symbols. Today, it is also defined as well-educated and having a certain level of knowledge at a certain area (Kışoğlu 2009). Now that environmental literacy is acquiring knowledge, habits and skills and developing attitudes that enable individuals have a positive communication with environment and make it sustainable in long term (Teksöz Tuncer and et al. 2008), it is a remarkable approach that needs to be taken into consideration in environmental education.

Environmental literacy is basically related to competence on knowing (knowledge), recording (behavior) and practicing (making efforts for sustainability) (Orr, 1992). While environmental knowledge includes the extents of knowledge in order to take environmental actions (Gayford and Dillon 1995), environmental behaviors form individual emotions and the priorities for environmental responsibilities. Therefore, it plays a crucial role in displaying environment-friendly behaviors (Pe'er, Goldman &Yavetz, 2007). In some scientific research looking into the relationship among knowledge, attitude and behavior, there is a correlation between knowledge-attitude, knowledge-behaviour, attitude-behavior whereas there is no correlation in some other research (Cheng & So, 2014).

Educational institutions are the very places for increasing environmental literacy. The main purpose of these institutions is to raise students as productive, conscious and responsible individuals for society and prepare them for citizenship. So, the education system and cycles at educational institutions should be in a position to support and develop the students' personal, professional and societal skills, actions and perceptions (Roth, 1992). High literacy rate in a society signifies that individuals understand how natural systems work out on the earth, what kind of effects human activities have on this system and their connections and that they have practical (applicable) knowledge of the related subject. The practical knowledge related to the system enables individuals to

develop their competencies of problem recognition, evaluation, knowing personal responsibilities and taking precautions, and also it will help them to develop an attitude for the use of natural sources and the decrease of environmental problems (Teksöz Tuncer and et al., 2008). Such attitudes are expected to develop especially among young people. From this point forth, one of the recent subjects at issue is environmental education at higher educational institutions (Moody et al., 2005; CELP, 2005; Kaplovitz & Levine, 2005). Those who gain expertise after their university graduation are expected to take active roles in their societal or professional lives and take their environmental knowledge, skills, attitudes and values gained during their university education to their circles (Teksöz Tuncer and et al., 2008). For example, the shared objective of the studies investigating the environmental literacy in the USA is to assess the level of environmental knowledge of the university students and to help the graduate students to grasp and develop environmental policy. In Canada, environment is an interdisciplinary subject and it is put forth that students, regardless of their majors, are supposed to be environmentally literate. In these countries, especially in the studies related to sustainable development, it is aimed to assess environmental literacy and determine the efficiency of sustainable development and environmental education (Thomas & Nicita 2000, Moody et al., Teksöz et al., 2010). These examples show that higher educational institutions adopt it as a principle to graduate students whose environmental knowledge, attitudes, behaviors and values have been developed and who can relate their professions with the environmental problems and care about the rights of future generations to live (Teksöz et al., 2010).

The pattern how natural sources are used has been one of the most significant environmental problems in Turkey in recent years. Because Landscape Architecture professional discipline is one of the planning discipline professions taking care of the planning and use format of natural sources, assessing the environmental literacy of the students majoring in Landscape Architecture and developing professional discipline considering the results obtained may contribute a lot to the position of the profession. In this regard, it will be beneficial to determine the level of environmental literacy among the students majoring in Landscape Architecture and to question the relationship between this level and learning plans.

Landscape Architecture profession is of a special feature since it requires an extensive knowledge in the areas of natural sciences and visual creativity. Landscape architecture is also of a creative attitude that helps it to define what it has understood from the world as well as solving spatial problems. Dealing with spatial problems requires knowing about societal needs and social structure. Because of this structure, it is interdisciplinary and complex (Gazvoda, 2002). The heavy increase in the world population, fast global urbanization, non-convertible and large-scale industrialization destroy environment and harm ecosystems and landscapes. The continuity and development of sustainable landscapes is one of the hardest and most important tasks of stakeholders and scientists. In fulfilling this task, landscape ecology and landscape architecture play a critical role. Landscape architecture is supposed to know societal needs to realize this critical role. Increasing environmental knowledge, developing environmental attitude, behavior and responsibility and participation in environmental activities/actions are required in order to succeed in knowing about societal needs and solving environmental problems.

This study was carried out to investigate the environmental knowledge, attitude and behaviors of Landscape Architecture students within the scope of environmental literacy scale. The level of environmental literacy of students aims to help understand the basic inadequacies of professional education. Also, it enables to discuss the attitudes to be developed for a sustainable landscape in the planning discipline in Turkey.

Method

With reference to the possibility of various approaches of Landscape Architecture departments affiliated to different faculties, the study was carried out by using the questionnaire form and technique based on environmental literacy scale at the Faculty of Architecture (Istanbul Technical University), Faculty of Agriculture (Ankara University) and Faculty of Forestry (Bartın University).

The environmental legislation, knowledge and attitudes of students were questioned by developing environmental literacy scale (Teksöz Tuncer et al., 2008; Teksöz et al. 2010). The

environmental literacy questionnaire form consists of four sections: demographic information, institutional and environmental legislation information related to environment, environmental knowledge test and environmental behavior pattern.

Research Sample

A total of 90 students were interviewed from Istanbul Technical University (ITU), Ankara University (AU) and Bartın University (BU); however, the responses of 87 students were processed in the questionnaire. 50%.6 (44 students) of them were from BU Faculty of Forestry, 26.4% were from AU Faculty of Agriculture and 23% (20 students) were from ITU Faculty of Architecture. While 67.8% of the students were female, 32.2% were male. The distribution of the students according to their grades is as follows: 1st grade: 16.1%; 2nd grade: 17.2%; 3rd grade: 34,5%; 4th grade: %26,4 and above 4th grade: 5.7%. The age of 10.3% ranges from 15 to 20, 89.9% are between 21 and 25 years old and 5.7% were aged 26-30.

Data Analysis

Data was assessed via factor analysis and frequency analysis in the software IBM SPSS Statistics 22. In accordance with the numerical values from the analyses, the environmental knowledge, attitudes and behaviors of students studying Landscape Architecture were evaluated. Likert Scale was used to assess the environmental literacy of these students. The responses under this section were made numerical in ordinal scale.

Results

Cumulative Grade Point Averages (CGPA) of 37.9% of the respondents are under 2.00; 29.9% is of 2.50-3.00 CGPA and 21.8% is of 3.00-3.50 CGPA. 73.6% of Landscape Architecture Students put forth that their professional discipline is architecture, 21.8% suggested it is natural sciences. Only 2.3% stated that it is agriculture and 2.3% said that it is closer to botany. 28.4% of them also stated that they were a member of the Student Branch at the Chamber of Landscape Architecture.

Environmental Legislation and Specialized Knowledge

65.5% of students know National Parks Law, 62.1% have the knowledge of Environmental Law and 52.9% of them know Construction Zoning Law. However, those who know about Cultural and Natural Heritage Preservation Law, Coastal Law, Forestry Law and Soil and Land Protection Law are below 50%. Although a high rate of the students knows National Parks Law, they stated that its importance is low in terms of their profession. They suggested that the most important law is Environmental Law for a Landscape Architecture. Because of the low level of their knowledge about Soil and Land Protection Law (%66.7), they did not see it is a significant law (Table 1).

Table 1

Frequency Analysis of Professional Legislation Knowledge Questions

Significant (%)	***Not significant (%)***	***Laws***	***I have knowledge (%)***	***I do not have knowledge (%)***
8	10.3	National Parks Law	65.5	34.5
66.7	8	Environmental Law	62.1	37.9
6.9	2.3	Construction Zoning Law	52.9	47.1
8.0	9.2	Cultural and Natural Heritage Preservation Law	49.4	50.6
3.4	29.4	Coastal Law	48.3	51.7
4.6	8	Forestry Law	43.7	56.3
2.3	32.1	Soil and Land Protection Law	33.3	66.7

Environmental Knowledge

The rate of correct answers for environmental knowledge questions is 57.04%. More than 90% of the students answered the biological diversity question (Q21) correctly. They stated that the most serious reasons for air pollution (Q22) are factories and work places (69%). Except for the correct answer, which power generation is provided through hydroelectric power plant (Q23), they also answered 'petrol-coal and wood burning' (20.7%) and nuclear plants (19.5%). While the rate of those who gave correct answers for the reasons of river and sea pollution was high, they alternatively stated that the municipal waste is the secondary reason. The question of renewable source (Q25) was answered correctly by 55% of them and 21.8% showed iron mine as a renewable source. The correct answers for the question about the functions of ozone layer are above 50%. Among the other responses are global warming (19.5%) and acid rains (11.5%). More than 95% of the respondents gave wrong answer to the question related to the 'waste control' (Q27). 49.4% expressed that the waste is delivered to recycling centers and 29.95 expressed it is thrown into sea. Those who responded that the official body making environmental protection decisions (Q30) is either TEMA or Turkey Environmental Protection Foundation were 19.1%. While 72.4% of them responded correctly that the most harmful domestic waste (Q29) was batteries, 21.8% indicated it as plastic package. Apart from the correct answer, 9.2% of the respondents pointed out that the most common cause for animal species extinction (Q30) was the increasing hunting rate. The rate of those who were unaware about the method of nuclear waste storage was 36.8% (Table 2).

Table 2

The Frequency Analysis of the Questions about Environmental Knowledge

	Questions	**Correct Answer**	**The rate of correct answers marked (%)**
Q21	There exists a variety of animal and plant species in different environments. Which term is used the best to define it?	Biological Diversity	90.8
Q22	Carbon monoxide is a serious air pollutant in Turkey. Which of the following is the most serious carbon monoxide source?	Motor vehicles	28.7
Q23	How is electricity power generated to a large extent in Turkey?	via hydroelectric power plants	48.3
Q24	Which one is the leading cause for river and sea pollution in Turkey?	Untreated domestic, industrial and agricultural waste	83.9
Q25	Which of the following is a renewable source?	Trees	59.8
Q26	Ozone is a protective one among the top layers of the atmosphere. Which of the following does it protect us from?	Harmful sunlight causing cancer	54.0
Q27	Where is the majority of waste collected?	Landfills	3.4
Q28	Which is the official body to make environmental protection decisions in Turkey?	Ministry of Environment and Urbanization	67.8
Q29	Which of the following can be considered as a harmful domestic waste?	Batteries	72.4
Q30	Which of the following is the most common cause for animal species extinction?	Habitats are destroyed by human beings.	78.2
Q31	The scientists have not successfully concluded the studies for nuclear waste storage. Which is the most common method of nuclear waste storage now in the world?	It is stored and kept under control	40.2

Environmental Attitude and Behavior

In this section where how well, their environmental attitudes have developed at a level of participation, it was evaluated the students' attitudes about liaising (organizational behavior) and cooperationwith the community as well as their individual attitudes.

Table 3

Developing Environmental Attitude

	Statement	Always (%)	Often (%)	Sometimes (%)	Rarely (%)	Never (%)
Q11	I attend the scientific studies such as seminars, panels or conference about environment	6.9	28.7	54	10.3	0
Q12	I follow the activities of voluntary agencies about environment (e.g. TEMA, Society for the Protection of Nature)	6.9	24.1	46	21.8	1.1
Q13	I discuss with my friends about how to protect environment and take precautions	10.3	24.1	43.7	19.5	2.3
Q14	My family and I exchange opinions about protecting environment and taking precautions for it.	18.4	24.1	35.6	16.1	5.7
Q15	I throw waste in the bin suitably at school or home, on a picnic or street.	74.7	16.1	2.3	4.6	2.3
Q16	I warn people to throw waste in the bin suitably at school or home, on a picnic or street.	44.8	34.5	9.2	10.3	1.1
Q17	I throw waste such as paper, glass, plastic, can, metal or battery in recycle bin	27.6	35.6	19.5	16.1	1.1
Q18	I prefer using recyclable products or the products from recycled materials (like buying products with recycling symbol on it)	14.9	23.0	46.0	13.8	2.3
Q19	I do not harm plants and also warn people not to do so (e.g. breaking tree or plant branches, picking flowers or grass).	52.9	29.9	13.8	2.3	1.1
Q20	I follow signs or signboards about protecting environment or nature	48.3	35.6	9.2	6.9	0.0

According to the students' responses, 30.57% of the students always participate in the collective activities and discuss about it while 27.57% participants do them often. The rate of those who sometimes take role in them and discuss about it is 27.93%. Rarely do 12.17% of them participate while only 1.7% of them never participate (Table3). About 45% and over have developed an individual attitude but it is seen that the option "sometimes" is predominantly marked for the related questions about attending scientific meetings (Q11), attending NGOs' activities (Q12) and preferring recyclable products (Q18). Such rates show that individual attitudes have not been able to become communal and they display their developing awareness in a restricted area (inner or friend circle etc.) (Table 3).

Table 4

The Frequency Analysis of the Questions about Environmental Behavior

	Statement	Strongly agree(%)	Agree (%)	Somewhat agree(%)	Disagree (%)	Strongly disagree (%)
Q1	I care about protecting environment.	73,6	21,8	3.4	0.00	1.1
Q2	I want those around me to protect environment.	44.8	39.1	14.9	0.00	1.1
Q3	I consider myself environmentally-conscious (Consciousness means having positive feelings about environment)	42.5	34.5	21.8	0.00	1.1
Q4	I frequently read documents, **books** about environment and nature.	14.9	17.2	51.7	16.1	3.4
Q5	I frequently read documents, newspapers about environment and nature.	13.8	27.6	48.3	8.0	2.3
Q6	I frequently read documents, magazines about environment and nature.	11.5	32.2	36.8	17.2	2.3
Q7	I always watch programs about environment and nature on TV.	21.8	37.9	29.9	9.2	1.1
Q8	I think that I should do something for natural habitats	43.7	36.8	17.2	1.1	1.1
Q9	I am personally responsible for preventing environmental pollution	57.5	31.0	9.2	0.0	2.3
Q10	I encourage people to take actions in order to protect environment	32.2	39.1	27.6	0.0	1.1

The students consider that they care about environmental protection, they warn people about protecting environment and encourage them to take actions for it, they feel responsibility for environmental pollution and think that they should take actions to protect habitats. However, they say that they are partly interested in the newspapers, magazines, written documents, books or documentaries about environment and nature (41.6%). The responses to the positive statements in the environmental attitude section are as follow: Strongly agree: 36.01%; Agree: 30.9%; Somewhat agree: 25.91%; Disagree: 5.73%; Strongly disagree: 1.75% (Table 4).

Table 5

Responsibility Factors and the Variance Values Related to Factors

Factor	**Questions about individual responsibility**	**Factor weight**	**Variance value**	**Factor loading**	**Cronbah 's Alpha**
Factor 1 Follow-up with visual/print media	Q6_ I frequently read documents, magazines about environment and nature.	,857	43,834	4,383	,857
	Q4_ I frequently read documents, books about environment and nature.	,850			
	Q5_ I frequently read documents, newspapers about environment and nature.	,836			
	Q7_ I always watch programmes about environment and nature on TV.	,641			
Factor 2 Individual responsibility	Q1_ I care about protecting environment.	,693	12,559	1,256	,748
	Q9_I am personally responsible for preventing environmental pollution	,680			
	Q10_I encourage people to take actions in order to protect environment	,668			
	Q2_ I want those around me to protect environment.	,638			
	Q8_ I think that I should do something for natural habitats	,514			
	Q3_ I consider myself environmentally-conscious	,510			

KMO and Bartlett's Test: ,827; Bartlett's Test of Sphericity Sig.:000

The responses in the section of environmental behavior and environmental attitude were evaluated by factor analysis. The factor accounts for 56.393% of the total variance. The follow-up with the visual/print media (factor 1) is of the highest variance and accounts for 43.834% of the total variance. While follow-up with the visual/print media is comprised of 4 components, individual responsibility (factor 2) is of 6 components and accounts for 12.559% of the total variance (Table 5). Considering the variance values of the factors, we see that the students have a weak attitude to fulfill the individual responsibility.

Participation and consciousness: In the analysis which is aimed to determine the students' participation in environment activities and consciousness about them were obtained three factors: Abiding by environmental rules (factor 1), expressing opinions and participation in the environment groups that have opinions (factor 2) and product preference and scientific follow-up (factor 3). These factors account for 60.574% of the total variance (Table 6).

Factor 1 (abiding by environmental rules) accounts for 29.904%; factor 2 (expressing opinions and participation in the environment groups that have opinions) accounts for 19.367% and factor 3 (product preference and scientific follow-up) accounts for 11.304% of the total variance. When analyzed the variance values of the factors, the students are seen to be primarily weak at following up with the scientific activities and preferring recycle products and secondarily weak at expressing personal opinions about environment. They are seen to be more active only in fulfilling individual responsibilities.

Table 6

Participation and Consciousness Factors and Variance Values Relating to the Factors

Factors	Participation Questions	Factor weight	Variance value	Factor loadings	Cronbah's Alpha
Factor 1 Abiding by environmental rules	Q15_ I throw waste in the bin suitably at school or home, on a picnic or street.	,815	29,904	2,691	,697
	Q20_ I follow signs or signboards about protecting environment or nature	,766			
	Q19_ I do not harm plants and also warn people not to do so	,758			
Factor 2 Expressing opinions and participation in the environment groups that have opinions	Q13_ I discuss with my friends about how to protect environment and take precautions	,799	19,367	1,743	,666
	Q14_ My family and I exchange opinions about protecting environment and taking precautions for it.	,759			
	Q12_ I follow the activities of voluntary agencies about environment	,673			
Factor 3 Product preference and scientific follow-up	Q18_ I prefer using recyclable products or the products from recycled materials	,789	11,304	1,017	,554
	Q17_ I throw waste such as paper, glass, plastic, can, metal or battery in recycle bin	,683			
	Q11_ I attend the scientific studies such as seminars, panels or conference about environment	,597			

KMO and Bartlett's Test: ,697; Bartlett's Test of Sphericity Sig.: ,000

Conclusion and Discussion

In this study, it was determined that the students of Landscape Architecture adopt the behavior of individual responsibility rather than the communal/organizational one about the environmental problems and they show this kind of behavior more in a relatively restricted area than in public space. Moreover, the claims that the profession of landscape architecture is interdisciplinary, creative, communal and spatial do not overlap the results that the students have a weak knowledge of environment; they do not have a good command of environmental legislation and institutions related to environment.

Ignorance of legislation brings it to a halt to claim the rights to solve environmental problems. It should be considered as a serious problem that they are unaware of the laws related to land and soil use since it is a professional discipline about "soil" itself. What is more, given that it is becoming more difficult to save soil and farm lands because construction and building trade is the main sector in Turkey, it could be thought that the problem will cause many ecological problems (e.g. disruption of biochemical cycles or a negative progress of design-process interaction). Although the unprotected soil and farm lands are on the agenda of local and national press, not only does it affect the sustainable management of landscape in a negative way that the students have a very limited knowledge of related law and they consider it unimportant according to the professional perspective, but also it leads to a weak role of landscape in the planning policy of its profession.

For a sustainable management of landscape, it is necessary to know about social problems and needs, to work collectively on a common ground and increase environmental consciousness and participation. No matter how effective their participation and consciousness about environment in their family or friend's circles, they do not attend mass or scientific meetings. The main reason for this might be a matter of self-confidence about the adequacy of knowledge in the related subject. It could be inferred that educational system of landscape architecture fails short to create informal environment (museums, protected areas, streets, NGOs etc.) due to the fact that they have lack of environmental knowledge and they are conscious about environment and participate in the related subject in a more limited circle (while with friends and family). The students could have problems knowing social, communal and ecological environments because of the fact that they spend more time with technological devices and prefer nature and recreation activities less than before due to the technological advancements and computer age. And so, they may refrain from reacting the trouble that occurs in such places. Therefore, science in landscape architecture education is not merely phenomenon to be taught in a formal setting (e.g. inside the school buildings) and it should continue in informal settings, as well, because it is known that open minded, participatory, concerned and volunteer individuals are raised in informal environments.

Simmonds (1995) identifies the components of environmental literacy under seven headings (McBride, 2011): Affect, ecological knowledge, socio-political knowledge, environmental issues, cognitive skills, environmentally responsible behaviors and additional determinants of these behaviors.

The main reason why the students do not take actions is related to the framework of landscape architecture education. Landscape architecture education has been continuing in the way it started in 1980s and has failed to adopt itself to the date.

Landscape architecture education is carried out in the framework of a program which is of intensive courses aiming to teach designing and 3D (three dimensional) skills but is short of theoretical courses. They hardly ever take theoretical courses and very few of such courses are supported with selective courses. In the first grade, the studio courses starting with design and drawing courses are succeeded by landscape design courses in the following grades and landscape planning course in the last grade. In the studio courses that are supposed to be about theoretical knowledge, no theories or policies are taught but physical planning are rather emphasized. As a result of emphasizing only physical planning, the students are unaware of why they are doing what and what they defend or protect. Moreover, they are fall short to understand the relationship between design and planning because they do not work mainly on urban scale to produce and develop major planning

decisions. It is naturally impossible that the students have a discourse or take actions in these studios without the theories and policies of design and planning.

In our age, it will only be possible to produce strategic decisions through the required analysis and synthesis about the subjects such as the protection, restoration, wise use, planning and management of natural and cultural sources as long as we train landscape architects having "operational environmental literacy".

In the education of landscape architecture professional discipline, a system planning should be taken into consideration rather than physical planning in order to train "operational" environmental literate candidates. It is crystal-clear that theory and practice should be attached importance so that a shared program could be developed in Landscape Architecture professional education, taught at different faculties in Turkey, and the program would be at international standards. Moreover, landscape design and landscape planning practices should be integrated into the curriculum, which will enable the students to develop environmental attitude, behavior and cognitive skills. Besides, it will also help the students to have attitudes and behaviors for making decisions, taking actions and sharing responsibilities that the courses which will develop their skills to set up projects and support them are incorporated in the curriculum.

Compared to the teaching plans at the universities in the Far East, the USA and European countries, it is seen that those in Turkey, which have the program of Landscape Architecture, have different approaches. The education in these parts of the world is of critical teaching and thinking methods although it is impossible to pronounce that a specific method is adopted in Turkey, moreover education in Turkey is shaped based on ideological thought.

Today, the students graduate from the university without a sufficient experience about the specific conditions and problems of practices because the infrastructure to build the continuity of education and practice in the education of landscape architecture is not developed sufficiently. Especially the knowledge of bureaucratic processes and legal infrastructures is not included sufficiently in the educational periods. Such problems are substantially based on that the educational and practical processes are determined independently of each other, teaching programs do not handle the problems and expectations of the practice periods as a direct input and the relationship between the university and occupational groups are restricted (Güzer, 2000; Demiroğlu et al., 2015). 54.88% of the students, a high rate, agreed on the following statement: "My traineeship did help me gain the ability to determine, express and solve the problems related to my profession". 17.07% of these students strongly agreed with this statement. Only 8.94 stated that they did not agree on this. The rate of the students who somewhat agree is 10.94%. More than half of the students (55.69%) said that the traineeship contributed to their perception of the global, environmental and social effects of the solutions related to their profession while 18.70% did not agree on this. The rate of those who strongly disagreed on it was 8.94% and those neither agree nor disagree on this statement were 19.67% (Demiroğlu et al., 2015).

As well as understanding the relationship between continuity and health of ecosystem and life, one should also have the scientific knowledge of and evaluate the potential risks by using this scientific knowledge. It is known that flow of information is provided though media in Turkey. Given that almost no programs are broadcast in media about ecosystem, impact-result, ecological systems and related processes, it is a natural and expected result that the rate of environmental literacy is low for students. However, it is another problem that educational system could not solve this problem. Ecology is an area that includes dynamic and complicated processes. Therefore, it is a debate that what kind of knowledge it should be based on and how the priorities should be determined. But formal and informal learning techniques should be utilized in company so as to create synergy in education. It is obligatory for Landscape Architecture professional discipline to consider a course program based on environmental and ecological literacy.

The environmental part covers more than the resource consumption. For this reason, the context that is formed by cultural reproduction is of a significant impact on supporting the human rights, the power of proving their own existence and the connection with others. It is the context that allows the link between humanity and nature (Ammar, 2003). In the analyses made, on the other hand, it is seen

that informal education, which suggests no political infiltration in terms of agency and stance against, is more effective. It is clear that formal education, as Hegel suggests, highly attests the need for educating the educators. Moreover, rote-learning based education rather than one that offers critical thinking raises only individuals with diplomas instead of those with the ability of thinking. On the other hand, no perception has grown or been developed that planning space and nature is a political area. Spatial planning is a political activity because related departments and their instruments constantly intervene with space. Thus, space is not an object that is dissociated with politics or ideology. It has always been politicized and strategic because it is the united form of historical and natural components (Lefebvre, 2009). As Harvey (1997) points out, spatial forms are not inanimate objects and it should be seen as a whole with the social process. The fact that Landscape Architecture in Turkey is offered under several faculties at universities, the failure to coordinate among the curricula and the state of "inertia" in education may hinder not only the students' motivation of learning but also developing a professional vision and mission.

References

Ammar, N. (2003). İslamda Ekolojik adalet ve kadınlar için insan hakları. İslam ve bahşedilmiş bir emanet [*Islam and Ecology: A best so we trust*]. In Richard C. Foltz, Frederick M., Dennyand Azizan Baharuddin (Ed.), *Islam and Ecology: A best so we trust*. The president and fellows of Harward College-Oğlak Yayıncılık ve Reklamcılık Ltd. Şti. İstanbul.

Berkowitz, A.R., M.E. Ford, &. Brewer, C.A. (2005). A framework for integrating ecological literacy, civics literacy, and environmental citizenship in environmental education. In Johnson, E.A., and M.J. Mappin (Ed.), *Environmental Educationor Advocacy: Perspectives of Ecology and Education in Environmental Education*. New York, NY: Cambridge University Press. pp. 227-265.

Cheng, I.N.Y., & So, W.W.M. (2014). Teachers' environmental literacy and teaching –stories of three Hong Kong primary school teachers. *International Research in Geographical and Environmental Education*, 24 (1), 58-79, http://dx.doi.org/10.1080/10382046.2014.967111

Demiroğlu D., Görmüş S. Birişçi T., Erdoğan R., Kalaycı Önaç A., Karadağ A. A. & Sezen I. (2014). Öğrenci Odaklı Peyzaj Mimarlığı Eğitim-Öğretiminde Stajın Yeri ve Önemi (Importance of Job Training in Student-Oriented Landscape Architecture Education]. In V. Ortaçeşme (Ed). *I. Peyzaj Mimarlığı Eğitim Öğretim Çalıştayı Bildiriler Kitabı*, pp. 251-265.

Gayford, C.G., & Dillon, P.J. (1995). Policy and the practice of environmental education in England: A dilemma for teachers. *Environmental Education Research, 1* (2), 173-184.

Gazdova, D. (2002). Characteristics of modern landscape architecture and its education. *Landscape and Urban Planning 60* (2002), 117–133.

Güzer, B.D. (2000). Bir Süreklilik Sorunu Olarak Eğitim, Tasarım ve Planlama Süreçleri [Education, Design and Planning Processes as a Sustainability Problem]. *Peyzaj Mimarlığı Kongresi*, 187-190, Ankara.

Harvey, D. (1997). *Postmodernliğin Durumu [The Condition of Postmodernism]*. (Turkish: S. Savran), Metis Publishing, İstanbul.

Intergovernmental Panel on Climate Change (2007). Climate Change 2007: The Physical Science Basis. Summary for Policy Makers. A Report of Working Group I of the Intergovernmental Panel on Climate Change. Geneva, Switzerland: IPCC.

IUCN, (2002). Education and Sustainability Responding to the Global Challenge. In D. Tilbury, R.B. Stevenson, J. Fien, D. Schreuder (Ed). IUCN Commission on Education and Communication (CEC) and IUCN–The World Conservation Union 2002. http://ibcperu.org/doc/isis/13028.pdf

Lefebvre, H. (2009). *Mekânın Üretimi* [*Production of Space*]. I. Ergüden (Tr). 2014, Sel Publishing, İstanbul.

McBride, B. B. (2011). *Essential Elements of Ecological Literacy and the Pathways to Achieve It: Perspectives of Ecologists.* Ph. D. Dissertation Univ. Of Montana Missoula University of Montana Scholar Works, http://scholarworks.umt.edu/etd.

Moody G., Alkaff H., Garrison D., & Golley F. (2005). Assessing the Environmental Literacy Requirement at the University of Georgia. *The Journal of Environmental Education, 36* (4), 3-9.

Orr, D.W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. Albany: State University of New York.

Palmer, M., E. Bernhardt, E. Chornesky, S. Collins, A. Dobson, C. Duke, B. Gold, R. Jacobson, S. Kingsland, R. Kranz, M. Mappin, M.L. Martinez, F. Micheli, J. Morse, M. Pace, M. Pascual, S. Palumbi, O.J. Reichman, A. Simons, A. Townsend, & Turner M. (2004). Ecology for a crowded planet. *Science 304*, 1251-1252.

Pe'er, S., Goldman, D., & Yavetz, B. (2007). Environmental literacy in teacher training: Attitudes, knowledge, and environmental behavior of beginning students. *The Journal of Environmental Education, 39*(1), 45-59.

Roth, C. E. (1968). *Curriculum Overview for Developing Environmentally Literate Citizens.* ERIC Reproduction Service No. ED 032982.

Roth, C. E. (1992). *Environmental Literacy: Its roots, evolution and directions in the 1990s*. ERIC/CSMEE Publications, The Ohio State University, http://files.eric.ed.gov/fulltext/ED348235.pdf

Simmons, D. (1995). Developing a framework for national environmental education standards. In papers on the Development of Environmental Education Standards (pp. 53-58). Troy, OH: NAAEE

Teksöz Tuncer G. Şahin E. & Ertepınar H. (2010). Çevre Okuryazarlığı, Öğretmen Adayları ve Sürdürülebilir Gelecek [Environmental Literacy, Pre-Service Teachers, and A Sustainable Future]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi [Hacettepe University Journal of Faculty of Education], 39* (39), 307-320.

Teksöz Tuncer G., Alp G. E. & Ertepınar H. (2008). *Ankara'daki Eğitim Fakültelerinde Çevre Okuryazarlığının Belirlenmesi [Determination of Environmental Literacy in the Faculties of Education in Ankara]*. TÜBİTAK Araştırma Projesi Sonuç Raporu, Ankara.

The Tribilisi Declaration, (1977). *The Tbilisi decleration: final report intergovernmental conference on environmental education*. Organized by UNESCO in Corporation with UNEP, http://www.gdrc.org/uem/ee/EE-Tbilisi_1977.pdf)

Thomas, I. & Nicita, J. (2002). Sustainability Education and Australian Universities. *Environmental Education Research, 8* (4), 475-492.

UNESCO-UNEP (United Nations Educational, Scientific and Cultural Organization-United Nations Environment Program). (1989). Environmental literacy for all. *Connect, 14 (2*), 1-8.

Nesibe Aydın Educational Institutions

Journal of Education and Future
year: 2019, issue:15, 119-127

Nesibe Aydın JEF

Construction of a Scale for Evaluating Turkish Learning Students' Attitude towards Turkish Language (Tashkent Case Study)*

Article Type	Received Date	Accepted Date
Research	22.05.2018	06.10.2018

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Abstract

"Attitude" in foreign language teaching is a concept that defines the overall beliefs and behaviour of students towards the language they learn. Students' eagerness for learning the language increases in cases where the attitude is positive, whereas this process is hindered in cases where the attitude is negative. Our study aimed at constructing a scale for evaluation of foreign students' attitudes towards Turkish language education, since the literature strived for a scale that evaluated attitudes towards Turkish Education as a foreign language. This scale, comprising of 73 items was applied to 206 students in Uzbekistan that were learning Turkish, and corresponding validity and reliability studies were conducted. As a result of relevant analyses, it was determined that the scale consisted of 61 items belonging to 5 distinct factors, i.e; listening, speaking, writing, reading and comprehension and attitude&motivation. Calculation of Cronbach's Alpha reliability coefficients having a valueover 0.70 suggested that the scales were reliable. Moreover, having the fit indices obtained by confirmatory factor analyses within the acceptable ranges proved that the constructional validities of scales were attained. Results of EFA-CFA and item analyses revealed that the scale was sufficiently applicable for students learning Turkish as a foreign language.

Keywords: Foreign language learning, motivation, attitude, reliability, validity.

* This study was derived from the research part of the doctoral thesis called “Effects of Turkish Success of Attitudes Related to Turkish Students Who Turkish Learners in Uzbekistan Universities”

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Türkçe Öğrenen Öğrencilerin Türkçeye İlişkin Tutumlarını Belirlemeye Yönelik Ölçek Geliştirme Çalışması (Taşkent Örneği)[*]

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	22.05.2018	06.10.2018

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Öz

Yabancı dil öğretiminde "tutum" öğrencilerin öğrenim gördüğü dile karşı sahip oldukları tüm düşünce ve davranışlardır. Öğrencilerin yabancı dile karşı olan tutumları olumlu veya olumsuz olabilir. Yabancı dil öğrenen öğrencilerin dile olan tutumu olumluysa öğrenme isteği artar ve dil öğrenme sürecini kolaylaştırır, tutum olumsuz ise öğrenmeyi engeller. Türkçe öğrenmeye yönelik tutumların belirlenebileceği ölçeğin alanyazında eksikliği duyulduğundan çalışmamızda yabancı öğrencilerinin Türkçe öğrenimine yönelik tutum ölçeğinin geliştirilmesi amaçlanmıştır. 73 madde olarak hazırlanan ölçme aracı Özbekistan'daki 206 Türkçe öğrenen öğrenciye uygulanıp geçerlik ve güvenirlik analizleri yapılmıştır. Yapılan analizler sonucunda, ölçekte toplam 61 madde ortaya çıkmış ve bu maddelerin 5 farklı boyutta (dinleme, konuşma, yazma, okuma ve anlama, tutum ve motivasyon) toplandığı bulunmuştur. Cronbach Alfa güvenirlik katsayıların .70 değerinin üzerinde hesaplanması, ölçeklerin güvenilir olduğunu göstermektedir. Ayrıca yapılan doğrulayıcı faktör analizi sonucunda hesaplanan uyum indekslerinin kabul edilebilir aralıklarda olması da ölçeklerin yapı geçerliliklerinin sağlandığını ortaya koymaktadır. AFA-DFA ve madde analizlerinin sonuçları, ölçeğin Türkçe öğrenen öğrencilere uygulanabilir düzeyde olduğunu göstermektedir.

Anahtar Sözcükler: Yabancı dil öğrenme, motivasyon, tutum, güvenirlik, geçerlilik.

[*] Bu makale, "Özbekistan'daki Üniversitelerde Türkçe Öğrenen Öğrencilerin Türkçeye İlişkin Tutumlarının Türkçe Başarısına Etkisi (Taşkent Örneği)" başlıklı doktora tezinden üretilmiştir.

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Introduction

Being a transitional phase into a new age, the 21st century demands improvement, modernization and qualitative efficiency of learning processes of human beings and our society. Development of educational methods that focus on the psychological status of students as a prerequisite for the effectiveness of the educational system and that cater for students' real needs by enhancing their creative skills are thus becoming prominent in higher educational institutions.

As a result of educational reforms undertaken after the independence of Uzbekistan and cooperation in the educational field between Uzbekistan and Turkey, positive attitudes toward the Turkish language -especially for Turkish spoken in Turkey- is rapidly being enhanced among Uzbekistan youth. Establishment of Turkish companies in Uzbekistan and watching Turkish series on television triggered an increase in the number of younger people who desired to learn Turkish and this number keeps on ever increasing. Hence, the responsibility of teachers as qualified experts for teaching Turkish as a foreign language should also be extended. Results of various theoretical and experimental research demonstrated that the prerequisite for the effectiveness of Turkish language education was the students' attitude towards the language and that it was directly related to the enhancement of motivation. Application of novel interactive educational methods for language education does not always yield to differentiated educational principles. Detachment from the language environment creates additional challenges regarding the motivation for language learning. A communicational, personalized approach that is based on cognitive and personality principles should be developed for Turkish language teaching. First of all, the language education should be provided based on students' field of interest, needs and motivations.

Language is the most important tool that human beings use to express their thoughts and emotions. The language that human beings use to convey their pasts to the future passes down numerous elements regarding the concepts differing from culture to arts, from existence to faith, and from history to present; beyond any doubt containing the cultural elements of societies (Kumsar and Kaplankıran, 2016).

Mete (2015), stated that the purpose of education for any language was the improvement of students' language skills. The main objective for Turkish language teaching is also the improvement of students' language skills. Language skills are based on comprehension and explanation. Comprehension comprises of reading and listening skills, whereas explanation involves speaking and writing skills. The person who provides the student with language skills can be said to be an efficient teacher.

According to Çakır (2015), a person who wants to learn a foreign language has to strive for speaking, writing, listening and comprehending, and reading in that language. Students' language skills will not nourish without proper motivation and attitudes of such students toward language would be negative. Dörnyei and Csizer (1998), state that the motivation is responsible for success in foreign language learning and students with inadequate motivation or that have different skills would not achieve high results and targets even if their education is provided by efficient teachers.

According to Gardner (1985), motivation has a major role in foreign language teaching. Motivation involves positive attitudes towards foreign language learning. And is based on factors that have the ability to satisfy students. Motivation nourishes in case the student strives for foreign language education and hence the corresponding attitude towards the language would be positive. This means that the students' objectives and desires regarding foreign language education would be clearly and expressly defined. Therefore, the effect of motivation with respect to planning and practising teaching should not be ignored (Mutlu, 2012).

Hall (2011) suggested that the motivation was the key factor for realizing a specific activity. He further advocates that it would even be hard to imagine learning a language without motivation. Furthermore, teachers express that the success or disappointment in language learning generally resulted due to either the presence or the absence of motivation and attitude.

Attitude is generally termed to be a tendency for giving positive or negative reactions. A student learning a foreign language also has negative or positive attitudes towards the language s/he is learning (Genç et al., 2016) Attitude is the overall summation of thoughts or behaviour they retain with respect to a certain subject. For instance a positive attitude towards the foreign language is demonstrated through the students' confidence and contentedness while talking in the foreign language, his/her eagerness to be in places where that language is spoken and his/her encouragement to people around him/her for the need of foreign language education (Özge Dagoğlu, 2004).

"Attitude" is the overall summation of thoughts or behaviour they retain with respect to a certain subject. Attitudes towards foreign language education might either be positive or negative. For instance, a positive attitude towards the foreign language is demonstrated through the students' confidence and contentedness while talking in the foreign language, his/her eagerness to be in places where that language is spoken and his/her encouragement to people around him/her for the need of foreign language education (Özge Dağoğlu, 2004).

Considering attitudes, Eagly and Chaiken (1993) suggest that an attitude is a psychological tendency. One can perform a task either willingly or unwillingly. Once there exists a need, the motivation nourishes in human beings, leading them to strive for their objectives.

According to Fishbein ve Ajzen (1975) attitude is a process. Negative or positive attitudes towards an event developafter a certain process. Nobody is born into this world innately loving or hating certain matters. Human beings are neutral to everything at first, and attitudes start to develop as time goes by.

Attitudes are vital in foreign language teaching. The attitude of the student towards a foreign language can be either positive or negative. A student with a positive attitude towards foreign language learning also has a strong intrinsic motivation for studying that language, which makes him/her more willing to learn that language and in turn making him/her reach their objectives more easily. A student with a negative attitude towards foreign language learning will have low levels of willingness to study, thus the process for achieving their objectives would be harder and more challenging. Hence, foreign language teachers should not oversee students' attitudes towards the language (Ref. Karatay, Kartallıoğlu, 2016).

Research regarding foreign students learning Turkish is not common and mostly focused on concepts of self-efficacy and attitude. Within the scope of research where self-efficacy of students learning Turkish as a foreign language with respect to comprehension skills, Tulumcu (2014) constructed a valid and reliable measurement tool that can measure levels of self-efficacy for listening and reading skills. Whereas, Okonkwo Ali (2001) in his research where he evaluated the relationship between Kazakh and Kirghiz students' attitudes towards the Turkish language, and their success in learning Turkish, he constructed a scale for measuring the effect of Kazakh and Kirghiz students attitudes towards the Turkish language in their Turkish learning success.

Nekzad (2016) used a (45) item 5-point-Likert-Scale that was constructed by Alzwari, Pour-Mohammadi ve Abidin (2012) and adapted to Turkish by researchers for evaluating attitudes of Afghani students towards the Turkish language that are learning Turkish as a foreign language.

The Aim of the Research

"Attitude" in foreign language teaching is a concept that defines the overall beliefs and behaviour of students towards the language they learn. Students' attitude towards the foreign language might have a positive as well as a negative form. Students' eagerness for learning the language increases in cases where the attitude is positive, which in turn paves the way for foreign language learning process or prevents this process in cases where the attitude is negative. Positive attitudes and motivation are interrelated concepts since both behavioursare based on needs. The objective of this study is the construction of a valid and reliable assessment tool for determining the degree of attitude towards the Turkish language for students that learn Turkish at universities in Uzbekistan.

Importance of the Study

Being the first study for determining the degree of attitude towards Turkish language for students that learn Turkish at universities in Uzbekistan, as well as the effectiveness of listening, speaking, writing, reading and understanding skills in language teaching, and the importance of attitude and motivation in language learning, our research is of importance in the field.

Method

Population sample

A total of 206 students that learn Turkish at Uzbekistan universities were included with respect to scale development process. The scale was constructed by performing statistical analyses on the data obtained from the population sample.

Construction of the Scale

An item pool with respect to attitudes towards Turkish language learning was generated as the first stage of constructing the *Scale for Evaluation of Turkish Learning Students' Attitudes Towards the Turkish Language*. A total of 73 items were collected in the item pool. A 5-point-Likert-Scale was utilized for expression of agreement degree to the scale items. These degrees were stated respectively as: "Absolutely disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly agree (5)".

Social scientists, academicians that specialize in Turkish language field views were taken primarily for face and construct validity and assessment and evaluation with respect to validity studies. Scale items were adjusted according to the views and critics received and consequently applied to the population sample. The scale for applied to the population sample for construct validity and reliability studies. Explanatory factor analysis was performed primarily for the construct validity. For the determination of items to be included in the scale by explanatory factor analysis, attention was paid for having eigenvalues of 1,factor loadings of 30, the location of the item only in on factor andhaving a difference of 10 where the item is located on two factors. In order for determining the distinct factors, factors having eigenvalues above 1 and the rate of explained variance were considered (Büyüköztürk, 2002).

Model fit of item-factor relationship obtained by explanatory factor analysis was tested by confirmatory factor analysis. Pearson correlation coefficients were utilized for determining the relationship between the scale factors. Item analysis techniques based on the differences between means of two groups and differences within groups, and based on items' total correlation was utilized for the analyses of items to be included in the scale. Internal consistency and split test methods were utilized for predicting the reliability of the scale. Cronbach's alpha internal consistency coefficient was calculated for predicting reliability by internal consistency method. SPSS 20 package program was used for data analysis, whereas Lisrel 8.7 was used for confirmatory factor analysis.

Findings and Discussion

This section contains the findings obtained by validity and reliability studies based on the results attained from the application of 73-item-scale to 206 students learning Turkish. Descriptive analyzes, exploratory and confirmatory factor analysis, item analysis, factor reliability analysis and determination of factor relationships were carried out during the construction of scale. Findings obtained with respect to validity and reliability studies were depicted in figures and interpreted as such through these stages.

Validity Study

Exploratory Factor Analysis and Confirmatory Factor Analysis were utilized for analyzing the scale's factor structure.

Exploratory Factor Analysis (EFA)

EFA results for 5 subscales and 73 items related to attitudes of Turkish learning students were evaluated. Results of Kaiser-Meyer-Olkin (KMO) test that was firstly conducted for determining the

adequacy of sample size for analysis and results of Barlett's sphericity test conducted for determining the suitability are provided in Table 1.

Table 1
KMO and Barlett Test Results for Scales

Scales	KMO	Barlett's Test of Sphericity
Listening Scale	.864	1633.957 *
Speaking Scale	.923	2172.485 *
Writing Scale	.892	1162.110*
Reading and Comprehension Scale	.901	1065.733 *
Attitude and Motivation Scale	.846	9452.063 *

*p < .01

Having a KMO rate over 60 signifies the "adequacy" of sample sizefor factor analysis (Brownlow, 2004, Pett, Lackey & Sullivan, 2003). Furthermore, significant values for chi-square were determined to inspect the results of Bartlett's test of sphericity. (p<.01). Taking these results into consideration, it was accepted that data could be factorized (Pett, Lackey & Sullivan, 2003; Child, 2006; Hutcheson & Sofroniou, 1999).

Results of analyses revealed that the 5 scales were consisting of a single factor just as is in their original form. Factor loadings for "Listening Scale",was observed to vary between .385 and.843 (4 items having factor loading below .30 wereeliminated from the scale). Moreover, the scale was observed to explained a variance of 52.83%. Factor loadings for "Speaking Scale".was observed to vary between .548and .862. Moreover, the scale was observed to explain a 60.15% variance (3 items having factor loadings below .30 were eliminated from the scale). Factor loadings for the "Writing Scale"wasobserved to vary between .548and .802. Moreover, the scale was observed to explain a 54.152% variance (1 item having a factor loading below .30 was eliminated from the scale). Factor loadings for "Reading and Comprehension Scale"were observed to vary between .418 and .842. Moreover, the scale was observed to explain a variance of 57.65%. It was observed that the factor loadings of "Attitude and Motivation Scale" varied between .401 and .681. Moreover, the scale was observed to explain a variance of 45.82%.

Confirmatory Factor Analysis (CFA)

DFA was performed for determining the fitness rate of the scale's factor structure and collected data, and corresponding fitness values are provided in Tablo 2 below. An acceptable to good fitness was generally observed while inspecting the fit indices.

Table 2
DFA Fit Indices

Scales	Fit Indices
Listening Scale	$\chi 2$/sd = 2.28; RMSEA =.052, GFI =.91, AGFI =.90 CFI= .95, and NFI =.93
Speaking Scale	$\chi 2$/sd = 1.89; RMSEA =.064,GFI=.90, AGFI =.90 CFI= .93, and NFI =.95
Writing Scale	$\chi 2$/sd = 2.56; RMSEA =.065,GFI=.93, AGFI =.90 CFI= .95, and NFI =.93
Reading and Comprehension Scale	$\chi 2$/sd = 1.67; RMSEA =.053 GFI =.92, AGFI=.91, CFI =.96, and NFI =.92
Attitude and Motivation Scale	$\chi 2$/sd = 2.45; RMSEA =.064,GFI=.91, AGFI =.89, CFI =.94, and NFI =.94

Reliability

Item analysis

item total correlation

Item Total Correlations explains the relationship between scores obtained from test items and the total test score. Positive and higher values of item-total correlations indicate that the items are sampling similar behaviour, which in turn indicates high internal consistency (Büyüköztürk, 2008).

It was observed that the Item Total Correlation of the scale itemswas observed to vary between .31and .80. It can be suggested that each of the scales was discriminating individuals well as a result of these analyses results. since items with an item total correlation value of 30 and moreis said to discriminate individuals having the measured attribute form the ones that do not have the related attribute to a good extent (Benoit, 2008).

Obtaining significantly different results from a comparison of average item scores by independent sample t-tests performed after forming two groups as the lower 27% and upper 27% groups regarding the scores attained from scales might be taken as an indication of the test's internal consistency. t-test results for comparison of scale's upper and lower 27% percent groups are provided in Table 4. Having significant values for all the items on each scale ($p < .01$) can be said to indicate the tendency of scale items to measure the attribute they specify.

Table 3

t-test Results for Upper 27% percent and Lower 27% Groups

Scales	Min.	Max.
Listening Scale	-10.45	3.172
Speaking Scale	-7.235	-..843
Writing Scale	-6.157	.390
Reading and Comprehension Scale	-8.487	-1.306
Attitude and Motivation Scale	-8.395	-..144

Cronbach's alpha and split half test correlations

Internal consistencies of constructed 5 subscales were investigated using Cronbach's alpha coefficient and reliability was tested using the split-half reliability test. Cronbach's Alpha coefficient values and split-half correlation values are provided in Table 4.

Table 4

The Cronbach's Alpha Coefficient and the Two Half-Test Correlation Values of the Scales

Scales	Number of Items	Cronbach's Alfa	R
Listening Scale	12	.87	.83
Speaking Scale	14	.91	.86
Writing Scale	11	.88	.83
Reading and Comprehension Scale	9	.90	.89
Attitude and Motivation Scale	15	.81	.87

Having internal consistency coefficients greater than .70 is generally deemed to be sufficient for the reliability of the scale (Liu, 2003). Therefore, having internal consistency coefficients greater than 0.70 for each scale and results obtained by inspecting Spearman-Brownsplit-half test indicate sufficient reliability of the scale.

Conclusions

Because Turkish and Uzbek are members of Turkish language family, they are similar in terms of sound, form, word, sentence and meaning structure. This similarity leads to problems in the education of Turkish. It may not be easy to learn this new language, which is not completely similar to

some Uzbek students. The rules of sound harmony of Uzbek language are different from Turkish. This can cause problems in listening, speaking, writing and reading skills. This situation is a great task for Turkish teachers as a foreign language. The opening of Turkish companies in Uzbekistan, watching the Turkish series, listening to Turkish music has increased the demand of young people especially to learn Turkish. This demand can be met by qualified teachers, quality textbooks and materials. But that is not enough. The students should have positive attitudes and motivations about Turkish. At this point, it is important for the students to determine the listening, speaking, writing, reading, understanding attitude and motivation levels. The determined levels will make teaching strategies and environments more effective.

Validity and reliability studies of *Evaluation of foreign students' attitudes towards Turkish language education* were conducted throughout this research. The scale comprised of 5 distinct subscales (listening, speaking, writing, reading and comprehension, attitude and motivation). Calculation of Cronbach's Alpha reliability coefficients having a valueover 0.70 (in the range of .81-.91) and having split half test correlation values between.83 and.89 demonstrated that the scales were reliable. Item total correlation values of scale itemswere observed to vary between .31and .80. It can be suggested that each of the scales was discriminating individuals well as a result of these analyses results. Significantly different results for scale items were obtained from comparisons of average item scores by independent sample t-tests performed after forming two groups as the lower 27% and upper 27% groups regarding the scores attained from scales (p<.(p <.01).High scores obtained in each of the scales indicated that the individual's attitudes towards Turkish education were high.Results of EFA-CFA and item analyses can be interpreted as the scale was fit for application to Turkish learning students. Reliability and validity can be applied to different sample groups and new researches can be done.

References

Büyüköztürk, Ş. (2002). *Sosyal bilimler için veri analizi el kitabı: İstatistik, araştırma deseni, SPSS uygulamaları ve yorum [Handbook of data analysis for social sciences: Statistics, research design, SPSS applications and interpretation]*. Ankara: Pegem Academy Publishing.

Brownlow, C. (2004). *SPSS explained*. London: Routledge.

Child, D. (2006). *The essentials of factor analysis*. London: Continuum International Publishing Group.

Çakır, G. (2015). Yabancı dilde konuşma becerisinin geliştirilmesinde öğretmen adaylarının görüşleri [Opinions of the teacher candidates on the development of speaking skills in foreign language]. *International Journal of Social Science*, 40, 193-203. https://www.jasstudies.com/Makaleler/1824652509_14-Yrd.%20Do%c3%a7.%20Dr.%20G%c3%bclcan%20%c3%87AKIR.pdf Access: 10.04.2018

Dörnyei, Z. & Csizer, K. (1998) Ten commandments for motivating language learners: Results of an empirical study. *Language Teaching Research*, 2(3), 205-229. http://journals.sagepub.com/doi/10.1177/136216889800200303 Access: 10.04.2018

Eagly, A. H. & Chaiken, S. (1993). *The Psychology of attitudes*. Fort worth: Harcourt Brace Jovanovich.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research. reading*. MA: Addison-Wesley.

Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitude and motivation*. London: Edward Arnold.

Hall, G. (2011). *Exploring English language teaching language in action*. London: Routledge.

Hutcheson, G. D. & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage.

Jöreskog, K.G. & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.

Karatay, H. ve Kartallıoglu, N. (2016). Yabancı dil olarak Türkçe öğrenme tutumu ile dil becerileri edimi arasındaki ilişki [The relation between the attitude of learning Turkish as foreign language

and acqusition of language skills]. *Journal of AIBU Social Sciences Institute*. 16(4), 203-213. http://sbedergi.ibu.edu.tr/index.php/sbedergi/article/view/1324 Access: 15.04.2018.

Kumsar, E. ve Kaplankıran, İ. (2016). Kazakların Türkiye Türkçesi öğreniminde yaptıkları yanlışlıklar ve bu yanlışlıkların düzeltilmesine yönelik öneriler [The mistakes that the Kazakh have done in learning Turkey Turkish and suggestions for aiming at the correction of them]. *Journal of Diyalektolog*. 12, 81-103. http://www.diyalektolog.com/DergiTamDetay.aspx?ID=105&Detay=Ozet Access: 01.05.2018

Mete, F. (2015). Türkçe öğretmenliği bölümünde yazma eğitimi dersi: Bilme ve uygulama karşılaştırması [Writing course in Turkish education department: Comparison to knowledge and practice]. *Journal of Ana Dili Eğitimi.* 3(2), 81-91. http://www.anadiliegitimi.com/download/article-file/14892 Access: 15.04.2018.

Mutlu, S. (2012). *Bilimsel süreç becerileri odaklı fen ve teknoloji eğitiminin ilköğretim öğrencilerinin bilimsel süreç becerileri, motivasyon, tutum ve başarı üzerine etkileri [The assessment of the attitude toward the target language of Afghan studens learning Turkish as a foreign language]*. (Unpublished Master dissertation). Trakya University, Institute of Science.

Nekzad, M. (2016). *Türkçeyi yabancı dil olarak öğrenen Afganistan uyruklu öğrencilerin Türkçeye karşı tutumlarının incelenmesi [The assessment of the attiude toward the target language of Afghan studens learning Turkish as a foreign language]*. (Unpublished Master dissertation). Dokuz Eylul University, Institute of Education Sciences, Izmir, Turkey.

Oyarkılıçgil Ateş, A. (2001). *Kazak ve Kırgız öğrencilerin Türkçeye karşı tutumlarının Türkçe öğrenim başarılarıyla ilişkisi [The relation between Kazakh and Kirghiz students attitudes towards turkish and their success in learning turkish language]*. (Unpublished PhD dissertation). Ankara University, Institute of Social Sciences, Ankara, Turkey.

Özge Daglıoglu, F. (2004). *Üniversite hazırlık sınıfı öğrencilerinin yabancı dil derslerine olan tutumlarını arttırılması ve program düzenlenmesi [An analysis of ways of improving positive attitudes towards foreign language learning amongst university prep school students and suggesstions on curriculum development]*. (Unpublished PhD dissertation), Yildiz Technic University, Institute of Social Sciences, Istanbul, Turkey.

Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks, CA: Sage.

Tulumcu, F. M. (2014). *Yabancı dil olarak Türkçe öğrenenlerin anlama becerilerine yönelik öz yeterlikleri [Self-efficacy for comprehension skills of learners of Turkish as a foreign language]*. (Unpublished Master dissertation), Sakarya University, Institute of Education Sciences, Sakarya, Turkey.

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