EURASIAN JOURNAL OF EDUCATIONAL RESEARCH

Bimontly Peer-Reviewed Journal, Year: 18 Issue: 77 / 2018
İki Ayda Bir Yayımlanan Hakemli Dergi, Yıl: 18 Sayı: 77 / 2018

EURASIAN JOURNAL OF EDUCATIONAL RESEARCH

Bimontly Peer-Reviewed Journal, Year: 18 Issue: 77 / 2018
İki Ayda Bir Yayımlanan Hakemli Dergi, Yıl: 18 Sayı: 77 / 2018

PUBLISHING MANAGER / Sahibi ve Yazı İşleri Müdürü
Anı Yayıncılık Eğitim ve Danışmanlık Reklam Kırtasiye Sanayi Ticaret Ltd. Şti. adına
Anı Publishing Education and Consultancy Advertisement Stationary Industry Trade Co. Ltd. in the name of
Özer DAŞCAN

EDITORIAL PRODUCTION ADMINISTRATOR / Yayın Yönetim
Dilek ERTUĞRUL

HEADQUARTER / Yönetim Merkezi
Anı Yayıncılık, Kızılırmak Sokak 10/A
06640 Bakanlıklar Ankara, TURKEY
ejer.editor@gmail.com
Tel: +90 312 425 81 50 pbx Fax: +90 312 425 81 11

Printing Date / Basım Tarihi: 20.09.2018
Printing Address / Matbaa Adresi: Vadi Grafik
İvedik OSB 770. Sokak No: 101 Yenimahalle-Ankara
Tel: +90 312 395 85 71
Broadcast Type / Yayın Türü: Local Broadcast / Yerel Süreli Yayın
Cover Design / Kapak Tasarımı: Anı Publishing / Anı Yayıncılık
Composition / Dizgi: Göksel ÇAKIR

Eurasian Journal of Educational Research (Print ISSN 1302-597X, e-ISSN: 2528-8911) is a bimonthly (6 issues per year) peer-reviewed journal published by Anı Yayıncılık.

Eurasian Journal of Educational Research **(EJER)** is abstracted and indexed in;

Emerging Sources Citation Index **(ESCI)**

The Education Resources Information Center (**ERIC**)

Social Scisearch,

Journal Citation Reports / Social Sciences Editon,

Higher Education Research Data Collection **(HERDC)**,

Educational Research Abstracts **(ERA),**

SCOPUS database,

EBSCO Host database,

ULAKBİM national index.

CONTENTS
İçindekiler

REVIEWERS of the 77th ISSUE
77. Sayı Hakemleri

Ahmet Şahin
Ali Ersoy
Arda Arıkan
Asiye Toker Gökçe
Burcu Şenler
Cevriye Ergül
Defne Erdem Mete
Deha Doğan
Emrah Çınkara
Firooz Sadighi
Gökhan Atik
Gurcu Erdamar
Gülseren Karagöz
Hassan Soodmand Afshar
Hyunju Lee
Jale Çakıroğlu
Kamile Demir
Maria del Carmen Arau Ribeiro
Mert Bastas
Mustafa Caner
Mustafa Sami Topcu
Nihan Demirkasımoğlu
Ömür Gürdoğan Bayır
Saadet Kuru Çetin
Sedat Kanadlı
Sibel Kaya
Süleyman Göksoy
Sündüs Yerdelen
Tamara Savelyeva

Eurasian Journal of Educational Research 77 (2018) 1-18

Eurasian Journal of Educational Research
www.ejer.com.tr

Views of Teachers Regarding the Life Skills Provided in Science Curriculum*

Dilek ERDURAN AVCI[1], Damla KAMER[2]

ARTICLE INFO

Article History:
Received: 18 Dec. 2017
Received in revised form: 26 Jul. 2018
Accepted: 05 Sept. 2018
DOI: 10.14689/ejer.2018.77.1

Keywords
4-H life skills, science literacy, teachers' perceptions, science course

ABSTRACT

Purpose: Teachers have an important role to help their students acquire and improve their life skills. Therefore, it is essential to ask what science teachers think about the concept of life skills and how they perceive this concept. The aim of this study was to examine how science teachers perceive life skills and what they think about life skills as part of the learning process in Turkish Science Course Curriculum. **Research Methods:** This research was conducted as a case-study. 26 science teachers, who worked in the centre of Burdur province, participated in the study. Data were collected with semi-structured interviews. **Findings:** This study revealed that science teachers believed that life skills are necessary for every individual but when it was assessed according to Turkish Science Course Curriculum, awareness of relating life skills to daily life was significantly low. Most teachers perceived life skills limited only to their own branch of education (e.g., science). **Implications for Research and Practice**: It was essential for us to increase the level of teacher awareness about life skills, which are integrated to the curriculum, in order to make the students gain and/or improve the life skills required in the 21st century. We propose that new policies, which focus on pre-service and in-service educational activities that help teachers to improve their vocational qualifications to integrate their own life skills with the courses, should be developed.

* This study was presented at the International Congress of Eurasian Educational Researches held in Mugla on May 31–3 June, 2016.

[1] Mehmet Akif Ersoy University, TURKEY, e-mail: derduran@mehmetakif.edu.tr, ORCID: https://orcid.org/0000-0001-6695- 7348

[2] Private Palmiye Middle School, TURKEY, e-mail: damlaozdemirsun@gmail.com, ORCID: https://orcid.org/0000-0002-0376- 6736

Introduction

As our world moves from the industrial age of 20th century to the information age of 21st century, we become more and more aware of the fact that the skills which lead to success in the 20th century do not guarantee success in the 21st century (Kivunja, 2015). This awareness reveals the skill demand and supply gap for the business world (OECD, 2016, p.3). Recent studies indicated an increase in difficulties that employers have been encountering in filling vacant positions (Cedefop, 2018). This problem is also known as the "21st-century skills gap" (Trilling & Fadel, 2009, p.7) or "skill mismatch" (Cedefop, 2018) in the business world. The competitive capacity and wealth of a country depends on having a qualified and well-educated workforce (Trilling & Fadel, 2009, p.7). This dependency makes the information-era world face the demand for growing individuals who have a new series of skills.

Life skills are the ones that are among the 21st-century skills (Partnership for 21st Century Skills [P21], 2015) and help us cope with daily life problems effectively (World Health Organization [WHO], 1997). Many worldwide organizations conduct educational activities which develop life skills for individuals (UNESCO, 2004; United Nations, 2003; WHO, 1997). All of these organizations consider life skills as necessary skills that help individuals to effectively manage the problems they encounter and believe it important to adopt into their life. Furthermore, these organizations emphasize the need to develop such skills to insure individuals align themselves with the demands of the information age.

Thus, some questions arise, first, "What are the necessary life skills in the 21st century?" There are many studies in the literature that classify life skills in various forms (Fox, Schroeder & Lodl, 2003; Hanbury, 2008, p.10; Hendricks, 1998; P21, 2015; United Nations, 2003). One of the most comprehensive classifications belongs to Hendricks (1998), who organized a model called 4-H life skills. These skills are divided into four main categories; Head (managing and thinking), Heart (relating and caring), Hand (giving and working), and Health (being and living). Life and career skills are grouped as flexibility & adaptability, initiative & self-direction, social & cross-cultural skills, productivity & accountability, leadership & responsibility in the P21 project (P21, 2015). Fox, Schroeder, and Lodl (2003) classified a total of 32 life skills under four themes (e.g., technical, communication, personal/social and leadership skills). WHO (1997) emphasizes that the nature of these skills may differ depending on the cultures and defines the main skill set for the life skills as decision making, problem-solving, creative thinking, critical thinking, effective communication, interpersonal skills, self-awareness, empathy, managing emotions, and stress. The skills that WHO has pointed out, are also common skills found in many of the classifications within the research literature.

The second question; "What are the level definitions for the skills that are essential in the 21st century and how can they be adopted in the curricula?" An important step for this question was the official approval of "The European Qualifications Framework for life-long learning" (EQF) in April 2008 by the European Parliament and European Council (European Communities, 2008). The

foundation of EQF is formed by eight levels which define minimum common qualifications and these levels are defined as "level indicators" that are formed by learning acquisitions including information, skills, and competence. In the last decade, many countries, most of which are European countries (e.g., Czech Republic, Spain, Italy, Lithuania), have accomplished national reforms in their national curricula aligned with the key competencies defined in the EQF (European Commission/EACEA/Eurydice, 2012). One of the purposes of these reforms was to develop the life skills of students in order to prepare them for life.

Turkey also tool steps in this direction by forming the national competency framework in 2015 according to the EQF (Turkish Qualification Framework [TQF], 2015), and completed the reforms, during which the competencies and the skills emphasized in the framework were inserted in the national curricula (The Turkish Ministry of National Education [TMNE], 2018). The life skills topic was included in Turkish Science Course Curriculum (TSCC) for the first time before this reform (The Turkish Ministry of National Education [TMNE], 2013). The purpose was to instruct and develop the life skills like analytical thinking, decision making, creative thinking, entrepreneurship, communication, and team-work together with the basic information. All of these life skills were included in TSCC as sub-learning domains. Among the primary objectives of the TSCC, the one regarding life skills was expressed as (TMNE, 2013); "*To make every individual take responsibility of daily life problems and to make them make use of information gained from science courses, scientific process skills, and other life skill*s" (p. II).

The findings of "21st Century Skills and Competences for New Millennium Learners in OECD Countries" (2009) indicated that the introduction of 21st-century skills has been conducted via reforms in compulsory education curricula in many countries, including Turkey. On the other hand, there are no national or regional policies to shape or summarize these skills. Similarly, there are only a limited number of teacher education policies that target instruction and development of the stated skills. The report emphasized the absence of policies for teachers to instruct and assess these skills (Ananiadou & Claro, 2009). Although Turkey's attempt to conduct curricula reforms in the same period with many other countries was considered as a positive development, a research study (Turkish Education Association [TEA], 2009) indicated that the teachers could not follow the changes in the curricula.

The third question; "What do we need to support the education and the instruction process for the skills required in the 21st century?" Our age demands individuals who have a new skill set (Kaufman, 2013; Trilling & Fadel, 2009, p.8). Kivunja (2014) claimed that this demand can be satisfied with a new learning paradigm; for example, "*Teaching our students so that they become well-equipped with the 21st-century skills is the new learning paradigm*" (p. 85). According to Kivunja, this paradigm shift process can only be sustained by providing students with the required education to master the skills that are essential in the 21st century. At this point, the studies which support the understanding and applying of life skills, essential in the 21st century, are quite limited for both the students (Ansari, Khorram,

Soleimaninejad &Ansari-Moghaddam, 2016; Erawan, 2010; Kennedy, Pearson, Brett-Taylor & Talreja, 2014; Saavedra & Opfer, 2012; Svanemyr, Baig & Chandra-Mouli, 2015; Trilling & Fadel, 2009, p.125; Wallace & Priestley, 2011) and the teachers, teacher candidates, and/or teacher educators (Avsar, 2007; Bacanak, 2013; Raja, Mullaikodi & Asaph, 2015; Suminar, Prihatin & Syarif, 2016).

Suminar, Prihatin, and Syarif (2016) stated that the professional skills of instructors are limited when it comes to understanding the scope and objective of life skills instruction, which leads to ineffective planning and realization of the learning process. Ansari et al., (2016) pointed out that medical students are often not aware of the importance of life skills and the authorities do not implement programs in this field. Gunes and Uygun (2016) indicated that they found a gap between the required teacher information & skill set and the information & skill set put into practice by the teachers. Then, they emphasized that this gap negatively affected the skill mismatch problem. Here, we can name the "good teachers" as the answer to our third question (Darling-Hammond, 2006; Kaufman, 2013; Saavedra & Opfer, 2012; Trilling & Fadel, 2009). Trilling and Fadel (2009) emphasized that teachers should be effective in the following process; "*They will need to be well coordinated with ongoing changes in curriculum, assessment, standards, and the overall learning environment*" (p.139). Ananiadou and Claro (2009) claimed that the attempts related to the aforementioned skills can only be realized if both teachers and students consider them worthy and useful for their teaching and learning experiences.

In Turkey, the Ministry of Education has been trying to realize the attempts to support life skills instruction with curricula reforms that cover compulsory education for a term of five years (TMNE, 2013, 2018). Science teachers are undoubtedly the pioneer practitioners who are supposed to integrate the life skills which were included in TSCC in 2013 for the first time into the classrooms. Therefore, we think that finding out the views of the science teachers about these skills included in the TSCC has a great importance in developing teacher education policies which will help us overcome the skill mismatch problem and to grow individuals who possess the required life skills. This study aimed to find out how Turkish science teachers perceived life skills, and what their opinions about the inclusion of life skills into the TSCC. The following research questions were asked:

1. How do Turkish science teachers perceive life skills?
2. What do Turkish science teachers think about the inclusion of life skills in the TSCC?

Method

Research Design

This research was designed as a case study, which is a qualitative research method. The case study approach is an empirical research method which studies a phenomenon within its real-life framework, in which boundaries between the fact

and the content are not clear, and which is used when more than one form of evidence or source of data is available (Yildirim & Simsek, 2011, p.277). In this study, the case study design was chosen to find out the views of science teachers about life skills in the TSCC.

Research Sample

In this study, purposeful sampling method was used because it allowed an in-depth study of the case (Yildirim & Simsek, 2011, p.107). In this context, we asked all of the science teachers employed in the secondary schools in Burdur province to participate in this research, and we received positive replies from 26 of the contacted teachers. 13 of the participants were male and the remaining 13 were female. They were employed in 13 different secondary schools. The teachers' ages ranged from 28 to 56, and the teachers had 6 to 35 years of working experience. 24 of the participants had a bachelor's degree. One participant was studying for a master's degree in science education and the other had completed a master's degree in physics. 20 of the teachers were graduates from the education faculty, 4 of them were graduates from science and literature faculties, and 2 of them were graduates from an education institute (e.g., a previously established 3-year duration teacher training institution).

Research Instruments and Procedures

An interview form was used as the research instrument. The interview form included questions about the demographic characteristics of teachers, what life skills mean for them, what they think about life skills being included in the TSCC, how they assess the acquisition of life skills (e.g., analytical thinking, decision making, creative thinking, entrepreneurship, communication, and teamwork) in science classes, the effectiveness of their own lessons to acquire these skills, how they practice the acquisition of these skills, what limitations and restrictions are there to acquiring these skills, and so forth. The researchers received expert support to compose the content of the form and to validate it linguistically. In the pilot study, 5 science teachers were interviewed in order to determine the question order and to find out the alternative questions, in case they were required. After the pilot study, the researchers presented the form to an expert and asked for feedback. Then the interview form including 13 questions, supported by the common view of experts and researchers, was finalized.

The researcher introduced herself to the participants and defined the aim of the study in their preliminary interview. At that time, the date and time were set for the participants' main interviews. The researcher met the teachers on their scheduled appointment dates in appropriate offices at the schools in which they worked. The interviews were semi-structured and recorded with a voice recorder.

Validity and Reliability

109 codes were generated during the data analyses of teachers' perceptions of life skills. Two experts collaborated in the code generation process. These codes were organized under themes according to their similarities. Two other experts

commented on the codes and the inter-rater reliability value was calculated at 93.57. A framework for data analysis was established using six life skills in the TSCC and this framework was employed in the descriptive analysis of the views about life skills in the TSCC.

Data Analyses

Content analyses and descriptive analyses were used in the data analyses process. The collected data were transcribed and then divided into two meaningful sections; "Teachers' Perceptions of Life Skills" and "Views about the Inclusion of Life Skills in the TSCC". Content analysis was applied to the first section and descriptive analysis was applied to the second section. In content analyses, similar data were gathered together within certain concepts and themes and interpreted in a meaningful way, whereas in the descriptive analyses, data were summarized according to previously determined themes (Yildirim & Simsek, 2011, p.224-227).

Results

Teachers' Perceptions of Life Skills

Teachers' perceptions of life skills as themes and sub-themes are presented in Table 1. According to Table 1, ten of the teachers related life skills to science literacy, three of them related life skills to the 4-H life skills model, and 13 of them related life skills to both science literacy and 4-H life skills.

Table 1

The Themes of Teachers' Perceptions of Life Skills and Their Distribution

Themes	Sub-themes	f	N
Science literacy	Key science conceptions	16	23
	SPS	5	
	STSE	45	
	Scientific and technical psychomotor skills	9	
4-H Life Skills	Thinking	11	16
	Managing	11	
	Relating	6	
	Caring	2	
	Living	1	
	Being	23	

(SPS: Science Process Skills, STSE: Science-Technology-Society-Environment, f: frequency, N: number of teachers)

Science Literacy

It was observed that 23 teachers' perceptions of life skills included the theme of science literacy. These teachers perceived life skills as applying scientific knowledge in everyday life, measuring, making observations, having knowledge about scientific

concepts and understanding these concepts. According to these teachers, learners who possess life skills use scientific knowledge outside of school and remember scientific explanations of events they observe in their environment. These teachers related the concept of life skills to their particular academic background and thought that a student, who used the knowledge that an acid and base react when they are mixed, demonstrated a life skill. According to them, a student having life skills should know the scientific reasons underlying a solar or lunar eclipse or tidal events, should have the knowledge of the human body, should remember about health, and should make use of the scientific knowledge. As shown in Table 1, teachers' examples were related to science literacy's sub-themes which are; "Key Science Conceptions", "Science Process Skills" (SPS), "Science-Technology-Society-Environment" (STSE) and "Scientific and Technical Psychomotor Skills". Four examples of teachers' quotes related to these sub-themes are presented below:

> *"... Children should apply scientific knowledge in daily life. We teach acids and bases. If a child goes home and remembers not to mix them or I mean, when he looks at a substance then he knows it is made of molecules ... I've recently bought a kidney from the butcher. My daughter asked me 'We will wash it before we eat it, won't we?' then I asked: 'Why?' She answered 'Its job is to filter urine, isn't it? So it is dirty'. Isn't this a life skill?"* (Erdinc) (Key science conceptions)

> *"… I want to teach how to observe something. I tell students 'Observe very carefully, look very carefully'. Everything in life is related to science." (Perihan)* (SPS)

> *"... We can teach them how long a plastic bag can dissolve in nature, but we cannot show that a child should throw it in the recycling box." (Salih*) (STSE)

> *"… Many things might be a skill. But you see that children are not even able to do simple things ... They cannot draw anything, they cannot even write or cut something ..." (Keriman*) (Scientific and Technical Psychomotor Skills)

4-H Life Skills

Some examples cited by 16 teachers were related to certain skills from the 4-H life skills model. The examples under this theme define life skills as dealing with problems faced in individual or social life. The skills, such as being responsible, being able to see the future, adapting to life, honesty, self-confidence, time management, achieving success, and communication were considered in this theme. Teachers' examples were related to six of eight life skills in the 4-H model. These six skills presented in Table 1 are thinking, managing, relating, caring, living and being. An interesting finding here is that; there were no examples of life skills that belong to the working and caring categories of the 4-H model, namely self-motivation, teamwork, empathy, sharing, and caring for others, among the examples given by the teachers.

Ahmet's examples were entrepreneurship, self-expression, choosing a suitable occupation, and critical interpretation. According to him, it was necessary to have life

skills in order to have a professional career. Latif said that all the skills that enabled students to grow up to good citizens and enabled them to survive in the future were life skills. Latif stated; "For *example, decision-making might be a life skill ... taking responsibility, communication, self-expression, self-confidence, creative thinking might be life skills also.*" Gamze defined life skills as, "*solving problems within the family, friendships and social interaction in everyday life*".

Views about the Inclusion of Life Skills in the TSCC

15 teachers stated that they had closely examined the TSCC, 5 teachers said that they just quickly reviewed it, and 6 teachers said that they did not examine the TSCC at all. Also, all of the teachers stated that they did not have any in-service training related to TSCC. Only one teacher said that he/she had noticed there was a learning area in the TSCC named life skills. After learning about it, 19 teachers had a positive opinion about the inclusion of the life skills in the TSCC, while 6 teachers said that the inclusion of the life skills in the TSCC was not beneficial because of the inability to perform the relevant activities. One teacher did not want to comment. Ahmet, who had a positive opinion, stated, "It is good for future generations. I think life skills are necessary for anyone to survive. It is beneficial for both the society and the individual." Erdinc, who thought the inclusion of the life skills in the TSCC brought no benefit at all, stated,

> "*Unless the course duration is changed, the weight of the topics is reduced, we have any extra time for experiments, and the central examination system is cancelled, inclusion of the life skills in the curriculum has no meaning... According to the curriculum, we must apply this. So, we're going to do it just because it says so? Has the curriculum been relaxed accordingly? Is the infrastructure prepared?*"

Views about Six Life Skills in the TSCC

Analytical thinking. Among the teachers, 20 of them said that science was an appropriate subject for the acquisition of analytical thinking skills; however, they also thought that each unit was not equally suited to acquire the corresponding skill. They thought that research homework, concept maps, a puzzle method, student clubs, the 5E method, and project competitions were all relevant in developing analytical thinking skills. For example, Ahmet said, "*Concept maps already go to the whole from parts... Students already apply analytical thinking to reach the whole.*" Fahri stated that he enabled students to acquire analytical thinking skills through the method he called "puzzle method". Another three teachers thought that mathematics, Turkish, or social studies were more appropriate subjects for achieving this skill and they argued that the science course was not suitable for achieving this skill. One of the teachers said that due to their age, analytical thinking skills might be possessed by students at the high school or university level.

Decision making. 19 teachers thought that the skill of decision-making was an appropriate skill to acquire in science class. They stated that experiments, teamwork, brainstorming, trips out of school, and other similar activities helped in the acquisition of the decision-making skill. Of these activities, making experiments was

the most dominant one, which was emphasized by 13 teachers, while seven of the teachers did not agree. These seven teachers instead thought that acquiring this skill depended on reading books, being confident, the socio-economic status of the family, attitudes between parents and the children, and similar variables.

Creative thinking. 24 teachers believed that creative thinking was an appropriate skill to acquire in science class. One of the other teachers believed that the creative thinking skill was a genetic property, and another one believed that this skill could be acquired by reading books. Some of the teachers explained that they could unfortunately not do activities to develop creative thinking skills because of the number of learning objectives in TSCC, the necessity of preparing the students for the central examinations, economic inadequacies, and the lack of materials. Other teachers stated that they tried to do activities to support the skill of creative thinking such as project work, open-ended questions, and event completion. The activity most frequently emphasized was project work.

Entrepreneurship. 23 teachers had positive opinions regarding this skill. They highlighted that project work, experiments, giving responsibility to students and encouraging them to be self-confident had a very positive effect on entrepreneurship. The teachers who did not have positive opinion regarding entrepreneurship thought that this skill depended on people's genetic character. They did believe though that if students had education relevant to their interests or if their class teacher helped them develop this skill at an early stage in their primary school education, they potentially could develop this skill.

Communication. All the teachers thought that science courses contributed positively to the acquisition or improvement of communication skills. Teachers believed that activities and practices such as teamwork, experiments, and presentations improved communication skills. Among them, the most emphasized activity was teamwork.

Teamwork. 16 of the teachers said that they provided opportunities for teamwork, but nine teachers preferred not to use teamwork, and only one teacher preferred it only for students in the 7th and 8th grades. Teachers stated that they performed project work, experiments, and homework presentations in the form of teamwork. According to them, students improved their sense of responsibility and communication skills through teamwork. In addition, they thought that teamwork helped students, who were passive in the classroom, to join activities in class as well as to become more active and confident. Teachers who did not provide opportunities for teamwork in their classes had the following reasons for not doing so; the central examination system, curriculum anxiety, crowded classes and ineffective use of time by students, lack of responsibility by students and communication problems.

Discussion, Conclusion and Recommendations

In this study, two aspects of science teachers' views were examined. These views reflected their perceptions of life skills and the inclusion of life skills in the TSCC. The results of this study regarding the two aspects of the teachers are discussed in the following section.

First, the science teachers' life skills perception was examined. We found that they had two different perspectives. Most of the teachers perceived life skills as science literacy; some of them related life skills to skills found in the 4-H life skills model. Furthermore, some of the teachers considered life skills as both themes of science literacy and 4-H life skills. In fact, there is no consensus in the literature as to what life skills are and what life skills are not. The reasons why most teachers, who participated in this research, perceived life skills as science literacy could be related to the vision of the TSCC. The vision of TSCC that has been applied for more than 10 years in Turkey was to make students develop science literacy (TMNE, 2005, 2013). Teachers have internalized this vision and may have directed their students to acquire this skill in this area. Thus, the concept of life skills may have led to the teachers' examples being directly related to their own subjects. A similar result was observed in Hanbury's (2008) research about street children educators, who were asked; "What are life skills?" and the examples they provided were; "giving oral rehydration", "resisting peer pressure" and "learning from each other" which were all related to their own role. At the same time, these educators gave examples similar to science teachers' such as time management, problem-solving, decision making, creative thinking, getting a job, brushing teeth, cooking, and self-confidence.

Most of the participant science teachers related life skills to science literacy and some of them considered these skills as ones that would help a person to overcome life problems as well as to succeed in personal and social life. The example skills provided by the teachers' overlapped with six of eight skill categories (e.g., thinking, managing, relating, caring, living, and being) from the 4-H life skills model (Hendricks, 1998). Skills from the "being" category, such as self-respect, self-responsibility, and feeling management, were the most emphasized ones. It was interesting that the provided life skills examples did not contain any examples related to "working" and "sharing" categories of the 4-H model such as teamwork, empathy, sharing, and caring for others. Lane, Pierson, and Givner (2004) stated in their study with a group of secondary and high school teachers, that cooperation and self-skills were among the social skills which were expected from the students. Ozturk and Bektas (2018) emphasized that pre-school teachers and first grade teachers shared a common thought about their students and they stated that their students had creative thinking and entrepreneurship as life skills.

Although a great majority of the science teachers brought examples about life skills which are related to their own branch of education (e.g., science) in our study, half of them perceived these skills as skills that existed both in science literacy and in the 4-H model. This was also emphasized in the report on life skills by UNESCO (2004); "The importance is also not to see 'life skills' in isolation, but to view a life

skills approach as a culmination of the combination of manual skills and psycho-social abilities" (p. 5).

Secondly, the teachers' perceptions about the six life skills (e.g., analytical thinking, decision making, creative thinking, entrepreneurship, communication, and teamwork) from the TSCC (TMNE, 2018) were examined in this study. Almost all of the teachers were unaware of the fact that the life skills were included in the TSCC, and from the interviews with the teachers, we thought that the reason behind this was that the TSCC has been in practice for only one year and that the teachers had not yet received any in-service training. Nevertheless, they considered these skills to be appropriate to include in science classes. Although many did not know that these skills were included as a sub-learning area, they included these skills in their lessons. They thought that these skills could be acquired mainly through project work and experiments. Some of the teachers' approach was critical to this situation. They said that they experienced difficulties in conducting lessons to make students gain life skills according to the curriculum. According to them, students needed to participate actively in the class to acquire these skills. However, they pointed out that it was very difficult to provide education to students which included life skills due to the education system, which was based on central examinations, and had crowded classes, which make it difficult for all students to participate in these activities. Similar problems were stated by Kurtdede-Fidan and Aydogdu (2018).

Balbag, Leblebicier, Karaer, Sarikahya and Erkan (2016) argued that the reforms made in the TSCC, which aimed to enhance the effectivity of the science education process, were not enough to prevent the problems which were encountered during the education process. This study emphasized that the problems encountered in science education process between 2010 and 2015 stemmed from the teachers, physical and environmental conditions, students, and the curriculum. We think that the relation between the teacher and the curriculum may be important. In some studies, we see that some teachers were found to not be following the curriculum changes and/or reforms or they were found to not be inspecting the content of their branch curricula (Erduran-Avci, Unal & Usak, 2014; Koyuncu & Kavcar, 2016; TEA, 2009). This fact makes it more difficult to understand and perceive the education program as a whole (TEA, 2009). Ayvaci, Bakirci and Yildiz (2014) made it clear that most of the science teachers thought periodic in-service training activities should be conducted. Other studies with teachers from other branches of education also had similar results and the same needs (Gultekin, Cubukcu & Dal, 2010; Ucar & Ipek, 2006).

It is obvious that we have to update our curricula and conduct educational reforms in order for our students to gain the required information, skills and competencies (Saavedra & Opfer, 2012). Ultimately, the teachers are the key actors in realizing the curriculum content within the classroom (Ayra & Kostereliogl u, 2015). That is why they are expected to integrate real-life related learning opportunities regarding skills that are vital in satisfying the needs of the 21st century (Basturk, 2012; Larson & Miller, 2011; Trilling & Fadel, 2009). Due to the fact that contemporary teachers have a higher tendency for life-long learning (Ayra &

Kostereliogl u, 2015), their awareness about life skills, together with their belief in that these skills will be used by students, plays a key role in satisfying this expectation (Saavedra & Opfer, 2012). This justifies the need for developing policies that empower the teaching profession, supports teachers, and provides them with coaching in order to solve the problem of the "21st-century skills gap" (OECD, 2013). Among these policies, it is important to combine the topics of "creating high-quality teacher education programs" (Ananiadou & Claro, 2009; Trilling & Fadel, 2009) and "providing effective in-service professional development for updating skills and information" (OECD, 2013) together. In this context, we think that future studies, which focus on (*i*) the competencies of teachers to help students gain the life skills required in the 21st century or improve their existing skills through in-class or out-of-class activities, (*ii*) the needs of the teachers, and (*iii*) encouraging or discouraging/limiting factors for the teachers, might contribute to the development of aforementioned policies.

References

Ananiadou, K., & M. Claro (2009). *21st century skills and competences for new millennium learners in OECD countries* (Report No. 41). OECD Education Working Papers, OECD Publishing.

Ansari, H., Khorram, M., Soleimaninejad, A., & Ansari-Moghaddam, A. (2016). Predictors of life skills level of students in Zahedan University of Medical Sciences in Southeast of Iran. *International Journal of Epidemiologic Research*, 3(1), 33-41.

Avsar, M. (2007). *Yuksek ogretimde ogrencilerin girisimcilik egilimlerinin arastirilmasi, Cukurova Universitesinde bir uygulama* [To determine entrepreneurship intentions of university students, study on Cukurova University students] (Unpublished Master's thesis). Cukurova Universitesi, Sosyal Bilimler Enstitusu, Adana.

Ayra, M., & Kostereliogl u, I. (2015). Ogretmenlerin yasam boyu ogrenme egilimlerinin mesleki oz yeterlik algilari ile iliskisi [The relationship between teachers' lifelong learning tendencies and their perceptions of professional self-efficacy]. *NWSA-Education Sciences*, *10*(1), 17-28.

Ayvaci, H.S., Bakirci, H., & Yildiz, M. (2014). Fen bilimleri ogretmenlerinin hizmet ici egitim uygulamalarına iliskin gorusleri ve beklentileri [Science and technology teachers' views and expectations about in-service training practices]. *Amasya Universitesi Egitim Fakultesi Dergisi*, *3*(2), 357-383.

Bacanak, A. (2013). Teachers' views about science and technology lesson effects on the development of students' entrepreneurship skills. *Educational Sciences: Theory & Practice*, *13*(1), 622-629.

Balbag, Z., Leblebicier, K., Karaer, G., Sarikahya, E., & Erkan, O. (2016). Turkiye'de fen egitimi ve ogretimi sorunlari [Science education and teaching problems in Turkey]. *Egitim ve Ogretim Arastirmalari Dergisi*, *5*(3), 12-23.

Basturk, R. (2012). Ilkogretim ogretmenlerinin hizmet ici egitime yonelik algi ve beklentilerinin incelenmesi [Investigation of elementary school teachers' perception and expectation about in-service education]. *Hacettepe Universitesi Egitim Fakultesi Dergisi, 42*(2012), 96-107.

Cedefop (2018). *Insights into skill shortages and skill mismatch: Learning from Cedefop's European skills and jobs survey* (Cedefop reference series; No 106). Luxembourg: Publications Office.

Danish, S., Forneris, T., Hodge, K., & Heke, I. (2004). Enhancing youth development through sport. *World Leisure Journal*, 46(3), 38-49. doi:10.1080/04419057.2004.9674365

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education*, 57(3), 300-314.

Erawan, P. (2010). Developing life skills scale for high school students through mixed methods research. *European Journal of Scientific Research*, 47(2), 169-186.

Erduran-Avci, D., Onal, N.S., & Usak, M. (2014). Turkish teachers' opinions about science-technology-society-environment acquisitions in science and technology course curriculum. *Journal of Baltic Science Education*, 13(2), 216-230.

European Communities (2008). *The European qualifications framework for lifelong learning*. Luxembourg: Office for Official Publications of the European Communities. doi: 10.2766/14352

European Commission/EACEA/Eurydice (2012). *Developing key competences at school in Europe: Challenges and opportunities for policy*. Eurydice report. Luxembourg: Publications Office of the European Union.

Fox, J., Schroeder, D., & Lodl, K. (2003). Life skill development through 4-H clubs: The perspective of 4-H alumni. *Journal of Extension*, 41(6).

Gultekin, M., Cubukcu, Z., & Dal, S. (2010). Ilkogretim ogretmenlerinin egitim ogretimle ilgili hizmet ici egitim gereksinimleri [In-service training needs of the primary school teachers regarding education-teaching]. *Selcuk Universitesi Ahmet Kelesoglu Egitim Fakultesi Dergisi*, 29, 131-152.

Gunes, F., & Uygun, T. (2016). Ogretmen yetistirmede beceri uyusmazligi [Skill discrepancy in teacher education]. *Ahi Evran Universitesi Sosyal Bilimler Enstitusu Dergisi*, 2(3), 1-14.

Hanbury, C. (2008). *The life skills handbook*. December 20, 2015, from http://clarehanbury.typepad.com/life-skills-handbooks/6-FREE-LifeSkills-Activity Sessions.pdf.

Hendricks, P. (1998). *Targeting life skills model*. Iowa State University Extension. Retrieved December 20, 2015, from http://www.extension.iastate.edu/4H.

Kaufman, K. J. (2013). 21 Ways to 21st century skills: Why students need them and ideas for practical implementation. *Kappa Delta Pi Record*, 49(2), 78-83. doi: 10.1080/00228958.2013.786594

Kennedy, F., Pearson, D., Brett-Taylor, L., & Talreja, V. (2014). The life skills assessment scale: Measuring life skills of disadvantaged children in the developing world. *Social Behaviour and Personality*, 42(2), 197-210.

Kivunja, C. (2014). Do you want your students to be job-ready with 21st century skills? Change pedagogies: A pedagogical paradigm shift from Vygotskyian social constructivism to critical thinking, problem solving and siemens' digital connectivism. *International Journal of Higher Education*, 3(3), 81-91. doi:10.5430/ijhe.v3n3p81

Kivunja, C. (2015). Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education*, *4*(1), 1-11. doi: 10.5430/ijhe.v4n1p1

Koyuncu, K., & Kavcar, N. (2016). Ogretmenlerin 2007 fizik programina ve uygulamalarina yonelik goruslerine kisisel ozelliklerinin etkisi [Effects of the teachers' personal features on their remarks about the 2007 secondary school physics curriculum and its applications]. *Amasya Universitesi Egitim Fakultesi Dergisi*, 5(2), 373-418. doi:10.17539/aej.33651

Kurtdede-Fidan, N., & Aydogdu, B. (2018). Life skills from the perspectives of classroom and science teachers. *International Journal of Progressive Education*, *14*(1), 32-55.

Lane, K.L., Pierson, M.R., & Givner, C.C. (2004). Secondary teachers' views on social competence: Skills essential for success. *The Journal of Special Education*, *38*(3), 174-186.

Larson, L.C., & Miller, T.N. (2011) 21st century skills: Prepare students for the future. *Kappa Delta Pi Record*, *47*(3), 121-123. doi: 10.1080/00228958.2011.10516575

OECD (2013). *Teachers for the 21st century: Using evaluation to improve teaching*. OECD Publishing.

OECD (2016). *Skills matter: Further results from the survey of adult skills*. Paris: OECD Publishing.

Ozturk, E., & Bektas, M. (2018). Ogrencilerin okul oncesi egitimden ilkokula gecislerinde yasam becerilerini kazanmalarina yonelik ogretmen goruslerinin incelenmesi [Examination of teachers' opinions about the acquisition of the life skills of the students transitioning from preschool to primary school]. *Journal of Human Sciences*, 15(2), 1097-1115. doi:10.14687/jhs.v15i2.5365

Partnership for 21st Century Skills (P21) (2015). *P21 framework definitions*. Retrieved April 01, 2018, from http://www.p21.org/our-work/p21-framework

Raja, W.D., Mullaikodi, M., & Asaph, A. (2015). Personal and institutional impact on life skills among teacher educators. *Paripex-Indian Journal of Research*, *4*(7), 55-57.

Saavedra, A.R., & Opfer, V.D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan*, *94*(2), 8-13.

Suminar, T., Prihatin, T., & Syarif, M.I. (2016). Model of learning development on program life skills education for rural communities. *International Journal of Information and Education Technology*, *6*(6), 496-499. doi: 10.7763/IJIET.2016.V6.739

Svanemyr, J., Baig, Q., & Chandra-Mouli, V. (2015) Scaling up of life skills based education in Pakistan: A case study. *Sex Education*, *15*(3), 249-262. doi: 10.1080/14681811.2014.1000454

The Turkish Ministry of National Education (TMNE) (2005). *Ilkogretim fen ve teknoloji dersi 6, 7 ve 8. siniflar ogretim programi* [Primary schools science and technology course curriculum for grades 6, 7, and 8]. Ankara: T.C. Milli Egitim Bakanligi.

The Turkish Ministry of National Education (TMNE) (2013). *Ilkogretim kurumlari (ilkokullar ve ortaokullar) fen bilimleri dersi ogretim programi* [Primary institutions (primary and middle schools) science course program]. Ankara: T.C. Milli Egitim Bakanligi.

The Turkish Ministry of National Education (TMNE) (2018). *Fen bilimleri dersi ogretim programi* [Science course curriculum]. Ankara: T.C. Milli Egitim Bakanligi.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco, CA: John Wiley & Sons.

Turkish Education Association (TEA) (2009). *Ogretmen yeterlilikleri ozet rapor* [Teacher qualifications summary report]. Ankara: Turk Egitim Dernegi, Adim Okan Matbaacilik Basim Yayin.

Turkish Qualification Framework (TQF) (2015). *Turkiye yeterlilikler cercevesi* [Turkish qualification framework]. Ankara: Mesleki Yeterlilik Kurumu.

Ucar, R., & Ipek, C. (2006). Ilkogretim okullarinda gorev yapan yonetici ve ogretmenlerin MEB hizmet ici egitim uygulamalarina iliskin gorusleri [The views of primary schools' administrators and teachers about in-service training programs in the Turkish educational system]. *Yuzuncu Yil Universitesi Egitim Fakultesi Dergisi*, *1*(3), 34-53.

UNESCO. (2004). *Report of the inter-agency working group on life skills in EFA*. Paris: Unesco.

United Nations. (2003). *Life skills training guide for young people: HIV/AIDS and substance use prevention*. New York: Economic and Social Commission for Asia and the Pacific.

Wallace, C. S., & Priestley, M. (2011). Teacher beliefs and the mediation of curriculum innovation in Scotland: A socio-cultural perspective on professional development and change. *Journal of Curriculum Studies*, *43*(3), 357-381. doi:10.1080/00220272.2011.563447

World Health Organization (WHO) (1997). *Life skills education for children and adolescents in schools*. Geneva: Programme on Mental Health World Health Organization.

Yildirim, A., & Simsek, H. (2011). *Sosyal bilimlerde nitel arastirma yontemleri* [Qualitative research methods in the social sciences]. Ankara: Seckin Yayincilik.

Fen Bilimleri Dersi Öğretim Programındaki Yaşam Becerileri ile İlgili Öğretmen Görüşleri

Atıf:
Erduran-Avci, D., & Kamer, D. (2018). Views of teachers regarding the life skills provided in science curriculum. *Eurasian Journal of Educational Research, 77, 1-18,* DOI: 10.14689/ejer.2018.77.1

Özet

Problem Durumu: Yaşam becerileri bireylerin hayat boyunca karşılaştıkları sorunlarla başa çıkmalarını ve yaşamlarını etkili şekilde yönetmelerini sağlayan becerilerdir. Bu noktada yaşamın niteliğini ve değerini artırmak için yaşam becerilerine sahip olmanın gerekliliği kaçınılmazdır. Yaşam koşullarıyla baş etme gereksinimi küçük yaşlardan itibaren bireylerin yaşam becerileri eğitimleri almalarını zorunlu kılmaktadır. Bu kapsamda birçok ülke yaşam becerilerine okul programlarında yer vermekte, ihtiyaçlar doğrultusunda çeşitli yaşam becerisi kazandırmaya yönelik programlar geliştirmekte ve uygulamaktadır. Geçmişten günümüze Türkiye'de fen dersi programlarında yaşam becerileri kavramı ilk kez 2013-2014 öğretim yılında uygulamaya konulan Fen Bilimleri Dersi Öğretim Programı'nda (FBDÖP) bir öğrenme alt alanı olarak karşımıza çıkmaktadır. FBDÖP'teki yaşam becerileri alt öğrenme alanı; bilimsel bilgiye ulaşılması ve bilimsel bilginin kullanılmasına ilişkin analitik düşünme, karar verme, yaratıcılık, girişimcilik, iletişim ve takım çalışması gibi temel yaşam becerilerini kapsamaktadır. Öğrencilerin yaşam becerileri kazanmasında ve bu becerileri geliştirmesinde öğretmenlerinin önemli rollerden birine sahip olduğu düşünüldüğünde, öğretmenlerin yaşam becerilerine ilişkin algılarının ve bu becerilerin FBDÖP'de yer almasına ilişkin görüşlerinin neler olduğu soruları ortaya çıkmaktadır.

Araştırmanın Amacı: Bu araştırmanın amacı, fen bilimleri öğretmenlerinin yaşam becerileri algılarını ve FBDÖP'te bir öğrenme alanı olarak yaşam becerilerinin yer almasını nasıl karşıladıklarını ortaya çıkarmaktır.

Araştırmanın Yöntemi: Bu araştırma, nitel araştırma yöntemlerinden biri olan durum çalışması olarak tasarlanmıştır. Araştırmanın çalışma grubunu 2013-2014 eğitim öğretim yılında Burdur ili merkezine bağlı ortaokullarda görev yapan ve araştırmaya gönüllü olarak katılmayı kabul eden fen bilimleri öğretmenleri oluşturmaktadır. Bu kapsamda 13 bayan, 13 erkek olmak üzere toplam 26 fen bilimleri öğretmeni araştırmaya katılmıştır. Veri toplama aracı olarak görüşme formu kullanılmıştır. Görüşme formunda; öğretmenlerin demografik özellikleri, yaşam becerilerinin onlar için ne ifade ettiği, bu becerilerin FBDÖP'te yer almasını nasıl karşıladıkları, alt yaşam becerisi alanlarını (analitik düşünme, karar verme, yaratıcı düşünme, girişimcilik, iletişim, ve takım çalışması) fen dersinde kazandırılmaya uygunluğu açısından nasıl değerlendirdikleri, kendi derslerinin bu becerilerin kazandırılmasında etkililiği, bu becerileri kazandırmak için nasıl uygulamalar yaptıkları, onları sınırlandıran ya da engelleyen durumlara ilişkin sorular yer almaktadır. Yarı yapılandırılmış olarak gerçekleşen görüşmeler ses kayıt cihazı ile kayıt edilmiştir. Veriler, betimsel ve içerik analizi yöntemleri kullanılarak analiz edilmiştir. Yazılı doküman haline getirilen veriler, anlamlı iki bölüme ayrılmıştır. Bu bölümler sırasıyla şunlardır; 'Öğretmenlerin yaşam becerileri algısı' ve 'FBDÖP'teki yaşam becerileri hakkında öğretmen görüşleri'. Bu bölümlerden ilki içerik analizi, ikincisi ise betimsel analiz ile gerçekleştirilmiştir.

Araştırmanın Bulguları: Öğretmenlerin yaşam becerileri hakkındaki görüşleri iki ana tema etrafında toplanmaktadır. Bu temalar fen okuryazarlığı ve 4-H yaşam becerileri olarak adlandırılmıştır. Araştırmanın bulguları öğretmenlerin çoğunun yaşam becerilerini fen okuryazarlığı olarak algıladığını, çok azının ise 4-H yaşam becerileri modelindeki bazı beceriler ile ilişkilendirdiğine işaret etmektedir. Bunun yanı sıra öğretmenlerin yarısı yaşam becerilerini hem fen okuryazarlığı hem de 4-H yaşam becerileri modelindeki düşünme, yönetme, bağlantı kurma, katkıda bulunma, yaşama ve olma becerileri olarak görmektedirler. Öğretmenlerin ifadeleri incelendiğinde fen okuryazarlığının 'anahtar fen kavramları', 'bilimsel süreç becerileri', 'fen-teknoloji-toplum-çevre' ve 'bilimsel ve teknik psikomotor beceriler' alt boyutları ile ilişkili olduğu görülmüştür. Hayatın getirdiği her türlü sorunla başa çıkmaya yönelik ve kişilerin kendi bireysel dünyasında veya sosyal yaşamında başarılı olmalarını sağlamaya yönelik öğretmen görüşleri 4-H yaşam becerileri modelindeki bazı becerilerle ilişkilendirilmiştir. Sorumlu olma, ileriyi görebilme, hayata uyum sağlama, dürüst olma, özgüven, zaman yönetimi, mücadele etme, başarılı olma, iletişim kurabilme gibi beceriler bu temada ele alınmıştır. Öğretmenlerin ifadeleri 4-H kapsamındaki sekiz yaşam becerisi temasından altısıyla uyumlu bulunmuştur.

Öğretmenlerin neredeyse tamamının yaşam becerilerinin FBDÖP'te yer aldığını fark etmediği görülmüştür. Ancak çoğunluğu bu becerileri fen derslerinde kazandırılmaya uygun beceriler olarak görmektedirler. Bu becerileri en çok proje çalışmaları ve deneylerle kazandırabileceklerini düşünmektedirler.

Araştırmanın Sonuçları ve Öneriler: Öğretmenlerin çoğu yaşam becerilerini fen okuryazarlığı olarak algılamaktayken, bazıları 4-H yaşam becerileri modelindeki bazı beceriler ile ilişkilendirmişlerdir. Aslında neyin yaşam becerisi olup neyin olmadığı konusunda literatürde bir fikir birliği sağlanmış değildir. Bununla birlikte bu araştırmaya katılan çoğu öğretmenin yaşam becerilerini fen okuryazarlığı olarak algılamasının nedeni FBDÖP'ün vizyonuyla ilişkilendirilebilir. Öğretmenlerin yarıdan daha azı bu becerilere yaşamın herhangi bir alanında karşılaşılabilecek kişisel sorunları yönetmeyi ve bu sorunları çözmeyi içeren daha geniş anlamlı bir pencereden bakarken, çoğu yaşam becerilerini özellikle kendi alanlarıyla (fen) sınırlı olarak algılamaktadırlar. Öğretim programı kapsamında bakıldığında öğretmenlerin yaşam becerileri farkındalıklarının düşük olduğu görülmüştür. Öğretmenler FBDÖP'te alt yaşam becerileri olarak yer verilen analitik düşünme, karar verme, yaratıcı düşünme, girişimcilik, iletişim ve takım çalışması becerilerini geliştirmeye yönelik zaman zaman etkinlikler gerçekleştirdiklerini ve bu becerilerin bireylerde olması gereken özellikler olduğuna inanmalarına rağmen, bu becerilerin FBDÖP'te yer aldığını bilmemektedirler. Bununla birlikte öğretmenler fen derslerinin bu tür yaşam becerileri geliştirmeye oldukça uygun bir ders olduğunu düşünmekte ve bu becerileri önemsenmesi gerektiğine inanmaktadır.

Bireylere ihtiyaç duydukları becerilerin kazandırılmasında en önemli paydaşlar arasında eğitim kurumları ve eğitimciler gelmektedir. Ülkelerin koşul ve ihtiyaçları baz alınarak öğretim programlarının içeriklerinin yaşam becerileri açısından değerlendirilmesi ve öğretmenlerin bu konudaki ihtiyaçları, yeterlilikleri, onları teşvik eden ve sınırlandıran durumlar hakkındaki görüşleri gibi birçok konuyu derinlemesine inceleyecek araştırmalara ve hizmet içi eğitimlere ihtiyaç olduğu düşünülmektedir.

Anahtar Kelimeler: 4-H yaşam becerileri, fen okuryazarlığı, öğretmen görüşleri, fen bilimleri dersi.

Eurasian Journal of Educational Research 77 (2018) 19-34

Eurasian Journal of Educational Research
www.ejer.com.tr

ERCoRe Learning Model Potential for Enhancing Student Retention among Different Academic Ability

Nur ISMIRAWATI [1], Aloysius Duran COREBIMA[2], Siti ZUBAIDAH[3], Istamar SYAMSURI[4]

ARTICLE INFO

Article History:
Received: 07 Feb. 2018
Received in revised form: 08 Jun. 2018
Accepted: 04 Aug. 2018
DOI: 10.14689/ejer.2018.77.2

Keywords
academic ability, conventional learning, ERCoRe learning, learning model, student retention

ABSTRACT

Purpose: This research was conducted to investigate the potential of the ERCoRe learning model in empowering the retention of students' of different academic ability. **Research Methods:** This was a quasi-experimental research using pre-test and post-test non-equivalent control group design of 2x2. There were two independent variables. The first variable was the learning model consisting of the ERCoRe model and conventional learning, and the second variable was academic ability, consisting of upper and lower levels of academic ability. The dependent variable was the students' retention. The samples for this research were the students of class X in Pangkep District, Indonesia.

The data from this research were analysed by using ANCOVA, followed by Least Significant Different (LSD). **Findings:** The ERCoRe learning model was shown to have more potential for improving the students' retention than conventional learning (11.58%). The interaction between the ERCoRe learning model and academic ability did not have an effect on students' retention, but it was seen from the combination groups that the retention of the higher academic ability students who experienced ERCoRe learning was higher (significantly different) than that of the other combination groups. **Implications for Research and Practice:** Teachers need to implement the ERCoRe learning model because this learning model can improve the level of students' retention.

[1] Graduate School State University of Malang, INDONESIA, Biology Education Programme, University of Muhammadiyah Parepare, INDONESIA, Email : nur_ismirawati@yahoo.co.id
ORCHID: https://orcid.org/0000-0003-2178-0520
[2] Corresponding Author: Biology Department State University of Malang, INDONESIA,
Email : durancorebima@gmail.com, ORCHID: https://orcid.org/0000-0002-2632-9467
[3] Biology Department State University of Malang, INDONESIA, Email : siti.zubaidah.fmipa@um.ac.id
ORCHID: http://orcid.org/0000-0002-0718-6392
[4] Biology Department State University of Malang, INDONESIA, Email : istamar_syamsuri@yahoo.com
ORCHID: https://orcid.org/0000-0003-1367-8796

Introduction

Retention is one indicator of success in learning. Based on retention, teachers can find out how much information is learned and stored by students over a long period of time, which can also be retrieved at any time (Driscoll, 2000; Sukmawati, Ramadani, Fauzi, & Corebima, 2015, p. 662). According to Chakuchichi (2011, p. 91), retention represents whether or not learning could be absorbed well. The higher the students' retention is, the more information can be understood and remembered well.

Retention is a common problem rarely noticed by teachers, because the learning activities tend to aim at mastering the concept, which is more likely to vanish (Sukmawati et al., 2015, p. 663). In fact, retention is an important aspect that must be pursued in learning. The quality of concept "mastery measured as retention having an important role" is related to the dimension of memorization. The retention also related to the dimension of critical thinking learning, connecting, remembering, and using all the knowledge and abilities ever obtained (Banikowski, 1999, p. 1).

Retention is the result of cognitive learning that can be measured in relation with the level of students' academic ability. Academic ability is a description of the level of students' knowledge or ability toward a subject matter that will be used as an asset to obtain a broader and more complex knowledge (Sukmawati et al., 2015, p. 664). Students with higher academic ability have a broader initial knowledge. A broader initial knowledge makes it easier for students to store more new information in their long-term memory. This condition makes the upper academic students have more retention toward the biology material than those of the lower academic ability. This is shown in research results of Jamaluddin (2014, p. 252) which revealed that there was a difference in retention between upper academic ability students and those with lower academic ability.

The empowerment of retention in biology learning at the senior high school level is very limited. The learning activities implemented are only limited to memorization without paying attention to the students' understanding, and evaluations are based only on the students' memorization; teachers are only completing the learning process (Adegoke, 2011, p. 538; Umar, 2011, p. 120). The quality of concept understanding measured as retention that plays a role for the formation of attitudes as well as the other skills is what is needed for life. Retention involves the process of coding, storing, and retrieving information stored in the memory (Santrock, 2004). Retention is also better than tests conducted immediately or with a delay of a few seconds or minutes (Carpenter, Pashler, & Cepeda, 2009, p. 762). The complexity of the process involved in retention and its positive influence on learning results have made research regarding retention to never be seen as outdated.

Retention is important for empowerment because it is a concept that is well understood by students and can be stored in memory and called upon when needed. However, in reality there are many things that have been stored in our memory, but cannot be retrieved which is known as forgetting. Related to this, Sanjaya (2008) expressed that retention can be taught through the use of certain strategies from

specific learning models. Because every student has a different level of retention, the use of the appropriate learning models for individual students is necessary. Research results related to retention has shown that the implementation of learning models can have an effect on the retention of students' learning results (Korkmaz Toklucu & Tay, 2016, p. 327). The abundant option of learning models makes it difficult to choose the best model that can support learning retention. The selection of the appropriate learning model should be done with great care.

One of the learning models considered to have an effect on students' retention is the ERCoRe learning model. The ERCoRe learning model has several advantages over conventional learning: 1) students construct knowledge from existing phenomena, dig up their initial ideas by reading at the stage of Eliciting, 2) students are active in the learning process by making mind mapping as a group through Restructuring, 3) the learning model generates discussion between students with different academic ability, and between students and teachers through Confirming, 4) through the activity of Reflecting, remaking mind mapping independently can foster motivation and high levels of learning creativity. Those advantages are categorized based on the activities involved in the ERCoRe learning model and they are closely related to the concept that underlies this learning model.

The philosophical concept of the ERCoRe learning model is constructivist which is clearly evident from the characteristics of the ERCoRe learning model, such as, the teacher facilitating the students' learning process by providing the needed information, suggesting learning resources, encouraging exploration, and learning together with the students Constructivist learning considers the importance of students' active involvement in the learning process rather than a teacher-centred approach (Akinoglu & Tandogan, 2007 p. 72). Furthermore, students' engagement in every learning stage can help them to build their knowledge, since they are actively involved in a process of meaningful knowledge construction. This is in line with the constructivist approach that emphases the importance of students' independent knowledge construction through the learning experience that they get from their pre-existing knowledge or from collaborative activities they do with other students. The classroom atmosphere will form an active learning environment, because constructivism sees knowledge as something that needs to be achieved by the students themselves based on their initial knowledge related to the lesson or from having experiences from collaborative learning experiments with their peers (Qarareh, 2016 p. 186; Kalpana, 2014 p. 28).

Based on Folasade & Akinbobola (2009, p. 46), the constructivist approach was developed based on cognitive theory. This makes the ERCoRe learning model have great potential to empower the students' cogition which can ultimately affect their retention. It will be easier to empower the cognitive aspects of the higher achieving students because they have more initial knowledge or skills related to the subject matter than the lower achieving students, and as a result, the higher achieving students are able to gain a wider variety and more complex knowledge more easily. So, Seah & Heng (2010, p. 479) revealed that the upper academic ability students can perform tasks well, but lower academic ability students require direct instruction.

Hence, the implementation of the ERCoRe learning model is indivisible from the students' cognitive levels.

The ERCoRe learning provides an opportunity for scaffolding between the upper academic ability students and those in the lower academic ability. The scaffolding process in cooperative groups provides benefits for both the lower academic ability students and those in the upper academic ability when performing academic tasks together (Uduafemhe, 2015). Lower academic ability students will gain special assistance from those with upper academic ability through tutorials (Yusnaeni, Corebima, Susilo, & Zubaidah, 2017, p. 247). Consequently, the academic ability of the upper academic ability students will increase because they provide services as tutors to the lower achieving students. Ahangari, Hejazi, & Razmjou (2014, p. 88) supported this fact by stating that the use of scaffolding in learning has a positive effect on students' retention. It is strengthened by the fact that the cognitive theory which underlies constructivism precedes the concept of retention.

Additionally, according to the research results of Kim (2005, p. 7), constructivist learning strategy is more effective than the conventional strategy in obtaining academic achievement. Constructivist learning has a positive effect on retention and academic ability (Karaduman & Gultekin, 2007; Semerci & Batdi, 2015, p. 171). Constructivist approach can also lead students to understand that acquiring knowledge is done directly, so that it is easier for them to understand it. According to Duyilemi & Bolajoko (2014, p. 628), constructivist learning provides real knowledge that helps students remember more easily.

Besides encouraging real-experience learning, ERCoRe learning also implements cooperative learning. Cooperative learning is crucial because it can improve students' retention, so that it can affect students' academic ability (Korkmaz et al, 2016, p. 316). Heterogeneous groups, in terms of the intelligence variation, in ERCoRe learning make students help each other, so that the low academic ability students can improve and equalize themselves with those of higher academic ability (Chambers & Abrami, 1991, p. 140). Another important aspect of cooperative learning is that it stimulates cognitive activity, promotes higher levels of achievement and higher retention of knowledge (Tran, 2014). The results of other research conducted by Huss (2006, p. 20), and Chianson, Kurumeh, & Obida (2010, p. 35), as well as, Tran & Lewis (2012) supported this statement by finding that the implementation of cooperative learning significantly improved students' retention which ultimately had a positive effect on their academic achievement.

Further, the continual use of the ERCoRe model is able to provide positive feedback and develop student centred learning. A student-centred learning strategy can help students to learn better as well as develop their ability and confidence to evaluate their knowledge. In addition, this learning strategy encourages students to be more active in interacting with their learning groups and in constructing their own knowledge (Kolari, Ranne, & Tiili 2005, p. 16). Through this learning model, students can communicate with each other to discuss opinions and conflicts, to make predictions, interpretations and explanations in constructing their knowledge, and to

be able to correct their misconceptions through discussion (Kolari & Ranne, 2003, p. 190). Those activities will result in an increase of retention.

Based on those facts explained above, this current research aimed to determine the effect of the ERCoRe Learning Model in enhancing retention of students of differing academic abilities. Therefore, the following hypotheses were tested:

1: There was an effect of the ERCoRe learning model on student retention.

2: There was an effect of different academic ability on student retention.

3: There was an effect of interaction between the ERCoRe learning model and different academic abilities on student retention.

Method

Research Design

The design of this research was a 2 x 2 factorial design which can be seen in Table 1. The research design used was a Pre-test/Post-test non-equivalent control group design as seen in Table 2. This research involved variables that consisted of independent variables (learning model and academic ability), and the dependent variable (students' retention).

Table 1

Quasi-Experimental Design of 2 X 2 Factorial

Academic ability (A)	*Learning model (X)*	
	Conventional Learning	*ERCoRe Learning*
Upper (A1)	*X1 A1*	*X2 A1*
Lower (A2)	*X1 A2*	*X2 A2*

Information:
X1 A1 = conventional learning upper academic ability
X1 A2 = conventional learning lower academic ability
X2 A1 = ERCoRe learning upper academic ability
X2 A2 = ERCoRe learning lower academic ability

Table 2

Pre-Test – Post-Test Non-Equivalent Control Group Design

Pre-test	Treatment	Post-test
O1	X1 A1	O2
O3	X1 A2	O4
O5	X2 A1	O6
O7	X2 A2	O8

Information:

O1, O3, O5, O7 = Pre-test score of retention

O2, O4, O6 O8 = Post-test score of retention

X1 A1 = Conventional learning upper academic ability

X1 A2 = Conventional learning lower academic ability

X2 A1 = ERCoRe learning upper academic ability

X2 A2 = ERCoRe learning lower academic ability

Research Samples

The sample collection procedure in this research had two stages; school determining and class determining. Firstly, the school selection process began with gathering the students' National Exam scores from nine State Senior High Schools in the Pangkep district, South Sulawesi, Indonesia. The data were then analysed using Anova and followed by a LSD test. Based on the LSD test, the schools were categorized into high academic achiever and low academic achiever schools. Then, one school from each category was selected for further sampling.

The second stage was the selection through a placement test of the experimental and control class from both high academic achiever and low academic achiever schools. The results of the placement test led to the selection of two homologous classes. The classes were randomly selected as the experimental class and the control class. The ERCoRe was implemented with the experimental group while the control group was taught using conventional learning.

The sample size from each school totalled 66 students with both the experimental and control groups having 33 students. In the classroom there were, 10 male students and 23 female students. The samples were from 10th grade students aged 15-16 years old.

Research Instruments and Procedures

The instruments used in this research consisted of a syllabus, lesson plans, student worksheet and retention measurement instrument (essay test). The syllabus, lesson plans, and student worksheet were validated before they are used. The validation was done by two experts, one university lecturer and one high school teacher. The average score of the validity process was considered valid when it showed 94.16 for the syllabus, 97.39 for lesson plans, and 96.47 for student worksheet.

The retention measurement instrument was tried out with students from grade 11 who successfully passed the grade 10 biology lessons. The data were then analysed using the Pearson Correlation Test and from the 25 items tested, 15 essay test items were found to be valid. The test was developed by referring to the C3 to C6 cognitive levels of Bloom's taxonomy revised by Anderson & Krathwohl.

The reliability of the retention measurement instrument (essay test) was also done to ensure that the questions consistently reflected the measured variables. The reliability was measured using Cronbach's Alpha. The results were then categorized based on the reliability categories as seen in Table 3. It was clear that all the items of retention test were valid and the Cronbach's Alpha internal consistency coefficient was 0.753.

Table 3

Reliability Category

Cronbach's Alpha Score	Description
≥0.9	Excellent
0.8 – 0.89	Good
0.7 – 0.79	Acceptable
0.6 – 0.69	Questionable
≤0.59	Poor

(Source: George & Mallery, 2003, p. 231)

This research involved 12 classroom meetings where the ERCoRe learning model was implemented to the experimental group as displayed in Table 4.

Table 4

ERCoRe Learning Model Syntax

Syntax	Activities
Eliciting	• Teacher gives articles or book contents that are related to the lesson as reading texts for students • Students collect important information from the reading • This activity is done at home
Restructuring	• From the reading process, students work in pairs to create mind maps • This activity is done at home
Confirming	• Students confirm the information that has been collected in the form of a mind map through classroom discussion and presentation • This activity is done in class
Reflecting	• Students evaluate and revise the information individually by creating a new mind map • This activity is done in class

(Source: (Ismirawati, Corebima, Zubaidah, & Syamsuri, 2015, p. 231).

The conventional learning for the control group was done through classroom discussion, lecturing, and homework. In this study, the researcher behaved too as the teacher in the experimental and control classes. Furthermore, students' retention was measured by using a retention test conducted two weeks after the post-test. The essays tests were used in the pre-test, post-test and retention test.

Data Analysis

The pre-requisite tests were performed on the collected data by using the normality test (Kolmogorov-Smirnov test) and homogeneity test (Levene - test) with $p>0.05$. The normality test result showed 0.200 significance level score. These results indicated that the data were normally distributed. Besides, the results of the homogeneity test showed that the significance value was 0.072, indicating that the data had the same variance (homogeneous). Furthermore, a hypothesis test was done using ANCOVA test to know the effect of the ERCoRe learning model and the different academic abilities on students' retention.

Result

The results of hypothesis testing between learning model, academic ability, and interaction between learning model and academic ability can be seen in Table 5.

Table 5

The Results of ANCOVA Hypothesis Testing of Student Retention

Source	Type III Sum of Squares	Df	Mean Square	F	Sig
Corrected Model	14762.728a	4	3690.681	78.957	.000
Intercept	35.301	1	35.301	.755	.388
XRET	5179.918	1	5179.918	110.881	.000
MODEL	230.237	1	230.237	4.926	.030
Academic Ability (AA)	273.210	1	273.210	5.845	.019
Model*AA	51.959	1	51.959	1.112	.296
Error	2851.306	61	46.743		
Total	161124.385	66			
Corrected Total	17614.031	65			

R Squared = .838 (Adjusted R Squared = .828)

The results of the hypothesis testing related to the learning model and academic ability showed that the p-level was smaller than alpha 0.05 ($p<0.05$) with significance of 0.030 and 0.019 respectively. This means that the learning model and academic ability had an effect on students' retention. The retention of students undergoing the ERCoRe learning model was 11.58% higher than that of students undergoing conventional learning. The retention of the upper academic students was 9.66% higher than that of the lower academic ability students.

The results of hypothesis testing of the interaction between the learning model and academic ability showed that the p-level was bigger than alpha 0.05 with the significance of 0.296. This means that the interaction between the learning model and academic ability did not have any effect on students' retention. Thus, it was concluded that learning model and academic ability had a significant effect on

students' retention, but the interaction between the learning model and academic ability did not have any significant effect on students' retention.

Although the interaction between learning model and academic ability do not have significant effect on retention, the post-hoc analysis (LSD) was conducted to see the position of the combination groups. The results of LSD test are presented in Table 6.

Table 6

LSD Test of The Interaction Effect Between Learning Model and Academic Ability Towards Students' Retention

Type of Learning/ Learning Model	Academic Ability	Post-test	Retention	Difference	Decrease (%)	Corrected mean	LSD Notation
Conventional	Low	42.861	32.918	-9.943	30.205	42.850	a
Conventional	High	47.288	38.842	-8.446	21.744	45.356	a
ERCoRe	Low	60.872	50.140	-10.732	21.404	46.165	a
ERCoRe	High	72.080	64.888	-7.192	11.087	52.260	b

The results of the LSD test showed that the corrected mean score of retention related to the combination of ERCoRe learning model and upper academic ability was significantly different from those of the other combination model groups. The corrected mean score of combination group of the ERCoRe learning model and lower academic ability was not significantly different from those of the conventional learning and upper academic ability, or the conventional learning and lower academic ability. The effect size value 3.7 %.

Discussion, Conclusion and Recommendations

The results of the ANCOVA test in Table 5 show that the ERCoRe learning model had a significant effect on learning retention. In ERCoRe learning activities, students actively focused their attention on finding important concepts from the literature for making mind mapping and for conducting discussions. Thus, students' attention needed to be established through the use of learning models. Research results revealed that learning models have a positive effect on students' ability to remember (retention), such as, the research results of Kvam (2000, p.136) and Tran (2012, p. 86).

Students may forget their previous information when they did not pay close enough attention. According to Santrock (2004); Wei, Wang, & Klausner (2012, p. 185), attention is closely related to retention. There are two factors that can cause

students to be unable to remember what they have learned, namely the process of forgetting and the fact that the information was not yet processed in the brain, so that the knowledge is ultimately lost. The process of forgetting causes the students to not remember the material that has been previously learned. Forgetting shows the act of having difficulties to retrieve information that has been received, processed, and saved into long-term memory (Winkel, 2005).

Based on the results of the LSD test in Table 6 related to the interaction between learning model and academic ability toward students' retention, it can be concluded that ERCoRe learning model has higher potential for increasing students' retention than conventional learning. In the constructivist-based ERCoRe learning model, the students are directed to be actively involved in learning and building knowledge through real-life experiences as cognitive activity rather than simply learning from abstract concepts (Buttler, Miller, Lee, 2001, p. 21). The results of research conducted by Karaduman & Gültekin (2007); Semerci & Batdi (2017, p. 172) revealed further that the constructivist approach helped students to improve their academic success and retention. This was in contrast to conventional learning, in which the teachers used teacher centred learning methods, so that it did does not have any contribution to the students' retention improvement.

The results of this research proved that the level of retention of the upper academic ability students in ERCoRe learning model was better than that of the lower academic ability students. From the corrected mean score, it was seen that there was a significant difference between the results of the ERCoRe upper academic students and ERCoRe lower academic students. These findings indicated that the upper academic ability group has higher retention than the lower academic ability group. The difference in retention between upper academic ability students and those of lower academic ability was related to the response difference produced by students. This was in line with the opinion of Cheng (2011, p. 2) stating that students who have different academic abilities experience the same learning, they would have different learning results. The difference of retention between upper and lower academic ability students was related to the factor of intelligence. This was also in accordance with the opinion of Merdinger, Hines, Osterling, & Wyatt (2005) stating that the intelligence factor was one of the factors that effectively affected learning success.

Related to the retention difference of upper and lower academic ability students, Anderson & Pearson (1984) stated that students having high initial ability would be better at reconstructing knowledge, so that they obtained good learning results. Santrock, (2004) also revealed that high-achieving students monitored their learning more systematically and independently, and evaluated their progress better than the low-achieving students. Identically, the research results of Lei (2002, p. 7) showed that high-achieving students were higher self-regulated learners, compared to the low-achieving students.

Table 6 of the LSD test shows that there was no significant difference between lower academic students undergoing ERCoRe learning model and the upper and

lower academic students undergoing conventional learning. As for the low retention of the lower academic students in the ERCoRe learning model, it was related to intelligence factor. Shaw (2001) also stated that students of low academic ability may have low retention. The characteristic of these students were that they preferred learning by using interesting media where the teacher gave explanations and the students took notes. These findings can explain the factors that affected some students who did not complete their study due to the lack of students' attention, interest and motivation toward learning activities. Based on the data, it can be said that the characteristics of students who were not proactive, tended to be passive and prefer conventional learning where the teachers who gave explanation and students took notes. This is because the lower academic ability students had difficulties in making mind mapping for several reasons: (1) students had a lack of initial knowledge about the concepts contained in the reading; (2) students did not pay attention when teachers explained the learning material; (3) students were not accustomed to make mind mapping.

A number of research investigations have been conducted to determine the effectiveness of various learning models at every level in various subjects, and the findings have revealed that the use of different learning models has had a positive effect on students' achievement compared to conventional learning. In addition, this has also proved that conventional learning is not effective (Agboghorom, 2014, p. 80; Adeyemo & Babajide, 2014, p. 918; Udo & Udofia, 2014, p. 34). This is a result of the cognitive ability of the students taught by using conventional learning is not empowered, thus their retention does not increase (Gambari, Yuki, Gana, & Ughovwa, 2014, p. 80). Conventional learning has often been described as the talk and chalk method for presenting information to students who are only listening (Duyilemi & Bolajoko, 2014, p. 628).

Although there is not any significant difference in retention among the combination groups between ERCoRe learning model and lower academic ability, conventional learning and upper academic ability, as well as, the conventional learning and lower academic ability, based on the difference in the corrected mean score of retention, it was seen that the retention of the lower academic ability students in the ERCoRe learning model was higher (1.78%) than that of the upper academic ability students from the conventional learning. Therefore, it can be expected that the ERCoRe learning model can be expected to improve the retention of lower academic ability students higher than that of the upper academic ability students in conventional learning.

Although this research has supported the findings of previous studies of retention, this research was seen to have some limitations: 1) the treatment was only given in 12 meetings during biology lessons which made it hard for the students to get familiar with creating a mind map, and 2) the retention measurement was done two weeks after the post-test.

Conclusion and Suggestion

Based on the results of this research, it can be concluded that the ERCoRe learning model has a significant effect on the increase of students' retention. The retention of the upper academic group using the ERCoRe learning model was higher (significantly different) compared to those of other combination groups. The ERCoRe learning model can be used as one of learning models which, when taught continuously, can increase students' retention. That is why the ERCoRe learning model is expected to be implemented for teaching students to better manage their memory, so that what they learn can be stored in their long-term memory.

Future research will be needed to study retention at other school levels such as elementary school, junior high school, and/or university. The test for retention measurement can also be done longer, for example, one month after the post-test. Furthermore, other variables can be added, like high order thinking skills and gender. Hopefully, this research can be useful for future studies that want to explore more about students' retention since it is closely related to learning success. Further research studies are required to better confirm if the ERCoRe learning model has more potential for improving the retention levels of the lower academic ability students.

References

Adegoke, B. A. (2011). Effect of multimedia instruction on senior secondary school students' achievement in Physics**.** *European Journal of Educational Studies*, *3*(3), 537-541.

Adeyemo, S. A., & Babajide, V. F. T. (2014). Effects of mastery learning approach on students' achievement in physics. *International Journal of Scientific & Engineering Research, 5*(2), 910-920.

Agboghorom, T. E. (2014). Mastery learning approach on secondary students' integrated science achievement**.** *British Journal of Education, 2*(7), 80-88.

Anderson, R., & Pearson, P. D. (1984). A Schema-Theoretic View of Basic Processes in Reading Comprehension. *Handbook of Reading Research*, *1*, 255–291. https://doi.org/10.1017/CBO9781139524513.007

Akinoglu, O., & Tandogan, O.R. (2007). The Effects of Problem-Based Active Learning in Science Education on Students' Academic Achievement, Attitude and Concept Learning. *Eurasia Journal of Mathematics, Science & Technology Education, 3*(1), 71-81.

Anderson, R., & Pearson, P. D. (1984). A Schema-Theoretic View of Basic Processes in Reading Comprehension. *Handbook of Reading Research, 1,* 255–291. https://doi.org/10.1017/CBO9781139524513.007

Banikowski, A. K. & Mehring, A. T. (1999). Strategies to Enhance Memory Based on Brain-Research. *Focus on Exceptional Children, 32*(2), 1-16.

Buttler, F. M., Miller, S. P., Lee, K. & Pierce, T. (2001). Teaching mathematics to students with mild-to-moderate mental retardation: A Review of the Literature. *Mental Reterdation, 39*, 20-31.

Carpenter, K. S., Pashler, H., & Cepeda, J. N. (2009). Using Test to Enhance 8th Grade Students' Retention of U.S. History Fact. *Applied Cognitive Psychology, 23,* 760-771.

Chakuchichi, D. (2011). Student retention as a function of the quality of learner support in open and distance learning: Students' perceptions at the Zimbabwe open university. *Zimbabwe International Journal of Open & Distance Learning, 1*(1), 90-98.

Chambers, B., & Abrami, C. P. (1991). The relationship between student team learning outcomes and achievement, causal attributions, and affect. *Journal of Educational Psychology*, *83*(1), 140-146.

Cheng, E. C. K. (2011). The role of self-regulated learning in enhancing learning performance. *The International Journal of Research and Review, 6*(1), 1-16.

Chianson, M. M., Kurumeh, M. S., & Obida, J. A. (2010). Effect of cooperative learning strategy on students' retention in circle geometry in secondary schools in Benue State, Nigeria. *American Journal of Scientific and Industrial Research, 2*(1), 33-36.

Driscoll, M. P. (2000). *Psychology of learning (2nd Ed.)* Boston: Allyn and Bacon.

Duyilemi, N. A., & Bolajoko, O. A. (2014). Effects of constructivists' learning strategies on senior secondary school students' achievement and retention in biology. *Mediterranean Journal of Social Sciences, 5*(27), 627-633.

Folashade, A., & Akinbobola, A. O. (2009). Constructivist Problem Based Learning Technique and the Academic Achievement of Physics Students with Low Ability Level in Nigerian Secondary Schools. *Eurasian Journal of Physics and Chemistry Education, 1* (1), 45–51.

Gambari, A. I., Yuki, A. A., Gana, S. E., & Ughovwa, Q. E. (2014). Improving secondary school students' achievement and retention in biology through video-based multimedia instruction. *Insight: A Journal of Scholarly Teaching. 9*, 78-91.

George, D. & Mallery, P. 2003. *SPSS for Windows Step by Step: A Simple Guide and Reference 11.0 update.* Boston: Allyn & Bacon.

Huss, J. A. (2006). Gifted education and cooperative learning: A miss or a match. *Gifted Child Today, 29*, 19-23.

Ismirawati. N., Corebima. D. A., Zubaidah. S., & Syamsuri. I. (2015). Prototype Model Pembelajaran ERCoRe untuk Meningkatkan Keterampilan metakognitif [Prototype of ERCoRe Learning Model to improve metacognitive skills]. *National Conference on Science Education Master in Science Education and Doctor Education IPA FKIP UNS.FKIP UNS*. November 227-239.

Jamaluddin. (2014). Pengaruh penerapan pembelajaran pola TEQ yang dipadukan dengan strategi kooperatif terhadap retensi konsep IPA peserta didik SD di kota mataram [The Effect of TEQ learning model combined with cooperative Strategy on Retention of Science Concept of Elementary School Students in Mataram City]. *Jurnal Kependidikan IKIP Mataram, 13* (3), 251-267.

Kalpana, T. (2014). A Constructivist Perspective on Teaching and Learning: A Conceptual Framework. *International Research Journal of Social Sciences, 3*(1), 27-29.

Karaduman, H., & Gültekin, M. (2007). The effect of constructivist learning principles based learning materials to students' attitudes, success and retention in social studies. *The Turkish Online Journal of Educational Technology, 6*(3), 98-112.

Kim, J.S. (2005). The Effects of a Constructivist Teaching Approach on Student Academic Achievement, Self-concept, and Learning Strategies. *Asia Pacific Education Review, 6*(1), 7-19.

Kolari, S., & Ranne, C. S. (2003). Promoting the conceptual understanding of engineering students through visualisation. *Global Journal of Engineering Education, 7*(2), 189-200.

Kolari, S., Ranne, C. S., & Tiili, J. (2005). Enhancing engineering students' confidence using interactive teaching methods - Part 2: Post-test Results for the Force Concept Inventory Showing Enhanced Confidence. *World Transactions on Engineering and Technology Education, 4*(1), 15-20.

Korkmaz Toklucu, S., & Tay, B. (2016). The effect of cooperative learning method and systematic teaching on students' achievement and retention of knowledge in social studies lesson. *Eurasian Journal of Educational Research, 66*, 315-334.

Kvam, P.H. (2000). The effect active learning methods on student retention in engineering statistic. *The American Statistician, 54*(2), 136-140.

Lei, L., Wang, L., & Tanjia C. (2002). Comparative Study of Self-Regulated Learning between High Achievers and LOW achievers. *Psychological Development and Education, 2*, 6-11.

Merdinger, M.J., Hines, A.M., Osterling, K.L., & Wyatt, P. (2005). Pathways to college for former foster youth: Understanding factors that contribute to educational success. *Child Welfare League of America,* LXXXIV (6), 867-896.

Qarareh, O. A. (2016). The Effect of Using the Constructivist Learning Model in Teaching Science on the Achievement and Scientific Thinking of 8th Grade Students. *International Education Studies, 9* (7), 178-196.

Sanjaya, W. (2008). *Startegi pembelajaran standar berorientasi standar proses [Learning Strategy Orienting out Processing Standards].* Jakarta: Kencana Predana Media Group.

Santrock, W. J. (2004). *Psikologi pendidikan (edisi kedua) [Educational Psychology (Second Edition)].* Jakarta: Prenada Media Group.

Semerci, C., & Batdi, V. (2015). A meta-analysis of constructivist learning approach on learners' academic achievements, retention and attitudes. *Journal of Education and Training Studies, 3*(2), 171-180.

Shaw, S. R. (2001). *Slow learners: Condemned to failure or failed by schools*. Paper presented to the convention of the National Association of School Psychologists. Washington, DC.

So, H. J., Seah, H. L., & Heng T. H. (2010). Designing Collaborative Knowledge Building Environments Accessible to all Learners: Impacts and design Challenges. *Computers & Education*, 479-490.

Sukmawati, I., Ramadani, S. D., Fauzi, A., & Corebima, A. D. (2015). Perbedaan pemberdayaan retensi antara siswa SMA akademik rendah dan tinggi melalui pembelajaran cooperative script dalam pembelajaran biologi. [The Difference in Retention empowerment between lower and upper academic Ability students of Senior High Schools through cooperative Script in Biology Learning]. *Proceedings of the 2nd conference Nasional Biologi, IPA, Dan Pembelajarannya FMIPA UM*, (October 2016), 662–667.

Tran, D. V., & Lewis, R. (2012). Effects of cooperative learning on students at a giang university in Vietnam. *International Education Studies, 5*(1), 86-99.

Tran, D.V. (2014). The effects of cooperative learning on the academic achievement and knowledge retention**.** *International Journal of Higher Education, 3*(2).

Udo, M. F., & Udofia, T. M. (2014). Effects of mastery learning strategy on students' achievement in symbols, formulae and equations in chemistry. *Journal of Educational Research and Reviews, 2*(3), 28- 35.

Uduafemhe, E. M. (2015). Comparative effects of scaffolding and collaborative instructional approaches on secondary school students' psychomotor achievement in basic electronics in north-central Nigeria. *IOSR Journal of Engineering (IOSRJEN), 5*(6).

Umar, A. A. (2011). Effects of biology practical activities on students' process skill acquisition in Minna, Niger State, Nigeria. *JOSTMED, 7*(2), 118–126.

Wei, F.Y. F., Wang, Y. K., & Klausner, M. (2012). Rethinking college students' self-regulation and sustained attention: Does text messaging during class influence cognitive learning. *Communication Education, 61*(3), 185-204.

Winkel, W.S. (2005). *Psikologi pengajaran [Teaching psychology]*. Yogyakarta: Media Abadi.

Yusnaeni., Corebima, A. D., Susilo, H., & Zubaidah, S. (2017). Creative thinking of low academic student undergoing search solve create and share learning integrated with metacognitive strategy. *International Journal of Instruction, 10*(2), 245-262.

Eurasian Journal of Educational Research 77 (2018) 35-64

Eurasian Journal of Educational Research
www.ejer.com.tr

Human Rights Education with Socioscientific Issues through the Environmental Education Courses

Ayse OZTURK[1]

ARTICLE INFO

Article History:
Received: 03 May. 2018
Received in revised form: 20 Jul. 2018
Accepted: 05 Sept. 2018
DOI: 10.14689/ejer.2018.77.3

Keywords
human rights education, socioscientific issues, curriculum development, environmental education, teacher training

ABSTRACT

Purpose: Human rights education is vital for democratic societies. For an effective human rights education, teachers need to have an in-depth comprehension regarding human rights in the first place. Accordingly, this study aimed to develop, implement and evaluate the Human Rights Curriculum Based on Socioscientific issues as Part of the Environmental Education Course (HRCSEC) for pre-service primary school teachers (PPSTs). **Method:** This study was designed as a quasi-experimental study with non-equivalent pre-test/post-test control group. The participants of the study include 77 PSPTs 38 of whom were included in the experimental group and 39 of whom were included in the control group. The implementation lasted for 14 weeks within the scope of the study. **Results:** The study results showed that following the implementation the experimental group pre-service teachers had significantly higher knowledge and attitudes regarding human rights compared to the control group pre-service teachers. In addition, the experimental group pre-service teachers were equipped with various acquisitions, in addition to knowledge and attitude development regarding human rights, such as, the relationship between environment and human rights and knowledge development. **Implications for Research and Practice:** According to the results of the research, it can be suggested to establish a human rights connection with SSI in environmental education courses for PSPTs to gain a holistic understanding of environment and human rights and in order to gain knowledge and attitude about human rights. For comprehensive information on the situation, studies can be conducted in environmental courses at different levels of education.

[1]Gaziantep University, TURKEY. e-mail:ozturkayse2007@gmail.com, ORCID:https://orcid.org/0000-0001-9279-1716

Introduction

Human rights can be defined as the rights associated with equality that people are due as a result of their existence (Flowers, Bernbaum, Rudelius-Palmer, & Tolman, 2000). Human rights education is the process during which knowledge and skills required to create a global sense of human rights are acquired. Human rights education is considered to be an effective strategy to prevent the violation of rights (Banks, 2002). The purposes of human rights education can be characterised as corroborating the respect for human rights and fundamental freedoms, making people more active citizens, introducing universal human rights values, raising tolerance and respect among people, and conducting studies to create a peace culture in international terms (Brander et al., 2002; Flowers, et al., 2009). Understanding human rights is vital for democratic societies (D'sa, 2004). Teachers have to fulfil important duties for human rights education process to be effective (Francis, 2012; Jennings, 2006; Osler & Starkey, 2010).The standards that are expected to be achieved by teachers in this sense include supporting all students' learning of human rights, creating effective learning environments that are based on human rights, designing and planning learning experiences for human rights education, and improving oneself as professional educators of human rights (Jennings, 2006). In order for teachers to offer an effective human rights education, they need to have an in-depth comprehension regarding human rights in the first place (Anees, 2014; Osler & Starkey, 1994). This makes it necessary to make regulations in teacher preparation programs in order to equip teachers with the competencies that are required for conducting human rights education (Jennings, 2006). Human rights can be made a separate course with the arrangements to be made in teacher training programs while it is also possible to teach human rights as part of various courses. In this sense, the environmental education course can be one of the courses in which human rights can be incorporated within teacher training programs. Nowadays, with the influence of scientific applications, the world has rapidly evolved and brought along environmental problems (Demirdelen & Odman, 2017; Topcu & Atabey, 2017). Air, water, soil pollution and global warming are some of these problems and energy resources are one of the most important causes of environmental pollution (Akyuz, 2015a, 2015b; Topcu & Atabey, 2017). Environmental pollution threatens many fundamental rights and freedoms, including the right to life, the right to a clean environment, the right to clean water and food and the right to health, and it constitutes one of the most fundamental causes of human rights violations (Akyuz, 2015a). All this draws attention to the close relationship between environmental issues and human rights. Human life depends on a healthy and sustainable environment. This makes environmental issues prominent in terms of human rights (Brander et al., 2002; UNEP, 2014). In other words, it is impossible for humans to survive without a healthy and sustainable ecosystem. Therefore, it is not possible to protect and maintain human rights if their ecosystem deteriorates. This situation draws attention to the fact that there is nature/ecology at the core of human rights and highlights the importance of human rights in the ecological sense (Akyuz, 2015a; Hung, 2007). According to the researchers, human rights education and environmental education are associated with and support one another. Therefore,

they can be dealt with together in curricula and units (Brander et al., 2002; Harris, 2004; Flowers et al., 2009). The relevant literature states that many environmental issues such as global warming and climate change, sustainable agriculture, sustainable environment, nuclear power plants, alternative energy resources, hazardous pesticides, acid rain, and recycling are associated with human rights (Benz, 2013; Clark & Sampson, 2008; Clarke, 2010; Moro, 2002; Rademacher, 2010; Ramamurthy, 2011). In this sense, due to the deterioration in ozone layer, Clarke (2010) has drawn attention to the existence of a rapidly growing movement regarding sustainable environment and human rights; while Hammarberg (2011) stated that climate change is a human rights problem. To this end, he asserted that certain fundamental rights such as the right to life, the right to housing, right to health, right to food, and the right to clean water are under threat. Rademacher (2010) stated that climate change negatively influences local people in Latin America in terms of human rights. Similarly, Caney (2008) defined climate change as a threat to human rights. Ramamurthy (2011), emphasized that a nuclear accident in nuclear power plants during the energy production process would be a human rights disaster while drawing attention to the importance of an international nuclear responsibility law that is suitable for the protection of human rights. Benz (2013), within the context of the Fukushima accident, stressed the influence of possible problems from nuclear power plants on human rights. Akyuz (2015b) expressed the negative effects of the Chernobyl disaster on the five fundamental human rights, which are the right to life, a safe environment, health, clean water, and food. While studying the concept of climate refugees that has come to the forefront as a result of climate change, Ziya (2012) noted that it has brought about various problems related to human rights. According to Demirdelen & Odman (2017), while the environmental problem of global warming and the possible negative effects of climate change on fundamental rights and freedoms have been being discussed, the sea level rise due to global warming has already forced a majority of the people of Tuvalu, the world's first climate refugees, to leave their homes and relocate to New Zealand or Australia. Characterised as climate refugees, these people are experiencing many problems arising from international law in relation to their fundamental rights and freedoms. In their study, Yardimoglu, Atas, Fidan, and Karadag (2014) revealed the relationship between clean energy resources, sustainable development and the right to a healthy life. Terada (2012) stated that pollution in electronic conversion areas poses a risk to both the environment and human rights. In addition, living in a healthy environment, using natural resources in a sustainable way, and protecting the natural and historical richness as a common heritage of humanity have all been defined as human rights. In this sense, there are environment-based human rights such as environmental protection and sustainable development. Environmental problems pose a problem for various rights and freedoms. In this respect, it can be said that environmental education courses have the necessary theoretical framework for raising awareness and attitude towards human rights.

Considering the evaluation regarding the relationship between the environment and human rights, it is possible to say that the situations which most influence

human rights emerge as a result of advances in science and technology. Socioscientific issues (SSI) refer to those issues which emerge as a result of science and technology products and processes, and have ethical and moral dilemmas at their core (Sadler & Zeidler, 2005a). SSI involves science based controversial issues (Sadler & Zeidler, 2005b; Topcu, Sadler, & Yilmaz-Tuzun, 2010). It is also known that these issues have their environmental, financial, scientific, ethical, moral, and political aspects and are about situations associated with human rights (Chang-Rundgren & Rundgren, 2010). These issues require sustainable development, consideration of the environment, understanding risks and possible outcomes, and making scientific decisions (Ratcliffe & Grace, 2003), and are closely related to human rights and constitute an important context for human rights education (Doganay & Ozturk, 2017; Bossér, 2018; Chang-Rundgren & Rundgren, 2010; Dolan, Nichols, & Zeidler, 2009; Sadler, Foulk, & Friedrichsen, 2017; Sousa, 2017; Zeidler & Keefer, 2003). Environmental education courses also include a wide range of socioscientific issues such as nuclear power plants, thermal power plant, climate change, recycling, and use of pesticides-methyl bromide, genetically modified organism (GMO), nuclear power plants, global warming, and alternative energy resources. These topics require the active participation of citizens in the decision-making process, thinking about risks and possibilities, considering sustainable development and the environment because they are closely related to human rights. In this sense, it is possible to say that SSI can be an important context to carry out human rights education during environmental education. Considering the literature review about environmental education and human rights education, there has not been a study dealing with human rights education within the context of SSI as part of environmental courses. Studies carried out in the context of environmental education and socioscientific issues have tended to focus not on human rights education in general but on knowledge, argumentation quality, risk perception, opinions, and decision-making skills related to SSI (Atabey & Topcu, 2018; Ayaz, Karakas, & Sarikaya, 2016; Calik & Coll, 2012; Domac, 2011; Evren-Yapicioglu, 2018; Kilinc, Boyes, & Stanisstreet, 2011; 2012; Iseri, 2012; Ozdemir & Cobanoglu, 2008; Ozturk & Leblebicioglu, 2015; Yavuz Topaloglu, & Balkan Kiyici, 2017) and citizenship education (Cao, 2015; Kolstø, 2001; Mapping & Johnson, 2005; Mulvaney, 2011; Ratcliffe & Grace, 2003; Smith & Pangsapa, 2008; Ozden, 2011). In addition, the fact that advances in science and technology have brought about environmental problems that influence the fundamental rights and freedoms which make it compulsory to establish this context in environmental education courses. Moreover, such a study is important to raise the awareness that problems brought about by technological advances manifest themselves not only in the natural environment but also in the fundamental rights and freedoms of all people.

Generalization and protection of human rights requires raising individuals who understand and value human rights (Flowers et al., 2000). In this sense, integration of human rights education into curricula particularly in democratic societies and the quality of primary school education, which is the first step where students encounter such concepts, is of great importance (Flowers et al. 2009; Karagozoglu, 2017; Saglam, 2017). As a matter of fact, one of the important focal points of studies that aim at

creating a universal human rights culture is focusing on primary school systems. In this direction, there is also a democracy, human rights and citizenship class at the primary school level in Turkey. Furthermore, studies regarding human rights education have been conducted in different classes in the primary school system through a variety of interdisciplinary links. This shows the need for efforts aimed at equipping primary school teachers that are to engage in teaching of human rights with the required knowledge, skills, and attitudes. It is important to make adjustments in primary school teachers' training programs in order to meet this need. It is believed that this will contribute to international studies aimed at improving human rights education as part of teacher training curricula. In the light of the aforementioned reasons, this study was aimed to develop, implement and evaluate the Human Rights Curriculum Based on Socioscientific issues as Part of the Environmental Education Course (HRCSEC) for pre-service primary school teachers (PPSTs). In accordance with this main objective, this study aimed to answer the following questions:

What is the influence of HRCSEC on PPSTs' knowledge and attitude development regarding human rights? What are the evaluations of PPSTs' about effectiveness of HRCSEC and their individual development regarding human rights?

Method

Research Design

This study was designed as a quasi-experimental study with non-equivalent pre-test/post-test control group. This design is employed when participants cannot be appointed to experimental and control groups neutrally. A comparison was made between the pre-test and post-test measurements of the experimental and control groups (Christensen, Johnson, & Turner, 2011). In this study, the participants could not be appointed neutrally to experimental and control groups. Of the two second year classes from the department of primary school education, one was randomly assigned as control group while the other was assigned as experimental group. Human Rights Curriculum Based on Socioscientific issues as Part of the Environmental Education Course (HRCSEC) was administered to the experimental group in the study. The control group was subjected to no experimental operation. Attitude Scale for Adults Regarding Human Rights (ASAHR) and Knowledge Test Regarding Human Rights (KTHR) were administered as pre-test and post-test to both the experimental and control groups. Effectiveness of HRCSEC and Individual Development Evaluation Form (EHIEF) was only administered to the experimental group as final measurement.

Validity and reliability studies for the experimental research process. Before the implementation, information was collected from PPSTs regarding their previous experiences associated with human rights in order improve the explanation of the changes observed in the dependent variable by the independent variable. In this sense, information was collected as to whether they had received training regarding human rights previously and engaged in any individual effort for obtaining information about human rights. One of the PPSTs in the experimental group stated

that he had participated in a training and engaged in individual efforts in this sense. That PPST participated in all the practices, but his measurement data were not included in the evaluation. In addition, ANCOVA was planned for ASAHR and KTHR in order to control the difference between the pre-test scores statistically. However, it could not be implemented since assumptions of the test were not met. The training process was not conducted by the researcher in order to prevent the possible bias likely to be caused by the researcher.

Preparation process of the Human Rights Curriculum Based on SSI as Part of the Environmental Education Course (HRCSEC). Needs analysis was carried out initially for the preparation of HRCSEC. Afterwards, program outcomes were identified; activity plans were prepared; pilot study was conducted; and the program was finalized prior to the implementation respectively. Detailed information regarding this process is given below.

Needs analysis studies. A two-stage approach was adopted for the needs analysis in the study. In the first stage, national and international documents regarding the relevant literature were analysed. Information was collected regarding the knowledge, attitudes, and skills that need to be possessed by pre-service teachers regarding human rights. The second stage involved administration of Needs Analysis Form Regarding Human Rights (NAFHR) in order to determine whether the pre-service teachers possessed the relevant knowledge, skills, and attitudes. The form includes open-ended questions. Information regarding the concept of human rights, fundamental rights and freedoms, violations of human rights, and the importance of human rights was collected. In this process, NAFHR was administered to 496 PPSTs studying at four different universities. The results showed that the pre-service teachers made incomplete or incorrect explanations regarding human rights and violations. The pre-service teachers could not make explanations as to why knowing, protecting, and spreading human rights is important. Of these pre-service teachers, 403 stated the works to develop knowledge and attitudes regarding human rights within teacher training programs as a necessity and need. These results were compared with the findings obtained through review of the relevant literature to reveal the needs.

Identifying the purposes for HRCSEC and developing activity plans. General purposes and acquisitions for HRCSEC were prepared according to needs analyses and the views of experts. With the needs analysis studies, it was determined for which rights, freedoms, and concepts the information and attitudes would be developed in the HRCSEC. The general purpose and gains for the HRCSEC were prepared by determining for which rights, freedoms and basic concepts the awareness and information would be provided in the information improvement dimension of the needs analysis. In this process, in line with the needs analysis, it was decided to convey knowledge and awareness about the rights, freedoms and basic concepts which are unknown to pre-service teachers and have low frequency among the listed rights, that is to say, which have a low awareness, which cannot be adequately explained in terms of their scope despite the fact that they are known as names and which can provide information improvement with socioscientific issues

in environmental education class. In the attitude improvement dimension of the needs analysis, in general, the reasons why fundamental rights and freedoms are important, and the gains that show the importance and necessity of generalizing and protecting human rights were prepared. At the same time, in weekly applications, awareness-raising gains were prepared for the importance and necessity of rights, freedoms or concepts taken as a basis. The general purpose and gains of the program, prepared after the needs analysis study, were finalized by presenting them to the expert opinion. The environmental education course was analysed in socioscientific terms in accordance with general purposes and acquisitions. What kinds of relationships can be established between which fundamental rights and freedoms and which SSI was determined. Then the relevant literature was reviewed to collect information about the methods and techniques to be set to work for the teaching-learning process. In this process, the strategy of teaching through discovery and the strategy of teaching through research-examination were taken as a basis. In this context, a teaching-learning process using active learning methods and techniques that put students in the center was adopted. In this sense, dilemma scenarios based on socioscientific issues, media report analysis, real jurisdiction reports on human rights, cooperative learning, role-playing methods, and projects were utilized. The activities were prepared based on the studies from the relevant literature (Doganay & Ozturk, 2017) and expert views. To finalize the prepared program, pilot studies were conducted for the activities prior to the main implementation. The framework that shows the general structure of HRCSEC is given in Figure 1.

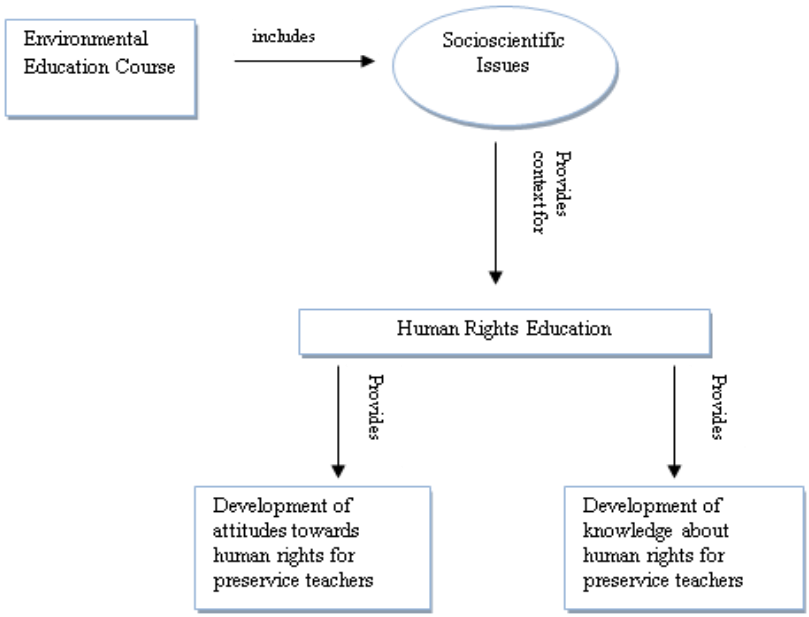

Figure 1. The Framework for The General Structure of HRCSEC

Figure 1 shows that environmental education course included socioscientific issues. Socioscientific issues provide context for human rights education. The practice

of human rights education is expected to develop attitudes and knowledge towards human rights of PPSTs. It also offers a holistic understanding of the relationship between the human rights, environment and the effects of development of science and technology.

Implementation process of HRCSEC. 14-week implementation was conducted within the scope of HREPSEC. During this process, the pre-service teachers were informed of the SSI about which the activities would be carried out beforehand. Thus, the pre-service teachers were allowed to collect information by conducting research. The practices carried out within the scope of HRCSEC, which was prepared in line with the environmental education course curriculum, are given below.

1st Week. In this week, the ASAHR and KTHR were administered to both groups. In addition, awareness-raising works were performed on fundamental rights and freedoms and the relationship between the environment and human rights for the experimental group. The methods of discussion, question-answer, and brainstorming were employed in this process.

2nd Week. The activity for the second week was based on global warming and climate change. A dilemma was employed to create an environment for discussion. This activity involved the possible outcomes of global warming and climate change as well as the responsibilities that need to be undertaken by countries to prevent such outcomes. Connections were established with the rights to life, environmental protection, housing, food, clean water, an adequate standard of living, and employment during this process. Thus, awareness was raised regarding the rights and their protection. In addition, practice opportunities were offered to list the rights according to priority.

3rd Week. In week three, the activity was also based on global warming and climate change, drama and role-play methods were employed. The class was divided into two groups during the activity. One of these groups performed as climate refugees who had to migrate due to negative influence of global warming and climate change. The other group acted as the government and people living in another country that was less impacted by this situation. The problems and the clashes between the refugees seeking shelter and the government as well as the people who did not want to accept them were performed. Connections were established with the rights to life, environmental protection, housing, property, immigration, an adequate standard of living, food, and clean water during this process.

4th Week. For week four, media report analyses were carried out in this activity based on the use of thermal plants for energy production. A conflict was analysed within the scope of the rights to environmental protection, health, employment, and public welfare.

5th Week. The role-play method was employed in this activity which a legal process extending to the European Court of Human Rights in relation to Yatagan

thermal plant was performed by the students. In this sense, a conflict based on the rights to environmental protection, health etc. and public welfare was dealt with.

6th Week. For week six the activity was about the use of cleaning products in socioscientific terms. It drew attention to the sustainable use of water. Cooperative learning and small and large classroom discussion methods were employed in the activity. Connections were established with the rights to sustainable development, clean water, life, and healthy life. The aim was to make students acquire a holistic and universal perception regarding the influence of water pollution on human rights in term of the environment.

7th Week. The activity for week seven focused on GMO's. Research-analysis, discussion, and cooperative learning methods were employed for the activity. A dilemma scenario was created in which one has to decide whether products with GMO should be produced or not. Connections were established with the rights to food, right to food security, healthy life, and life.

8th Week. For week eight, hydroelectric power plants (HPP) were dealt with as one of the alternative energy resources. Accordingly, news in the media regarding HPP was analysed in this activity. In this sense, evaluations were made regarding the rights to housing, food, environmental protection, sustainable energy, and respect for common heritage of humanity, property, and housing.

9th Week. During week nine, the Chernobyl accident was the point of focus in socioscientific terms. Connections were made with the rights to life, environmental protection, freedom of press (e.g., freedom of information), and healthy life.

10th Week. Recycling was dealt with as SSI in the week 10 activity. A connection was established with sustainable development. In this sense, the relationship between the right to sustainable environment, sustainable economy, and environmental protection and recycling was analysed. Then they prepared posters and presented them. This activity involved small group work. The pre-service teachers conducted research initially.

11th Week. The pre-service teachers worked in small groups during the 11thweek. They identified a SSI associated with the environment as a group. They evaluated the situation from the aspect of human rights and created a poster. They presented the work they prepared in the class one-by-one, and all the class participated in the discussions.

12th Week. In the 12th week, the activity focused on the use of GMO and pesticides-methyl bromide as SSI. It dwelt on sustainable agriculture, sustainable environment, the right to health, provision of adequate food, and the right to environmental protection. In this process, the pre-service teachers faced a conflict through the dilemma scenario. All-class discussion was conducted. The pre-service teachers used the information they obtained through research-analysis to present the relevant justified decisions.

13th and 14th Weeks. In the final two weeks of activities, the pre-service teachers worked in groups of five or six. They were asked to develop projects providing information about human rights and their importance within the context of environmental issues. The pre-service teachers conducted many projects such as preparation and presentation of posters and banners, organizing works to inform, drawing attention to the importance of the right to environmental protection and sustainable environment via the planting of tree saplings, and establishing recycling stations by focusing on the importance of sustainable development. Afterwards, ASAHR and KTHR were administered to the experimental and control group pre-service teachers. In addition, EHEF was administered to the experimental group.

Implementation process of the control group. In the control group, the environmental education course was carried out as a normal course in the curriculum. In this respect, the topics in the curriculum were conveyed to the students through active learning methods and techniques. However, it should be noted about the application process that the control group curriculum included topics such as nuclear power plants, global warming, thermal power plants, etc. However, these topics were addressed only as environmental issues in the control group. In this process they were not used in the context of socioscientific issues like the experimental group's curriculum, and they were not used to provide information or for the attitudes of human rights as well as being an environmental situation. This situation related to the application process of the experimental and control group can be explained by a sample topic. For example, while global warming and climate change were addressed as environmental issues in the control group, they were addressed as a socioscientific issue that concerns both the environment and human rights in the experimental group. In this respect, they were addressed in relation to the rights of the environment, living, environmental protection, housing, property, refuge, adequate living standards, nutrition, and clean water in experimental group curriculum. As a result, in the control group, applications were made in line with the aims of the environmental education class and no intervention was made regarding human rights education.

Study Group

The study was conducted at the faculty of education of a state university in Turkey. Study group included 38 experimental and 39 control group PPSTs (e.g., a total of 77 pre-service teachers) who were in their second year. Experimental group students' with age ranges from 19 to 20. 20 were female and 18 were male. Control group students' age ranges were from 19 to 20. 22 of them were female and 17 were male. None of these pre-service teachers had previously been trained regarding human rights. In addition, none of these PPSTs had experience regarding knowledge acquisition concerning human rights.

Research Instruments and Procedures

Attitude Scale for Adults Regarding Human Rights (ASAHR). The ASAHR was developed and employed in the study to reveal the pre-service teachers' attitude change towards human rights. To develop the ASAHR, literature was reviewed to

create an item pool initially. To this end, the developed scales, published manifestos and agreements were analysed. A draft form including 43 items was prepared within the context of the accessed theoretical information and a 5-point Likert type was adopted for the form. Content validity of the form was ensured by five expert faculty members and five expert lawyers. The necessary corrections were made according to these views, and the form was reorganized to include 40 items. In the later step, a pilot study was conducted on 10 pre-service teachers. The form was finalized with the received feedbacks. Explanatory factor analysis was carried out on the database including 389 people. After examination, five items were excluded from the scale, and the analysis was repeated. At the end of the repeated explanatory factor analysis, it was seen that the scale had two factors: "Attitude towards human rights" and "Attitude towards the protection and development of human rights". Factor loads of items range from .626 to .823. Total score correlations range from .633 to .820. The Cronbach Alpha internal consistency coefficients of the sub-scales were .960 and .939. These two sub-factors explained 52.724% of the total variance. The Cronbach Alpha internal consistency coefficient of the entire scale was .930. The relationship between the total scores of the two factors was calculated to be .126. This result implied that the factors do not measure the same construct. Correlation values were calculated to determine the relationship between ASAHR sub-factors and the entire test. High and significant correlation values (.676; .816) indicated that these two sub-factors were the components of the Attitude Scale for Adults Regarding Human Rights (ASAHR). At the end of EFA, a two-factor scale with 35 items was obtained. Confirmatory Factor Analysis (CFA) was conducted to see whether the construct obtained based on the data obtained through the EFA yielded adequate fit index as well as to test construct validity. CFA was conducted on database including 350 people. At the end of CFA, RMSEA value was found to be .035, NFI value .932, AGFI value .872, CFI value .973, IFI value .979, RFI .978, RMR value .017, and X2/df value 1.432. These fit indices showed that the model has good fit (Kline, 2005). As a result, a Likert-type scale with two factors and 35 items was obtained to determine the attitudes of pre-service teachers regarding human rights. Among these factors, there were items for determining the attitudes of pre-service teachers towards the protection and development of fundamental rights and freedoms in the "attitude towards the protection and development of human rights" factor. Example items of this factor are as follows: "One of the main purposes of the education should be to provide knowledge, skills, and attitudes related to human rights", "In the society, awareness-raising activities should be focused on strengthening respect for human rights", "People should be provided with the awareness of acting together against violations of rights in the national and international context". In the factor of "attitude towards human rights", there were items to determine the attitudes of pre-service teachers towards fundamental rights and freedoms. Example items of this factor are as follows: "The sustainable use of the environment and natural resources is a necessary right for all humanity", "All people should have the right to adequate nutrition, clothing, shelter and clean water", "Differences such as gender, race, colour, and religion should not be an obstacle to having fundamental rights and freedoms", "Taking measures for environmental problems such as global warming is not

necessary if they will bring severe economic constraints to the country" (e.g., adverse item), "The state should take measures to provide freedom of the press and obtainment of information".

Knowledge Test Regarding Human Rights (KTHR). KTHR was developed and employed in the study in order to reveal the changes in the PPSTs' knowledge acquisition regarding human rights. The sources in the relevant literature were reviewed, and 35 multiple choice questions suitable for the acquisitions were prepared. These questions were presented to the experts for them to evaluate for content validity. The number of the questions was reduced to 28 according to the received feedbacks. KTHR was administered to 92 pre-service teachers who had acquired knowledge regarding human rights previously. After the test, item analysis was conducted to calculate the difficulty and discrimination indices of each item. The items with discrimination indices below .20 were excluded from the test. Independent-samples *t*-test was conducted to see whether there was a significant difference between the lowest and highest 27% groups. Following those operations, difficulty and discrimination indices, standard deviations, and *t*-test results of the test items were obtained. The analyses pointed to four items that were not valid and reliable. These four items were excluded from the test. Since the excluded items did not reduce the content validity of the test, no corrections were made to add new questions. In order to calculate the reliability of KTHR including 24 multiple choice questions, Kr-20 value and average difficulty value of the test were calculated. In the end, a test with items whose discrimination indices ranged from .35 to .69 with an average difficulty of .59 and with a Kr-20 value corresponding to .87 was obtained. In KTHR, question roots, in which information related to human rights was asked directly and information related to human rights in the environmental context, were used. Sample question roots to the questions in the information test are as follows: "Which of the following is not among the characteristics of human rights?", "In which classification are the environmental rights, the right to peace, the right to benefit from the common heritage of mankind in the field of human rights?", "It was determined that radioactive waste had spread to the environment due to leakage in a nuclear power plant. In this process, it was decided to solve the problem without informing the inhabitants in order to avoid chaos and to avoid the reaction of people. What fundamental rights and freedoms of the inhabitants have been violated by this decision?", "It is the duty of the state and citizens to improve the environment, protect the environment and prevent environmental pollution. This is also a burden for citizens in terms of the environmental protection. A citizen who has learned that dangerous substances and wastes are released to the nature has applied to the relevant state institution with a petition. In this process, what rights has the citizen used to protect his/her what rights?"

Effectiveness of HRCSEC and Individual Development Evaluation Form (EHIEF). EHIEF was employed to receive participants' views regarding effectiveness of HRCSEC and to evaluate whether they observed any change in themselves in terms of their perceptions and attitudes regarding human rights at the end of the process. The form made up of open-ended questions was prepared after receiving

expert opinions. To this end, the pre-service teachers were asked, "Do you think the practices implemented to improve the knowledge and attitudes regarding human rights within the scope of HRCSEC are beneficial and necessary? Can you explain why?" and "Did you notice any change in your attitude and knowledge regarding human rights before and after the practices? Can you explain how?" via EHIEF.

Data collection. The ASAHR and KTHR were administered to both experimental and control groups in the study. In the data collection process, the ASAHR was administered, and after a 15-minute interval, the KTHR was administered as well. One-to-one interviews were made with the experimental group pre-service teachers during the administration of EHIEF, and these interviews were recorded.

Data Analysis

Analyses of quantitative data. Quantitative data regarding the improvement of knowledge and attitude towards human rights were statistically analysed. In this process, ASAHR and KTHR data sets were analysed to see whether they were fit for covariance analysis. It was seen that the assumptions that were necessary for the analysis were not met thoroughly. For the ASAHR and KTHR pre-test and post-test scores, normality and equality of variances assumptions were analysed for the independent *t*-test fitness. After the analyses a Mann-Whitney U test was employed for the analyses of the pre-test score of ASAHR and pre-test and post-test scores of the KTHR. The ASAHR post-test score dataset was analysed via an independent-samples *t*-test.

Analyses of qualitative data. The views regarding the effectiveness of HRCSEC and individual development were analysed via content analysis. Initially, open and selective coding (Strauss & Corbin, 1990) processes, which are the first steps of content analyses, were followed for the analyses. The data set was analysed line-by-line according to the research purposes during the analysis. Codes were created based on the meanings emerging directly or indirectly. The created codes were grouped taking into account their similarities and differences. Five categories were obtained. These categories were re-analysed and divided into two themes: evaluations regarding effectiveness of HREPSEC and individual acquisitions regarding human rights. In the presentation of the findings, quotations from the students are provided according to their sequence numbers.

Validity and Reliability Studies for the Analysis of Qualitative Data

The studies below were conducted to ensure the reliability and validity of the study results:

Interview data were recorded to prevent data loss. The research process was explained in detail in a way that other people could understand how the research results were obtained and how deductions were made. Direct quotations were provided for the readers to envision the described situation as well as to support the research findings. Inter-coder reliability was employed to ensure the reliability of the obtained results. Inter-coder reliability was calculated at 91% (Miles & Huberman,

1994). Discussions were carried out with experts regarding the codes which coders had disagreed upon in order to be sure agreement was reached.

Results

Results Concerning the Attitude Improvement Regarding Human Rights

ASAHR was administered as pre-test and post-tests to the experimental and control groups in order to reveal if there was any change in the pre-service teachers' attitudes regarding human rights. Mann Whitney U Test was carried out to see if there was a statistically significant difference between the experimental and control group pre-service teachers' ASAHR pre-test scores. The Mann Whitney U Test showed that there was no statistically significant difference between the experimental and control group pre-service teachers' pre-test scores [U= 722, p >.05]. Also, the test showed that mean rank pre-test score of the experimental group was 38.50 and the mean rank pre-test score of the control group was 39.40. This was indicative of the fact that the pre-service teachers from both the experimental and control groups had similar attitude scores regarding human rights prior to the implementation.

Independent-samples *t*-test was conducted to reveal if there was a statistically significant difference between the experimental and control group pre-service teachers' ASAHR post-tests scores. The test showed that there was a statistically significant difference between the experimental and control group pre-service teachers' ASAHR post-test scores in favour of the experimental group pre-service teachers [t(75)=19.32, p<.05]. Also, the test showed that mean post-test score of experimental group was 149.13 and mean post-test score of control group was 78.38. This was indicative of the fact that the experimental group pre-service teachers had higher attitudes than the control group pre-service teachers following the implementation.

Results Concerning Knowledge Improvement Regarding Human Rights

Mann-Whitney U Test was carried out to see if there was a statistically significant difference between the experimental and control group pre-service teachers' KTHR pre-test and post-test scores. The Mann-Whitney U Test showed that there was no statistically significant difference between the experimental and control group pre-service teachers' KTHR pre-test scores [U=703.50, p >.05]. Also, the test showed that the mean rank pre-test score of experimental group was 38.00 and mean rank pre-test score of the control group was 39.97.

Mann-Whitney U Test for KTHR post-test scores showed that there was a statistically significant difference between the experimental and control group pre-service teachers' KTHR post-test scores in favour of the experimental group pre-service teachers [U=.00, p >.05]. The mean rank score was calculated for post-test of experimental group as 58.00 and for post-test of control group as 20.00. Mean ranks

indicated that the experimental group pre-service teachers turned out to be more knowledgeable following the implementation.

Results for Views Regarding Effectiveness of HRCSEC and Individual Development

The experimental group students were asked to evaluate effectiveness of HRCSEC and individual development. The results are given in Table 1.

Table 1

Results for Views Regarding Effectiveness of HRCSEC and Individual Development

Themes	Categories	Codes
Evaluations regarding the effectiveness of HRCSEC	The views regarding the necessity and the importance of HRCSEC	-Considering HRCSEC necessary to raise individuals who are aware of the fundamental rights and freedoms -Considering HRCSEC important to provide knowledge and skills to participate in the discussions about the environment and human rights -Considering HRCSEC necessary to make people comprehend that fundamental rights and freedoms are important -Considering HRCSEC necessary to understand the relationship between the environmental problems and violation of rights -Considering HRCSEC necessary to make people responsible individuals in relation to the environment and human rights
	The views regarding the benefits of HRCSEC	-Obtaining necessary acquisitions for professional development -Raising an awareness regarding the violation of rights in daily life -Making people acquire knowledge regarding rights through real life problems -Making people comprehend the necessity and importance of the human rights education -Making people comprehend the relationship between the environment and human rights -Creating an awareness of responsibility regarding the environment and human rights

Table 1 Continue

Themes	Categories	Codes
Individual acquisitions regarding human rights	Creation of understanding and knowledge	-Acquiring detailed knowledge regarding the fundamental rights and freedoms -Understanding what is the violation of rights -Understanding that human rights are universal values -Not memorizing but learning meaningfully -Learning how to use rights in the daily life -Constructing knowledge regarding what one can do in the face of violation of rights -Understanding the responsibilities of citizens and government regarding human rights -Understanding the relationship between the environment and human rights
	Attitude development	-Considering the knowledge acquisition regarding human rights important -Considering the spread and protection of human rights important -Stating the importance of preventing the violation of rights -Being eager to undertake responsibility for the protection of rights -Considering the studies to raise consciousness regarding human rights necessary -Being eager to follow the publications regarding human rights -Wishing to support the efforts regarding human rights
	Behaviour development	-Engaging in behaviours that are appropriate for human rights -Following the publications about human rights -Participating in the efforts about human rights

Table 1 shows that the results regarding the implementation process and individual development fell under two themes: evaluations regarding the effectiveness of HRCSEC and individual acquisitions regarding human rights. Of these two, evaluations regarding effectiveness of HRCSEC referred to views about importance, necessity and benefits of HRCSEC for human rights education. This theme has two categories: the views regarding the necessity and importance of HRCSEC and the views regarding the benefits of HRCSEC. The category about the necessity and importance of HRCSEC draws attention to raising individuals who are aware of fundamental rights and freedoms, making people comprehend the importance of protecting the rights and freedoms, providing knowledge and skills to participate in discussion about the environment and human rights, understanding the relationship between the environmental problems and violation of rights, and equipping people with the responsibility of being sensitive towards the environment and human rights. In this sense, it is possible to say that the practices are considered important and necessary not only in terms of acquiring knowledge and attitude towards human rights but also in terms of understanding the connection between the

environment and human rights, equipping citizens with the responsibility regarding the environment and human rights, and providing knowledge and skills to participate in the discussions. One of the pre-service teachers commented on this issue as follows:

> "I think such practices should be part of the environmental education course. We acquired so many things regarding the human rights and the importance of the protection of human rights…Before the practices, human rights and environmental problems were two separate issues for me…I even did not know the right to environmental protection…We understood the relationship between the environmental problems and protecting the nature…We realized that we have responsibilities to protect the environment and human rights as citizens…We discussed the controversial issue that we frequently see on TV and the news. These are really the situations that we encounter in our daily lives…With these discussions, our skills of looking from another perspective, advocating our opinions with justifications and proofs, and persuasion and rhetoric skills improved. We gained experiences about how to participate in the discussion that are on the agenda regarding human rights and environmental problems…thus, such practices should be supported…" (T13)

The views regarding the benefits of HRCSEC included acquisitions regarding the professional development, comprehension of the necessity and the importance of human rights education, creating an awareness regarding the violation of rights in the daily life, offering the acquisitions regarding the rights by means of real life problems, comprehension of the relationship between the environment and human rights, and creating a sense of responsibility for the protection of the environment and human rights. In this sense, it is possible to say that the practices were considered useful for professional development, acquisition of awareness and knowledge regarding the violation of rights through real life situations, comprehension of the relationship between the environment and human rights, and raising sense of responsibility for the protection of environment and human rights. One of the pre-service teachers who considered the practices for the professional development necessary stated the following:

> "… They provided the necessary knowledge for professional development. This is because we also need to teach human rights to our students. However, there is no such course in our teaching curriculum…" (T16).

It was seen that the views regarding the individual acquisitions about human rights are divided into three categories: the creation of understanding and knowledge, attitude development, and behaviour development. Fundamental rights and freedoms, violation of rights, prevention of the violation of rights, and knowledge acquisition about human rights as a universal value were stated within the scope of creation of understanding and knowledge. In addition, meaningful learning regarding the rights, understanding the relationship between environment and human rights, the responsibilities of citizens and the government, and the increase in the number of rights one is informed about were emphasized. One of the pre-service teachers expressed meaningful learning regarding the human rights as follows:

> "… If we were taught the human rights course only, it would be plain memorization. However, we acquired knowledge within the life itself as part of the environmental education course. We learnt how rights and violation of rights appear in our lives and what they mean via real life experiences…" (T28).

One of the pre-service teachers expressed the improvement of knowledge about human rights as follows:

> "I learned a lot about what rights we have at the events... In the first place, the rights I know increased. Previously, I only knew a few fundamental rights like education and the right to life. Now I can say that I know most of the fundamental rights and freedoms ...there were also rights such as environmental protection and protection of the common heritage of mankind ...I understand what the violation of a right is and what it is not. I saw it has a very different meaning than we think ...." (T7).

Another pre-service teacher expressed the following about knowledge improvement:

> "When I compare with what I knew at the beginning of the term …, I can say that I know so much about human rights now ...both the number of rights I know increased and I understood their meaning and scope better ..." (T21)

In terms of attitude development, they emphasized the importance of knowledge acquisition, generalization and protection of human rights, and the prevention of the violation of human rights, considered the efforts regarding human rights necessary, and expressed their willingness to participate in such efforts. In addition, they also wish to follow the publications regarding human rights and undertake responsibilities for the protection of the rights. One of the pre-service teachers pointing to the importance of the necessity of engaging in efforts about human rights and the prevention of the violation of human rights stated the following:

> "…Most of the people either do not know their fundamental rights and freedoms or are not aware of their importance…People should be informed about the rights and violation of rights. Only in this way, the violation of rights can be prevented, and people can live better lives…" (T32).

In relation to behaviour development, the pre-service teachers stated that they tried to behave according to human rights, followed the relevant publications, and participated in the relevant efforts. One of the pre-service teachers commented on following the publications regarding human rights as follows:

> "…At first I thought human rights were so shallow. I started to understand with examples from the real life. I started to read now. Particularly social-cultural rights draw my attention most…" (T24).

When an overall evaluation is made based on these results, it is possible to say that the pre-service teachers in the experimental group consider the practices necessary and important and personally observed various improvements in themselves regarding knowledge, understanding, attitudes, and behaviours regarding human rights.

Discussion, Conclusion and Recommendations

The study results indicated that the experimental group pre-service teachers that were given HRCSEC had significantly higher knowledge and attitude compared to the control group pre-service teachers. Acquisition of high level knowledge and attitude by the experimental group pre-service teachers following the implementation process may be indicative of the fact that SSI can provide a suitable context for human rights education within the environmental education course. Doganay & Ozturk (2017) also reported that SSI presents an effective context for attitude development regarding human rights. In this sense, he stated that SSI such as nuclear power plants, hydroelectric power plants, global warming, climate change, thermal power plants, and genetically modified organisms offer the necessary context for human rights education. On the other hand, attention was drawn to the relationship between human rights and numerous environmental aspects that were evaluated in the context of SSI in various studies (Akyuz, 2015a, 2015b; Benz, 2013; Clarke, 2010; Chang-Rundgren & Rundgren, 2010; Colakoglu, 2010; Davies et al., 2017; Demirdelen & Odman, 2017; Dolan et al., 2009; Evren-Yapicioglu, 2018; Kadioglu, 2008; Moro, 2002; Ziya, 2012; Rademacher, 2010; Yardimoglu, et al., 2014) in the related literature. This supports the claim advocated in this study that SSI can be an effective context for human rights education as part of environmental education courses.

In addition, lower knowledge and attitude development observed in the control group pre-service teachers compared to the experimental group pre-service teachers and little change compared to their status prior to the study were remarkable points to consider. This was because; some of these situations (e.g., environmental problems, energy problems, water pollution, etc.) known as SSI were actually part of the environmental education course curriculum. The control group pre-service teachers also encountered some of these issues within the scope of the environmental education course. Then why did not further knowledge and attitude development take place with regard to human rights? Issues such as thermal power plants, water pollution and global warming were only considered as environmental issues and problems within the scope of the environmental education course. In other words, environmental damage in the traditional approach was considered as pollution or destruction of nature, and the relation of environmental problems to human rights was ignored. However, such environmental problems adversely affect people's fundamental rights and freedoms, in particular, the right to life (Akyuz, 2015a). When such issues were evaluated within the context of SSI, they gained importance not only as environmental problems but also in social, political, and economic terms as well as from the aspect of human rights (Sadler & Zeidler, 2005a). In this sense, the meanings and deductions derived from the evaluation of such issues differed as well. This situation was taken into account during the research process, and relevant arrangements were made to draw the pre-service teachers' attention towards human rights. In this sense, these problems were started to be perceived not only in environmental terms but also as human rights problems. A holistic perspective was created for the relationship between the environment and human rights in this

process. The understanding that protecting the environment means protecting human rights, and it was necessary to improve human rights (Flowers et al., 2009; UNEP, 2014) was acquired by the pre-service teachers. On the other hand, even if the environmental education course offers context to teach many rights within the scope of human rights, it is clear that this development cannot take place unless this connection is intentionally established. Teachers are expected to undertake this responsibility consciously and engage in planned activities to improve students' knowledge and attitudes (Darder, 2009).

Furthermore, the pre-service teachers were made to experience real events/problems from daily life regarding human rights through the activities based on SSI. These issues were frequently on the agenda via media or political campaigns and lead to arguments. Their connections with fundamental rights and freedoms were highlighted. In this sense, these socioscientific issues enabled meaningful learning for the pre-service teachers and facilitated the transfer. This situation may be indicative of the fact that the context of socioscientific issues served important educational purposes such as meaningful learning and transfer during the process of human rights education (Zajda & Ozdowski, 2017). In addition, it was recognized that the implementation provided knowledge and skills to participate in the relevant discussions regarding the environment and human rights. Experiences regarding the rights through real life problems allowed meaningful learning about the rights, skills to participate in social discussions, attitude development concerning human rights, knowledge acquisition, and raising awareness about violation of human rights, which were indicative of important acquisitions in terms of human rights education (Doganay & Ozturk, 2017; Jennings, 2006; Shiman, 1999; Tibbitts, 1996). Moreover, research results showed that the practices provided a sense of responsibility to the pre-service teachers to protect the environment and human rights, allowed understanding of the responsibilities of governments and citizens, and adopting positive attitudes to undertake responsibilities. Sense of responsibility is an important acquisition in terms of human rights education (Reardon, 1995; Tarrow, 1990). Gaining such acquisitions is very important. Conducting human rights education from a global perspective and raising awareness regarding global problems is a problem repeatedly mentioned as part of human rights education (Brander et al., 2002; Spreen & Monaghan, 2017; Tibbits, 1996). It is possible to say that this study helped to develop understanding regarding the universality of human rights, and the practices drew attention to many global problems such as global warming, climate change, and sustainable development. In addition, acquisition of knowledge, skills, and attitudes regarding human rights is an important component of teacher training taking into account the fact that pre-service teachers will offer human rights education in the future (Anees, 2014; Jennings, 2006; Karakus, 2018; Osler & Starkey, 1994). As a matter of fact, the Ministry of National Education (2017) included the sensitivity of teachers to human rights and natural environment within the scope of general qualifications of the teaching profession in Turkey. At the same time, in the primary school teaching undergraduate program updated by the Council of Higher Education (2018) in Turkey, it has been foreseen to convey knowledge about human rights both as a separate course within the elective courses as well as

with an interdisciplinary approach. In this case, the gains from the study can be said to be important for pre-service teacher education in Turkey. Considering that primary school teachers will give classes on human rights at the primary school level, it can be said that the gains would be indirectly beneficial for increasing the quality of human rights education at the primary school level. In this sense, it is possible to say that such practices make important contributions to the professional development of pre-service teachers. On the other hand, applications were found to be beneficial for pre-service teachers to gain proficiency in environmental discussions, to understand the relationship between environment and human rights, and to acquire citizenship responsibility. In the context of education for the environment, it is aimed at bringing up participant and responsible individuals (Ozdemir, 2007) and integrating the human rights and citizenship education (Atasoy, 2015). It can be concluded that the use of the socioscientific context in environmental education will provide gains for environmental education as well as for human rights.

Considering the study results generally, it is possible to say that HRCSEC served the purposes of human rights education such as offering knowledge, attitude, and behaviours and raising awareness in relation to the violation of human rights. According to the results of the research, it can be suggested to establish a human rights connection with SSI in environmental education courses for PPSTs in order to gain a holistic understanding of the environment and human rights and also to gain knowledge and attitude regarding human rights. Additionally, studies focusing on possible problems and their solutions are important to make the practices more effective. In this sense, researchers may be recommended to conduct action research in this matter. On the other hand, this study was limited with 77 PPSTs. In this direction, studies can be conducted at different stages of education and with larger samples in order to more fully obtain the comprehensive and detailed information needed to better understand this situation.

References

Akyuz, E. (2015a). Cevre sorunları ve insan hakları iliskisi [The relationship between the environmental issues and human rights]. *Akademik Sosyal Araştırmalar Dergisi, 3*(5), 427-436.

Akyuz, E. (2015b). How do environmental issues threaten basic human rights? The case of the Chernobyl Nuclear Disaster in Ukraine. *Usak Universitesi Sosyal Bilimler Dergisi, 8*(2), 85-98.

Anees, A. (2014). Teacher education and human rights. *International Journal of Academic Research in Education and Review, 2*(9), 206-210.

Atabey, N., & Topcu, S. (2018). The effects of socioscientific issues based instruction on middle school students' argumentation quality. *Journal of Education and Practice, 8*(36), 61-71

Atasoy, E. (2015). *İnsan-doga etkilesimi ve cevre icin egitim* [Human-nature interaction and education for the environment]. Bursa: Sentez Yayinlari.

Ayaz, E., Karakas, H., & Sarikaya, R. (2016). Sinif ogretmeni adaylarinin nukleer enerji kavramina yonelik dusunceleri: Bagimsiz kelime ilişkilendirme örnegi [Class teacher candidates' opinions on the concept of nuclear power: the sample of independent word association test]. *Cumhuriyet Universitesi Fen Fakultesi Fen Bilimleri Dergisi*, 37, 42-54.

Banks, D.N. (2002). Human rights education at the dawn of the 21st century. *Social Science Docket*, 20-26. Retrieved from https://archive.org/stream/ERIC_ED466987#page/n23/mode/2up

Benz, E. (2013). Lessons from Fukushima: Strengthening the international regulation of nuclear energy. *William & Mary Environmental Law & Policy Review, 37*(3), 845-883.

Bossér, U. (2018). *Exploring the complexities of integrating socioscientific issues in science teaching* (Unpublished doctoral dissertation). Linnaeus University Department of Chemistry and Biomedical Sciences, Kalmar. Retrieved from https://www.diva-portal.org/smash/get/diva2:1167677/FULLTEXT01.pdf

Brander, P., Oliveira, B., Gomes, R., Ondrackova, J., Keen, E., Surian, A., … Suslova, O. (2002). *Compass a manual on human right education with young people*. Germany: Council of Europe.

Calik, M., & Coll, R. K. (2012). Investigating socioscientific issues via scientific habits of mind: Development and validation of the scientific habits of mind survey. *International Journal of Science Education, 34*(12), 1909- 1930.

Caney, S. (2008). Human rights, climate change, and discounting. *Environmental Politics, 17*(4), 536-555.

Cao, B. (2015). *Environment and citizenship*. Abingdon, Oxon: Routledge.

Chang-Rundgren, S. N., & Rundgren, C. J. (2010). SEE-SEP: From a separate to a holistic view of socioscientific issues. *Asia-Pacific Forum on Science Learning and Teaching, 11*(1), 1-24.

Christensen, L. B., Johnson, R. B., & Turner, L. A. (2011). *Research methods, design, and analysis*. Boston, MA: Allyn & Bacon/Pearson.

Clark, D., & Sampson, V. (2008). Assessing dialogic argumentation in online environments to relate structure, grounds, and conceptual quality. *Journal of Research in Science Teaching, 45*(3), 293-321

Clarke, M. E. (2010). *Climate change and human rights: A case study of the unit and global warming in Canadian Arctic* (Unpublished master's thesis). Retrieved from ProQuest Digital Dissertations (UMI No. MR72545)

Colakoglu, E. (2010). Haklar soyleminde cevre egitiminin yeri ve Turkiye'de cevre egitiminin anayasal dayanaklari [The rights discourse of environmental

education place and constitutional basis of environmental education in Turkey]. *Turkiye Barolar Birligi Dergisi*, 88, 151-171.

Council of Higher Education. (2018). *Sinif ogretmenligi lisans programi* [Classroom teacher undergraduate program]. Retrieved from http://www.yok.gov.tr/documents/10279/41805112/Sinif_Ogretmenligi_Lisans_Programi.pdf

D'sa, B. (2004). *A study of preservice teachers' attitudes toward human rights and unfair labour conditions: A comparison of the influence of two teaching methods.* (Unpublished doctoral dissertation). Utah State University Interdepartmental Education Program, Logan.

Darder, A. (2009). An eco-pedagogy in the pursuit of social justice and peace. In J. Andrzejewski, M. Baltodano, & L. Symcox (Ed.), *Social justice, peace, and environmental education: Transformative standards.* New York: Routledge.

Davies, K., Adelman, S., Grear, A., Magallanes, C. L., Kerns, T., & Rajan, S. R. (2017). The Declaration on Human Rights and Climate Change: A new legal tool for global policy change. *Journal of Human Rights and the Environment*, *8*(2), 217-253.

Demirdelen, O., & Odman M. T. (2017). Kuresel isinmanin yol actigi sorunlardan biri: Iklim multecilerinin hukuki statusu [One of the problems caused by global warming: The legal status of climate refugees]. *Sosyal Bilimler Dergisi, 4*(13), 470–497.

Doganay, A., & Ozturk, A. (2017). Developing attitudes towards human rights through socioscientific issues in science courses: An action research. *Multidisciplinary Journal of Educational Research*, 7(3), 253-286. doi: 10.17583/remie.2017.2873

Dolan, T. J., Nichols, B. H., & Zeidler, D. L. (2009). Using socioscientific issues in primary classrooms. *Journal of Elementary Science Education, 21*(3), 1-12.

Domac, G. G. (2011). *Biyoloji egitiminde toplumbilimsel konularin ogrenilmesinde argumantasyon tabanli ogrenme surecinin etkisi* [The effect of the argumentation based learnings in terms socioscientific issues in biology education] (Unpublished master's thesis). Gazi Universitesi Egitim Bilimleri Enstitusu, Ankara.

Evren-Yapicioglu, A. (2018). Advantages and disadvantages of socioscientific issue-based instruction in science classrooms. *International Online Journal of Education and Teaching (IOJET), 5*(2), 361-374. Retrieved from http://iojet.org/index.php/IOJET/article/view/327/240

Flowers, N., Bernbaum, M., Rudelius-Palmer, K., & Tolman, J. (2000). *The human rights education handbook: Effective practices for learning, action, and change*. Minneapolis: University of Minnesota. Retrieved from http://hrlibrary.umn.edu/edumat/pdf/hreh.pdf

Flowers, N., Brederode-Santos, M. E., Claeys, J., Fazah, R., Schneider, A., & Szelényi, Z. (2009). Compass: Manual on human rights education for children. Budapeste: Council of Europe Retrieved from http://www.eycb.coe.int/compasito/pdf/Compasito%20EN.pdf

Francis, J. C. (2012). Designing teacher education programs for human rights. *Journal of Peace Education and Social Justice, 6*(1), 36-50

Hammarberg, T. (Ed.). (2011). *Human rights in Europe: no grounds for complacency*. Strasbourg: Council of Europe Publishing.

Harris, I. (2004). Peace education theory. *Journal of Peace Education, 1*(1), 5-20

Hung, R. (2007). Is ecological sustainability consonant or dissonant with human rights? Identifying theoretical issues in peace education. *Journal of Peace Education, 4*(1), 39-55.

Iseri, B. (2012). *Fen ve teknoloji ogretmen adaylarinin nukleer enerjinin riskleri ve faydalari hakkindaki dusuncelerine farkli bilgi kaynaklarinin etkileri* [Student science teachers' ideas of about risks and benefits of nuclear energy effects the different sources of knowledge (Unpublished master's thesis). Ahi Evran Universitesi Fen Bilimleri Enstitusu, Kirsehir.

Jennings, T. (2006). Human rights education standards for teachers and teacher education. *Teaching Education, 17*(4), 287-298.

Kadioglu, M. (2008). Kuresel iklim degisimi ve etik [Climate change and ethics]. *TMMOB Iklim Degisimi Sempozyumu*(pp.393-424), Ankara, Turkey. Retrieved from https://www.tmmob.org.tr/sites/default/files/871bd64012152bf_ek.pdf

Karagozoglu, N. (2017). Insan haklari egitiminde gazetelerden yararlanma [Using newspapers in human rights education]. *Kirsehir Egitim Fakultesi Dergisi, 18*(3), 64-79

Karakus, M. H. (2018). *Cocuk edebiyati eserleriyle insan haklari egitimi programinin gelistirilmesi, uygulanmasi ve değerlendirilmesi* [Development, implementation and evaluation of human rights education program with works of children's literature] (Unpublished master's thesis). Gaziantep Universitesi Egitim Bilimleri Enstitusu, Gaziantep.

Kilinc, A., Boyes, E., & Stanisstreet, M. (2011). Turkish school students and global warming: Beliefs and willingness to act. *Eurasia Journal of Mathematics, Science, & Technology Education, 7*(2), 121-134.

Kilinc, A., Boyes, E., & Stanisstreet, M. (2012). Exploring students' ideas about risks and benefits of nuclear power using risk perception theories. *Journal of Science Education and Technology, 22*(3), 252-266.

Kline, R. B. (2005). *Principles and practice of structural equation modelling*. New York: Guilford.

Kolstø, S. D. (2001). Scientific literacy for citizenship: Tools for dealing with the science dimensions of controversial socio-scientific issues. *Science Education*, 85, 291-310.

Mapping, M., & Johnson, E. A. (Eds.) (2005). *Environmental education and advocacy. Cambridge*. UK: Cambridge University Press.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* Thousand Oaks & London: Sage Publication.

Ministry of National Education. (2017). *Ogretmenlik meslegi genel yeterlilikleri* [General qualifications of teaching profession]. Retrieved from https://oygm.meb.gov.tr/meb_iys_dosyalar/2017_12/11115355_YYRETMENLYK_MESLEYY_GENEL_YETERLYKLERY.pdf

Moro, L. N. (2002). Refugee education in a changing global climate: The case of Sudanese in Egypt. *46th Annual Meeting of Comparative and International Education Society*. Orlando, FL. Retrieved from https://eric.ed.gov/?id=ED479095

Mulvaney, D. (2011). Environment and citizenship. *Environmental Ethics, 33*(3), 323-324.

Osler, A., & Starkey, H. (1994). Fundamental issues in teacher education for human rights: A European perspective. *Journal of Moral Education, 23*(3), 349-359.

Osler, A., & Starkey, H. (2010). *Teachers and human rights education*. Stoke-on-Trent, UK: Trentham Books.

Ozdemir, N., & Cobanoglu, E. O. (2008). Turkiye'de nukleer santrallerin kurulmasi ve nukleer enerji kullanimi konusundaki ögretmen adaylarinin tutumlari. [Prospective teachers' attitudes towards the use of nuclear energy and the construction of nuclear plants in Turkey]. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 34, 218-232

Ozdemir, O. (2007). Yeni bir cevre egitimi perspektifi: Surdurulebilir gelisme amacli egitim [A new environmental education perspective: Education for sustainable development]. *Egitim ve Bilim, 32*(145), 23-39.

Ozden, M. (2011). 4. ve 5. siniflar fen ve teknoloji dersinin vatandaslik egitimi bakimindan islevselligi [The function of science and technology courses in 4th and 5th grades in terms of citizenship education] (Unpublished doctoral thesis). Anadolu Universitesi Egitim Bilimleri Enstitusu, Eskisehir.

Ozturk, S., & Leblebicioglu, G. (2015). Sosyo-bilimsel bir konu olan hidroelektrik santraller (HES) hakkinda karar verilirken kullanilan irdeleme sekillerinin incelenmesi [Investigation of reasoning modes in making a decision about hydroelectric power plants which is a socioscientific issue]. *Necatibey Egitim Fakultesi Elektronik Fen ve Matematik Egitimi Dergisi, 9*(2), 1-33.

Rademacher, A. C. (2010). *Climate change and indigenous people in Latin America* (Unpublished master's thesis). University of Denver, Denver, Colorado. Retrieved from https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=1531&context=etd

Ramamurthy, S. (2011). Towards a human rights compatible nuclear liability regime: some human rights reflections from India. *The International Journal of Human Rights, 15*(8), 1234–1248

Ratcliffe, M., & Grace, M. (2003). *Science education for citizenship*. Maidenhead, UK: Open University Press.

Reardon, B. (1995). *Educating for human dignity. Learning about rights and responsibilities.* Philadelphia: University of Pennsylvania Press.

Sadler, T. D., Foulk, J. A., & Friedrichsen, P. J. (2017). Evolution of a model for socioscientific issue teaching and learning. *International Journal of Education in Mathematics, Science and Technology, 5*(2), 75-87. DOI:10.18404/ijemst.55999

Sadler, T.D., & Zeidler, D. L. (2005a). The significance of content knowledge for informal reasoning regarding socioscientific issues: Applying genetics knowledge to genetic engineering issues. *Science Education*, 89, 71-93.https://doi.org/10.1002/sce.20023

Sadler, T. D., & Zeidler, D. L. (2005b). Patterns of informal reasoning in the context of socioscientific decision making. *Journal of Research in Science Teaching*, 42, 112–138.https://doi.org/10.1002/tea.20042

Saglam, H. I. (2017). Ilkokulda insan haklari ve yurttaslik ve demokrasi egitimi [Human rights and civic and democracy education in primary school]. In R. Turan (Ed.), *Ogretmen adaylari icin insan haklari ve demokrasi egitimi* [Human rights and democracy education for prospective teachers] (pp. 219-229). Ankara: Pegem Yayincilik.

Shiman, D. (1999). *Economic and social justice: A human rights perspective*. Minneapolis: Human Rights Resource Centre, University of Minnesota.

Smith, M. J., & Pangsapa, P. (2008). *Environment and citizenship: Integrating justice, responsibility and civic engagement*. London: Zed books.

Sousa, C. (2017). Integrating bioethics in sciences' curricula using values in science and socio-scientific issues. *Multidisciplinary Journal for Education, Social and Technological Sciences, 4*(1), 122-134. https://doi.org/10.4995/muse.2017.6481

Spreen, C. A., & Monaghan, C. (2017). Leveraging diversity to become a global citizen: Lessons for human rights education. In M. Bajaj (Ed.), *Human rights education: Theory, research, praxis*. Pennsylvania: University of Pennsylvania Press

Strauss, A., & Corbin, J. (1990). *Basic of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage

Tarrow, N. (1990). Human rights education: A Comparison of Canadian and U.S. approaches. *Educational Research Quarterly, 12*(49), 12-22.

Terada, C. (2012). Recycling electronic wastes in Nigeria: Putting environmental and human rights at risk. *North-western Journal of International Human Rights, 10*(3), 154-172.

Tibbitts, F. (1996). On human dignity: A renewed call for human rights education. *Social Education, 60*(7), 428-431.

Topcu, M. S., & Atabey, N. (2017). Sosyobilimsel konu icerikli alan gezilerinin ilkogretim ogrencilerinin argumantasyon nitelikleri uzerine etkisi [The effect of socioscientific issues based field trips on elementary school students' argumentation quality]. *Bartin Universitesi Egitim Fakultesi Dergisi, 6*(1), 68-84.

Topcu, M. S., Sadler, T. D., & Yilmaz-Tuzun, O. (2010). Preservice science teachers' informal reasoning about SSI: The influence of issues context. *International Journal of Science Education, 32*(18), 2475-2495

UNEP compendium on human rights and the environment: Selected international legal materials and cases. (2014). Retrieved from https://www.ciel.org/wp-content/uploads/2015/03/UNEP_Compendium_HRE_Mar2014.pdf

Yardimoglu, M., Atas, H., Fidan, A., & Karadag, U. (2014). Temiz enerji ve insan sagligi [Clean energy and human health]. *International Energy and Securıty Congress Programme*, Turkey. Retrieved from http://akademikpersonel.kocaeli.edu.tr/melda/bildiri/melda13.11.2014_13.18.33bildiri.pdf

Yavuz Topaloglu, M., & Balkan Kiyici, F. (2017). Ortaokul ogrencilerin hidroelektrik santrali hakkindaki gorusleri [Middle school students' opinions about hydroelectric power plants]. *Ahi Evran Universitesi Kırsehir Egitim Fakultesi Dergisi (KEFAD)*, 18, 159-179.

Zajda, J., & Ozdowski, S. (2017). Globalisation and human rights education: Emerging issues. In J. Zajda & S. Ozdowski (Ed.), *Globalisation, human rights education & reform* (pp.1-15). Netherlands: Springer.

Zeidler, D. L., & Keefer, M. (2003). The role of moral reasoning and the status of socioscientific issues in science education: Philosophical, psychological and pedagogical considerations. In D. L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 7-38). The Netherlands: Kluwer Academic Press

Ziya, O. (2012). Multeci gocmen belirsizliginde iklim multecileri [Climate refugees in the uncertainty of being a refugee or migrant]. *Turkiye Barolar Birligi Dergisi*, 99, 230-240. Retrieved from http://portal.ubap.org.tr/App_Themes/Dergi/2012-99-1156.pdf

Çevre Eğitimi Dersinde Sosyobilimsel Konularla İnsan Hakları Eğitimi

Atıf:

Ozturk, A. (201x). Human rights education with socioscientific issues through the environmental education courses. *Eurasian Journal of Educational Research*, 77, *35-64,* DOI:

Özet

Problem Durumu: İnsan hakları eğitimi küresel bağlamda temel hak ve özgürlüklere ilişkin anlayış ve saygının oluşturulması için gerekli bilgi, beceri ve tutumun kazandırılması sürecidir. Demokratik toplumlar için büyük önem taşıyan ve barış kültürünün oluşturulmasına önemli katılar sağlayan insan hakları eğitiminin etkili bir şekilde gerçekleştirilmesinde öğretmenlere önemli görevler düşmektedir. Öğretmenlerin insan hakları eğitimini etkili bir biçimde gerçekleştirilmesi için ise öncelikle kendilerinin insan haklarıyla ilgili derinlemesine bir anlayışa sahip olmaları gerekmektedir. Bu durum, öğretmen yetiştirme programlarında insan hakları eğitimi için düzenlemeler yapılmasının gerekliliğini ortaya koymaktadır. Öğretmen yetiştirme programlarında insan hakları eğitimi için bağlantı kurulabilecek derslerden biri de çevre eğitimi dersidir. Küresel ısınma ve iklim değişikliği, sürdürülebilir çevre, nükleer enerji santralleri, alternatif enerji kaynakları, zararlı peptisitler, asit yağmurları, geri dönüşüm gibi çevresel birçok konunun insan hakları üzerinde etkisi bulunmaktadır. İnsan hakları üzerinde etkisi olduğu belirtilen bu durumlarfen ve teknolojideki gelişmelerin ürün ve sürecine bağlı olarak ortaya çıkmakta olup sosyobilimsel konular olarak adlandırılmaktadır. Bu doğrultuda, çevre eğitimi derslerinde insan hakları eğitimini gerçekleştirmek için uygun bağlamlardan birinin sosyobilimsel konular olabileceği söylenebilir. Bununla birlikte, ilgili alan yazın incelendiğinde çevre eğitimi ve sosyobilimsel konular bağlamında gerçekleştirilen çalışmaların ise insan hakları eğitimine değil vatandaşlık eğitimi ve sosyobilimsel konulara ilişkin bilgi, risk algısı, görüşler, karar verme becerisi, argümantasyon becerisivb. üzerine odaklandığı görülmektedir. Böyle bir çalışmanın, insan haklarına ilişkin bilgi ve tutum kazandırmanın yanı sıra; fen ve teknolojideki gelişmelerin beraberinde getirdiği birçok problemin çevresel olduğu kadar temel hak ve özgürlükler için de sorun olduğu bilincinin kazandırılması için de önem taşıdığı söylenebilir. Evrensel bir insan hakları kültürünün oluşturulması amacıyla gerçekleştirilen çalışmaların önemli odaklarından birinin ilkokul sistemleri olduğu düşünüldüğünde, sınıf öğretmen adaylarına insan hakları ile ilgili bilgi ve tutum kazandırılması için çalışmalar yapılmasının önem kazandığı söylenebilir.

Araştırmanın Amacı: Bu çalışmada, sınıf öğretmen adayları için "Çevre Eğitimi Dersinde Sosyobilimsel Konular Temelli İnsan Hakları Eğitimi Programı'nın (ÇSİHEP'in) geliştirilmesi, uygulanması ve değerlendirilmesi amaçlanmıştır. Bu ana amaç doğrultusunda şu sorulara yanıt aranmıştır: ÇSİHEP'in sınıf öğretmen adaylarının insan haklarına ilişkin bilgi ve tutum gelişimi üzerine etkisi nasıldır?

Sınıf öğretmen adayları, ÇSİHEP'in etkililiğini ve insan haklarına ilişkin bireysel gelişimlerini nasıl değerlendirmektedir?

Yöntem: Eşdeğer olmayan ön-test son-test kontrol gruplu yarı deneysel desen olarak tasarlanan araştırmanın katılımcılarını, deney grubunda 38 ve kontrol grubunda 39 olmak üzere toplam 77 sınıf öğretmeni adayı oluşturmuştur. Araştırma kapsamında, 14 hafta uygulama gerçekleştirilmiştir. Araştırmada, deney grubuna ÇSİHEP uygulanmış, kontrol grubuna ise deneysel herhangi bir işlem uygulanmamıştır. Çalışmada, araştırmacı tarafından geliştirilen Yetişkinler için İnsan Haklarına İlişkin Tutum Ölçeği (YİHTÖ) ve İnsan Haklarına İlişkin Bilgi Testi (İHBT) deney ve kontrol grubuna ön-test ve son-test olarak uygulanmıştır. ÇSİHEP'in Etkililiğini ve Bireysel Gelişimi Değerlendirme Formu (ÇEBDF) ise yalnızca deney grubuna son ölçüm olarak uygulanmıştır. Araştırmada, nicel verilerinin istatistiksel analizi için önce Kovaryans analizi sonra Bağımsız gruplar t testi ön sayıltıları kontrol edilmiştir. Bu işlem sonrasında, YİHTÖ ön test puanı, İHBT ön-test ve son-test puanları analizleri için Mann Whitney U testi, YİHTÖ son-test puanı ise Bağımsız gruplar T testi yapılarak analiz edilmiştir. ÇEBDF verileri ise içerik analizi yapılarak çözümlenmiştir. Bu analiz sonucunda, iki tema ve beş kategoriye ulaşılmıştır. Nitel verilerin analizinde güvenirlik çalışmaları yapılmıştır.

Bulgular: Araştırma bulguları, deney ve kontrol grubunda yer alan öğretmen adaylarının YİHTÖ ön-test puanları arasında istatistiksel olarak anlamlı bir fark olmadığını [U= 722, p >.05]; YİHTÖ son-test puanları arasında deney grubu lehine istatistiksel olarak anlamlı bir fark olduğunu göstermiştir [t(75) =19,32, p<.05]. Yine araştırma bulguları deney ve kontrol grubu İHBT ön-test puanları arasında istatistiksel olarak anlamlı bir fark olmadığını [U=703,50, p >.05]; İHBT son-test puanları arasında istatistiksel olarak deney grubunun lehine anlamlı bir fark olduğunu göstermiştir [U=.00, p >.05]. Bu bulgular, uygulamalar sonrasında deney grubu öğretmen adaylarının insan haklarına ilişkin bilgi ve tutumlarının kontrol grubu öğretmen adaylarınınkine göre anlamlı olarak daha yüksek olduğunu göstermiştir. ÇEBDF bulguları ise ÇSİHEP'in etkililiğine ilişkin değerlendirmeler ve insan haklarıyla ilgili bireysel kazanımlar olmak üzere iki tema altında toplanmıştır. ÇSİHEP'in etkililiğine ilişkin değerlendirmeler kapsamında bulgular iki kategoride toplanmıştır. Bunlardan ÇSİHEP'in gerekliliği ve önemine ilişkin görüşler kategorisi kapsamında; uygulamaların temel hak ve özgürlüklerin farkında bireyler yetiştirmek, hak ve özgürlükleri korumanın önemini kavratmak, çevre ve insan hakları ile ilgili tartışmalara katılım için bilgi ve beceri sağlamak, çevresel problemler ve hak ihlalleri arasındaki ilişkinin anlaşılmasını sağlamak, çevre ve insan haklarına duyarlı vatandaş sorumluluğu kazandırmak için gerekli ve önemli bulunduğu belirlenmiştir. ÇSİHEP'in sağladığı faydalara ilişkin görüşler kategorisi kapsamında ise uygulamaların mesleki gelişim için kazanım sağlamak, insan hakları eğitiminin gerekliliğini ve önemini kavratmak, gerçek hayat durumları üzerinden hak ve hak ihlalleri için farkındalık ve bilgi kazandırmak, çevre ve insan hakları ilişkisini kavratmak, çevre ve insan haklarını korumak için sorumluluk bilinci oluşturmak için faydalı görüldüğü saptanmıştır. İnsan haklarıyla ilgili bireysel kazanımlar temasına ilişkin görüşler ise anlayış ve bilgi oluşumu, tutum ve davranış gelişimi olmak üzere

üç kategoride toplanmıştır. Anlayış ve bilgi oluşumu kapsamında temel hak ve özgürlükler, hak ihlalleri, hak ihlallerinin önlenmesi, evrensel bir değer olarak insan hakları için bilgi kazanımının gerçekleştiği belirtilmiştir. Ayrıca, haklarla ilgili anlamlı öğrenmeye, çevre ve insan hakları arasındaki ilişki ile vatandaş ve devlet sorumluluklarını anlamaya, bilgi sahibi olunan hak sayısında artışa vurguda bulunulmuştur. Tutum gelişimi bağlamında ise öğretmen adayları insan hakları ile ilgi bilgi kazanımının, yaygınlaştırma ve korumanın, hak ihlallerinin önlenmesinin önemini vurgulamış, insan haklarıyla ilgili çalışmaların yapılmasını gerekli bulduklarını ve bu çalışmalara destek vermeye istekli olduklarını belirtmişlerdir. Ayrıca, insan haklarıyla ilgili yayınları takip etmeye ve hakların korunması için sorumluluk almaya istekli olduklarını da ifade etmişlerdir. Davranış gelişimi ile ilgili olarak ise öğretmen adayları insan haklarına uygun davranmaya çalışma, ilgili yayınları takip etme ve çalışmalara katılma davranışlarını gerçekleştirdiklerini belirtmişlerdir.

Sonuç ve Öneriler: Araştırma sonuçları genel olarak değerlendirildiğinde ÇSİHEP'in; insan haklarına ilişkin bilgi, tutum ve davranış kazandırdığı, hak ihlallerine ilişkin farkındalık oluşturduğu ve çevre ile insan hakları arasındaki ilişkinin anlaşılmasını sağladığı söylenebilir. Bu doğrultuda, sınıf öğretmen adaylarına, çevre ile insan hakları arasındaki ilişkiye yönelik bütüncül bir anlayış kazandırılması ve insan hakları eğitimi için çevre eğitimi derslerinde sosyobilimsel konularla insan hakları bağlantısının kurulması; farklı eğitim kademelerinde çevre derslerinde çalışmalar yapılarak duruma ilişkin kapsamlı bilgi sağlanması önerilebilir.

Eurasian Journal of Educational Research 77 (2018) 65-80

Eurasian Journal of Educational Research
www.ejer.com.tr

Accuracy Order of English Grammatical Morphemes of Saudi EFL Learners*

Abuelgasim Sabah Elsaid MOHAMMED[1], Abdulaziz Bashir SANOSI[2]

ARTICLE INFO

Article History:
Received: 18 Jan. 2018
Received in revised form: 1 May. 2018
Accepted: 5 Sept. 2018
DOI: 10.14689/ejer.2018.77.4

Keywords
Second Language Acquisition, Morpheme Acquisition, Natural Order Hypothesis

ABSTRACT

Purpose: This paper investigates the accuracy order of grammatical morphemes followed by Saudi EFL learners. The major aim of the research was to reveal the pattern of grammatical morpheme acquisition of the participants, and to compare it against the Natural Order Hypothesis (NOH) as stated by Krashen (1977). The different factors that affected the generated order were also discussed. ***Research Methods:*** The present research adopted a descriptive quantitative design. Three groups of male and female students (*n*= 258) participated in the study. The participants were selected randomly from public schools and university colleges. They responded to a grammar elicitation task designed to test their accuracy of using grammatical morphemes. Pica's (1983) TLU method was used to assess the participants' performance. ***Findings:*** It was found that Saudi EFL learners developed the accuracy of using grammatical morphemes in a similar sequence regardless of their educational stages. Although this sequence was fixed, there seemed to be a clear effect of the educational stage upon the quality of their usage. The generated accuracy order was found to be different from the NOH. This result suggested that the participants' first language (L1) affected the accuracy order of grammatical morphemes. ***Implications for research and practice:*** The findings of the study suggested that course book lesson plans should be designed according to the generated order to facilitate grammatical morpheme acquisition. Further research that will utilize a bigger size of samples is also required to confirm the generated order.

* This research was supported by the Deanship of Scientific Research at Prince Sattam Bin Abdulaziz University, Saudi Arabia, under the research project # 2017/2/7702.

[1] Department of English language, Prince Sattam Bin Abdulaziz University, Howtat Bani Tamim, Saudi Arabia. ab.ibrahim@psau.edu.sa. ORCID 0000-0001-9791-0905.

[2] Corresponding Author: Department of English language, Prince Sattam Bin Abdulaziz University, Howtat Bani Tamim, Saudi Arabia. a.assanosi@psau.edu.sa. ORCID 0000-0003-3447-2818

Introduction

One of the famous approaches that attempted to explain language acquisition is the Innatist view, which was suggested by Noam Chomsky and his followers in the late 1950s. The main argument that led to the emergence of the Innatist theory was that language learners learn more than the input they are exposed to. It was argued that learners, in fact, benefit from something that, as White (2003) described, goes far beyond the input. This argument, which is known as the Poverty of Stimulus Theory, was originally presented by Chomsky (1965) who claimed that the innate knowledge of the language is traced back to a Language Acquisition Device (LAD) that is possessed by every child regardless of their first language (L1). Correspondingly, children acquire their L1 system by manipulating a universal grammar (UG) system that fits every natural language. As a crucial part of linguistic structure, morphemes are believed to be acquired in a specific order. However, no final answer has been presented to the question of whether this order is universal or L1 specific. Answering such a question would be significant as it might provide insightful pedagogical implications on grammar instruction and language acquisition.

In accordance with the Innatist theory, many questions regarding the nature of learner language have been posed. Researchers have shown a considerable interest specifically to the continuum that language learners follow. Children, it was assumed, utilize their built-in syllabus, to acquire linguistic items in a unified sequence. This built-in syllabus, as it was termed by Corder (1967), controls the developmental patterns with which children process their first language (L1). Although the focus of these studies was to justify errors that children committed while they produced their language, as well as to depict these errors as a natural consequence of the developmental stages; it was nevertheless insightful to the subsequent research on the developmental sequence of acquisition.

As far as the second language (L2) is concerned, other questions emerged, the most prominent of which was about whether this built-in capacity was also used by adult learners. It was claimed that all humans possess the instinctive ability to process language, and it keeps working until a late age in life. It can be inferred from this claim that L2 learners also follow a predetermined order of acquisition; however, researchers did not take these views for granted. Rather, there was a sensible argument based on the grounds that L1 acquisition is different from SLA. This argument revolves around the fact that, in contrast to SLA, L1 acquisition is inevitable, represents part of natural development, requires no motivation, and starts with no previous linguistic knowledge. However, it was believed that "the strategies adopted by the learners of a second language are substantially the same as those by which a first language is acquired" (Corder 1967, p. 165). The similarity of these strategies, it was believed, results in similar developmental patterns, and as a result, this hypothesis underwent continuous testing throughout the subsequent decades.

In this regard, researchers have classified two types of developmental patterns in SLA. The first is what is termed by VanPatten and Benati (2010), as (Stage-like Development) or (Sequence of Acquisition) by (Ellis, 2010). This type of sequence

addresses the steps L2 learners take to acquire an entire linguistic feature. It was found that there are definite stages that are followed by L2 learners in order to acquire specific features such as question formation, word order, and negation. Research on this concept proved that most L2 learners follow these patterns regardless of their learning settings.

An example of the developmental patterns in SLA is what Ellis (2010) termed (Order of Acquisition) and was referred to as (Ordered Development) by other researchers such as VanPatten and Benati (2010). This was concerned with the development of different linguistic features over time. The primary concern of most studies that investigate this type of development is the acquisition of grammatical morphemes of a language. Studies of this type appeared relatively early and yielded interesting results that enriched the language acquisition literature.

Morpheme Acquisition Order (MAO)

Early investigations of morpheme acquisition revealed that "second language learning was predicted to consist of the acquisition of rules and structures of target language in a gradual process over an extended period of time" (Mansouri, 2008, p. 2). Justifications of these findings were not definitive and remain, as many phenomena of SLA, a matter of speculation. One of the first linguistic elements to be tested for their gradual acquisition was the morphemic system of languages. In the following sections, MAO studies are discussed along with the major perception of MAO and its related concepts.

L1 Morpheme Studies

The first morpheme studies dealt with first language acquisition. Several studies were conducted to investigate the sequence with which children acquired their mother tongue. Brown (1973) studied the development of 14 English grammatical morpheme acquisitions by three English-speaking children. He monitored their progress longitudinally and found that the three children had followed an order which started with present progressive [-ing], and went through 13 morphemes and finished with the contradictable auxiliary morpheme.

Shortly after the Brown (1973) findings, de Villiers and de Villiers (1973) conducted a cross-sectional study to investigate the order of acquisition of the same 14 grammatical morphemes by 21 children. They found that the subjects followed the same order revealed earlier by Brown (1973). These two studies provided to be powerful support for the hypothesis of universal predictable MAO.

Generally speaking, researchers believe that "among first language learners, the existence of developmental sequences may not seem surprising because their language learning is partly tied to their cognitive development" (Lightbown & Spada, 2013, p. 245). Conversely, the developmental patterns of L2 learners entail much argument since the existing linguistic system may interfere with the L2 and influence the developmental sequences.

L2 Morpheme Studies

In the 1970s, many studies that dealt with MAO were conducted. Dulay and Burt carried out three studies (1972, 1973, & 1974) which investigated the universal regularities in child SLA. They concluded that "regardless of first language background, children reconstruct English syntax in similar ways" (Dulay & Burt, 1974, p. 37). After applying three different methods (i.e., Group Score Method, Group Mean Method, and Syntax Acquisition Index (SAI) method), the rank order they found was similar among all children whose L1 were different (i.e., Spanish, Chinese, Japanese, and Norwegian). These results were inspiring to almost all subsequent studies especially with reference to the different linguistic backgrounds of the subjects and the variety of the methods followed. Table 1 below presents the rank order obtained via one of those pioneer studies.

Table 1
L2 Rank Order (Sequences) Obtained

Group Score Method	Group Means Method	SAI Method
1 case	*1 case*	*1 case*
2 article	*2 article*	*2 copula*
3 copula	*3.5 {copula}*	*3.5 {article}*
	{ing}	*{-ing}*
4 -ing	*5 plural*	*5 auxiliary*
5 plural	*6 auxiliary*	*6 plural*
6 auxiliary	*7 past -reg*	*7.5 {past irregular}*
		{possessive}
7 past –reg	*8.5{past –irregular}*	*10 {past regular}*
	{possessive}	*{long plural}*
		{3rd person}
8 past –irreg.	*10 long plural*	
9 long plural	*11 3rd person*	
10 possessive		
11 3rd person		

(Dulay & Burt, 1974, p. 51)

Likewise, Bailey, Madden and Krashen (1974) investigated the order of acquisition of grammatical morphemes followed by EFL learners of different backgrounds. The focus of the study was on adult learners who were divided into two groups: Spanish L1 and non-Spanish L1, the results are tabulated in table 2.

Table 2
Morpheme Acquisition Order of Adult Learners

Spanish L1 group	Non-Spanish L1 Group
1 article a, the	*1- present progressive –ing*
2 present progressive -ing	*2- contractible copula*
3 plural –s	*3- past irregular*
4 contractible copula	*4- plural –s*
5 contractible auxiliary	*5- contractible auxiliary*
6 past irregular	*6- articles a, the*
7 3rd person	*7- 3rd person singular*
8 possessive -'s	*8- possessive –'s*

(Bailey et al., 1974, p. 239)

These results led to a common belief about the supposition of the regular order of morpheme acquisition. The hypothesis was then standardised as Krashen (1977) posited it as one construct of his monitor model and termed it as the Natural Order Hypothesis.

The Natural Order Hypothesis (NOH)

According to the NOH, "acquirers of a given language tend to acquire certain grammatical structures early and others later" (Krashen, 1982, p. 12). Krashen concluded the results of many contemporary English morpheme order studies at that time, including his own, (Krashen (1977), presented the average acquisition order of English grammatical morphemes for L2 learners as seen in Figure 1.

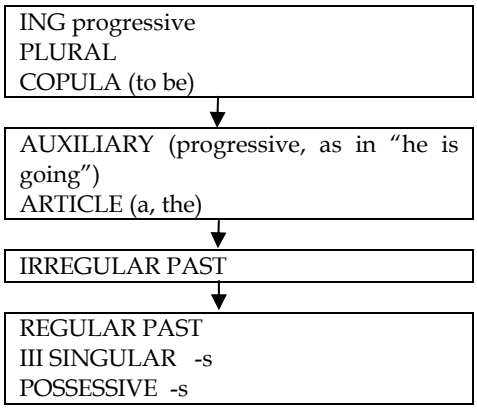

Figure 1. Average Order of Acquisition of Grammatical Morphemes for English as a Second Language (Children and Adults)

Source: Krashen, 1982, p. 13.

As one notes, Krashen (1982) put morphemes in boxes. He claimed that morphemes in the same box are normally acquired before those in the next box. However, no claims were made about ordering relations for morphemes in the same box. In this way, this order seems to be more flexible and yields similar results in future studies.

Comparing this acquisition order to that of Dulay and Burt (1974), it is apparent that although there are some differences at first glance, there is also a considerable similarity in the general pattern of the acquisition order. It was evident that Dulay and Burt (1974) studied 12 grammatical morphemes while Krashen's pattern consists of only nine. This difference is likely to cause some variations in order. If we exclude the three extra morphemes in Dulay and Burt's order and compare the other to Krashen's order, the results will look like what appears in Table 3.

Table 3
A Comparison Between Acquisition Orders by Dulay & Burt (1973) and Krashen (1977)

Dulay and Burt	Stephen Krashen
1- article	*progressive -ing*
2- copula	*plural -s*
3- progressive - ing	*copula*
4- plural –s	*Auxiliary*
5- auxiliary	*Article*
6- regular past	*irregular past*
7- irregular past	*regular past*
8- possessive –s	*3rd Person -s possessive -s*
9- 3rd Person -s	

Considering the fact that the order of single morphemes in one box in Krashen's order is not final, it is apparent that 5 out of 9 morphemes shared the same rank. Additionally, even the differences between the other morphemes were slight (i.e., regular and irregular past).

The (NOH) remains an inspiring tool that is frequently used by Second Language Acquisition (SLA) researchers to assess the development of learners' competence in syntax and grammar. Despite that, 44 years of research literature has shown no consensus on some pivotal components of the hypothesis, for example, as to whether the order is truly universal and impervious to other external factors such as L1 background, the linguistic quality of the morphemes or the setting of language learning. Ultimately, in recent years, research has provided ample support for the assertion that although there is some kind of consistency in the acquisition of grammatical morphemes by EFL learners, special attention should be paid to important influencing factors that may govern this order. The effect of L1 on morpheme acquisition is the most important of these factors.

Effect of L1 on MAO

The early morpheme studies claimed that order of acquisition was not affected by the learners L1. Much of the current debates, notwithstanding; revolves around the effect of L1 on order of acquisition. For some researchers, the influence of L1 over morpheme acquisition order might be overlooked or neglected because "many morpheme studies have lumped different L1 groups together" (Luk & Shirai, 2009, p. 725). Analogously, Murakami and Alexopoulou (2016, p. 28) argue that "morphemes encoding language-specific concepts (e.g., definiteness) are more severely affected by L1 than morphemes encoding universal-specific concepts." For this reason, it was noted that English articles are the most rank-changing morphemes across different orders of acquisition. By the same token, many other research studies proved prominent influence of L1 over the order of morpheme acquisition (Izumi & Isahara, 2004; Khor, 2012; Schenk & Choi, 2013; and Seog, 2015) to name a few.

Based on the noticeable influence of L1 on MAO which was apparent in the previous studies, the present research adopted the concept that there are some

disparities of morpheme order that can be traced back to L1 interference. These deviations, although slight, show patterns of consistency within learners of the same native language. Accordingly, the researchers hypothesised that order of morpheme acquisition of Saudi learners, and inevitably all Arabic-L1 learners, is different from the proposed NOH.

Acquisition Order vs. Accuracy Order:

The concepts of acquisition order and accuracy order have been used interchangeably in the morpheme acquisition literature; however, certain theoretical and methodological differences can be noted between the two concepts. Initially, researchers used the term acquisition order. The acquisition-learning hypothesis was dominant at that time, so it was the norm to use the term (acquisition), yet other first morpheme studies adopted the term accuracy order. This was based "on the grounds that the more accurately a morpheme was used, the earlier it must have been acquired" (Ellis, 2010, p. 91).

An important methodological criterion to consider; however, was that acquisition, as defined by the monitor model of Krashen (1977), cannot be investigated at a point in time or cross-sectionally. Rather, "acquisition orders are concerned with when learners begin to do things correctly most of the time. The standard measure is 90 per cent accurate" (VanPatten & Benati, 2010, p. 28). Measuring this cannot be achieved except by adopting a longitudinal method. Accuracy order, on the other hand, can be measured at one point in time and then accounted for as the acquisition order depending on the above-mentioned considerations.

Accordingly, many modern studies have accepted this view and termed the process as (acquisition order) although they have adopted cross-sectional methods. Examples of these studies are Behajat & Sadighi, 2011; Dabove, 2014; Ibrahim eth al., 2013; and Murakami & Alexopoulou, 2016. Other studies, nevertheless, committed to the methodological standards and termed the process as accuracy order (Barrot, 2009; Kharrati et al., 2015; Murakami, 2013; and Seog, 2015).

Throughout this research, the two terms have been used interchangeably; however, because this study is cross-sectional in nature, the term (accuracy order) is used when the context requires defining the process studied in the current research.

Purpose of the Study

This study investigated the morpheme accuracy order followed by Saudi Arabian EFL learners. To achieve this, this research tested the following two null hypotheses:

$H_0$1. Saudi EFL learners develop the acquisition of English grammatical morphemes in a similar order regardless of their age and learning setting

$H_0$2: There is no relation between the Saudi MAO and the orders stated by the NOH.

Method

Research Design

This study employed a descriptive quantitative approach to check its variables. Seliger & Shohamy (2000, p. 117) stated that "a descriptive case study might provide an in-depth linguistic analysis of the development of some aspects of grammatical ability with a second language learner"; moreover, it was carried out cross-sectionally. Although the first morpheme studies were conducted longitudinally, the recent trends applied by most applied linguistic researchers have been to apply the cross-sectional method in investigating the different applied linguistics issues. The reason for this was that longitudinal design is impractical or not economical and may result in losing some or most of the participants. Moreover, Dornyei (2007, p. 89) noted that "in cross-sectional study, we are less exposed to the detrimental impact of unforeseen external events that are beyond our control". However, researchers agreed that when using cross-sectional design in morpheme studies, what is actually measured is the accuracy order that can be considered an indication of acquisition order.

Research Sample

Three groups of Saudi Arabian EFL learners cooperatively participated in the current study. The total number of participants in study sample was [258] male and female students who were selected randomly from four schools and two university colleges at Houtat Bani Tamim in the central region of Saudi Arabia. They represented three educational stages and were distributed into three groups. Group A was incorporated of 85 intermediate school students, and Group B was composed of 84 secondary school students. Group C included male and female college students.

Research Instrument

The data of this research were collected via a grammaticality judgement test of 11 statements *(see Appendix A for a copy of the test)*. Each of the statements included one or more grammatical mistakes pertaining to grammatical morphemes. The same test was used to collect data from the three groups of participants who were asked to rewrite the statements and correct the grammatical mistakes taking advantages of the adjacent constituents i.e. the linguistic context of each statement.

The test was designed in the Suppliance in Obligatory Context (SOC) method, as explained by Brown (1973). When using such a method, the linguistic context of the statement provides an obligatory context that requires only one possible answer. The researchers used different structural and semantic clues to create the obligatory context for each morpheme. For example, adverbs of frequency were used to prompt using present simple morpheme {-S} and distinctive or repeatedly-mentioned nouns were inserted to indicate using definite articles. The objective of using such a method was to make the test more structured and systematic and to avoid diversified answers that would make scoring inaccurate. Six grammatical morphemes were targeted via the test: three of them were noun-related morphemes and three were verb-related. The noun-related morphemes were plural {-S}, possessive {-'S}/ {-S'}, and the articles;

whereas, the verb-related morphemes were progressive {-ing}, regular past {-Ed} and third person singular {-S} (See appendix A for the test). The selected grammatical morphemes were present in the seven major L1 and L2 morpheme studies according to Dabove (2014).

The accuracy of use of each of the six morphemes was assessed 3 times in different statements of the test. Given that the total number of the test statements was only eleven, some statements assessed the use of two or three morphemes simultaneously.

Validity and Reliability

To determine the content validity of the test, the researchers distributed the targeted morphemes among the test items evenly. After that, the test was presented to a jury of seven academics in the fields of applied linguistics, ELT, and TEFL to analyse its structure and decide if it provided a proper representation of the content it aimed to measure. All of the members were cooperative and they replied with valuable suggestions and advice that were used to edit the final copy of the test.

After conducting the validity measures, the researchers carried out a pilot study which incorporated 87 EFL students representing two different educational stages. 43 of the participants were secondary-school students while the other 44 were college students. The first version of the test was responded to by the participants. After the scoring process, the researchers revised the test and made some slight changes related to possible occasions where students would perform avoidance or compensation strategies and hence provide unrequired responses. The pilot study scores were then used to compute the Cronbach Alpha Coefficient of internal consistency to check the reliability of the test. The generated reliability value was (.89). Given that the optimal reliability coefficient normally ranges between .70 and .80, Dornyei (2007) and Seliger and Shohamy (2000), the reliability of the instrument from the present study seemed to be convincing to the researchers. Therefore, the final version of the test was distributed to collect the research data.

Procedures

The researchers distributed 300 copies of the test to the selected schools and colleges. The test was administered by the actual teachers of the participants in normal classes. A short guide that described the test and its mechanism was handed out to the teachers who administered the test. After completing the process, the researchers collected 274 copies which represented 91% of the distributed ones. Later, the researchers excluded 16 copies because they were incomplete. This accounted for the final body of data composed of 258 test copies.

Data Analysis

The test statements were scored in a method that is capable of providing sufficient data that could be processed by the Target-like Use (TLU) formula from Pica (1980). According to this method, the overall students' performance should be assessed. In this way, the scoring took into account the correct production of morphemes and the cases of overgeneralization or incorrect morpheme suppliance. Therefore, a score of 1

is given for any correct response whereas another score of 1* is given for the incorrect suppliance of morphemes. For example, when the subjects provided an {-ING} morpheme for a situation where a third person singular {-S} was required, this overuse was marked (1*) to indicate that the subjects have knowledge of the {-ING} morpheme but their use lacked accuracy. Finally, the scores of both correct usage and overgeneralization were tabulated in independent columns at the end of the test sheet to be counted and analysed. To maintain rater reliability, both researchers scored all of the test papers separately after agreeing on the above criteria. There was complete agreement between the two raters on almost all of the participants' scores. In the few cases, where the scores were different, they discussed the situation in detail, and then the paper was re-evaluated accordingly.

The researchers adopted accuracy usage of morphemes as a tool to measure acquisition order. This has been a common method in nearly all recent cross-sectional morpheme studies since actual acquisition can only be investigated longitudinally (Barrot, 2009; Ellis, 2010; Lightbown and Spada, 2013; and Murakami; 2016). To achieve this, the researchers utilized the (TLU) method (Pica 1983). TLU is computed by a formula which reduces the score of the subjects each time s/he uses a morpheme incorrectly. The TLU formula is shown in Figure 2.

$$TLU = \frac{Number\ of\ Correct\ Suppliance}{Number\ of\ Obligatory\ Contexts + Number\ of\ Overgeneralization\ Errors} \times 100$$

Figure 2. Pica's (1983) TLU Formula

When applying this formula, overgeneralization errors are penalized effectively. Accordingly, TLU is considered more accurate and fairer in measuring morpheme accuracy and acquisition (Ibrahim et al., 2013; Kharrati et al., 2015; Lightbown & Spada, 2013; Seog, 2015; and Murkami, 2016).

To investigate the correlation between the rank-order of the present research and the previously-generated orders, for example, NOH by Krashen (1977), the researchers computed a Spearman rank-order correlation. They employed SPSS software to compute the correlation.

Results

The TLU scores achieved by members of each group were computed. The mean TLU scores for each group are presented in Table 4.

Table 4

The Mean TLU Scores of Grammatical Morphemes Across The Three Groups

Morpheme	**Mean TLU Scores**		
	Group A	Group B	Group C
Plural {-S}	55.7	68.5	74.6
Past {-ed}	48.2	60.9	66.1
Progressive {-ing}	39.1	52.6	59.5
3rd person {-S}	33.8	42.2	48.5
Possessive {-S}	23.6	33.5	37.7
Articles	9.4	16.8	21.1

According to these findings, the first hypothesis of this research ($H_0$1) was approved. The research sample displayed a morpheme acquisition pattern which is presented in Figure 3.

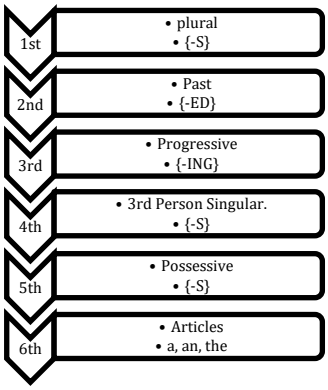

Figure 3. Saudi EFL Learners MAO

This order was fixed across the three groups of participants; therefore, it was taken as a model of Saudi EFL Learners grammatical morpheme acquisition.

The relation between the generated MAO and Krashen (1977) was analysed and the results from the Spearman correlation are displayed in Table 5.

Table 5

Spearman's Rho Correlation Coefficient (Tow-Tailed) of Accuracy Orders: Comparison of The Present Study with The NOH.

	The present study	Sig. (2-tailed)
Krashen_NOH	.429	.397

These findings imply that there was no correlation between the NOH and the generated Saudi EFL MAO. This was evident in the low correlation coefficient (0.42). Accordingly, the second hypothesis of the research ($H_0 2$) was accepted. The research sample displayed the morpheme acquisition pattern presented in Figure 3.

Discussion, Conclusion and Recommendations

According to the results of this research, the participants developed the acquisition of English grammatical morphemes in a specific order regardless of their educational stages. The highest TLU scores achieved by members of the three groups pertained to the plural {-S} morpheme while the lowest TLU score was related to the articles (a, an, the). It can be inferred from these findings that Saudi EFL learners acquired plural {-S} morpheme earlier than the other morphemes. This finding is based on the assumption that accuracy equals acquisition i.e. the more accurately a morpheme is used the earlier it is acquired). This assumption was adopted in almost all of the cross-sectional MAO studies, as it was difficult to longitudinally monitor morpheme acquisition.

The second rank of the study MAO was occupied by the regular past morpheme {-ed} followed by progressive {-ing}, third person singular {-S}, and possessive {-S}. There was a considerable difference between the TLU scores of each of these morphemes across the three groups. The last rank, however, was occupied by the articles (a, an, the). The sharp difference between the TLU scores of articles and the other morphemes made it the most confirmed rank of the MAO. The performance of the three groups regarding articles was poor with an average TLU score of only (15.7%) which clearly indicated a low-level competence of all the participants regarding articles.

The findings, which were yielded by hypothesis 1 of this research, conformed to the results from many previous studies. Barrot (2009), Ibrahim et al., (2011), Khor (2012), and Kharrati et al., (2015) found a consistency in the MAO patterns exhibited by their subjects. The results also coped with the findings of the first studies that inspired the NOH. Since the studies of Dulay and Burt (1973, 1974) and Bailey et al., (1974), there has been a kind of agreement that MAO is universal to all learners. This view seems too general for contemporary researchers who are sceptical regarding the element of universality; however, they do not often reject the systemic nature of morpheme acquisition. Luk and Shirai (2009), for example, accept the notion of universal aspects of morpheme acquisition, but they bound this to learners with

similar L1 backgrounds. Many other contemporary researchers follow these views and suggest specific MAO patterns for different groups of EFL learners.

To investigate these different concepts, the researchers analysed the relationship between NOH and the generated order. It was found that there was no correlation between the two. All the studied morphemes occupied different ranks in the two orders. However, the most considerable differences were between the ranks of articles, progressive {-ING} and past {-ED}. Bearing in mind that the participants' L1 (Arabic) has different equivalent morphemes to the plural {-S} and past {-ED}, it can be suggested that MAO is determined by the participants L1. The difference of the article systems of Arabic and English, that is the absence of indefinite articles in Arabic,) was further evidence to support this claim since articles occupied the latest rank of the EFL learners' MAO in this present study.

These results also coordinated with the findings of some previous studies that found deviations from NOH. Seog (2015), for example, found complete differences between Korean MAO and NOH. She confirmed the previous results that had been generated by an earlier study by Kim (2001) of Korean learners. The findings of Dabove (2014), also reported deviations from NOH although some similarities to other previous rank orders were witnessed. These findings then proved that there might be deviations from NOH by learners of different L1 backgrounds that are caused by various factors.

The findings of the present study support the claim that EFL learners of the same L1 background and learning setting acquire morphemes in a fixed predetermined order. This order is not affected by the learning setting (e.g., age and exposure to English); however, the quality of morpheme usage correlated positively to the educational stage of the learners. Moreover, although this pattern of acquisition was systematic and fixed, it was not universal. There was a clear effect of the learners' L1 that seemed to shape the order of each learners group with similar L1 backgrounds. These findings may provide important implications to future teachers and curriculum designers.

Although it was claimed that instruction may not be capable of altering the acquisition sequence of different linguistic elements, it would be fruitful for curriculum designers and Saudi EFL teachers to be aware of the systematic nature of grammatical morpheme acquisition and the order in which EFL learners acquire grammatical morphemes. Based on the results of this study, it is recommended that course designers and Saudi EFL teachers utilize this MAO pattern to shape their course plans. Accordingly, grammar lessons should be sequenced according to the generated order in order to help students acquire grammatical morphemes, and more focus should be placed on those morphemes that have no counterparts in Arabic and hence occupy a late rank in the order. Further studies employing larger sample sizes are also needed in order to clearly confirm the order revealed by this study.

References

Bailey, N., Madden, C., & Krashen, S. (1974). Is there a "natural sequence" in adult second language learning? *Language Learning,* 24, 235-243.

Barrot, J. (2010). Accuracy order of selected grammatical morphemes in the monitored written Compositions of Filipino adult language. *Philippine ESL Journal*, 4, 45 -65.

Behajat, F. & Sadighi, F. (2011). The acquisition of English grammatical morpheme: A case of Iranian EFL learners. *The Modern Journal of Applied Linguistics,* 3(2), 105-123.

Brown, R. (1973). *A First language: The early stages*. Cambridge, Massachusetts, Harvard University Press.

Corder, P. (1967). The significance of learners' errors. *International Review of Applied Linguistics*, 5, 161-171.

Dabove, A. (2014). *A study of morpheme acquisition in an EFL corpus of L1 Spanish – L2 English: Some pedagogical implications* (Master's thesis). Retrieved from digibug.ugr.es/.../1/AGUSTINA%20DEMARTA%20TFM%20final%20version.pdf

de Villiers, J., & de Villiers, P. (1973). A cross-sectional study of the acquisition of grammatical morphemes in child speech. *Journal of Psycholinguistics Research*, 2, 267-278.

Dornyei, Z. (2007). *Research methods in applied Linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.

Dulay, H., & Burt, M. (1973). Natural sequence in child second language acquisition. *Language Learning,* 24(1), 37-53.

Ellis, R. (2010). *The study of second language acquisition*. Oxford: Oxford University Press.

Ibrahim, A., Nor, M., & Abu, A. (2013). English grammatical morpheme acquisition order of Malay secondary school students. *Jurnal Pendidikan Bitara UPSI, Journal of Sultan Idris Education University*, 4, 1-22.

Izumi, E. & Isahara, H. (2004). Investigation into language learners' acquisition order based on an error analysis of a learner corpus. In L. Anthony, S. Fujita, & Y. Harada (Ed.), *An interactive workshop on language e-learning* (pp. 63-71).

Kharrati, A., Ahmadi, S., Mohammaditabar, M., & Sadighi, F. (2015). The accuracy order of English grammatical morphemes of Iranian EFL learners: An explanation of a universal order. *Modern Journal of Language Teaching Methods*, 5(4), 43-51.

Khor, S. (2012). *A corpus-based study in morpheme acquisition order of young learners of English*. Retrieved from Uppsala University, www.diva-portal.org/smash/get/diva2:608517/FULLTEXT01.pdf.

Kim, J. (2001). *Grammatical morpheme accuracy order in Korean adult learners of English* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (UMI No. 3039252).

Kown, E. (2005). The "natural order" of morpheme acquisition: A historical survey and discussion of three putative determinants. *Teachers College, Columbia University Working Papers in TESOL & Applied Linguistics*, 5(1), 1-21.

Krashen, S. (1977). The monitor model for adult second language performance. In Burt, M., Dulay, H., & Finocchiaro, M. (Ed.), *Viewpoints on English as a second language*. New York, Regents Publishing.

Krashen, S. (1981). *Second language acquisition and second language learning*. New York: Pergamon Press Inc.

Krashen, S. (1982). *Principles and practice in second language acquisition*. New York: Pergamon Press Inc.

Lightbown, P., & Spada, N. (2013). *How languages are learned* (4th ed.). Oxford: Oxford University Press.

Luk, Z., & Shirai, Y. (2009). Is the acquisition order of grammatical morphemes impervious to L1 knowledge? Evidence from the acquisition of plural -s, articles, and possessive 's. *Language Learning*, 59(4), 721-754.

Mansouri, F. (Ed.). (2008). *Second language acquisition research: Theory construction and testing*. Cambridge: Cambridge Scholar Publishing.

Murkami, A., & T. Alexopoulou. (2016). L1 influence on the acquisition order of English grammatical morphemes: A learner corpus study. *Studies in Second Language Acquisition*, 38, 365 - 401. doi:10.1017/S0272263115000352

Murakami, A. (2013). *Individual variation and the role of L1 in the L2 development of English grammatical morphemes: Insights from learner corpora* (Doctoral dissertation, University of Cambridge). Retrieved from https://www.repository.cam.ac.uk/handle/1810/254430.

Pica, T. (1983). Target-like use (TLU) analysis. In Robinson, P. (Ed.), T*he Routledge encyclopaedia of second language acquisition* (pp. 627-628). London and New York: Routledge Taylor and Francis Group.

Schenk, A. & Choi, W. (2013). Unlocking the secrets of morphosyntactic development by examining acquisition order of disparities in an EFL context. *Open Journal of Modern Linguistics*, 3(1), 47-57. doi: 10.4236/ojml.2013.31006

Seliger, H., & Shohamy, E. (2000). (2000): *Second language research methods* (5th ed.). Oxford: Oxford University Press.

Seog, D. S. Y. (2015). Accuracy order of grammatical morphemes of Korean EFL learners: Disparities among the same L1 groups. *Linguistic Research 32 Special Edition*, 151-171.

VanPatten, B., & Benati, A. (2010). *Key terms in SLA*. London and New York. Continuum International Publishing Group.

Appendix A.

Grammaticality Judgement Test

Correct each statement in the spaces provided. **ONLY** Correct the **Underlined** words, please.

1- My brother work for organization, its headquarters is located in Dammam.
……
2- He invite me to cup of tea last night.
……
3- Now I am go with all of my friend.
……
4- This is the boys room.
……
5- sun rise in east.
……
6- Look! the child is move his both hand.
……
7- hour ago, I finish interesting game.
……
8- My brother house was sold to rich man.
……
9- Yesterday I visit Riyadh by Hamad car.
……
10- At present, they are stay in USA.
……
11- Everyday Hind read 3 page in book.
……

TLU

Mrphm	RCS	OCS	NCS	TLU
Prog.		3		
Reg_pst		3		
3rdps		3		
Pls		3		
poss		3		
Indfa		3		
Indfan		3		
Defar		3		
SUM		**24**		

Eurasian Journal of Educational Research 77 (2018) 81-104

Eurasian Journal of Educational Research
www.ejer.com.tr

African University Students' Intercultural Experiences with Impeding Factors: Case from Northern Cyprus*

Hale ERDEN[1]

ARTICLE INFO

Article History:
Received: 10 Jun.2017
Received in revised form: 04 Jan. 2018
Accepted: 05 Sept. 2018
DOI: 10.14689/ejer.2018.77.5

Keywords
higher education, intercultural competence, intercultural identity

ABSTRACT

Purpose: Like all foreign university students throughout their university lives abroad, African university students (AUSs) similarly face impediments while they study in Northern Cyprus (NC). Their intercultural experiences yield managing factors contributing to impediments throughout their university lives in NC. This study aimed at identifying the perceptions of AUSs regarding factors contributing to impediments and their frequency throughout their study period in NC. **Research Methods:** The study adopted an interpretive methodology within a qualitative research paradigm. Data were collected through focus-group interviews (FGIs) and in-depth interviews (I-DIs). Focus group members (FGMs) were 50 AUSs studying in various departments and various universities in NC. I-DIs took place with 75 different African university students (dAUSs) studying at various departments of universities throughout NC. Data were analysed using NVivo software. **Findings:** Compared results showed that AUSs suffered from various adaptation problems in their social life, social relations, education, financial barriers and health. The study provided data regarding how AUSs view social life, how they perceive relationships among local people, local students and themselves, how they feel about their education and the educational environment, how they manage their finances and how they handle their health problems in NC. Adapting to a host country and culture requires that legal authorities, higher education providers and managers are one step ahead of the system. Implications for further research and practical suggestions were made throughout the study. **Implications for Research and Practice:** The results emphasized the importance to be given to English language as a primary foreign language, a part of career paths and an indicator of various job opportunities. Similarly, with support of integrative motivation, the students' can set more realistic goals towards integrating into the international community. Studies in relation to integrative motivation among foreign students facilitated omitting the impediments for university students.

*This study was presented as an oral presentation at the 2nd International Eurasian Educational Research Congress in Ankara, 08 – 10 June, 2015

[1] Education Faculty, Cyprus Social Sciences University, North Cyprus, Mersin 10 Turkey, e-mail: hale.erden@kisbu.edu.tr, ORCID: https://orcid.org/0000-0003-4177-6203

Introduction

Foreign students mostly suffer from impediments upon arriving in the host country and culture. The importance of identifying the intercultural experiences of foreign students, especially regarding factors and frequency of these factors which contribute to obstructions throughout their university lives, in a foreign country, has been gaining importance since it strongly contributes to finding solutions for dealing with foreign students, their problems and/or the issues they face. Identification of these hindrances also serves to explore and better deal with additional management issues in relation to the identified impediments. In this study, perceptions of AUSs regarding factors contributing to the impediments they faced and their frequency were identified. Identification of such kind of impediments can facilitate taking necessary precautions on managing these impediments at once.

Impediments can be the result of lack of planning which includes; starting without a new idea, without an arrangement idea, without clear knowledge skills as well as without clear planning skills (Harris, 1996). Therefore, planning before and after accepting students to the host country and universities should be carried out accordingly, since impediments containing structural and conceptual ones impact both their emotional and professional well-being (Hussein, 2011). Foreign students attending universities in foreign countries and different cultures always need to deal with issues and problems of adjustment within social and educational organizations. Some students are aware of the issues and problems in advance whereas others are not. In fact, those students who think that the new country and culture is just like their own country and culture may suffer more.

Foreign students studying abroad are expected to adjust rapidly to the social, organizational and educational practices of the host university. Foreign students, who are not aware of the impediments and differences in advance, may experience culture shock. Many researchers promote worldwide intercultural understanding (Zhou, Jindal-Snape, Topping, & Todman, 2008). However, in a Southern Cyprus (SC) study, little was known about the experiences of foreign students studying in universities (Georgiou & Savvidou, 2014). This study was administered at a private SC university. In contrast, the present study focused on NC. Although Turkey is the only country, in terms of diplomacy, economy, and politics, that has recognized Northern Cyprus, there are in fact internationally recognized universities in NC, which offer English language based instruction with students from around the world. African based students choose to study in NC in part because their home countries recognize the programs as well as due to scholarship opportunities and university fees (Güsten, 2014). A total of 13,452 African based students from 45 African countries were studying in NC during the 2012-2013 academic years. This represents 50.1% of the total of 26,860, third world students from all over the world, except students from NC and Turkey (The Higher Education Department of the Ministry of National Education and Culture, NC, personal communication, September 11, 2017).

The relevance of the current study is two-fold. First, it was an initial study that described the perceptions of foreign university students regarding their quality of life in NC, and second, it potentially enabled educators as well as managers of higher education institutions to begin valuing the intercultural experiences of both local and foreign students in NC. While the current study sought to describe the perceptions, the factors contributing to their perceived impediments and the respective frequency were also identified through the following research question: "What do AUSs report about factors and frequency of factors that contribute to impediments on their university lives in NC?"

Method

Research Design

Interpretive methodology within a qualitative research paradigm was adopted as an epistemological position. Phenomenology was used as the research design within the interpretivist scope.

Research Participants

Analogous sampling of the AUSs through purposive sampling was applied. 50 focus group members (FGMs) participated to the focus group interviews (FGIs) while another 75 AUSs participated in the in-depth interviews (I-DIs). FGMs were AUSs from various grade levels, various departments and various universities in NC. Ten African university students (dAUSs) from each of the five different universities (U1-U5) participated in the first phase of the study.

I-DIs were conducted with 75 dAUSs to verify the commonality of the identified factors contributing to impediments with 15 AUSs from each of the five universities in the second phase of the study.

Research Instrumentation and Procedures

A semi-structured interview form-1 for FGIs, AUS-U1-AUS-U5, was produced and implemented to identify the perceptions of AUSs regarding the factors contributing to any impediments throughout their university lives in NC.

After the initial identification of factors contributing to any impediments, an unstructured interview form-1 for the I-DIs was produced and implemented to identify perceptions of AUSs regarding common factors contributing to impediments throughout their university lives in NC. Throughout the process, data analysis results of FGIs and I-DIs were compared and then common themes were regarded as common impediments.

The data regarding perceptions of AUSs on the factors contributing to impediments obtained through FGIs, the data regarding the perceptions of AUSs on factors contributing to common impediments obtained through I-DIs and the data regarding the perceptions of AUSs on the frequency of common impediments

obtained through FGIs were formatted and imported into the NVivo software package for analyses. Utilizing content analysis, key issues were coded and then counted to identify the perceptions of African university students regarding common factors that contributed to impediments throughout their university lives in NC. Reviewing the nodes of thematic ideas as categorized through the NVivo software package, enabled for the identification of the factors contributing to impediments, the factors contributing to common impediments, and the frequency of common impediments contributing to impediments throughout the AUSs' university lives in NC.

FGIs for identifying the factors contributing to impediments throughout the university lives of AUSs were conducted from January to June 2012; whereas, FGIs for identifying the frequency of factors contributing to impediments throughout the university lives of AUSs were conducted from September to December 2013 and the I-DIs were conducted from January to May 2013. The data collection process for the FGIs, to identify factors contributing to students' impediments lasted between 87-94 minutes. Similarly, the data collection process for I-DIs to identify common factors contributing to impediments lasted between 77-89-minutes. The data collection process for identifying frequency of factors contributing to impediments throughout university lives of AUSs, lasted between 65-79-minutes. A representation of the phases followed for data collection is summarized below:

Phase 1. FGIs - 50 participants - identified as AUSs

Phase 2. I-DIs - 75 participants - identified as dAUSs

Phase 3- FGIs - 50 participants - identified as AUSs (e.g., similar Focus Group Interview participants with Phase 1)

Data Collection and Data Analysis

An interpretive approach was used for the qualitative data collection. Semi-structured-interviews and I-DIs were applied as data collection methods. Data collected through this interpretive approach were analysed using the content analysis method, which includes identifying, coding, categorizing, classifying and labelling the main themes in the data (Miles & Huberman 1994; Patton, 2002). Utilizing content analysis, key issues were coded and then counted to identify the perceptions of African students regarding factors, common factors and then the frequency of common factors contributing to impediments throughout their university lives in NC. Next, the NVivo software package was used to categorize the thematic ideas into nodes.

Reliability and Validity

Experts in the field of Educational Sciences were consulted to review the research instruments and data. Based on these reviewers' comments, the researcher redesigned the ambiguous and uncertain questions and reworded the complex and/or unclear items in order to enhance content validity as well as reshaping or removing the ineffective and non-functional questions. In addition, the reviewers

face-validated the final questions before proceeding. The researcher's position, triangulation and audit trial were the techniques used (Lincoln & Guba, 1985) to secure the dependability of the results, obtained from the data by using open-ended and semi-structured interview forms. Zohrabi (2013) described techniques called the-status-of-the-researcher, the-choice-of-informants, the-social-situations-and-conditions, the-analytic-constructs-and-premises, and the-methods-of-data-collection-and-analysis for enhancing external reliability. For the current study, as an instructor, the researcher's profession increased the possibility of reaching the most appropriate participants. Additionally, the researcher described the participants clearly; therefore, any independent researcher who might desire to replicate the study can do it very easily. Also, the study was conducted in an academic environment assuring that the participants' social situation and condition was fairly constant and uniform. Similarly, main terms, constructs, definitions, units of analysis and premises were delineated and their underlying assumptions were elaborated explicitly. Data were collected using semi-structured and unstructured interview forms while methods and thematic interpretations were explored clearly. Although Nunan (1999), expressed internal reliability through low inference descriptors and having mechanically recorded data, it was difficult to accurately observe factors leading to impediments in AUSs' university lives in NC. Elaborated descriptions and explanations during the I-DIs enhanced the internal reliability and any independent researchers/observers can at any time again observe and replicate these factors rather easily. Similarly, the interviews were recorded and preserved for replication of the data.

Results

The findings of this research question, "What do AUSs report about factors and frequency of factors contributing to impediments in their university lives in NC?" are presented in a category followed by these respective emerging themes.

Common-Factors-and-Frequency-of-Factors-on-Adaptation-Impediment

Common factors and frequency of common factors contributing to impediments of AUSs' experiences throughout their study period in NC were identified. In this category, five themes and 16 sub-themes were identified. The themes were identified as the adaptation to; *social-life, social-relations, education, financial-barriers* and *health-problems*.

Theme 1: Adaptation to social life. The theme of *adaptation to social life* generated sub-themes (e.g., *lack of peaceful heart* and on *lack of self-reliance, self-esteem, and self-appraisal)*. Nearly all of the participants agreed that issues regarding *lack of peaceful heart* (coded 260 times with a frequency of *always*) generally were coded in *violence, gang groups, substance usage* and *gambling* and gave rise to *exclusions from the society, gun carrying, alcohol usage, selling and taking illegal substances, attendance problems* and *sleeping disorders* whereas more than half of the participants revealed that issues regarding *lack of self-reliance, self-esteem, and self-appraisal* (coded 268 times with a frequency of *often*) generally resulted from *lack of family encouragement, a lack of*

communal encouragement, feeling like a minority and *lack of motivation* and give rise to a *change in the state of personal affection*.

Some of the qualitative descriptions during the interviews are illustrated below.

"At first, I felt really alone when I arrived to Cyprus. This was because I couldn't adapt myself to the social life. I could not make friends nearly one month. That broke my self-trust and self-esteem. Then, I made lots of friends, thanks God. I made friends of my own community. I sometimes feel as if I am minority. At first years of my studentship, I could see people poking each other and showing me I go to bazaar for buying some fruit and vegetable, for example. This was really bad because I felt bad when people pointed at me. I felt myself as minority person lots of time." (dAUSs60)

"I felt really alone because I was away from my family. During my first semester, I was really de-motivated which change my personal affection a lot. I felt as if the society I was exposed to was excluding me. I heard some people carrying guns, taking and/or selling illegal substances, drinking alcohol and so on. We should not surprise that the society excludes such kind of things, but I did not do anything. Therefore, I did not deserve to be in such kind of exclusion. It was really disappointing issue for me." (dAUSs3)

While these two participants agreed on the difficulties they faced in adaptation to social life and making friends as well as on the changes in their personal state, the participant below further points out the lack of support provided by local teachers in adapting to social life.

"Teachers at the university generally do not appraise any foreigner's success. I attended to an international competition on my field last year when I was a third year student. When I first told my teacher about the competition, she didn't like the idea of my attending to an international competition, she did not appraise me. Surprisingly, she did not encourage me. I didn't listen to her; I trusted my feelings and joined to the competition. I got a mansion. It was a good thing for me. But the teacher of mine did not like my mansion as well. I told to the dean about her. The dean asked me not to worry, because he would talk to her. After my mid-term exams, I was sure that he told to her about my issue because she said I complained her to the dean, so she cut lots of grades from my exam. She was punishing me although my grade should be AA. She gave me CC grade. This time I really complained about her, because my CGA was 4.00 out of 4.00 and I knew that my exam was passed very well. I should get AA. That really de-motivated me. I could not sleep for days. I did not want to join the classes for a while. It was just disappointing issue for me. After complain of the dean, a committee re-examined my exam paper and my grade was AA. It was a shame for a university teacher not to appraise a student due to attending to an international competition, but just trying to punish the student. She broke my self-appraisal with what she had tried doing to me. My experience tells me that what I faced was discrimination due to my skin-color may be or due to my success may be, I do not know what she thought actually." (dAUSs65)

These examples from Theme 1, "Adapting to Social Life", facilitated a deeper understanding of the impediments as well as provided a clearer criticism to the management of social life of the African university students in NC.

Theme 2: Adaptation to social relations. The theme of adaptation to social relations generated sub-themes for *road signals*, *difference in meals*, *and lack of communal identity*, *body odours*, *local language use* and *adjustment.* Nearly all of the participants revealed that issues regarding *road signals* (coded 304 times with a frequency of *sometimes*) generally stemmed from *left-right confusions* and gave rise to *confusions while in traffic.* Nearly all of the participants agreed that issues regarding *difference-in-meals* (coded 318 times with a frequency of *sometimes*) generally were based on *getting accustomed to the Turkish/Cypriot-cuisine* and gave rise to an *acceptance process*. Also, issues regarding *lack of communal identity* (coded 290 times with a frequency of *sometimes*) generally were based from *unity among AUSs* and gave rise to *problems in integration to the lives of local students* and *problems in integration to the lives of local people*. Similarly, issues regarding *body-odours* (coded 302 times with a frequency of *sometimes*) generally were based on *extremely hot weather conditions* and gave rise to *exclusions from the friend environment, loss of affection* and *feeling alone.* The issues students' reported, regarding *local language use* (coded 317 times with a frequency of *sometimes*), were generally based on *poor and underdeveloped communication skills* and gave rise to *misunderstandings, societal exclusion* and *depression.* Similarly, nearly all of the participants revealed that issues regarding *adjustment* (coded 303 times with a frequency of *sometimes*) generally arose from *adjustment to changes* and gave rise to *academic, social, cultural, economic* and *religious changes*.

Some of the qualitative data obtained from the interviews showing adaptation to social relations by the African students are illustrated below.

> *"Road signals are reversed here. I always confuse left-right conditions in traffic. Meals are also different from my country. When I go to a restaurant to eat something, I cannot find my country's meals to eat. I try to get accustomed to Cypriot Turkish kitchen, Mediterranean meals are delicious, but I do not like eating Kebab all the time. I sometimes face acceptance problem with this because I cannot find good things to eat at all restaurants, but my friends like eating Kebab a lot. But I do not. This creates acceptance problem between my friends and me."* (dAUSs8)

> *"… You see I am not white. Some of my local classmates do not like black people and their body odours. This is what they make me feel. This is not discrimination I know it very well. Cyprus is a very hot country. I always take shower, I feel myself very clean. But, they think that black people smell bad. White classmates believe that we do not take shower or so on. I refuse to communicate with them due to their behaviour as far as I do have to. When we need to talk, they start talking their first language next to me and try not to smell next to me. It is as if they do not want me to talk to them. I sometimes feel alone when I am in class and with my classmates, especially at project times."* (dAUSs35)

> *"… I felt lots of changes as soon as I arrive to Cyprus. Cultural changes, economical changes, religious changes. Starting from the last change, the religious change, I am not Muslim. I am Christian. I need to go to a Christina church, but I cannot find a church here. We have a place (the Youth Centre) to meet in Nicosia; we come together and pray every Sunday. When I was in my own country, I was working as an office manager. I was earning good amount of money. Here, I have a scholarship for my studies, but I need some*

more money to survive. Therefore, I start to work in a restaurant here. I do not earn much, but I can survive as a student here. Local people in Cyprus and African students in Cyprus have lots of cultural differences. Cultural differences make us not to come together mostly. Here students are rich. Most of them have their cars; they make up a lot; they wear clothes of different brands. They come to school as if they are going to a club. However, I do not have a car here, I make up, but not much because I am a student. Studentship is studentship. I am not going to a club; I am going to school, to class. Therefore, my clothes are suitable to my school." (dAUSs59)

"I feel changes on social relations. Local people mostly refuse to communicate with African students here. Therefore, African students hire their houses closer to each other; we live closer to each other. We do not want to be separated from each other because we don't want to be alone. Some of our friends are getting married here and they have children. We want our community to be together in Cyprus. We want our children grow up together, not together with children of around. This creates problem with local people. We feel to take such kind of precautions actually. We don't have much mutual communication with local people. … I need to mention about academic changes as well. People mostly do not use technology in classes. There are intelligent mobiles everywhere, but they do not have educational value in our classes for example." (dAUSs54)

The preceding four quotations illustrated what AUSs face while adapting to social life in NC and provide helpful hints for management of the social relations of African university students in NC.

Theme 3: Adaptation to education. The theme on *adaptation to education* yielded sub-themes on *useless office hours,* on *quality* and on *inadequate use of international language.* Nearly half of the participants agreed that issues regarding *useless-office-hours* (coded 319 times with a frequency of *often*) were generally based on there *being both full-time and part-time faculty members* and *locked doors* which gave rise to *irregularity of office-hours* and *irregularity of part-time faculty members.* More than half of the participants agreed that issues regarding *quality* (coded 286 times with a frequency of *usually*) were generally based on *recruitment-policies* and gave rise to the *cycle in hiring their graduates* and *questioning the qualifications of faculty members.* Also, issues regarding the *inadequate use of international* language (coded 297 times with a frequency of *often*) were generally based on *perceptions* and gave rise to *barriers with communication* and *barriers with lessons.*

The qualitative data on adaptation to education show specific difficulties.

"I am not happy with the office hours. Generally lecturers are not in their offices at the office hours. But I keep apart some of the lecturers; they are in their offices when they are not in the class or when it is not their lunch-time. I can ask my questions whenever I need them. This keeps small amount of lecturers unfortunately. Most of the part-time and full time lecturers are not in their offices at office hours. I knock at the lecturer's office door, but it is mostly locked. Part-time lecturers do not have office hours mostly. I want to ask my questions whenever I need them." (dAUSs11)

In our class, there are foreigner students, local students and students from Turkey. As an international university, it is an English medium university. Foreign students do not

understand the local language. But, we have all improved ourselves in Turkish to understand the course itself. Otherwise, we cannot survive in that department. That's ridiculous." (dAUSs74)

When I first learned that most of the lecturers are graduates of this university, I felt really sad out the quality of the lecturers. They represent a cycle; they were once undergraduates and then graduate students of the same university. They have not got any experience abroad or at another institution. I also question whether they were qualified in their job. As far as I observe and face, most of them unfortunately cannot even use proper English throughout classes; I need to spend time to investigate the lesson after the class in further sources to comprehend clearly. This is a shame for this university." (dAUSs41)

The preceding quotations demonstrate concern and constructive criticism for the management of education.

Theme 4: Adaptation to financial barriers. The theme of *adaptation to financial barriers* yielded sub-themes regarding *part time work, transportation, communication* and *housing*. Nearly all of the participants revealed that issues regarding *part time work* (coded 302 times with a frequency of *always*) were generally based on the *lack of financial freedom* and the *lack of enough scholarship options*. This gave rise to *low average payments, late working hours, heavy working conditions* and *bad work place conditions*. Similarly, more than half of the participants agreed that the issues regarding *transportation* (coded 282 times with a frequency of *often*) were generally based on *higher taxi prices, higher car hiring expenses,* and *difficulties faced upon selling a used car*. These gave rise to *irregular bus hours, no/bad Internet connection, old buses* and *crowded buses at higher times*. Also, more than half of the participants said that issues regarding *communication* (coded 282 times with a frequency of *often*) were generally based on *expensive-Internet-fees, expensive-phone-fees* and *requirement-of-having-cheaper-phone-lines-for-foreign-students*. This gave rise to *missing-family-affectionate* and *communication-barriers* whereas issues regarding *housing-conditions* (coded 338 times and *usually* happens) generally based on *higher expenses for foreign students had given* and gave rise to *expensive hiring fees* and *not having fully furnished* and *equipped houses to hire.*

Qualitative data documenting African university students' adaptations to financial barriers are illustrated in the following quotations.

"I was working and earning some money in my own country, but here I have lessons. During the first semester of my studentship here, I did not want to work. I had a scholarship. Through time I realized that I needed to work. I have been working in a restaurant since then. I need to survive myself. My scholarship is not enough. Actually, it is not enough for most of the foreign student, because here is a very expensive country. Part-time work conditions are heavy in general. I need to work at night at the restaurant. I have friends working at heavier conditions…. Some of them work at construction sector. Some of them work at hotels. Work owners do not pay us (the foreign students) as they pay local workers. We should be very careful; every kind of excuse can mean to stop working at the work because their perception is not positive to us generally…. I feel that

they need us because we work with lower expenses. We also mean cheaper labour for them. No-one inspects part-time workers at work places." (dAUSs71)

"As soon as I arrived the island, I see that there is not transportation system established for the community. Universities offer regular bus services. They have regular times and regular routes. Also, they are really crowded at higher times. When I need to hire a taxi, I need to pay extra money. When I need to hire a car, it is really expensive. If I buy a car, I need to think how to sell it when I graduate. Transportation is really a big issue throughout the island." (dAUSs22)

"Internet usage is problem for me. Internet means conducting my researches, studying my lessons, communicating my friends and my family especially. I need to travel nearly half an hour from my house to my school campus. I want to use Internet effectively while traveling at the bus. However, I cannot do it properly because buses of my university sometimes offer Internet. Mostly, there is not Internet, or there is bad Internet connection. The managers should improve the conditions of Internet at buses." (dAUSs18)

"There are two communication operators here. The communication fees are very expensive. Internet fees are very expensive. Communication and Internet packages offer limited options and they are really expensive because there is not any kind of competition among the communication operators. They nearly offer similar prices to the similar packages. I miss my family and I call them nearly every day. They also call me regularly. I cannot call my friends at regular basis, for example. We have expensive fees as the communication barrier." (dAUS37)

"During my first year here, I was at the dormitory. I did not reserve for the dormitory for the next year because I applied to an English university for transferring. In August, I learned that my transfer was not positive. In September, I searched for a house to live in, because I did not have a reserved place at the dormitory. Generally dormitories are reserved for the new comers, and older students need to pay extra money to stay at dormitories. The house I hired was not at a very good condition, but I had to find somewhere to live. Houses are very expensive especially for foreign students. Additionally, they are not furnished well. I had to find some furniture, such as a bed to sleep on and a table to study on. The house is not well equipped." (dAUSs26)

The preceding quotations clearly document the concerns and useful criticisms for the management of finances.

Theme 5: Adaptation to health problems. The theme of *adaptation to health problems* generated a theme of *coping*. Nearly all of the participants agreed that issues regarding *coping* (coded 410 times with a frequency of *always*) were generally based from *university hospitals, state hospitals* and *pesticide residue* which gave rise to *student health insurance, level of attention to patients, paying money* and *unhealthy environment.*

Qualitative descriptions obtained during the interviews relating to the adaptation of African students towards health issues are illustrated in the following quotations.

"Foreign students here should cope with some health issues. Some universities offer reductions at the university hospital when we become ill. It is like a student's health insurance they offer us. Some universities do not have university hospital so we do not

have reductions. Private hospital fees are really expensive. When we go to the state hospitals, mostly we do not see a smiling face. Doctors do not take care of our health problems at state hospitals. Once, I was ill, I went to the state hospital, but the doctor of the state hospital kindly offered me to come to his private clinic. I felt really bad about that. I was surprised. I was at the state hospital for my illness, and the doctor asked me to come to his private clinic to get better, but he did not try to cure me at the state hospital. It is not only me, but I have lots of friends experiencing this at the state hospitals." (dAUSs5)

"Municipalities do not work properly in North Cyprus. They do not collect garbage regularly. The workers must be on strike at regular basis; otherwise environment cannot be dirty like that. When I go to supermarket, I see vegetables and fruits which are really good condition. Three years ago, on my first semester at the university here, I bought some tomatoes and some Charleston pepper. I put them on the refrigerator for a night. They grew much more than I bought them over a night. Then, I heard similar stories from my friends around me. They observed such kind of differences on the fruits and vegetables. I have been working in a kitchen of a hotel. I have been learning Turkish. I have improved a lot in Turkish. I read some daily Turkish newspapers. They mention about the pesticide residue on the fruits and vegetables produced here and on some of the imported fruits and vegetables. I experienced growing vegetables in my refrigerator over a night. Now, I am sure that some fruits and vegetables, that both produced here and imported from other countries, have pesticide residue. No one has controlled what we eat here. Environment is really dirty and what we eat and drink is not controlled; and thus they contain pesticide residue…. I don't know how to protect myself from dangerous illnesses." (dAUSs43)

The above comments demonstrate the concerns and constructive criticism for the management of the students' health.

Discussion, Conclusion and Recommendations

Discussion

The adaptation process for foreign students appears to be challenging from the very beginning upon their arrival to the host country. Having an increasing level of success during the adaptation process gives rise to success at school and professional life. As a result, the better the foreign students' level of adaptation to their new culture and society, the higher level of success. Analysis of the current study revealed that various themes, for example, adaptation-on-social-life, adaptation-on-social-relations, adaptation-on-education, adaptation-on-financial-barriers and adaptation-on-health-problems. Similarly, analysis of a Southern-Cyprus originated study revealed four dimensions called the dimension on interaction, dimension on interactional barriers, dimension on affectivity as well as the dimension on survival strategies (Georgiou & Savvidou, 2014). Similarly, international students studying at an African university revealed that they faced adjustment challenges in terms of language, lack of social support networks, financial and strains on roles (Maundeni, Malinga, Kgwatalala, & Kasule, 2010). Comparing the results was important because the above mentioned studies took place in Southern-Cyprus and Africa. Similarly,

the current study took place in Northern-Cyprus among African students. The compared results revealed that students in these countries have to deal with communal interaction, adapt social life skills with local students, local people and other foreign students, deal with affective demanding, handle survival conditions including financial barriers and overcome educational needs and requirements to improve themselves.

AUSs studying in NC had some social-life-adaptation-problems. They felt that they had adaptation problems in social life. They did not feel very safe in NC as they mostly faced violence, gang-groups, substance users/sellers, and gamblers as dangers. This was because some of the foreign students in NC fell into legal gaps, which unfortunately allowed these students to be in the middle of violence, to be part of gang-groups, to use/sell substances and/or to gamble. Subsequently, since NC society was not accustomed to these kinds of illegal activities, the locals immediately removed all foreign students from their lives. Drug usage and excessive amount alcohol usage were potential dangers, which resulted as risks to their health, university students faced while studying abroad because they were understudied and inexperienced regarding the skills of living abroad. Foreign university students should be aware of these dangers, identify the risk/s they are exposed to, acquire how they can protect themselves from the risk/s and fill in gaps in their knowledge in this sense (Aresi, Moore, & Marta, 2016). Similarly, drug usage hinders academic achievement, is harmful to be healthy and cause personal safety risks. Identifying and getting in touch with students at risk is necessary in order to help them remove drugs from their lives, and facilitate the improvement of their academic, health and safety conditions (Arria et al., 2017). Thus, foreign students' adaptation to a new society, their identity change and final success are strongly effected by personal, pedagogical and psychological factors (Gu, Schweisfurth, & Day, 2010). In terms of stress predictors of students trying to survive in a different society, the indicators identified were alcohol, drug use, and conflict with a faculty/staff member and unacceptable relationships with their roommates (Dusselier, Dunn, Wang, Shelley, & Whalen, 2005). Drinking excessive level of alcohol and using drugs can result in individual and social level consequences. Individual level consequences include kinds of physical injuries and social level consequences result in promoting negative stereotypes. Educational advisors, instructors and staff should develop strategies to monitor, train, protect, and prevent the misuse of alcohol and drugs among the students from abroad as well as the local students (Mitchell, Poyrazli & Broyles, 2017). Results indicated that students with internal beliefs are less stressed than those with external. Results also showed that self-esteem and academic stress as well as life stress had a significant negative correlation because students having higher levels of self-esteem had lower levels of stress and vice versa (Abouserie, 1994). Similarly, it was suggested that the adaptation of students, change in identity and fundamental success have been influenced by personal, pedagogical and psychological factors as well as by organizational and social cultures (Gu, Schweisfurth, & Day, 2010). Also, the more change in the characteristics of success obtained fewer limitations in terms of support and conditions of the contacts in which they were involved (Gu,

Schweisfurth, & Day, 2010). AUSs must first adapt to social life in NC before they can adapt to their new living conditions.

AUSs studying in NC suffered from social-relations problems. Gill (2007) revealed that intercultural adaptation gives rise to the process of intercultural learning, which then facilitates learning regarding the changes of self-experience as well as of self-knowledge, acquiring their experience of learning, and on being aware of the others values as well as the conception of the world. However, a recent study concluded that there was not any evidence supporting the moderation effect of the personality of students regarding intercultural competences and studying abroad (Ramirez, 2016). The new country of the students should provide the best conditions for the foreign students as part of their living and educational needs. It is also strongly suggested to conduct more research to better understand what is happening in the institutions of higher learning and to perceive to what extent the foreign students have managed the social adaptation and intercultural interaction after enrolling in institutions of higher learning (Dorozhkin, & Mazitova, 2008**).** International students usually suffer from intensive homesickness. This intensive homesickness can cause mood disorders and anxiety, give rise to mental and physical health injuries, and occasionally lead to attendance problems for school participation resulting in school withdrawal (Thurber, & Walton, 2012). AUSs living in NC as foreign students in a new society mainly suffer from problems with left-right-road-signals, differences-in-meals, and withdrawal-from-the-society due to adaptation-on-social-life, concerns about body-odour, local-language as well as overall adjustment issues. Research results for international students from South-Asia studying in Australia indicated that South-Asian students had negative learning and study practices compared to Australian students. Similarly, South-Asian students are found to be learners learning at the surface level, learners having lower and passive participant levels and learners having higher levels of interaction with other Asian based students (Chaimers, & Volet, 1997). Also, students studying abroad feel relaxed when they can communicate. Therefore, they need to use online facilities to communicate. Online communication helps students by enhancing their experiences for promoting skills at the sociocultural, informational, relational and psychological levels (Sandei, 2014). Although local students reveal that they prefer working with students sharing the similar backgrounds (Moore, & Hamton, 2015), as time passes, foreign students learn the new culture better and see diversity. Similarly, their cultural backgrounds and their level of intercultural interaction form a strong tie (Colving, Volet, & Fozdar. 2014). Culture in intercultural communication has been overlapping with context, history, performance, and power (Alexander, et al., 2014). Similarly, multicultural context does not lead to greater intercultural communication (Garcia-Jimenez, Rodrigo-Alsina & Pineda, 2017). Adapting to a new culture, host country and host country's people always takes time for a foreign student. Time passes and they get accustomed to such differences; however, what they feel and how they handle the process is the issue.

AUSs studying in NC suffer from some educational problems regarding the instructors' available office-hours not suiting the students' timetables due to the

students' heavy study/work load, the instructors' degrees on the specified subject and issues with the international language use in class and at school environment. The participants agreed that instructors generally are not found in their offices when it is their scheduled office-hour. Although office-hours are designed for extra help for the students to improve their academic skills, instructors mostly see these hours as their free time. Sometimes they leave their offices and lock their office doors to the students. Similarly, most of the instructors do not hold a Ph.D. or Ed.D. degree, but they teach at universities. However, the participants believed that instructors should hold necessary degrees on the specific subject to be able teach at the faculties. The participants also revealed that foreign students register to universities in NC because they offer English medium instruction. The participants of the current study asserted that they chose to study at a university providing English medium instruction in order to improve their English level for their professional life as well as to expand their working opportunities after graduation. Unfortunately, they found out that most of the instructors do not use English in classes; rather instructors intended to use their native language because most of the students in the class know or acquire which is the native language of the instructor. Therefore, AUSs felt alienated in their class-work in terms of comprehension, meeting the requirements of the course, taking active part in discussions and communication that consequently face serious educational barriers. Research on comparing overseas students to British students concluded that overseas students had significant barriers while adapting to the academic conditions. Such kind of adaptation barriers included responding positively to the demands of the lesson, study methods, independent learning skills, language needs, participation requirements and time management skills (Burns, 1991). Comparing overseas students and local students in terms of various stress indicators, overseas students have significantly higher degrees of stress indicators (Burns, 1991). Thus, overseas students should be provided an additional amount of academic and counselling support and resources. Similarly, designing learning environments for fostering students' development in terms of intercultural adaptation is one of the social responsibilities of tertiary institutions (Volet, & Ang, 1998). Thus, students are strongly suggested to be given clear tracks in order to manage pedagogic inter-culturalism for conceptualising complexity of intercultural class practices (Tupas, 2015). The satisfaction level of students can be increased through the expertise of the teaching staff, the level and type of courses offered as well as the types of learning environment designed (Butt, & Rehman, 2010). When tertiary institutions do not facilitate the improvement of students' needs and design learning environments necessary for students' needs, then the students suffer from academic and life stress. Though academic and life stress change regarding the gender of the students, identified significant stress predictors have a close relationship to the level of facing chronic illnesses, depression based difficulties, anxiety disorders, seasonal affective disorders, mononucleosis as well as sleep disorders (Abouserie, 1994). Research results revealed that female students were more stressed than male students. Research results also showed that there was a significant positive correlation between academic based stress and locus of control (Abouserie, 1994). A study resulted that AUSs studying in England, suffered from

adaptation problems including discrimination, domination, gossip based problems and AUSs' not being able to better learn the English language and culture of English people as well as had enormous amount of contact with the students from their regions (Maundeni, 2001). Positive learning environments can be improved through creating interaction among peers and academic activities (Ulmanen, Soini, Pyhältö, & Pietarinen, 2014). AUSs in this sense need to deal with some educational issues regarding office-hours and English-language-usage.

AUSs studying in NC had some financial-barriers problems. Participants of the study revealed that they need to work part-time to earn their living in NC. Those who have very high grades earned scholarships from the Ministry of Foreign Affairs and/or Ministry of National Education in NC; but the numbers of these students were limited. The rest of the students need to earn their living. Part-time work conditions were very hard for a foreign student. Male students mostly needed to work at heavy works for long hours as well as for lower payments. This kind of situation made foreign students feel alienated, have poor sleeping hours and order, not to be able to attend morning classes regularly, and have less success at school. Trockel, Barnes and Egget (2000) found that there was a positive correlation between sleep times of the students (e.g., specifically waking up times) and the amount of variance in the grade point averages, and they concluded that lower average grades were mainly connected with later wake up times. Also, the number of paid or volunteer hours worked per week was associated with lower average grades. Similarly, living expenses cost a lot in NC. Although mostly location of the school and the house are not too far away from each other, participants revealed that buses are usually very over-crowded; bus times and Internet-connections are usually irregular. In the same way, participants agreed that foreign students do not have cheaper-Internet and mobile-phone options. Luckily, most universities provide students with free-Internet within the school and in the school's-library. After school, students need to pay for the Internet expenses especially if they stay away from the university campus. Participants also revealed that they missed their families and they needed to have ongoing communication with their families. Similarly, they asserted that they needed to socialize to do their projects. However, communication expenses were expensive in NC. Also, the students who preferred to stay at a house off-campus needed to pay for extra hiring fees, buy second hand furniture and housewares for the house as property owners (e.g., landlords) generally asked students to bring their furniture and houseware upon hiring (e.g., renting) a house.

African students studying at university in NC had some health-adaptation-problems. In NC, there was only one university that had a university hospital. Participants revealed that the students of that university had discounted treatment rights in this specific university hospital. Similarly, one of the universities had a health centre with limited treatment options. However, other universities in NC did not have a university hospital. Therefore, upon being sick, students felt strongly about going to a private-hospital, because students believed that they do not receive enough interest by the doctors at state-hospitals. Similarly, they believed that locally produced fruits and vegetables contained pesticide-residue. There was not enough

control over locally produced food in NC (Aydeniz, 2013; Caga, 2014) which caused a strong danger in having serious illnesses such as cancer due to pesticide-residue on the locally grown fruits and vegetables. In this sense, AUSs desired to be able to find out organic fruits and vegetables believing the fact that it is their right to live at the uppermost healthy conditions especially the environment, air quality and food safety. Unfortunately, AUSs in NC needed to go to a private-hospital when the university they studied at did not offer private hospital facilities and also they wanted greater control over the locally produced food and imported food.

In conclusion, intercultural experiences of African students studying in NC facilitated the handling of management-issues brought with them, such as, since adaptation-problems regarding social-life and societal-interaction brought management-issues-over-society; adaptation-problems regarding education and health-problems gave rise to management-issues-over-institutions; and adaptation-problems regarding financial-barriers yielded management-issues-over-leadership.

Conclusion

Adapting to social life in NC requires avoiding violence, gang-groups, substance users/sellers and gamblers. Similarly, traffic in foreign students' countries and in NC differs from each other. Also, Cyprus is a very hot country and residents of NC mostly do not prefer eating spicy-food. However, as lovers of spicy-food, eating spicy-food in a very hot country gives rise to unwanted-body-odours. This may prevent African students going out for socializing, feel loss-of-affection, being excluded, feeling alone and being depressed. Also, African students' native language is different from the local language in NC, which led to limited communication opportunities. In addition to this, level of education, institutional and country based changes, instructors' cultural way of behaviour, way of lecturing, economic backgrounds of the African students and their friend environment, social life they experienced in NC as well as praying conditions all changed in NC. Additionally, some FMs may not have considered the foreign students in their classes and did not use English as the medium of the lesson. FMs are also recommended to have internal discipline in order to supply extra help for foreign students regarding their lessons. Attending regularly scheduled office hours can be a beginning. Also, African students cannot join other groups because most students do not use English in-class-times for education and socializing purposes. As non-native speakers of the Turkish language, African students cannot progress properly in their studies and in social interaction, as language seems to be one of the barriers to them. FMs are also strongly recommended to consider using English as the medium of instruction and design lessons integrating African students and other students.

Housing, transportation and communication expenses cost a lot in NC. Students, who stay at a house need to pay for hiring fees, buy second hand furniture and housewares for the house. The property-owners generally ask students to bring their furniture and housewares upon hiring a house. Similarly, they need to supply their transportation needs when their houses are located away from the university bus line. Also, they need to pay for their communication fees, especially for Internet costs

when they stay at private houses, but they do not have to pay for Internet when they stay in the university dormitories. Also, African students need to pay extra money for a private-hospital to get treatment because they do not have any health insurance. Similarly, in NC they buy fruits and vegetables, which are very expensive and contain pesticide residues.

Recommendations

Legal authorities are strongly recommended to prevent African students from taking advantage of legal gaps. Legal gaps may facilitate them to be in the middle of violence, gang-groups, substance users/sellers and gamblers. It is recommended that authorities take the necessary legal precautions to keep African students away from crime as well as protecting their safely. Future research on exploring how international students in NC are affected from legal gaps and identifying what precautions are required can be beneficial. In addition to this, higher education providers and governmental authorities should be in contact with following the attendance of the foreign students in classes. Most of the students just pay their money to the university but do not regularly attend classes. Authorities from the university should report the chronically absent students to the governmental authorities to have the student deported from the country unless the student documents the cause of the non-attendance. Also, authorities are strongly recommended to apply policies on part-time working conditions per each student. Each student who wants to work to earn some money can only work under certain circumstances and for limited hours. Summer holidays can be kept exemptions and students can be allowed to work full-time unless they do not continue summer school. Governmental policies need to be maintained regarding the work permits and entry records for establishing a system. Each student who wants to work should have a working permit from the governmental authorities of which they should submit it to each work place they start working. On the other hand, each student entering the country should submit a record entry while registering for the university. It seems that governmental and safety authorities and higher education providers are strongly recommended to work in close cooperation.

Higher education institutions are recommended to have effective and fruitful orientation days just before the new semester begins for foreign university students including African students to make sure that these students learn general rules of the new country and culture. Living in a new country and culture including topics on traffic, food, routines they can apply to communicate with the local students and local people, where to wash their clothes regularly, where to stay, where to pray, where the classes and hospitals/health centre are located and/or part-time work conditions should all be part of the orientation days to facilitate the adjustment process for the African students. Similarly, to be able to study in NC, African students need to adjust themselves to academic, social, cultural, economic and religious related changes. Future research on exploring whether current orientation days/weeks at higher education institutions in NC are beneficial or not for students and describing how to make it more advantageous to re/design these days/weeks regarding the benefits of the students is important.

FMs are recommended to consider the out-of-class-time educational needs of the students and obey their posted office-hours. Similarly, African students generally study at English-medium programs. FMs, whose use native language of other students, but not English, are recommended to consider their language needs. Otherwise, they cannot follow the program successfully since language is a strong barrier to go further in all perspectives. Future research on exploring the level of international language usage at higher education institutions in NC would be beneficial to help education planners take the necessary steps for attracting more international students.

AUSs are recommended to stay in university dormitories. If they do not stay in the dormitories, they are recommended to hire houses close to the university bus-line in order to not pay extra housing and/or transportation fees. Additionally, Internet fees mostly do not cost anything at dormitories and school libraries. They are recommended to use Internet facilities while they are at the dormitory and/or library. Otherwise, they will need to pay extra for Internet use. Similarly, university providers are recommended to supply health insurance and a healthy environment for all students as well as for African students. Therefore, the AUSs can get discounts from the private-hospitals and eat healthy food. Future research on living and studying conditions of international students in a host country and culture would be beneficial for state-planners and education planners to plan as well as to take necessary precautions. Governments are suggested to promote a system for more closely inspecting the living conditions of AUSs in NC. Working on these issues should be part of the government's plans to promote higher education, and to attract more international students and FMs to higher education institutions in NC

References

Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self-esteem in university students. Educational Psychology: *An International Journal of Experimental Educational Psychology, 14*(3), 323-330. https://doi.org/10.1080/0144341940140306

Alexander, B. K., Arasaratnam, L. A., Avant-Mier, R., Durham, A., Flores, L., Leeds-Hurwitz, W., … Halualani, R. (2014). Defining and communicating what "intercultural" and "intercultural communication" means to us. *Journal of International and Intercultural Communication, 7*(1), 14-37. https://doi.org/10.1080/17513057.2014.869524

Aresi, G. Moore, S., & Marta, E. (2016). Drinking, drug use, and related consequences among university students completing study abroad experiences: A systematic review. *Substance Use & Misuse, 51*(14), 1888-1904. https://doi.org/10.1080/10826084.2016.1201116

Arria, A. M., Calderia, K. M., Allen, H. K., Bugbee, B. A., Vincent, K. B., & O'Grady, K. E. (2017). Prevalence and incidence of drug use among college students: An

8-year longitudinal analysis. *The American Journal of Drug and Alcohol Abuse, 43*(6), 711-718. https://doi.org/10.1080/00952990.2017.1310219

Aydeniz, O. (2013). *Soframiza gelen sebze ve meyvler zehirli mi*? Retrieved fromhttp://www.kibrispostasi.com/index.php/cat/1/col/117/art/19289/PageName/KIBRIS_POSTASI

Burns, R. B. (1991). Study and stress among first year overseas students in an Australian university. *Higher Education Research and Development, 10*(1), 61-77. https://doi.org/10.1080/0729436910100106

Butt, B. Z., & Rehman, K. U. (2010). A study examining the students' satisfaction in higher education. *Procedia Social Behavioural Sciences 2*, 5446-5460.

Caga, U. (2014). *Zehir uyarisi*. Retrieved from http://www.diyaloggazetesi.com/kibris/zehir-uyarisi-h5068.html

Chaiers, D., & Volet, S. (1997). Common misconceptions about students from south-East Asia studying in Australia. *Higher Education Research and Development, 16*(1), 87-99. https://doi/org/10.1080/0729436970160107

Colvin, C., Volet, S., & Fozdar, F. (2014). Local university students and intercultural interactions: Conceptualising culture, seeing diversity and experiencing interaction. *Higher Education Research and Development, 33*(3), 440-455. https://doi/org/ 10.1080/07294360.2013.841642

Dorozhkin, I., U., & L. T. Mazitova (2008). Problems of the social adaptation of foreign college students. *Russian Education and Society, 50*(2), 23-30. https://doi/org/10.2753/RES1060-93935000202

Dusselier, L., Dunn, B., Wang, Y., Shelley, M. C., & Whalen, D. F. (2005). Personal, health, academic, and environmental predictors of stress for residence hall students. *Journal of American College Health, 54*(1), 15-24. https://doi/org/10.3200/JACH.54.1.15-24

Garcia-Jimenez, L., Rodrigo-Alsina, M., & Pineda, A. (2017). The social construction of intercultural communication: A Delphi study. *Journal of Intercultural Studies, 38*(2), 228-244. https://doi.org/10.1080/07256868.2017.1289903

Georgiou, M., & Savvidou, C. (2014). Either you know Greek or too bad for you': International students' intercultural experiences in Cyprus. *Intercultural Education, 25*(1), 41-54. https://doi/org/10.1080/14675986.2014.883190

Gill, S. (2007). Oversea students' intercultural adaptation as intercultural learning: A transformative framework. *Compare: A Journal of Comparative and International Education, 37*(2), 167-183. https://doi/org/10.1080/03057920601165512

Gu, Q., Schweisfurth, M., & Day, C. (2010). Learning and growing in a 'foreign' context: intercultural experiences of international students. *Compare: A Journal of Comparative and International Education, Special Issue: Globalization,*

Educational Governance and Decentralization, 40(1). https://doi/org/10.1080/03057920903115983

Güsten, S. (2014). *Students flock to universities in Northern Cyprus*. Retrieved from https://www.nytimes.com/2014/02/17/world/europe/students-flock-to-universities-in-northern-cyprus.html?mcubz=1

Harris, L. C. (1996). The impediments to initiating planning. *Journal of Strategic Marketing, 4*(2), 129-142.

Hussein, J. W. (2011). Impediments to educative practicum: The case of teacher preparation in Ethiopia. *Research in Post-Compulsory Education, 16*(3), 333-355.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, California: Sage Publications.

Maundeni, T. (2001). The role of social networks in the adjustment of African students to British society: Students' perceptions. *Race, Ethnicity and Education, 4*(3), 253-276. https://doi/org/10.1080/13613320120073576

Maundeni, T., Malinga, T., Kgwatalala, D., & Kasule, I. (2010). Cultural adjustment of international students at an African university. *Journal of Psychology in Africa, 20*(1), 79-84. https://doi/org/10.1080/14330237.2010.10820345

Miles, M., & Huberman, M. (1994). *Qualitative data analysis*. Beverly Hills: Sage Publications.

Mitchell, M. A., Poyrazli, S. & Broyles, L. M. (2017). Hazardous alcohol use and cultural adjustment among U.S. college students abroad in Italy: Findings and recommendations for study abroad staff and researchers. *Substance Abuse, 37*(1), 215-221. https://doi.org/10.1080/08897077.2015.1019663

Moore, P., & Hamton, G. (2015). It's a bit of a generalisation, but …': Participant perspectives on intercultural group assessment in higher education. *Assessment and Evaluation in Higher Education, 40*(3), 390-406. https://doi/org/10.1080/02602938.2014.919437

Nunan, D. (1999). *Research methods in language learning*. (8th ed.) Cambridge: CUP.

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Ramirez, E. R. (2016). Impact on intercultural competence when studying abroad and the moderating role of personality. *Journal of Teaching in International Business, 27*(2-3), 88-105. https://doi.org/10.1080/08975930.2016.1208784

Sandei, T. L. (2014). "Oh, I'm here!": Social media's impact on the cross-cultural adaptation of students studying abroad. *Journal of Intercultural Communication Research, 43*(1), 1-29. https://doi/org/10.1080/17475759.2013.865662

The Higher Education Department of the Ministry of National Education and Culture, NC, personal communication, September 11, 2017

Thurber, C. A., & Walton, E, A. (2012). Homesickness and adjustment in university students. *Journal of American College Health, 60(5)*, 415-419. https://doi/org/10.1080/07448481.2012.673520

Trockel, M.T., Barnes, M.D., & Egget, D. L. (2000). Health-related variables and academic performance among first-year college students: Implications for sleep and other behaviours. *Journal of American College Health, 49*(3), 125-131. https://doi/org/ 10.1080/07448480009596294

Tupas, R. (2015). Intercultural education in everyday practice. *Intercultural Education, 25*(4), 243-254. https://doi/org/10.1080/14675986.2014.883166

Ulmanen, S., Soini, T., Pyhältö, K., & Pietarinen, J. (2014). Strategies for academic engagement perceived by Finnish sixth and eighth graders. *Cambridge Journal of Education, 44*(3), 425-443. https://doi/org/10.1080/0305764X.2014.921281

Volet, S. E., & Ang, G. (1998). Culturally mixed groups on international campuses: An opportunity for intercultural learning. *Higher Education Research and Development, 17*(1), 5-23. https://doi/org/10.1080/0729436980170101

Zhou, Y., Jindal-Snape, D., Topping, K., & Todman, J. (2008). Theoretical models of culture shock and adaptation in international students in higher education. *Studies in Higher Education, 33*(1), 63-75. https://doi/org/10.1080/03075070701794833

Zohrabi, M. (2013). Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and Practice in Language Studies, 3*(2), 254-262.

Afrika Kökenli Üniversite Öğrencilerinin Yaşadıkları Zorluklar ile Kültürlerarası Deneyimleri: Kuzey Kıbrıs Örneği

Atıf:

Erden, H. (2018). African university students' intercultural experiences with impeding factors: Case from Northern Cyprus. *Eurasian Journal of Educational Research, 77, 81-104,* DOI: 10.14689/ejer.2018.77.5

Özet

Problem Durumu: Yabancı uyruklu üniversite öğrencileri genel olarak lisans, yüksek lisans ve doktora eğitimlerini tamamlamak amacıyla çeşitli ülkelere gitmektedirler. Eğitimleri sırasında çeşitli ülkelerden ve çeşitli kültürlerden belli bir ülkeye gelen her öğrenci, geldikleri ülke için bir renktir. Her öğrencinin kültürel, dilsel ve/ya dinsel farklılıkları okudukları ülke için bir renk çemberi şeklindedir. Bu renk çemberini oluşturan öğrencilerin başetmek zorunda kaldıkları çeşitli zorluklar mevcuttur.

Öğrencilerin kültürlerarası yaşadığı tecrübeler gittikleri ülkelerin eğitim sağlayıcılarının birçok faktörü yönetmesi ile ilişkilidir.

Araştırmanın Amacı: Bu araştırmanın amacı, Kuzey Kıbrıs'ta öğrenim gören Afrika kökenli üniversite öğrencilerinin yaşadıkları zorluklar ve bu zorulukların sıklıklarına ilişkin görüşlerini belirlemektir.

Araştırmanın Yöntemi: Bu araştırmada nitel yaklaşım kapsamında olgubilim deseni kullanılmıştır. Görüşmeler ses kayıtlarına alınmıştır. Örnekleme yöntemi olarak amaçlı örnekleme yöntemi çeşitlerinden benzeşik örnekleme kullanılmıştır. Verilerin analizinde deneyimlerin betimlenmesi, açıklanması ve temaların açığa çıkarılmasına özen gösterilmiştir. Odak grup görüşmeleri Kuzey Kıbrıs'ta bulunan farklı üniversitelerin değişik bölümlerinde öğrenim gören 50 Afrika kökenli üniversite öğrencisi ile tamamlanırken, derinlemesine görüşmeler ise aynı üniversitelerin aynı bölümlerinde öğrenim gören değişik 75 Afrika kökenli öğrenci ile tamamlanmıştır. Odak grup görüşmeleri sırasında, her üniversiteden 10'lu gruplar halinde öğrenci grupları oluşturulmuştur. Derinlemesine görüşmeler sırasında ise, her üniversiteden 15'er öğrenci ile birebir karşılıklı görüşmeler yürütülmüştür. Odak grup görüşmeleri-1 ile Afrika kökenli öğrencilerin Kuzey Kıbrısta yaşadıkları zorlukları belirlemek amaçlanırken, derinlemesine görüşmeler ile odak grup görüşmeleri-1 ile belirlenen zorlukların görüşülen öğrenciler için ortak olan zorlukların belirlenmesi amaçlanmıştır. Ortak zorlukların belirlenmesi ile, odak grup görüşmeleri-2 planlanmıştır. Odak grup görüşmeleri-2 ile belirlenen ortak zorlukların sıklıklarının belirlenmesi amaçlanmıştır. Odak grup-1 ve odak grup-2 görüşmeleri için yarı yapılandırılmış görüşme formu, derinlemesine görüşmeler için derinlemesine görüşme formu kullanılmıştır.

Odak grup görüşmeleri-1 ile belirlenen Afrika kökenli öğrencilerin yaşadıkları zorluklar, derinlemesine görüşmeler ile belirlenen Afrika kökenli öğrencilerin yaşadıkları zorlukların ortak olanları ve odak grup görüşmeleri-2 ile belirlenen Afrika kökenli öğrencilerin yaşadıkları zorlukların sıklıklarına ilişkin sonuçlar N-Vivo paket programı aracılığıyla sırasıyla analiz edilmiştir. N-Vivo paket programı aracılığıyla zorluklar, ortak olan zorluklar ve zorlukların sıklıklarına ilişkin kodlar belirlenmiş, bu kodlar ise paket program aracılığıyla tematik fikirler olarak kategorize edilmiştir.

Yorumlama yönteminin kullanıldığı nitel çalışmada, toplanan veriler içerik analizi kullanılarak analiz edilmiştir. Çalışma boyunca, içerik geçerliliği, yüzeysel geçerliliği, sonuçların güvenirliği, dış güvenirlik ve iç güvenirlik sağlanmıştır.

Araştırmanın Bulguları: Araştırmanın bulguları iki kategori halinde verilmiştir. İlk kategori olan uyum zorluğuna ilişkin ortak faktörler için, 5 tema ve 16 alt tema belirlenmiştir. Temalar, sosyal hayata uyum, sosyal ilişkilere uyum, eğitime uyum, maddi engellere uyum ve sağlık sorunlarına uyum şeklinde sıralanmıştır. Tüm temalara ilişkin alt temalar bulunmuştur.

Diğer kategori ise, uyumu zorlaştıran ortak faktörlerin sıklığı olarak belirlenmiştir. Buna göre, sosyal hayata uyum temasının alt teması olan huzur eksikliği her zaman,

özgüven-özsaygı ve özdeğerlendirme eksikliği alt teması ise sık sık olarak belirlenmiştir. Bununla birlikte, sosyal ilişkilere uyum temasının alt temaları olan yol/trafik işaretleri, yemeklerdeki farklılıklar, ortak kimlik eksikliği, kendini ayarlama ve yerel dilin kullanımı herzaman sıklığındayken, vücut kokuları ise bazen sıklığında belirlenmiştir.

Eğitim temasının alt temaları olan yetersiz ofis saatleri ve uluslararası dil kullanımının yetersizliği sık sık şeklinde belirlenirken, kalite alt teması ise genellikle şeklinde belirlenmiştir. Ayrıca, maddi engellere uyum temasının alt teması olan yarı zamanlı çalışma koşulları her zaman şeklinde belirlenirken, ulaşım koşulları ve iletişim koşulları sık sık olarak belirlenmiştir. Aynı şekilde, konut koşulları ise genellikle şeklinde belirlenmiştir. Öte yandan, sağlık sorunlarına uyum temasının alt teması olan başa çıkma, herzaman şeklinde belirlenmiştir.

Araştırmanın Sonuçları ve Önerileri: Sonuç olarak, Kuzey Kıbrıs üniversitelerinde okuyan öğrenciler için sosyal hayata uyum, sosyal ilişkilere uyum, eğitime uyum, maddi engellere uyum ve sağlık sorunlarına uyum şeklinde engeller belirlenmiştir. Bu engellerin alt temaları olan huzur eksikliği, yol/trafik işaretleri, yemeklerdeki farklılıklar, ortak kimlik eksikliği, yerel dilin kullanımı, kendini ayarlama, yarı zamanlı çalışma koşulları ve başa çıkma her zaman ortaya çıkarken, özgüven-özsaygı ve özdeğerlendirme eksikliği, yetersiz ofis saatleri, uluslararası dil kullanımının yetersizliği, ulaşım koşulları ve iletişim koşulları sık sık ortaya çıkmıştır. Öte yandan, kalite ve konut koşulları genellikle ortaya çıkan engeller olarak belirlenmişken vücut kokuları bazen ortaya çıkan engel olarak belirlenmiştir.

Yetkililerin, Afrika kökenli öğrencilerin yasal boşluklardan yararlanılmasını önleyecek yasal önlemler almaları, Afrika kökenli öğrencilerin isteyerek yada istemeyerek suça karışmasını engelleyebilir. Yasal boşlukların özellikle, şiddet içeren çetelerin oluşmasını engelleyici yönde olması, madde kullanıcı ve/ya satıcılarının ve/ya kumar oynayan ve/ya oynatanların yasal olarak engellenmesi ve bu tür ortamların oluşmaması için gerekli denetimlerin sıklıkla yapılması Afrika kökenli öğrencilerin böyle ortamlardan uzak durmalarını ve onların güvenli ortamlarda olmalarına sebebiyet vermesi açısından önemlidir.

Bununla birlikte, yüksek öğrenim kurumlarının, yeni dönemin başlamasından hemen önce ülkeye gelen Afrika kökenli öğrencilerin yeni geldikleri ülkenin kültürünü ve genel kurallarını tanımalarına olanak verecek şekilde ve sıklıkla oryantasyon programlarının düzenlemesi öğrencilerin ortama alışmalarına fırsat verecektir. Ayrıca, Afrika kökenli öğrencilerin Kuzey Kıbrıstaki yaşam kalitelerinin belli üzeyde olması onların akademik, sosyal, kültürel, ekonomik ve dini değişikliklere uyum sağlamalarıyla olumlu yönde ilişkilidir. Bu anlamda öğrencilere anlamlı rehberlik edilmesi önemlidir. Halihazırda yapılmakta olan oryantasyon programlarının geliştirilmesi ve daha etkin hale getirilmesi önerilmektedir.

Öğrencilerin öğrenimlerini tamamlamak için geldikleri Kuzey Kıbrıs'ta, okul sonrası çalışmak isteyen Afrika kökenli öğrencilere belirli sınırlamalar getirilmesi, öğrencilerin üniversitelerde kayıtlı görünüp hiç derslere katılmadan sadece çalışarak hayatlarını kazandıkları bir ortamın oluşmasına sebebiyet vermektedir. Böyle bir

durum, daha ucuza iş imkanlarına sahip olan Afrika kökenli öğrencilerin ülkede iş imkanlarının sınırlandırılmasına neden olurken aynı zamanda kendileri de ucuz işçilik kavramının oluşmasının ana sebebi haline gelmektedirler. Ucuz işçi olarak görülen Afrika kökenli öğrencilerin bu anlamda hakları yenmekte ve daha az para karşılığında çalıştırılmaktadırlar. Buna ilişkin ülke yöneticilerine öğrencilere çalışma izni süreci başlatması, bu öğrencilerin ülkeye giriş-çıkışlarının, derslere katılım sağlamalarının ve çalışma hayatlarının en ince ayrıntısına kadar incelendiği bir kayıt sisteminin oluşturulması önerilmektedir.

Ayrıca, öğrencilerin yaşam koşullarının belirlenebilmesi, hükümetlerin ülke refahını ve yüksek öğrenimi geliştirmelerine olanak sağlayacaktır. Bu anlamda, hükümetlerin öğrencilerin yaşam koşullarını belirlemeleri bir plan dahilinde bir süreci kapsamalı ve öğrencilerin daha sağlıklı ortamlarda yaşamaları sağlanmalıdır. Böyle bir süreci yönetebilmek için, hükümetlere öğrencilerin yaşam koşullarının incelendiği ve denetlendiği bir sistemin oluşturulması önerilmektedir.

Anahtar sözcükler: Yükek öğrenim, kültürlerarası yetkinlik, kültürlerarası kimlik.

Eurasian Journal of Educational Research 77 (2018) 105-128

Eurasian Journal of Educational Research
www.ejer.com.tr

The Relationship between Pre–Service Teachers' Cognitive Flexibility and Interpersonal Problem Solving Skills

Hanife ESEN–AYGUN[1]

ARTICLE INFO

Article History:
Received: 26 Feb. 2018
Received in revised form: 16 Jul. 2018
Accepted: 04 Aug. 2018
DOI: 10.14689/ejer.2018.77.6

Keywords
Cognitive flexibility, problem solving, teacher training, pre-service teacher

ABSTRACT

Purpose: In this study, the aim was to investigate pre–service teachers' cognitive flexibility in terms of specific variables and determine the relationship between pre–service teachers' cognitive flexibility and interpersonal problem solving skills. **Research Methods:** The study was designed in descriptive correlation model. Data were collected via the Cognitive Flexibility Inventory and Interpersonal Problem Solving Inventory from 531 pre–service teachers who studied in the Primary Teacher Training Departments during the fall semester of the 2017–2018 academic years. **Findings:** The findings indicated that there were significant differences according to gender and maternal education status, while there were no significant differences according to class level, department, and fathers' education status, socio–economic and socio–cultural status. In addition, there was a relationship between pre–service teachers' cognitive flexibility and interpersonal problem solving skills.

Implications for Research and Practice: It has been shown that pre–service teachers, who are cognitively flexible, are able to solve problems constructively and persistently. It is thought that an important characteristic of the professional and personal development and success of pre–service teachers who are trained to educate future generations to use their cognitive flexibility skills effectively in the solution of interpersonal problems. Based on the findings, it is recommended to take measures within the scope of teacher training in order to develop the capacities of cognitive flexibility of pre–service teachers.

[1] Çanakkale Onsekiz Mart University, TURKEY, e-mail: hanifeesen@comu.edu.tr, ORCID: https://orcid.org/0000-0001-9363-7083

Introduction

With the participation of independent learners in the production process of knowledge, information is perceived as a process rather than a product (Kilic & Demir, 2012). The new point of view that has emerged in knowledge production requires skills such as planning, controlling behaviours and ways of thinking (Doganay, 1997; Kilic & Demir, 2012). This view of information has redefined learning as a flexible adaptability in the process of acquiring knowledge (Kehagia, Murray, & Robbins, 2010). Based on these explanations, it is understood that this perspective of producing and learning information has been called called cognitive flexibility by researchers.

It has been seen that different researchers emphasize different features to explain the concept of cognitive flexibility, which expresses the process of using information. For example, Spiro (1992) defined cognitive flexibility as the ability to choose the most effective or appropriate alternative strategy for a subject or problem, focusing on the attention of the individual. Similarly, Batting (1979) defined cognitive flexibility as the ability to use the most effective learning strategies related to the topic studied or to determine the steps to solve a problem. It is understood that researchers describe cognitive flexibility as choosing the right way to solve the problem that is encountered. On the other hand, Martin and Anderson (1998), as opposed to the above definitions, define cognitive flexibility as the ability to see all options before making a choice, rather than choosing the right path. Spiro, Feltevich, Jacobson and Coulson (1991) define cognitive flexibility as the ability to think at different angles to use knowledge in the future where it is likely to be encountered by the individual. By this definition, it is understood that the aim is to reach the level of expert learner. In contrast to these definitions, Karadeniz (2008) defined cognitive flexibility, as the knowledge of the individual, and the capacity to use cognitive building independently of the situation. Based on the common features of the definitions that researchers have made regarding the concept of cognitive flexibility, it is understood that cognitive flexibility is the ability of the individual to choose the best way by evaluating all options against new present and possible situations.

Based on the knowledge gained from the definition of cognitive flexibility, it appears that individuals with cognitive flexibility have the following characteristics:

- Confident in their own capacity and behave accordingly (Bandura, 1977)
- Being willing to adapt to a new situation (Martin, & Anderson, 1998),
- Being aware of alternative ways and options (Martin, & Anderson, 1998, Martin, & Rubin, 1995),
- Using information and cognition flexibly and transferring this information in different ways according to the content given (Karadeniz, 2008),
- Being able to make decisions on their own and with high self–esteem, looking at events from different views, providing internal control, being less depressed and optimistic (Sapmaz, & Dogan, 2013),

- Being open to analysts and innovators (Jonassen, & Grabowski, 1993), controlling self–learning, doing self–learning more and preferring deductive learning.

It is noteworthy that the characteristics of cognitively flexible individuals, which express the way they acquire and use information, resemble those of advanced individuals in problem solving skills. Because, one of the personal characteristics that is effective in problem solving skills is the capacity of cognitive flexibility (Alper, & Deryakulu, 2008). Problem–solving skill is a comprehensive and complex cognitive process involving meta–cognitive thinking, including determining the most effective solution and deciding on the solution (D'Zurilla, & Nezu 2001; Evin–Gencel, 2015; Greiff, Wüstenberg, Csapó, Demetriou, Hautamäki, Graesser, & Martin, 2014; Sahin–Taskin, 2017; Saracaloglu, Altay, & Eken, 2016). In this respect, individuals with problem solving skills are defined as successful individuals who understand the source of the problem, who are systematic and determined, who use various decision making techniques, and who produce alternative solutions. According to Isen (2002), creative problem solving skills are influenced by flexible thinking capacity. This shows the importance of cognitive flexibility in situations such as producing new solutions to problem solving, probing different approaches, using old knowledge. Based on this information, it is thought that individuals with cognitive flexibility skills are thought to be more productive than problem solving. Problem solving skills are an important skill area both in academic life and in everyday life (Kennedy, Tipps, & Johnson, 2004). When teachers' professional competencies are examined, it is expected that teachers should prepare flexible curricula appropriate to different learning professions, encourage their students to think meta–cognitively and bring analytical thinking skills (Ministry of Education [MoNE], 2017). It is thought that these qualifications, defined as professional skills by the General Directorate of Teacher Training and Development, should be acquired within the scope of teacher training. For this reason, problem solving and cognitive flexibility skills in teacher education are at the forefront. In the light of this information, it is understood that pre–service teachers, who are responsible for educating future generations of students, should have problem solving skills. In this direction, this research was aimed at determining the relationship between cognitive flexibility levels of pre–service teachers and interpersonal problem solving skills. When studies of problem solving skills in Turkey were examined, it was understood that there were not many studies focusing on the relationship between interpersonal problem solving skills and cognitive flexibility. However, cognitive flexibility capacity is at the forefront of the features that affect the way in which individuals deal with problems. Due to the fact that, it is thought that cognitive flexibility levels of advanced individuals with interpersonal problem solving skills will also improve. For the first time, this study examined the relationship between cognitive flexibility capacity and interpersonal problem solving skills in Turkey. In this respect, it was thought that the pre–service

teachers who will be working in the future would shed light on the ongoing work on the subject of cognitive flexibility skills.

The sub-problems of the study were determined as follows:

1. Is there a significant difference between the gender of the pre-service teacher and the levels of cognitive flexibility?
2. Is there a significant difference between the departments of the pre-service teacher and the levels of cognitive flexibility?
3. Is there a significant difference between the class level of the pre-service teacher and the levels of cognitive flexibility?
4. Is there a significant difference between the socio-economic status of the pre-service teacher and the levels of cognitive flexibility?
5. Is there a significant difference between the socio-cultural status of the pre-service teacher and the levels of cognitive flexibility?
6. Is there a significant difference between maternal (e.g., Mother) educational status of the pre-service teacher and the levels of cognitive flexibility?
7. Is there a significant difference between paternal (e.g., Father) educational status of the pre-service teacher and the levels of cognitive flexibility?
8. Is there a relationship between cognitive flexibility levels of the pre-service teacher and interpersonal problem solving skills?

Method

Research Design

This research was designed in the descriptive correlation model. Studies designed in the descriptive correlation model are investigations aimed at determining the characteristics of large groups considering relation between variables (Buyukozturk, Kilic-Cakmak, Akgun, Karadeniz, & Demirel, 2012; Field, 2009; Fraenkel, & Wallen, 2006; Karasar, 2006). In this context, cognitive flexibility levels of pre-service teachers and interpersonal problem solving skills were determined in this study.

Research Sample

The sample of this research was the pre-service teachers who were studying at the Teacher Training Department of a university in the Marmara Region of Turkey during the fall semester of the 2017-2018 academic years. It is mostly pre-school teachers or classroom teachers who meet in the school for the first time (Oktay, 1999). Although the pre-school education participation rate is high in Turkey, some children start primary school directly. Accordingly, it is thought that the first

welcoming role of the child is shared by pre-school teachers and primary school teachers. Children who spend most of their time in school with a single teacher tend to adopt and imitate the teacher as a role model (Argun & Ikiz, 2003). Therefore, it is thought that the role of pre-school and classroom teachers is important in providing children examples of cognitive flexibility skills. A total of 531 pre-service teachers participated in the study, including 316 from the Department of Elementary Education Teacher Training and 215 from the Department of Preschool Education Teacher Training. In addition, participants consisted of 308 female pre-service teachers and 223 male pre-service teachers. The other features of the pre-service teachers are presented in Table 1.

Table 1

Participants' Features

School Type	Maternal Educational Status (N)	Paternal Educational Status (N)	Degree	Socio-Economic Status	Socio-Cultural Status
Primary School	287	192	Good	24	150
Secondary School	101	116	Middle	408	371
High School	111	165	Bad	99	10
University	34	58			
Total	531	531		531	531

Research Instruments and Procedures

In collecting research data, the Cognitive Flexibility Inventory which was developed by Dennis and Wal (2010) and adapted for the Turkish Language and Culture by Sapmaz and Dogan (2013) and the Interpersonal Problem Solving Inventory developed by Cam and Tumkaya (2007) were used.

The Cognitive Flexibility Inventory consists of two factors as Alternatives and Control. A total of 20 items are included in the measurement. Exploratory and confirmatory factor analysis was used in the provision of validity of the measuring tool. As a result exploratory factor analysis, it was understood that the items were collected in two factors. Alternatives sub-dimension consisted of 13 items while Control sub-dimension consisted of 7 items. The fit indices achieved as a result of confirmatory factor analysis indicated that the instrument was well adapted ($\chi 2$=406.98, sd=167, $\chi 2$/sd=2.44, AGFI=0.90, GFI=0.92, NFI=0.96, RFI=0.95, CFI=0.98, IFI=0.98, RMR=0.052, RMSEA=0.054). This indicated that the validity of the structure of the inventory was confirmed. The Cronbach's alpha coefficient of the inventory was calculated as .90 for the whole scale, .90 for the Alternatives factor and .84 for the Control factor. In addition, test-repeat test coefficient CFI was calculated at .75 for whole of the scale, .78 for Alternatives sub-dimension and .73 for the Control sub-dimension. This indicated that the instrument was reliable.

The Interpersonal Problem Solving Inventory consisted of five factors, such as, Approaching Problems in a negative way, Constructive Problem Solving, Lack of Self–confidence, Unwilling to Take Responsibility, and Insistent–persevering Approach. Exploratory factor analysis was used to provide validity for the measurement tool. As a result of the exploratory factor analysis, 50 items reached a factor load of more than .40. Approaching Problems in a negative way consisted of 16 items, Constructive Problem Solving consisted of 16 items, Lack of Self–confidence consisted of 7 items, Unwilling to Take Responsibility consisted of 5 items and Insistent–persevering Approach consisted of 6 items. The Cronbach alpha coefficient of the inventory was calculated between .67 and .91. In addition, the test–retest reliability was calculated between .69 and .89. The information obtained indicated that the measuring tool was valid and reliable.

The results of this study, which examined the relationship between the levels of cognitive flexibility and problem solving skills of prospective teachers, were collected during the fall semester of the 2017–2018 academic years. Before the data were collected, permission was obtained from the relevant faculty members. Afterwards, the students of the Teacher Training Department were given necessary explanations about the study and the data were collected based on volunteerism.

Data Analysis

558 pre–service teachers participated in the research. However, the answers of the pre–service teachers who were missing or misplaced their inventories were not included in the data set. Thus, the answers of 531 pre–service teachers' responses were statistically processed. First, the suitability of the normal distribution of the data set was investigated.

To decide for normality, skewness and kurtosis coefficients were calculated, and Kolmogorov Smirnov tests were also performed. The findings of the normality hypothesis are as follows:

Table 2

Descriptive Statistic

	Statistic	Standard Error
Mean	3.48	.01
Median	3.50	
Variance	.16	
Standard Deviation	.40	
Minimum	2.00	
Maximum	5.25	
Skewness	.16	.10
Kurtosis	.38	.21

The data set is normally distributed because the value obtained by dividing the skewness and kurtosis values by their standard error is in the range of 1.96 to + 1.96 (Tabachnick, & Fidell, 2001).

Table 3

Kolmogorov–Smirnov *Test Results*

Statistic	df	Sig.
.06	530	.28

The examined Kolmogorov–Smirnov Test results revealed that the *p* value was greater than 5%, and as a result, it was understood that the data had normal distribution (Field, 2009). The findings indicated that the data set was normal. In this respect, it was decided that parametric tests should be used in this study (Kalayci, 2010).

Results

The findings related to pre–service teachers' cognitive flexibility level in terms of some variable is presented in this part of study. In this context, the findings are presented according to the order of the research questions.

Findings obtained within the scope of the first research question are as follows:

Table 4

t–Test Results According to Gender for Cognitive Flexibility

	N	Mean	Sd.	df	T	p
Female	308	3.50	.39	530	2.04	.04
Male	223	3.40	.46			

When the answers for cognitive flexibility of pre–service teachers in Table 1 were examined, it was seen that there is a significant difference in favour of female students according to gender t(530)= 2.04, p< .041.

Findings obtained within the scope of the second research question are as follows:

Table 5

T–Test Results According to Department for Cognitive Flexibility

	N	Mean	Sd.	df	T	p
Elementary Education	306	3.47	.41	530	.73	.44
Pre–School Education	225	3.50	.39			

When the answers for cognitive flexibility of pre–service teachers in Table 2 were examined, it was seen that there was no significant difference according to the department t(530) = .73, p <.44. However, when the mean scores of the answers were examined, it is seen that the cognitive flexibility levels ($\bar{x}$ =3.50) of the pre–service

teachers who were educated in Preschool Education are more positive than the pre-service teacher ($\bar{x}$=3.47) who studied Elementary Education.

Findings obtained within the scope of the third research question are as follows:

Table 6

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.31(a)	2	529	.72

Table 6 presented the homogeneity of variances. When the data set was examined closely, it was understood that the variances were homogeneous, Sig. (.72) > .05. Accordingly, an Anova test can be employed.

Table 7

Anova Results According to Class Level for Cognitive Flexibility

	Sum of Squares	df	Mean Square	F	p
Between Groups	.78	4	.19	1.18	.31
Within Groups	78.91	527	.16		
Total	79.70	531			

When the answers for cognitive flexibility of pre-service teachers in Table 3 were examined, it was seen that there was no significant difference according to the class level F (531) = 1.18, p <.316. Nevertheless, when the means of answers were examined, the cognitive flexibility levels ($\bar{x}$ = 3.55), the first grade ($\bar{x}$ = 3.48), the second grade ($\bar{x}$ = 3.49) and the third grade ($\bar{x}$ = 3.44) of the pre-service teachers from the fourth grade, it was understood that it was more positive.

Findings obtained within the scope of the fourth research question are as follows:

Table 8

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.31(a)	2	529	.78

Since the *p*-value was more than .05 (.78), the basic assumption of the Anova test is provided.

Table 9

Anova Results According to Socio-Economic Status for Cognitive Flexibility

	Sum of Squares	df	Mean Square	F	p
Between Groups	.23	4	.07	.46	.70
Within Groups	82.89	527	.17		
Total	83.13	531			

When the answers for cognitive flexibility of pre-service teachers in Table 4 were examined, it was seen that there was no significant difference according to their

socio–economic status F (531) = .46, p <.70. However, when the averages of the answers were examined, it was found that the cognitive flexibility levels of the pre–service teachers indicated that the socio–economic income level of the family, in the Good ($\bar{x}$ = 3.52) condition, were more positive than the pre–service teachers who were in the Middle ($\bar{x}$ = 3.47) and Bad ($\bar{x}$ = 3.46) conditions.

Findings obtained within the scope of the fifth research question are as follows:

Table 10

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.23	2	529	.79

As seen in table 10 because the *p*-values were more than .05 (.79), the basic assumption of the Anova test is provided.

Table 11

Anova Results According to Socio–Cultural Status for Cognitive Flexibility

	Sum of Squares	df	Mean Square	F	p
Between Groups	.68	4	.34	2.07	.12
Within Groups	80.83	527	.16		
Total	81.51	531			

When the answers for cognitive flexibility of pre–service teachers in Table 5 were examined, it was seen that there was no significant difference according to the socio–cultural level F (531) = 2.07, p <.12. However, when the averages of the answers were examined, it was found that the cognitive flexibility levels of the pre–service teacher ($\bar{x}$ = 3.52) indicated that the socio–cultural status level of the family in the Good state were more positive than the pre–service teachers who were in the Middle ($\bar{x}$ = 3.46) and Bad ($\bar{x}$ = 3.46) states.

Findings obtained within the scope of the sixth research question are as follows:

Table 12

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.89	3	528	.44

It was seen that because the *p*-values were more than .05 (.44), the basic assumption of the Anova test is provided.

Table 13

Descriptive Statistics

	N	Mean	Std. Deviation	Std. Error
Primary School	287	3.50	.41	.02
Secondary School	101	3.43	.41	.04
High School	111	3.44	.36	.03
University	32	3.68	.45	.09
Total	531	3.48	.41	.01

The mean and standard deviation are presented in Table 13.

Table 14

Anova Results According to Maternal Education Status for Cognitive Flexibility

	Sum of Squares	df	Mean Square	F	p
Between Groups	1.38	4	.46	2.76	.04
Within Groups	81.62	527	.16		
Total	83.00	531			

When the answers for cognitive flexibility of pre–service teachers in Table 14 were examined, it was seen that there was a significant difference according to the maternal education status, F (531) = 2.76, p <.04.

Table 15

Multiple Comparisons

	Maternal Education Status	(J) Maternal Education Status	Mean Difference (I–J)	Std. Error	Sig.
			Lower Bound	Upper Bound	
Tukey HSD	Primary School (PS)	SS	.06	.04	.55
		HU	.05	.04	.62
		U	–.18	.08	.16
	Secondary School (SS)	PS	–.06	.04	.55
		HS	–.00	.05	.99
		U	–.24(*)	.09	.04
	High School (HS)	PS	–.05	.04	.62
		SS	.00	.05	.99
		U	–.24	.09	.05
	University (U)	PS	.18	.08	.16
		SS	.24(*)	.09	.04
		HS	.24	.09	.05
Bonferroni	Primary School (PS)	SS	.06	.04	1.00
		HU	.05	.04	1.00
		U	–.18	.08	.22
	Secondary School (SS)	PS	-.06	.049	1.00
		HS	-.00	.05	1.00
		U	-.24	.09	.05
	High School (HS)	PS	-.05	.04	1.00
		SS	.00	.05	1.00
		U	-.24	.09	.06
	University (U)	PS	.18	.08	.22
		SS	.24	.09	.05
		HS	.24	.09	.06

According to Table 15, it seems that pre-service teachers ($\bar{x}$ = 3.68) whose mother is a university graduate differ significantly compared to the pre-service teachers who graduated from primary school ($\bar{x}$ = 3.50), middle school ($\bar{x}$ = 3.43) and/or high school ($\bar{x}$ = 3.44).

Findings obtained within the scope of the seventh research question are as follows:

Table 16

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.81(a)	3	528	.48

According to Table 16, because the *p*-value was more than .05 (.48), the basic assumption of the Anova test is provided.

Table 17

Anova Results According to Paternal Education Status for Cognitive Flexibility

	Sum of Squares	df	Mean Square	F
Between Groups	.47	4	.11	.70
Within Groups	81.89	527	.16	
Total	82.37	531		

When the answers for cognitive flexibility of the pre–service teachers in Table 7 were examined, it was seen that there was a significant difference according to the paternal education status, F (531) = .70, p< .59.

Findings obtained within the scope of the last research question are as follows:

Table 18

Results of Correlation Analysis of Interpersonal Problem Solving Skills with Cognitive Flexibility Level

		Interpersonal Problem Solving
Interpersonal Problem Solving	Pearson Correlation	1
	Sig. (2–tailed)	
	N	531
Cognitive Flexibility	Pearson Correlation	.41(**)
	Sig. (2–tailed)	.00
	N	531

When Table 11 was examined, it was seen that the answers from the pre–service teachers about the Cognitive Flexibility Inventory and the Interpersonal Problem Solving Inventory were related. When the findings were evaluated in relation to each other, it was understood that there was a positive weak correlation between the level of cognitive flexibility of pre–service teachers and the level of problem solving skills,

r= .41. The results of the correlation analysis for the sub–factors of both instruments are as shown in Table 19.

Table 19

Results of Correlation Analysis of Sub–Scale of Interpersonal Problem Solving Skills with Sub–Scale of Cognitive Flexibility Level

		PNA	CPS	SD	I	PA
Alternatives	Pearson Correlation	.21(**)	.74(**)	.26(**)	.25(**)	.43(**)
	Sig. (2–tailed)	.00	.00	.00	.00	.00
	N	531	531	531	531	531
Control	Pearson Correlation	.70(**)	.15(**)	.53(**)	.41(**)	.09(*)
	Sig. (2–tailed)	.00	.00	.00	.00	.03
	N	531	531	531	531	531

Table 19 shows that pre–service teachers had a higher positive correlation (r= .74) between the sub–factors of Alternatives in Cognitive Flexibility and the answers they gave to the Constructive Problem Solving sub–factors within problem solving skills; it was also seen that there was a low correlation (r= .43) in the positive direction with the sub–factor of Insistent–Persevering Approach. When the data related to the Control sub–factor within the cognitive flexibility were examined, it was seen that there was a high level of relationship between the Approaching Problems sub–dimension in a negative way and the Lack of Self–confidence sub–dimension (r= .70), as well as, a mid–level relationship was understood as a low level of correlation in the positive direction between the Unwilling to Take Responsibility sub–dimension (r= .53).

Discussion, Conclusion and Recommendations

The results of this study, in which the cognitive flexibility levels of pre–service teachers were examined in terms of the relationship between specific variables and cognitive flexibility and interpersonal problem solving skills, reveal that the cognitive flexibility levels of pre–service teachers were good, though not very high. This finding was similar to the results of related studies (Cuhadaroglu, 2013; Kilic, & Demir, 2012). Taking into account the effects of the teaching profession on the development of the individual, it is understood that the cognitive flexibility levels of the pre–service teachers are positive in terms of professional development (Cuhadaroglu, 2013; MoNE, 2017; Ocak, 2016; Simsek, 2017). Considering cognitive flexibility is influenced by the self–efficacy belief (Ates–Cobanoglu & Yurdakul, 2014; Shimogori, 2013), it is thought that it is important to have cognitive flexibility in terms of the professional competence perceptions of teachers. Cognitive flexibility is essential for helping humans cope with complicated tasks (Ionescu, 2012). Thus, it is

thought that teachers who face dozens of children's problems every day should be cognitively flexible. Research has drawn attention to the link between cognitive flexibility and communication (Bandura, 1977; Martin, & Anderson, 1998). Based on this, the development of cognitive flexibility capacities of teacher candidates, in terms of healthy communication with the students, is believed to positively contribute to the teaching profession. It is also known that the level of cognitive flexibility is a factor in making responsible decisions (Bilgic & Bilgin, 2016).

When the data related to cognitive flexibility was examined by gender, it was understood that the cognitive flexibility levels of female pre-service teachers differ significantly from males. When relevant studies in the literature were examined, in contrast to the findings of this study, it was seen that the male pre-service teachers were cognitively more flexible in some study results (Altunkol, 2011; Cuhadaroglu, 2013; Kilic, & Demir, 2012) while there is no significant difference in gender in some other studies (Bilgin, & Bilgic, 2016; Cuhadaroğlu, 2011; Diril, 2011; Gokcen, Lacin, &, Yalcin, 2015; Martin, & Rubin, 1995; Oz, 2012). Therefore, it was understood that the result obtained from this study differed from other studies. This can be explained by differences in the functioning of the male and female brains. Accordingly, this finding can be explained by their gender roles and the fact that women are more elaborate than men (Bilgin, & Bilgic, 2016). For example, Gur, Turetsky, Matsui, Yan, Bilker, Hughett and Gur (1999) revealed that gender-specific biological differences affect cognitive functions of the male and female brains. In another study, it was emphasized that the maturation of the brains of adolescent girls is more advanced than that of males (Celik, Tahiroglu, & Avcı, 2008). Similarly, when studies of brain functioning were examined, it was seen that the brains of females in adolescence are developed two years ahead of males (Brizendine, 2006). Although researchers point out the ages of 12–18 years old when describing adolescence (Gul, & Gunes, 2009; Senemoglu, 2011), adolescence can last even further to 19–21 years of age (Derman, 2008). When the sample of this study was taken into consideration, it was understood that the vast majority of the participants were in the 18–22 age group. This can be interpreted as the continuing effects of adolescence. For this reason, it was thought that in this study, the cognitive flexibility levels of female pre-service teachers were higher than those of the male pre-service teachers because of the biological differences in the functioning of the brain, so that the cognitive functions were more advanced and therefore cognitively more flexible.

When the cognitive flexibility levels of the pre-service teachers were examined by considering the part they were studying, it was understood that the cognitive flexibility levels of the pre-service teachers in Preschool Education and Elementary Education Departments did not show any significant difference. Taking into consideration the baseline scores for the years 2014–2017, the majority of the pre-service teachers participating in the study, which were in their early years of university, it was understood that the scores of the pre-service teachers were close to each other (http://universite.taban-puanlari.com/). Although the concepts of academic achievement and cognitive flexibility are different from each other, the researches draw attention to the link between cognitive awareness and academic

achievement (Demir, & Doganay, 2010; Yucel, 2011). In this research, Pre–school and Elementary Education can be interpreted as the fact that the cognitive flexibility skills of the pre–service teachers were not different from each other because their academic achievements were similar to each other. In summary, it is thought that the cognitive functions of the pre–service teachers in these departments are similar.

Another variable examined in the study was whether the class level of the pre–service teachers was significantly different from the cognitive flexibility skills. When the findings were evaluated in this context, it was understood that the cognitive flexibility skills of the pre–service teachers did not show any significant difference according to class level. It was seen that this finding was supported by the findings of other studies in which cognitive flexibility skills of pre–service teachers were researched (Kilic, & Demir, 2012). One of the biggest obstacles to the development of cognitive flexibility skills is automation (Cuhadaroglu, 2013). Automation occurs as the level of expertise and knowledge increases, yet the individual is not willing to adapt to new situations (Cuhadaroglu, 2011). In this direction, it was thought that the capacities of cognitive flexibility did not change much in the following years of learning experiences as a result of pre–service teachers' adaptation to the teaching profession and automatic thinking.

In this study, it was assumed that the socio–cultural and socio–economic status of the parents of the pre–service teachers, were related to the capacity for cognitive flexibility. However, research findings indicated that there was no significant difference in the socio–economic and socio–cultural status of the pre–service teachers' families and their cognitive flexibility skills. It was understood that this result obtained was similar to the results of other past studies in the field (Diril, 2011; Oz, 2012).

When the cognitive flexibility levels of the pre–service teachers were examined considering the educational status of the parents, it was understood that there was no meaningful difference according to the education level of the father while there was a significant difference in favour of the mother being a university graduate. When the relevant research literature was examined, it was noticed that parental attitudes were not related to cognitive flexibility skills (Bilgin, 2009), but parental attitudes can be effective on cognitive flexibility skills (Diril, 2011). While the findings on gender variables above have been interpreted, it has been stated that the cognitive functions of females are more advanced than males in adolescence, but also in the following years; the use communication, emotional memory and anger management, sensitivity, stress, decision making and emotional control in terms of traits, are more advanced in female brains than males (Brizendine, 2006). For this reason, in this study, it was thought that while the paternal (e.g., father's) educational status for the pre–service teachers was not a variable explaining cognitive flexibility, the maternal education status did explain the cognitive flexibility skill levels of the participating pre–service teachers. On the other hand, although the importance of parents in the development of the individual is great, the mother–child relationship was one step ahead of the father-child dynamic (Kaya, 1997; Ozensel, 2004; Sanlı, & Ozturk, 2012). It was known that the mother's approach to the child affects the whole life of the

child (Ciftci, 1991). Nevertheless, as the level of education in mothers increases, children seem to support their development positively in terms of more attention to education, more research, richer learning environments and healthy communication skills (Erkan & Kirca, 2010). In addition, it has been known that the level of maternal education status does play a role in a child's cognitive development (Butun–Ayhan & Aral, 2007). In this respect, it was thought that the better cognitive flexibility levels of the pre–service teachers who were the students of mother's who were university–graduates was due to the fact that the mothers were more likely to be biologically cognitive flexible as mentioned above and that the mothers were more effective in child development.

Finally, in this study the relationship between pre-service teachers' cognitive flexibility levels and interpersonal problem solving abilities were investigated. It is thought that teachers who face dozens of undesirable behaviours in the classroom each day are important in learning more about the prevention of the unwanted behaviour related to the problem–solving skills of teachers and the quality management of the learning–teaching process. Research has emphasized that the level of cognitive flexibility and problem solving skills are interrelated (Canas, Quesada, Antolí, & Fajardo, 2003; Isen, 1999; Fitzgerald, 1997; Krems, 1995; Walker, Liston, Hobson, & Stickgold, 2002; Yucel, 2011). In this research, it was understood that pre–service teachers have a weak positive relationship between their cognitive flexibility skills and their interpersonal problem solving skills. However, when the findings from the sub–factors of the measurement tools were examined, it was understood that there was a high positive correlation between the Alternative Dimension of cognitive flexibility and the Constructive Problem Solving factor of problem solving skill; there was also a high positive correlation between the Alternative Factor of cognitive flexibility and the Insistent–Persevering Approach factor of problem solving skill. On the other hand, it was understood that there was a positive high correlation between the Control factors of cognitive flexibility and Approaching problems in a negative way factor of problem solving; there was also a positive modest correlation between Control factor of cognitive flexibility and the Lack of self–confidence factor of problem solving. In addition, there was a positive weak correlation between the Control factor of cognitive flexibility and Unwilling to take responsibility factor of problem solving. When the findings were closely examined, it appeared that there were such things as; "Considering many options before deciding on a topic", "Taking all possible facts and information into consideration while trying to understand the causes of behaviours", which involves producing alternative solutions to the new situations of the Alternatives factor of cognitive flexibility. On the other hand, while the Constructive Problem Solving factor, which is a related to Alternatives factor, has items such as; "I try to find more solutions for solving a problem", "I have a problem, I search for what I need for a successful solution". The Insistent–Persevering approach factor included; "I try to solve it if I have a problem with my interpersonal relationships", "I try to solve it, but I try to solve it". As understood from the items on both measuring instruments, it was thought that individuals who were cognitively flexible and able to produce alternatives from these items were determined to try various solutions as well as

solve the problem. When examining the items related to the control factor, which was another sub–factor of cognitive flexibility, the items such as; "I have difficulty deciding when I face difficult situations", "I feel like losing control when I encounter difficult situations", "I do not know exactly what to do when I encounter difficult situations". Approaching problems in a negative way, Lack of self–confidence, and Unwilling to take responsibility factors which were related to the Control factor includes items, such as, "When I have a problem, what I do for a solution is that I cannot change the situation I'm in", "In the event of a problem, whatever happens, I expect the first step to be taken from the other side" and "I feel desperate when I have a problem". When examined, cognitive flexibility was related to interpersonal problem solving, it was understood that individuals who can produce creative and effective solutions to solve a problem are successful in constructive problem solving and are persistence. On the contrary, it was understood that the individuals who were concerned about losing control in a difficult situation were also pessimistic about the solution to the problem, were not trusting of themselves and at the same time avoided taking responsibility. The information obtained from this study suggested that cognitive flexibility skills will improve the ability of the advanced pre–service teachers to solve problem solving skills.

It was thought that the success of pre–service teachers who were trained to instruct future generations in the effective use of their cognitive flexibility skills in the solution of interpersonal problems is an important characteristic of their professional and personal development. Thus, it is suggested to give importance in teacher training programs to the goal of increasing cognitive flexibility and individuals' problem solving skills. Especially, it is thought that cognitive flexibility should be emphasized in Classroom Management and Effective Communication courses to deal with students' routine problems, and additionally, it should be taken into consideration in pedagogy and professional knowledge courses in order to satisfy students academically because cognitive flexibility can guide instruction (Boger–Mehall, 1996). Findings obtained from this research provided important information regarding the level of cognitive flexibility of pre–service teachers, but the findings were limited to the pre–service teachers who were educated in the Primary Education Department. For this reason, it is recommended to apply the study to different sample groups. Thus, the generalizability of this relationship between cognitive flexibility and problem–solving skills will be expected to increase. In addition, this research focused on interpersonal problems solving. For future research, it is recommended focus be placed on different aspects of problem solving. In this direction, the relationship between problem–solving skills and cognitive flexibility is thought to be more inclusive.

References

Alper, A., & Deryakulu, D. (2008). The effect of cognitive flexibility on students' achievement and attitudes in web mediated problem based learning. *Education and Science*, *33*(148), 49–63.

Altun, İ. (2003). The perceived problem solving ability and values of student nurses and midwives. *Nurse Education Today, 23*, 575–584.

Altunkol, F. (2011). *The analysis of the relation between cognitive flexibility and perceived stress levels of college students* (Unpublished master thesis). Çukurova University, Institute of Social Sciences, Adana.

Argun, Y. & İkiz, E. 2003. Okul oncesi ogretmenligi programının ogrencilerin mesleki tutum ve algılarına etkilerinin incelenmesi [Examining the effects of the pre–school teacher's program on the professional attitudes and perceptions of the students]. OMEP Dunya Konsey Toplantısı ve Konferansı. 8–11 Ekim 2003 Kusadası /Turkiye, Proceeding 3, pp .412–429. Ya–Pa Yayıncılık. İstanbul.

Ates–Çobanoglu, A., & Yurdakul, B. (2014). The effect of blended learning on students' achievement, perceived cognitive flexibility levels and self–regulated learning skills. *Journal of Education and Practice*, *5*(22), 176–197.

Bandura, A. (1977). Self–efficacy: Towards a unifying theory of behavioural change. *American Psychologist, 33*, 344–358.

Batting, W.T. (1979). Are the important "individual differences" between or within individuals? *Journal of Research in Personality, 13*, 546–558.

Bilgic, R., & Bilgin, M. (2016). Analysis of the relationship between the cognitive flexibility levels and decision strategies in adolescents based on sex and education level. *Usak Üniversitesi Egitim Arastırmaları Dergisi, 2*(2), 39–55.

Bilgin, M. (2009). Bilissel esnekligi yordayan bazı degiskenler [Some variables that predict cognitive flexibility]. *Journal of Educational Faculty of Çukurova University, 3*(36), 142–157.

Boger–Mehall, S. R. (1996). Cognitive flexibility theory: Implications for teaching and teacher education. In *Society for Information Technology & Teacher Education International Conference* (pp. 991–993). Association for the Advancement of Computing in Education (AACE).

Brizendine, L. (2006). *Kadın beyni* [Female brains] (Çev: Zeynep Heyzen Ates). İstanbul: Lord Matbaası.

Butun–Ayhan, A., & Aral, N. (2007). The adaptation study of the bracken basic concept scale–revised form for six–year–old children. *Journal of Educational Faculty of Hacettepe University, 32*, 42–51

Buyukozturk, S., Kilic–Cakmak, E., Akgun, O. E., Karadeniz, S., & Demirel, F. (2012). *Bilimsel arastirma yontemleri* [Scientific research methods] (13. ed). Ankara: Pegem Akademi.

Canas, J., Quesada, J., Antolí, A., & Fajardo, I. (2003). Cognitive flexibility and adaptability to environmental changes in dynamic complex problem–solving tasks. *Ergonomics*, *46*(5), 482–501.

Çam, S., & Tumkaya, S. (2007). Developing the interpersonal problem solving inventory (ipsi): The validity and reliability process. *Turk Psikolojik Danısma ve Rehberlik Dergisi*, *3*(28), 95–111.

Celik, G., Tahiroglu, A., & Avcı, A. (2008). Structural and neuro–chemical changes of brain in adolescence. *Klinik Psikiyatri Dergisi*, *11*(1).

Ciftci, O. (1991). Çocugun sosyallesmesinde ailenin rolu [The role of the family in socializing the child]. *Sosyal Politika Çalısmaları Dergisi*, *1*(2), 1–4.

Cuhadaroglu, A. (2011). *Predictors of cognitive flexibility.* Unpublished doctoral dissertation, Ankara Universitesi Egitim Bilimleri Enstitusu, Ankara

Cuhadaroglu, A. (2013). Predictors of cognitive flexibility. *Cumhuriyet Uluslararası Egitim Dergisi, 2*(1), 86–101.

Demir, O., & Doganay, A. (2010). The effect of metacognitive strategies ınstructed through cognitive coaching on the metacognitive skills and retention in 6th grade social studies lesson. *Elementary Education Online*, *9*(1), 106–127.

Derman, O. (2008). Ergenlerde psikososyal gelisim [Psychosocial development in adolescents]. *Adolesan Sağlığı II Sempozyum Dizisi*, *63*, 19–21.

Diril, A. (2011). *An investigation of cognitive flexibility in terms of socio–demographic variables and anger level and anger styles in adolescent.* Unpublished master thesis, Çukurova Univesity Institute of Social Sciences, Adana.

Dogan–Lacin, B. G., & Yalcin I. (2018). Predictive roles of self–efficacy and coping strategies in cognitive flexibility among university students. In progress. doi: 10.16986/HUJE.2018037424

D'Zurilla, T.J., & Nezu, A.M. (2001). *Problem solving therapies*. Handbook of Cognitive Behavioral Therapies,(2nd ed). Ed. KS Dobson. New York: Guilford Press.

Evin–Gencel, I. (2015). Learning styles and problem solving skills of Turkish Prospective Teachers. *International Journal of Progressive Education*, *11*(2).

Field, A. (2009). *Discovering statistic using SPSS* (3th Ed.). London: SAGE.

Fitzgerald, G. E. (1997). An interactive multimedia program to enhance teacher problem–solving skills based on Cognitive Flexibility Theory: Design and outcomes. *Journal of educational Multimedia and Hypermedia*, *6*(1), 47–76.

Fraenkel. J. R., & Wallen. N. E. (2006). *How to design and evaluate research in education* (Sixth edition). The McGraw–Hill Companies.

Genc, S. Z., & Kalafat, T. (2010). Prospective teachers' problem solving skills and emphatic skills. *Kuramsal Egitimbilim, 3*(2), 135–147.

Greiff, S., Wustenberg, S., Csapó, B., Demetriou, A., Hautamäki, J., Graesser, A. C., & Martin, R. (2014). Domain–general problem solving skills and education in the 21st century. *Educational Research Review*, *13*, 74–83.

Gur, R. C., Turetsky, B. I., Matsui, M., Yan, M., Bilker, W., Hughett, P., & Gur, R. E. (1999). Sex differences in brain gray and white matter in healthy young adults: Correlations with cognitive performance. *The Journal of Neuroscience, 19* (10), 4065–4072.

Gul, S. K., & Gunes, I. D. (2009). Problems of adolescence and violence. *Sosyal Bilimler Dergisi*, *11*(1), 79–101.

Ionescu, T. (2012). Exploring the nature of cognitive flexibility. *New Ideas in Psychology 30*, 190–200.

Isen, A. M. (1999). On the relationship between affect and creative problem solving. In Sandra W. Russ (Ed.), *Affect, creative experience, and psychological adjustment* (pp. 3– 17). London: Taylor& Francis Group.

Isen, A. M. (2002). A role for neuropsychology in understanding the facilitating influence of positive affect on social behaviour and cognitive processes. In C. R. Snyder & S. J. Lopez (Ed.), *Handbook of positive psychology* (pp. 528–540). New York, NY, US: Oxford University Press.

Jonassen, D.H., & Grabowski, B. (1993). *Handbook of individual differences, learning and instruction.* New Jersey: Lawrence Erlbaum Associates, Publishers.

Kalayci, S. (2010). *SPSS uygulamalı çok degiskenli istatistik teknikleri [Spss applied multivariate statistical techniques].* Ankara: Asil Yayın Dagıtım.

Kaptanbas–Gurbuz, E., & Sezgin–Nartgun, S. (2018). Cognitive flexibility and self-efficacy levels of pedagogical formation program students. *The Journal of International Social Research, 11*(55), 628–640.

Karadeniz, S. (2008). Bilişsel esneklige dayalı hiper metin uygulaması: sanal bilgisayar hastanesi [Hypertext based on cognitive flexibility: virtual computer hospital.]. *Turk Egitim Bilimleri Dergisi, 6(*1), 135–152.

Karasar. N. (2006). *Bilimsel arastırma yontemi [Scientific research method]* (16. edition). Ankara: Nobel Yayın Dagıtım.

Kaya, M. (1997). Ailede anne–baba tutumlarının çocugun kisilik ve benlik gelisimindeki rolu [The role of parental attitudes in the child's personality and self-development]. *Ondokuz Mayıs Unıversity Review of the Faculty of Divinity*, *9*(9), 193–204.

Kehagia, A. A., Murray, G. K., & Robbins, T. W. (2010). Learning and cognitive flexibility: fronto-striatal function and monoaminergic modulation. *Current Opinion in Neurobiology*, *20*(2), 199–204.

Kennedy, L., Tipps, S., & Johnson, A. (2004). *Guiding children's learning of mathematics*. New York: Wadsworth.

Kilic, F., & Demir, O. (2012). Views of prospective classroom teachers regarding creating instructional environment based on cognitive coaching and cognitive flexibility. *Elementary Education Online*, *11*(3), 578–595.

Krems, J. F. (1995). Cognitive flexibility and complex problem solving. *Complex problem solving: The European perspective*, 201–218.

Martin, M. M., & Anderson, C. M. (1998). The Cognitive Flexibility Scale: Three validity studies. *Communication Repots, 11*, 1–9.

Martin, M. M., & Rubin, R. B. (1995). A new measure of cognitive flexibility. *Psychological Reports, 76*, 623–626.

Ministry of National Education, (2017). Ogretmenlik Meslegi Genel Yeterlikleri [General Qualifications of Teaching Profession]. Retrieved 15.01.2018 from http://oygm.meb.gov.tr/meb_iys_dosyalar/2017_12/11115355_YYRETMENLYK_MESLEYY_GENEL_YETERLYKLERY.pdf

Morera, O. F., Maydeu–Olivares, A., Nygren, T. E., White, R. J., Fernandez, N. P., & Skewes, M. C. (2006). Social problem solving predicts decision making styles among us Hispanics. *Personality and Individual Differences, 41*, 307–317.

Ocak, G. (2016). Meslek olarak oğretmenlik [Teaching as a profession]. In *Eğitim bilimine giris (*10. baskı). Ankara: Pegem Akademi.

Oktay, A. (1999). Yasamın sihirli yılları: Okul oncesi donem [Magic years of life: Pre–school period]. İstanbul: Epsilon Yayıncılık.

Oz, S. (2012). *Analysis of the relationship between the cognitive flexibility, adaptation and anxiety levels in adolescents based on sex, socio–economic status and education level.* (Unpublished master thesis). Çukurova Univesity Institute of Social Sciences, Adana.

Ozensel, E. (2004). Turk toplumunda çocugun yetistirilmesinde annenin rolu: Konya ili ornegi [The role of mother in raising children in Turkish society: Konya province example.]. *Degerler Egitimi Dergisi*, *2*(6), 77–96.

Sapmaz, F., & Dogan, T. (2013). Assessment of cognitive flexibility: Reliability and validity studies of Turkish version of the Cognitive Flexibility Inventory. *Ankara University, Journal of Faculty of Educational Sciences, 46*(1), 143–161.

Saracaloglu, A. S., Altay, B., & Eken, M. (2016). Variables predicting social problem solving skills of pre–service elementary teachers. *Adıyaman Universitesi Sosyal Bilimler Enstitusu Dergisi*, *1*(2), 679–721.

Shimogori, Y. (2013). *Impact of biculturalism on self–efficacy and cognitive flexibility of japanese adults.* Unpublished doctoral dissertation. Claremont Graduate University and San Diego State University.

Spiro, R.J. (1992). Cognitive flexibility, constructivism and hypertext: random access ınstruction for advanced knowledge acquisition. In Ill–Structured Domains. Duffy, T. M. & Jonassen, D. (Ed.), *Constructivism and the Technology of Instruction: Hillsdale*. New Jersey: Erlbaum.

Spiro, R. J., Feltovich, P. J., Jacobson, M. J., & Coulson, R. L. (1991). Cognitive flexibility, constructivism, and hypertext: Random access instruction for advanced knowledge acquisition in ill–structured domains. *Educational Technology*, *31*(5), 24–33.

Sahin–Taskin, C. (2017). Effects of active learning environments supported with self– and peer assessment on pre–service teachers' pedagogical and self–efficacy beliefs. *Asia–Pacific Journal of Teacher Education*, *45*, 1–20.

Sanlı, D., & Ozturk, C. (2012). An analysis of the factors affecting the child rearing attitudes of mothers. *Buca Faculty of Education Journal,* 32, 31–48.

Simsek, H. (2017). Egitim sisteminde ogretmenin rolu ve ogretmenlik meslegi [The role of the teacher in the education system and teaching profession]. In *Egitim bilimine giris* (8. ed). Ankara: Pegem Akademi.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistic (4th edition).* Allyn and Bacon.

Walker, M. P., Liston, C., Hobson, J. A., & Stickgold, R. (2002). Cognitive flexibility across the sleep–wake cycle: REM–sleep enhancement of anagram problem solving. *Cognitive Brain Research*, *14*(3), 317–324.

Yucel, O. (2011). *The effects of problem based learning on cognitive flexibility, self-regulation skills and students' achievements*. (Unpublished master thesis). Bahçesehir University, İstanbul. Online: Retrieved 22.01.2017. from: http://universite.taban–puanlari.com/

Öğretmen Adaylarının Bilişsel Esneklik Düzeyleri ile Kişilerarası Problem Çözme Becerileri Arasındaki İlişkinin İncelenmesi

Atıf:

Esen-Aygun, H. (2018). The relationship between pre–service teachers' cognitive flexibility and interpersonal problem solving skills. *Eurasian Journal of Educational Research, 77,* 105-128, DOI: 10.14689/ejer.2018.77.6

Özet

Problem Durumu: Bağımsız öğrenenlerin bilginin üretimi sürecine katılmasıyla birlikte bilgi bir üründen ziyade bir süreç olarak algılanmaktadır. Bilgi edinmeye ilişkin bu görüş öğrenmeyi de bilgi edinme sürecinde esnek bir şekilde uyum sağlama becerisi olarak yeniden tanımlamaktadır. Bilgiyi üretme ve öğrenmeye ilişkin bu bakış açısının araştırmacılar tarafından bilişsel esneklik olarak adlandırıldığı anlaşılmaktadır. Alanyazın incelendiğinde, bilişsel esnekliğin, bireyin mevcut ve muhtemel yeni durumlar karşısında tüm seçenekleri değerlendirerek en

iyi yolu seçme becerisi olduğu anlaşılmaktadır. Bilişsel olarak esnek bireylerin bilgiyi edinme ve kullanma şeklini ifade eden özelliklerin problem çözme becerisi gelişmiş bireylerin özelliklerine benzediği dikkati çekmektedir. Çünkü problem çözme becerisinde etkili olan kişisel özelliklerden biri de bilişsel esneklik kapasitesidir. Problem çözme becerisine sahip bireyler, problemin kaynaklarını anlayan, sistematik ve kararlı, çeşitli karar verme tekniklerini kullanan, alternatif çözüm yolları üretmede başarılı kişiler olarak tanımlanmaktadır. Problem çözme becerisi üst düzey düşünme ile birlikte en etkili çözüm yollarının belirlenmesi ve çözüm yoluna karar vermeyi içeren geniş kapsamlı ve karmaşık bilişsel süreci ifade etmektedir. Bu bilgilerden hareketle, bilişsel esneklik becerisine sahip bireylerin problem çözmede daha üretken oldukları düşünülmektedir. Öğretmen eğitiminde, üst düzey düşünme becerileri gelişmiş ve yeni durumlar karşısında etkili karar verebilen bireyler yetiştirmek açısından problem çözme ve bilişsel esneklik becerileri ön plana çıkmaktadır. Ülkemizde problem çözme becerileri ile çalışmalar incelendiğinde çeşitli öğrenim düzeylerinde pek çok çalışma bulunmakla birlikte kişilerarası problem çözme becerileri ile bilişsel esneklik arasındaki ilişkiye odaklanan bir çalışmanın olmadığı anlaşılmaktadır. Oysa bireylerin problemi ele alış biçimini etkileyen özelliklerin başında bilişsel esneklik kapasitesi gelmektedir. Bu nedenle, kişilerarası problem çözme becerisi gelişmiş bireylerin bilişsel esneklik düzeylerinin de gelişmiş olacağı düşünülmektedir. Bu çalışma ile ilk kez ülkemizde bilişsel esneklik kapasitesi ile kişilerarası problem çözme becerisi arasındaki ilişki ele alınacaktır. Bu doğrultuda, çalışmanın öğretmen adaylarının bilişsel esneklik becerileri konusundaki gelecek çalışmalara ışık tutacağı düşünülmektedir.

Araştırmanın Amacı: Bu araştırmada öğretmen adaylarının bilişsel esneklik düzeylerinin çeşitli değişkenler açısından incelenmesi ve kişilerarası problem çözme becerilesi ile ilişkinin belirlenmesi amaçlanmaktadır. Araştırma soruları aşağıdaki gibidir:

1. Öğretmen adaylarının cinsiyetleri ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
2. Öğretmen adaylarının öğretim gördükleri bölüm ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
3. Öğretmen adaylarının öğrenim gördükleri sınıf düzeyi ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
4. Öğretmen adaylarının sosyo–ekonomik durumu ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
5. Öğretmen adaylarının sosyo–kültürel durumu ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
6. Öğretmen adaylarının anne eğitim durumu ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?
7. Öğretmen adaylarının baba eğitim durumu ile bilişsel esneklik düzeyleri arasında anlamlı farklılık bulunmakta mıdır?

8. Öğretmen adaylarının bilişsel esneklik düzeyleri ile kişilerarası problem çözme becerileri arasında bir ilişki bulunmakta mıdır?

Araştırmanın Yöntemi: Bu araştırma betimsel tarama modelinde tasarlanmıştır. Araştırmanın örneklemini 2017–2018 eğitim–öğretim yılı güz yarıyılında Marmara Bölgesi'nde bir üniversitenin Temel Eğitim Bölümü'nde öğrenim görmekte olan öğretmen adayları oluşturmaktadır. Araştırma verilerinin toplanmasında, Bilişsel Esneklik Envanteri ile Kişilerarası Problem Çözme Envanteri kullanılmıştır.

Araştırmanın Bulguları: Öğretmen adaylarının bilişsel esnekliğe ilişkin cevapları cinsiyete göre incelendiğinde, kadın öğretmen adaylarının lehine anlamlı farklılık olduğu görülmektedir $t(530)= 2.047$, $p< .041$. Öğretmen adaylarının bilişsel esneklik kapasitesi ile öğrenim gördükleri bölüm ve sınıf arasındaki ilişki dikkate alındığında, bölüme $t(530)= .73$, $p< .44$ ve sınıf düzeyine göre anlamlı farklılık olmadığı anlaşılmaktadır $F(531)= 1.18$, $p< .31$. Öğretmen adaylarının bilişsel esnekliğe ilişkin cevapları sosyo–ekonomik gelir düzeyi ve sosyo–kültürel duruma göre incelendiğinde, sosyo–ekonomik gelire göre $F(531)= .46$, $p< .70$ ve sosyo–kültürel duruma göre $F(531)= 2.07$, $p< .12$ anlamlı farklılık olmadığı görülmektedir. Öğretmen adaylarının bilişsel esneklik düzeyleri ile ebeveynlerin eğitim durumları arasındaki ilişki incelendiğinde, anne eğitim durumuna göre anlamlı farklılık bulunurken $F(531)= 2.76$, $p< .04$; baba eğitim durumuna anlamlı farklılık olmadığı görülmektedir $F(531)= .70$, $p< .59$. Son olarak öğretmen adaylarının bilişsel esnekliğe ilişkin cevapları incelendiğinde, öğretmen adaylarının bilişsel esneklik kapsamındaki Alternatifler alt faktörü ile problem çözme becerisi kapsamındaki Yapıcı Problem Çözme alt faktörlerine vermiş oldukları cevaplar arasında pozitif yönde yüksek ilişki ($r= .74$) bulunduğu; Israrcı–Sebatkar Yaklaşım alt faktörü ile arasında da pozitif yönde düşük ilişki ($r= .43$) olduğu görülmektedir. Bilişsel esneklik kapsamındaki Kontrol alt faktörüne ilişkin veriler incelendiğinde ise Probleme Olumsuz Yaklaşma alt faktörü ile pozitif yönde yüksek düzeyde ilişki ($r= .70$), Kendine Güvensizlik alt faktörü ile pozitif yönde orta düzeyde ilişki ($r= .53$) ve Sorumluluk Almama alt faktörü ile de pozitif yönde düşük düzeyde ilişki olduğu anlaşılmaktadır.

Araştırmanın Sonuçları ve Önerileri: Bu çalışmada, öğretmen adaylarının bilişsel esneklik düzeylerinin iyi olduğu anlaşılmaktadır. Bununla birlikte, bilişsel esnekliğe ilişkin veriler cinsiyete göre incelendiğinde, kadın öğretmen adaylarının bilişsel esneklik düzeylerinin erkek öğretmen adaylarından anlamlı düzeyde farklılık gösterdiği anlaşılmaktadır. Bu durumun beynin işleyişindeki biyolojik farklılıklardan kaynaklandığı, buna bağlı olarak bilişsel fonksiyonlarının daha ilerde olduğu, dolayısıyla bilişsel olarak daha esnek oldukları düşünülmektedir. Öğretmen adaylarının bilişsel esneklik düzeyleri öğrenim görmekte oldukları bölüm dikkate alınarak incelendiğinde, Okul Öncesi Eğitimi ve Sınıf Eğitimi Anabilim dallarında öğrenim gören öğretmen adaylarının bilişsel esneklik düzeylerinin anlamlı farklılık göstermediği anlaşılmaktadır. Bu bölümlerde öğrenim görmekte olan öğretmen adaylarının bilişsel fonksiyonlarının benzerlik gösterdiği düşünülmektedir. Elde edilen bulgulardan hareketle, öğretmen adaylarının bilişsel esneklik becerilerinin sınıf düzeyine göre anlamlı farklılık göstermediği anlaşılmaktadır. Bu doğrultuda, öğretmen adaylarının öğretmenlik mesleği eğitimine uyum sağlamaları ile birlikte

otomatik düşünmeye başlamaları sonucunda bilişsel esneklik kapasitelerinin öğrenim yaşantılarının ilerleyen yıllarında çok fazla değişmediği düşünülmektedir. Öğretmen adaylarının bilişsel esneklik becerileri ile yetişmiş oldukları ailelerin sosyo–ekonomik ve sosyo–kültürel durumları arasında anlamlı bir farklılık olmadığına işaret etmektedir. Veriler anne–baba eğitim durumuna göre incelendiğinde annesi üniversite mezunu olan öğretmen adaylarının lehine anlamlı farklılık bulunduğu anlaşılmaktadır. Bireylerin gelişiminde anne–çocuk ilişkisi bir adım öne çıkmaktadır. Bununla birlikte, annelerde öğrenim düzeyi yükseldikçe, çocukların eğitimi ile daha fazla ilgilenme, zengin öğrenme ortamları sunma ve sağlıklı iletişim kurma gibi özellikler bakımından çocuklarının gelişimini olumlu yönde desteklediklerini görülmektedir. Alt faktörlere ilişkin bulgular incelendiğinde, alternatif üretebilen öğretmen adaylarının Yapıcı Problem Çözme ve Israrcı–Sebatkar Yaklaşım olma özellikleri dikkati çekmektedir. Buna ek olarak; bilişsel esnekliğin Kontrol alt boyutu ile problem çözmenin Probleme Olumsuz Yaklaşma Kendine Güvensizlik ve Sorumluluk Almama faktörü ile de ilişkili olduğu anlaşılmaktadır. Gelecek nesilleri yetiştirmekle görevli öğretmen adaylarının bilişsel esneklik becerilerini etkili olarak kullanmaları sonucunda kişilerarası problemlerin çözümünde başarıya ulaşmalarının, onların hem mesleki hem de kişisel gelişimleri bakımından önemli bir özelliği olduğu düşünülmektedir. Bu nedenle öğretmen yetiştirme programlarında bilişsel açıdan esnek ve problem çözme becerisi gelişmiş bireyler yetiştirme hedefine önem verilmesi önerilmektedir. Bu araştırmadan elde edilen bulgular öğretmen adaylarının bilişsel esneklik düzeyleri ile önemli bilgiler sunuyor olsa da elde edilen bulgular Temel Eğitim Bölümü'nde öğrenim gören öğretmen adayları ile sınırlıdır. Bu nedenle, çalışmanın farklı örneklem gruplarına uygulanması önerilmektedir. Böylece, bilişsel esneklik ve problem çözme becerisi arasındaki bu ilişkinin genellenebilirlik niteliğini arttıracağı düşünülmektedir.

Anahtar Sözcükler: Bilişsel esneklik, problem çözme, öğretmen eğitimi, öğretmen adayı.

Eurasian Journal of Educational Research 77 (2018) 129-144

Eurasian Journal of Educational Research
www.ejer.com.tr

Reflective EFL Education in Iran: Existing Situation and Teachers' Perceived Fundamental Challenges

Mohammad ALIAKBARI[1], Maryam ADIBPOUR[2]

ARTICLE INFO

Article History:
Received: 18 May. 2018
Received in revised form: 3 Aug. 2018
Accepted: 12 Sept. 2018
DOI: 10.14689/ejer.2018.77.7

Keywords
reflective teaching, current status, EFL teachers, challenging obstacles

ABSTRACT

Purpose: The significance of reflective teaching has been widely underscored in the literature. A primary consideration concerning the actualization of teacher reflection is seeking existing challenges to the approach and planning to handle them. This study sought to explore the current status of reflective teaching among Iranian EFL teachers and their perception of fundamental challenges to teacher reflection. **Methods**: Adopting a mixed-method approach, this study took advantage of questionnaire and open-ended survey. The data were collected from 176 high school teachers. To indicate whether any significant discrepancy existed between the expected and observed behaviours, chi-square goodness-of-fit test was run at item level. Concerning the data collected through the open-ended survey, the recurrent themes were identified, and the major categories of challenges, subcategories, and their frequency of being mentioned were extracted. **Findings**: The results of chi-square goodness-of-fit test were statistically significant in 28 items out of 29, that is, there were significant discrepancies between the expected and observed behaviours in case of 28 dimensions of teacher reflection included in the instrument. Following the thematic analysis, five main categories of obstacles were extracted, including the obstacles relevant to teachers, students, educational system (macro and micro level), political system, and parents. In terms of frequency, the categories of educational system and teacher-relevant obstacles were the first and second most frequently mentioned categories. **Implications for Research and Practice**: Indicating an inappropriate situation, the results implied the necessity for change in teacher education programs and highlighted the role of the Ministry of Education in facilitating teacher reflection.

[1] English Department, Ilam University, IRAN, maliakbari@mail.ilam.ac.ir, ORCID: orcid.org/0000-0002-5974-9708

[2] Corresponding Author: English Department, Ilam University, IRAN, maryam.adibpour87@gmail.com, ORCID: orcid.org/0000-0001-9919-9600

Introduction

Over the years, numerous researchers and scholars have emphasized the importance of reflective teaching and referred to the pedagogical benefits of applying its principles in instruction (Bailey, 1997; Bolton, 2010; Farrell, 1998; Sowa, 2009). Reflective teaching became prominent in EFL education as the method-centred approach lost its acceptability. During the method era, EFL teachers were expected to passively follow the methods. Theorists and experts were regarded as the qualified agents for producing knowledge, and the mere role of teacher was channelling content knowledge from expert to learner without any noticeable share in altering the content according to contextual considerations (Crandall, 2000; Kumaravadivelu, 2003). In the twentieth century, a stream of criticism against the notion of method arose, and some scholars persuasively questioned the acceptability of the method-centred approach toward teaching (Allwright, 1991; Pennycook, 1989; Stern, 1992). The fall of method was accompanied by the rise of postmethod, and postmethod was associated with new orientations toward teacher and teaching. Reflective teaching evolved and found more voice in language education as a result of postmethod debate (Akbari, 2007; Prabhu, 1990). Originated from Dewey's views, the concept of reflective teaching entered the realm of EFL teaching from general education. The approach considered an influential position for teachers. According to it, not being treated as apprentices assigned to execute scholars' good-for-all prescriptions (Kumaravadivelu, 2003), teachers were supposed to be involved actively in the process of self-observation and self-evaluation. Teacher reflectivity highlighted the role of teachers as those who were allowed to adjust the educational content according to context, reflect upon and analyse their classroom events, and solve classroom dilemmas accordingly. They were encouraged to take advantage of observation, journal keeping, video/audio recording, peer suggestions, learner views, as well as relevant books and articles to promote their teaching effectiveness.

The foundation of reflective teaching approach was established by prominent scholars such as Dewey (1933), Schön (1983), Gore and Zeichner (1991); Jay and Johnson (2002), and Freeman and Richards (1993). Meanwhile, its components have been expanded over time by subsequent theorists. Dewey (1933) described reflective teachers as those who have "the ability to look back critically and imaginatively, to do cause-effect thinking, to derive explanatory principles, to do task analysis, also to look forward, and to do anticipatory planning" (p. 13). Schön took a step further. Referring to the efficiency of teachers' reflective acts in comparison to experts' top-down prescriptions, he (1983) distinguished practical reflective processes, called reflective-in-action and reflective-on-action. Reflection-in-action referred to teachers' reflective attempts to solve unexpected problems that occur during teaching based upon their experience. Reflection-on-action, on the other hand, referred to teachers' reflective acts to plan their teaching and evaluate its efficiency afterwards. Bartlett (1990) considered reflection as transcending the technicalities of teaching and thinking beyond the need to promote instructional techniques. He highlighted the necessity of teachers' movement from "how to" questions to "what" and "why" ones to establish control over their actions and create "the possibility of transforming their everyday classroom

life" (p. 205). In a similar vein, Kumaravadivelu (2003) defined reflective teaching with regard to teacher's self-directed evaluation, action research, and contextual specificities. He viewed reflective teachers as teachers who collect information about what occurs in their classrooms, spot problems, and conduct action research to solve classroom dilemmas.

The assumed role for reflective teachers significantly evolved when EFL education, in line with other disciplines, took on a critical flavour. Inspired by Freire's (1972) ideas on the emancipatory potential of education (Kumaravadivelu, 2003), ideological concerns became the centre of attention. Critical pedagogists (e.g., Giroux, 1988; Pennycook, 1989; Simon, 1984, 1987) warned against the role of education in sustaining unequal power relations. Adopting a critical perspective, language was recognized as ideology, not merely a system, and EFL education was believed to involve social, cultural, and political issues, rather than merely linguistic information (Kumaravadivelu, 2006). Critical pedagogists regarded schools as "cultural arenas where heterogeneous ideological, discursive, and social forms collide in an unremitting struggle for dominance" (McLaren, 1995, p. 30).

So far, a brief history on the development of the concept of reflective teaching was presented. It is noteworthy that reflective teaching has been affected by various trends, and there does not exist quite rough consensus among scholars about its components (Akbari, Behzadpour, & Dadvand, 2010). For the purpose of this study, the construct is defined based upon the framework presented by Akbari et al. (2010). In an attempt to develop and validate a reflective teaching instrument, they proposed a five-factor model of teacher reflection. The components included practical, affective, cognitive, metacognitive, and critical elements. The practical component dealt with teachers' use of reflective tools and procedures, such as journal writing, audio/video recordings, observation, and group discussions. The cognitive component involved teachers' attempts for professional growth through conducting action research, participating in conferences, and reading relevant books and journals. The affective (learner) component was concerned with teachers' reflection on learners' affective, cultural, and cognitive states. The metacognitive component dealt with teachers' own view of teaching, their personality, beliefs, and emotional states. Finally, the critical component was concerned with teachers' consideration of sociopolitical aspects of teaching and their attempts to raise learners' awareness.

The significance of reflective teaching in teacher education programs and the need to equip teachers with reflective skills have been widely underscored in ELT literature (Brandt, 2008; Farrell, 2008; Johnson, 2006; Wallace, 1991). Crandall (2000) warns against the danger of educating teachers in the light of prescriptivism and suggesting cookbook-like instructions for effective teaching. Highlighting that decontextualized theories do not match the multidimensionality and unpredictability of classroom setting, she refers to teacher inquiry and reflection as important devices for the "development of language teaching theory and appropriate language teacher education" (p. 40). Implying the beneficial nature of teacher reflection, Farrell's (2016) study indicated how reflective practice can help novice teachers cope with the complexities they experienced at the beginning of teaching. The participants of his

study were three novice ESL teachers who had started teaching in a university in Canada. They formed a teacher reflection group and reflected on their teaching with Farrell as the facilitator for one semester. The reflection group was found to noticeably help teachers overcome many of the shocks they experienced in their first year of teaching. Verifying the positive effect of teacher reflection on student outcome, several studies have been conducted in recent years. In 2007, Taghilou explored the issue with two homogeneous groups of Iranian pre-university students as participants. The experimental and control group were taught the same materials by two reflective and non-reflective teachers. After 14 weeks, a standard achievement test was administered to both groups to compare their language abilities. The results revealed significantly higher scores and more student satisfaction and support in the experimental group.

Additionally, in 2008, Akbari, Kiany, Naeeni, and Allvar, as a part of their study examined the relationship between teachers' degree of reflectivity and student achievement outcome. Thirty EFL teachers' performances on a teacher reflectivity instrument were matched against their students' final scores as a measure of their achievement. The results indicated a high correlation between teacher reflectivity and student achievement outcomes. Concerning the relationship between EFL teachers' reflective practice and self-efficacy, Baleghizadeh and Javidanmehr (2014) conducted a study with 120 EFL teachers and found a significant relationship between the two constructs. Seeking how well the six components of reflective teaching predicted teacher efficacy, the results of their study revealed that the six-predictor model was statistically significant and accounted for 39% of the variance of teacher efficacy. In fact, recent studies imply the advantageous nature of reflective teaching.

It is noteworthy that besides considering the benefits of reflective teaching and its position in postmethod, a crucial issue which requires special attention is the existence of potential challenges to the trend. As Kumaravadivelu (2006) states, there exist challenging barriers, including pedagogical and ideological ones. The pedagogical barriers deal with the transmission model of EFL teacher education, and the ideological ones are the barriers manipulated by political, economic, and cultural forces sustaining unequal power relations and marginalization. In a similar vein, Akbari (2008a) refers to strict administrative frameworks, the need to highly qualified teachers, as well as social, political, and economic obstacles. Besides predicting the obstacles theoretically, there is a need to probe the existing challenges in practical terms. Reviewing the literature, one finds that quite recently a few studies have been conducted in this regard. Concentrating on the context of private language institutes, Soodmand Afshar and Farahani (2017) made an attempt to investigate EFL teachers' perception of inhibitors to reflective practice. The results of their study revealed that lack of knowledge, teaching situation, and affective-emotional inhibitors were three types of barriers mainly reported by private institute teachers. In another study, Moradkhani and Shirazizadeh (2017), as a part of their research, interviewed ten teachers (five private institute teachers and five state school teachers) to explore factors affecting their reflective practice. The findings of this small-scale study were indicative of five main factors, including knowledge of reflection, institutional demands, teachers' attitude toward teaching, availability of resources, and collegial support.

Having reviewed recent studies on challenges to teachers' reflective practice, some gap is felt concerning the educational context of state schools. State schools generally hold a special position. They address huge numbers of students and provide free education. It is of supreme importance that they do not fall behind currently acceptable trends in language teaching. Gaining insight into the existing challenges and obstacles to state school teachers' reflective practice paves the way for boosting the situation and mitigating educational shortcomings. Taking account of the pedagogical benefits of reflective teaching and the dearth of large-scale systematic research on challenges to state school teachers' reflective practice, this study sought to address the following research questions:

1. Taking account of different dimensions of reflective teaching, is there any significant difference between the expected and observed behaviours of Iranian EFL teachers teaching at state high schools?
2. What are fundamental challenges to the actualization of reflective teaching in Iranian state high schools according to EFL teachers?

Method

Research Design

This study adopted a mixed-method approach. It took advantage of both qualitative and quantitative data, and the instruments were determined accordingly.

Research Sample

The participants of this study included 176 EFL teachers, who taught at Iranian state high schools. They were selected through convenience sampling from five provinces of Iran, including Fars, Ilam, Kermanshah, Chaharmahal va Bakhtiari, and Isfahan. The sample consisted of 97 males and 79 females, within the age range of 26 to 66 years old. The participants' teaching experience ranged from 2 to 42 years, with a central tendency of 21. They held various degrees of A.D., B.A., M.A., and Ph.D. 94 of them were B.A. holders, 56 teachers had M.A. degree, and respectively 18 and 8 of them held A.D. and Ph.D. degrees.

Research Instruments and Procedures

In order to investigate the status of reflective teaching among the participants, Reflective Teaching Instrument (Akbari et al., 2010) was applied. This instrument is a 29-item questionnaire, and encompasses five components, including practical, cognitive, affective, metacognitive, and critical components. It is designed based upon a five-point Likert scale ranging from "never" to "always". Concerning the reliability of the instrument, Cronbach's alpha estimate proved to be .94, which indicate very good internal consistency. In the next stage in order to explore the participants' perception of the existing challenges to reflective teaching, a survey was designed. The primary version of the survey was evaluated and judged by two experts in applied linguistics, and the final version was prepared after making some modifications based

upon their comments. The survey was comprised of open-ended questions, seeking teachers' views and elaborations on fundamental challenges to reflection in their teaching context. In order to distribute the instruments, both face-to-face and email methods were applied. The instruments were distributed to a total of 238 EFL teachers; 176 of them completed and returned the instruments to the researchers.

Data Analysis

The data collected through the Reflective Teaching Instrument were fed into SPSS 19. To indicate whether any significant difference (discrepancy) existed between the expected and observed behaviours, a chi-square goodness-of-fit test was run at item level. Concerning the data collected through the open-ended survey, the recurrent themes were identified by thematic analysis following the principles established by Braun and Clarke (2006). To do so, the responses were read, re-read, and then coded attending to repeated meanings and themes. The major categories of mentioned challenges, subcategories, and their frequency of being mentioned were extracted.

Results

In order to gain insight into the status of reflective teaching among the participants, descriptive statistics and chi-square goodness-of-fit test were employed to analyse the collected data. The results of the descriptive statistics are displayed in Table 1.

Table 1

Descriptive Statistics for EFL Teachers' Reflection

Participants	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
EFL teachers	176	37	131	86.937	20.337	-.345	-.245

The total mean score of the sample proved to be 86.94 (SD= 20.34). The minimum and maximum scores of the EFL teachers were 37 and 131, and the distribution was negatively skewed.

In order to perform a more detailed analysis, chi-square tests were run at item level. The results are displayed in Table 2.

Table 2
Chi-Square Test for EFL Teachers' Reflection

Items	Teacher reflection	Never	Rarely	Sometimes	Often	Always	x^2	*df*	*Asymp. sig.*
1	Journal keeping for reviewing purposes	44.9%	25.0%	17.0%	9.1%	4.0%	90.534[a]	4	.000
2	Seeking colleagues' feedback	6.8%	15.3%	37.5%	28.4%	11.9%	56.102[a]	4	.000
3	Reflection after each lesson	19.9%	34.7%	33.5%	9.7%	2.3%	72.068[a]	4	.000
4	Discussing practical/theoretical issues with colleagues	5.1%	13.6%	42.0%	27.8%	11.4%	77.807[a]	4	.000
5	Observing other teachers' classrooms	49.4%	19.9%	17.6%	8.0%	5.1%	109.000	4	.000
6	Asking peers to observe one's teaching	55.7%	22.2%	12.5%	7.4%	2.3%	159.057	4	.000
7	Reading books/articles on effective teaching	26.1%	19.3%	16.5%	19.3%	18.8%	4.625[a]	4	.328
8	Participating in workshops/conferences	14.8%	20.5%	29.5%	21.6%	13.6%	14.227[a]	4	.007
9	Writing articles based on classroom experiences	33.0%	17.6%	27.8%	14.8%	6.8%	38.375[a]	4	.000
10	Searching the internet to see the recent developments	29.0%	16.5%	18.8%	21.6%	14.2%	11.500[a]	4	.021
11	Conducting small-scale research to solve classroom problems	8.0%	26.1%	35.8%	21.6%	8.5%	49.852[a]	4	.000
12	Thinking of classroom events as potential research topics	6.8%	17.6%	37.5%	31.8%	6.3%	71.670[a]	4	.000
13	Talking to students to learn about their learning styles and preferences	9.7%	20.5%	29.0%	27.3%	13.6%	24.739[a]	4	.000
14	Talking to students to learn about their family backgrounds and interests	8.5%	24.4%	34.7%	19.9%	12.5%	37.182[a]	4	.000
15	Asking students whether they like a teaching task	17.6%	21.6%	35.2%	15.9%	9.7%	32.011[a]	4	.000
16	Thinking about one's teaching philosophy	5.7%	14.2%	31.8%	27.3%	21.0%	38.034[a]	4	.000
17	Thinking of the ways one's biography affects one's teaching	5.7%	20.5%	33.5%	24.4%	15.9%	37.352[a]	4	.000
18	Thinking of the significance of one's job as a teacher	3.4%	9.7%	24.4%	26.1%	36.4%	62.239[a]	4	.000
19	Finding out the aspects of one's teaching that cause a sense of satisfaction	2.3%	7.4%	17.6%	33.0%	39.8%	91.330[a]	4	.000
20	Thinking about one's strengths and weaknesses as a teacher	11.4%	9.1%	13.6%	23.3%	42.6%	66.557[a]	4	.000
21	Thinking about previous experiences as a student and its effect on teaching	8.5%	11.9%	31.3%	26.7%	21.6%	32.636[a]	4	.000

Table 2 Continue

Items	Teacher reflection	Never	Rarely	Sometimes	Often	Always	x^2	*df*	*Asymp. sig.*
22	Thinking of inconsistencies that occur in classroom practice	1.7%	11.9%	30.7%	34.7%	21.0%	64.227[a]	4	.000
23	Discussing instances of social injustice	15.9%	24.4%	30.1%	19.9%	9.7%	21.614[a]	4	.000
24	Thinking of ways to enable students to change their social lives	11.4%	27.3%	30.1%	17.6%	13.6%	24.284[a]	4	.000
25	Attending to less-discussed topics such as discrimination	18.2%	25.6%	33.5%	14.2%	8.5%	33.659[a]	4	.000
26	Thinking about political aspects of teaching	29.5%	25.0%	25.6%	11.9%	8.0%	31.443[a]	4	.000
27	Trying to promote tolerance and democracy in class and society	14.2%	16.5%	33.5%	23.3%	12.5%	26.045[a]	4	.000
28	Thinking about the effect of gender and social class on students' achievements	4.0%	18.2%	32.4%	28.4%	17.0%	43.375[a]	4	.000
29	Thinking of outside social events that can influence teaching inside the class	6.3%	8.5%	33.5%	30.1%	21.6%	53.545[a]	4	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 35.2.

As represented in Table 2, the results of the chi-square test regarding the EFL teachers' reflective teaching questionnaire were statistically significant (p<.05) in 28 items out of 29. In other words, there were significant discrepancies between the expected and observed behaviours in case of 28 aspects of teacher reflectivity included in the questionnaire. The mere item for which there was not a significant difference between the expected and observed behaviours was item seven, which dealt with reading books and articles on effective teaching.

In the next step, the EFL teachers' perceived barriers to reflective teaching were analysed and categorized. The mentioned barriers and their frequencies are displayed in Table 3.

Table 3.

EFL Teachers' Perceived Barriers to Reflective Teaching

Category	Mentioned barriers	Frequency
Teachers	Belief in the irrelevance of reflective considerations to teaching	31
	Economic problems (financial pressures, low salary, dealing with a second job)	29
	Lack of motivation	16
	Personal life problems and concerns	11
	Belief that reflective practices are difficult and energy consuming	4

Table 3 Continue

Category		Mentioned barriers	Frequency
		Personal dislike of interacting with colleagues on teaching issues	5
		Colleagues' dislike of talking about teaching issues and being observed	21
		Lack of self-confidence	2
		Colleagues' too limited educational knowledge to interact with on educational issues	10
		Personal low sociopolitical knowledge	2
		Colleagues' jealousy	5
		Belief that reflective considerations make controlling class difficult	4
Students		Students' lack of motivation and interest	16
		Students' behavioural and informational unpreparedness	12
		Students' expectations	4
		Students' low language proficiency which requires dedicating the whole time to their improvement	6
Educational System	Macro	Large classroom population	9
		Time limitation	55
		Having to cover a lot of material	4
		Rarity of workshops/conferences on teaching/learning issues	7
		Lack of enough equipment	7
		Curriculum	11
		Book	9
		Lack of evaluative agents to assess teachers' teaching practice and teachers' high job security	4
		Strict control of cultural and religious issues	14
		Giving no emotional/financial value to teachers' extra efforts	8
		Lack of planning for observation and interaction in the system	6
		Total dominance of the Ministry of Education and a technician view of teachers (top-down transmission-based approach)	15
	Micro	School principal's expectations	4
		School permission and laws	14
Political system		Political limitations and pressures	27
Parents		Parents' expectations	5

The participants' mentioned obstacles to reflective teaching were classified into five categories, including the obstacles relevant to teachers, students, educational system (macro and micro level), political system, and parents. The total frequencies of the mentioned categories were found to be respectively 140, 38, 167, 27, and five. The category associated with the educational system was found to be the most frequently-mentioned one, and the category of parent expectations had the least frequency. Concerning individual barriers (regardless of the categorization), the results revealed that the first five most frequently-mentioned barriers were respectively attributed to

time limitation, teachers' belief in the irrelevance of reflective considerations to teaching, teachers' economic problems, political limitations, and colleagues' dislike of talking about teaching issues and being observed.

Discussion, Conclusion, and Recommendations

Indicating an inappropriate situation regarding the status of reflective teaching in Iranian state high schools, the results of the study revealed that, save for item seven, in case of all items of the instrument, the results of the chi-square test were significant. It could be inferred that the state high schools' EFL teachers highly disregarded various dimensions of reflective teaching. The results are in congruence with Rahimi and Chabok's (2013) report on the status of reflective teaching in Iran. The findings implied that Iran's EFL teacher education has fallen behind acceptable trends, and its approach toward teacher-learning is in harmony with traditional perspectives. As Sangani and Stelma (2011) refer to, the public system of pre-service teacher education does not take required actions to promote the status quo. Research conducted by Eslami and Fatahi (2008) suggests that having finished pre-service teacher training, Iranian EFL teachers are prepared to follow grammatically-oriented teaching strategies. The existing situation requires serious attention of EFL teacher education centres. The results of goodness of fit chi-square test indicated that, in case of item seven, there was a significant discrepancy between the observed and expected behaviours. This item dealt with teachers' attention to reading books and articles on effective teaching. The reason behind such a finding could be the fact that a good number of participants had entered higher education. Studying at the higher education level is accompanied with studying TEFL books and articles. Such EFL teachers are not highly representative of the country's EFL teachers.

Taking account of the thematic analysis of teachers' perceived challenges to reflective teaching, five broad categories were extracted, including obstacles relevant to teachers, students, educational system (macro and micro level), political system, and parents. The challenging obstacles associated with the category of educational system were found to have the highest frequency. At macro level, the educational system dealt with the following problematic areas: time restriction, absolute dominance of the Ministry of Education, the technician view toward teachers, populated classrooms, curriculum, and book. At micro level, school permission and its inhibitive laws were frequently referred to as challenging factors. Consistent to the findings of this research, prior studies on reflective teaching acknowledged the inhibitory role of centrally controlled educational system, institutional demands, textbook, syllabus, large classroom population, and heavy volume of educational content (Mälkki and Lindblom-Ylänne, 2012; Sangani & Stelma, 2011). According to Akbari (2008b), decentralization of decision making in terms of content and teaching methodology is one of the fundamental requirements of reflective teaching. He believes that as long as ministerial authorities are considered as the merely qualified agents for educational decision making, classroom problems will not be solved. Along the same lines, Mehrmohammadi (2004) believes that "teachers are almost entirely excluded from the decision making process by the centralized system of education in Iran" (p. 139).

Concerning the issue of time limitation, the weekly hours of English courses are decided by the Ministry of Education. Moreover, curriculum, teaching content, and books are highly affected by decisions made at the upper levels of educational administration. Thus, some fundamental changes at the level of the Ministry of Education are required.

The second most frequently-mentioned category of challenging obstacles referred to teacher-relevant factors. These factors included teachers' financial problems, their belief in the irrelevance of reflective considerations, lack of motivation, personal life problems and concerns, as well as colleagues' dislike of collaboration and their limited knowledge on educational issues. Concerning financial problems, Sangani and Stelma (2011) argue that financial constraints, low salaries, and preoccupation with second job are among significant factors that negatively affect reflective teacher development and practice in developing countries. Akbari (2008a) resembles teachers to factory workers in terms of long working hours, low payment, and poor working conditions. He believes that teachers' financial and occupational challenges do not leave them with the time and willingness to act as reflective practitioners. Given as such, it is inferred that teachers' financial well-being is an important prerequisite to their reflective orientations.

Another noticeable obstacle among teacher-relevant inhibitive factors was teachers' belief in the irrelevance of reflective considerations to teaching. Such perspectives have roots in teachers' unfamiliarity with reflective teaching, and teacher education programs seem responsible for these patterns of thought. It seems that pre-service teacher education centres do not pay adequate attention to reflective practice. Furthermore, having finished the period of studying TEFL, the prospective teachers mainly get deprived of influential training to renew their knowledge and keep pace with the pedagogical approaches in vogue. The in-service teacher education programs are inefficient, and teachers' teaching is mainly dependent on a predetermined transmitted body of knowledge received during the early pre-service teacher education. Hence, one can easily find numerous in-service teachers with a fossilized knowledge of EFL pedagogy. Given as such, the consideration of reflective teaching in pre-service and in-service teacher education programs is suggested.

Another teacher-relevant obstacle dealt with teachers' poor collaboration with colleagues in observing each other's teaching, providing support, and giving feedback. According to Richards and Lockhart (1994), "teachers are often reluctant to take part in observation or related activities since observation is associated with evaluation" (p.12). As an advantageous process associated with teacher growth and professional development (Johnson, 2009; Valencia & Killion, 1988), peer observation requires safe environments, in which teachers view themselves as peers, who do not hold positions of dominance over each other (Aukland, 1991; Johnson, 2009). Teachers must know the aim is describing and learning from each other, not judging and evaluating (Pacheco, 2005). Along with emotional security and adequate instruction, EFL teachers should be culturally prepared and do not find their identity endangered. It is suggested that collaborative skills be introduced and practiced in pre-service and in-service teacher education programs to be internalized and fostered.

The third broad category of obstacles dealt with student-relevant factors, including students' expectations, demotivation and behavioural, affective, and informational unpreparedness. In a similar vein, Minnot (2010) referred to poor student behaviour as an obstacle to teacher reflective practice. Additionally, Mälkki and Lindblom-Ylänne (2012) pointed to students' expectation as a significant factor challenging teachers' reflective practice. According to them, students sometimes are reluctant to reflective education due to their tendency to "the kind of learning environment they are used to, based on their histories as students" (p. 47). Students' discipline as well as prior experience and familiarity with reflective approach could potentially facilitate the actualization of reflective teaching. It is noteworthy that the application of reflective teaching is more plausible in less populated classrooms in which more discipline and motivation exist. The fourth broad category of barriers refers to political limitations and pressures. Such obstacles have been warned about in the literature. Akbari (2008a) referred to social and political barriers as challenges to postmethod pedagogy. Kumaravadivelu (2006) pointed to ideological barriers, imposed by political, economic, and cultural forces that are in favour of unequal power relations and marginalization. It is important to be realistic and avoid exaggeration and perfectionism in discussing teachers' role; however, reflective teachers can peacefully raise awareness about ideological issues and play a part in reducing the hegemonic power of education. Finally, the last category of inhibiting factors refers to parents' expectations. Along with principals and students, parents might have certain beliefs and expectations that might be contradictory to teachers' reflective practice. In such situations, informing parents about the advantages of reflective teaching and its role in promoting teaching effectiveness could be fruitful.

It is noteworthy that this study had some limitations. The participants were selected through convenience sampling from five provinces of Iran, and this could lower representativeness. It is suggested that this study gets replicated with a wide range of participants coming from various provinces. It is hoped that this study has shed some light on the areas that should be prioritized in surmounting the obstacles to reflective teaching and could act as a positive step towards mitigating EFL educational problems.

References

Akbari, R. (2007). Reflections on reflection: A critical appraisal of reflective practices in L2 teacher education. *System, 35*(2), 192-207.

Akbari, R. (2008a). Postmethod discourse and practice. *TESOL Quarterly*, *42*(4), 641-652.

Akbari, R. (2008b). Transforming lives: Introducing critical pedagogy into ELT classrooms. *ELT Journal, 62*(3), 276-283.

Akbari, R., Behzadpour, F., & Dadvand, B. (2010). Development of English language teaching reflection inventory. *System, 38*(2), 211-227.

Akbari, R., Kiany, G. R., Naeeni, M., & Allvar, N. (2008). Teachers' teaching styles, sense of efficacy and reflectivity as correlates of students' achievement outcomes. *IJAL, 11*(1), 1-27.

Allwright, R. L. (1991*). The death of the method.* Lancaster, England: The Exploratory Practice Centre.

Aukland, R. (1991). A review of the peer coaching literature. *Journal of Staff Development, 12*(1), 22–27.

Bailey, K. M. (1997). Reflective teaching: Situating our stories. *Asian Journal of English Language Teaching*, *7*(1), 1-19.

Baleghizadeh, S., & Javidanmehr, Z. (2014). Exploring EFL teachers' reflectivity and their sense of self-efficacy. *E-International Journal of Educational Research*, *5*(3), 19-38.

Bartlett, L. (1990). Teacher development through reflective teaching. *Second Language Teacher Education,* 202-214.

Bolton, G. (2010). *Reflective practice: Writing and professional development.* London: Sage.

Brandt, C. (2008). Integrating feedback and reflection in teacher preparation. *ELT Journal, 62*(1), 37–46.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101.

Crandall, J. (2000). Language teacher education. *Annual Review of Applied Linguistics, 20*, 34-55.

Dewey, J. (1933). *How we think*. Boston: D.C. Heath.

Eslami, Z. R., & Fatahi, A. (2008). Teachers' sense of self-efficacy, English proficiency, and instructional strategies: A study of nonnative EFL teachers in Iran. *TESL-EJ*, *11*(4), 1-19.

Farrell, T. S. C. (1998). ESL/EFL teacher development through journal writing. *RELC, 29*(1), 92-109.

Farrell, T. S. C. (2008). *Teaching reading to English language learners: A reflective guide*. CA: Corwin Press.

Farrell, T. S. C. (2016). Surviving the transition shock in the first year of teaching through reflective practice. *System*, *61*, 12-19.

Freeman, D., & Richards, J. C. (1993). Conceptions of teaching and the education of second language teachers. *TESOL Quarterly*, *27*(2), 193-216.

Freire, P. (1972). *Pedagogy of the oppressed*. Harmondsworth, United Kingdom: Penguin Books.

Giroux, H. A. (1988). *Schooling and the struggle for public life: Critical pedagogy in the modern age.* Minneapolis: University of Minnesota Press.

Gore, J. M., & Zeichner, K. M. (1991). Action research and reflective teaching in pre-service teacher education: A case study from the United States. *Teaching and Teacher Education, 7*(2), 119-136.

Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education, 18*(1), 73-85.

Johnson, K. E. (2006). The sociocultural turn and its challenges for second language teacher education. *TESOL Quarterly, 40*(1), 235-257.

Johnson, K. E. (2009). *Second language teacher education*. NY: Routledge.

Kumaravadivelu, B. (2003). *Beyond methods: Macrostrategies for language teaching*. London: Yale University Press.

Kumaravadivelu, B. (2006). *Understanding language teaching: From method to postmethod*. Mahwah, NJ: Lawrence Erlbaum Associates.

Lee, I. (2007). Preparing pre-service English teachers for reflective practice. *ELT Journal, 61*(4), 321-329.

Liou, H. C. (2001). Reflective practice in a pre-service teacher education program for high school English teachers in Taiwan, ROC. *System, 29*(2), 197-208.

Mälkki, K. & Lindblom-Ylänne, S. (2012). From reflection to action? Barriers and bridges between higher education teachers' thoughts and actions. *Studies in Higher Education, 37*(1), 33-50.

McLaren. P. (1995). *Critical pedagogy and predatory culture*. London: Routledge.

Mehrmohammadi, M. (2004). Teacher classroom research: Reflection on a nation-wide experience in Iran. *Journal of Humanities, 11*(3), 133-144.

Minott, M. A. (2010). Reflective teaching and how it aids in coping with heavy workloads, mandated Policies and disagreements with colleagues. *Current Issues in Education, 13*(1). 1-29.

Moradkhani, S., & Shirazizadeh, M. (2017). Context-based variations in EFL teachers' reflection: The case of public schools versus private institutes in Iran. *Reflective Practice*, *18*(2), 206-218.

Pacheco, A. Q. (2005). Reflective teaching and its impact on foreign language teaching. *Revista Electrónica "Actualidades Investigativas en Educación", 5*, 1-19.

Pennycook, A. (1989). The concept of method, interested knowledge, and the politics of language teaching. *TESOL Quarterly, 23*(4), 589-618.

Prabhu, N. S. (1990). There is no best method, why. *TESOL Quarterly, 24*(2), 161-176.

Rahimi, A., & Chabok, S. (2013). EFL teachers' levels of reflective teaching and their conceptions of teaching and learning. *Journal of Advanced Social Research, 3*(1), 12-29.

Richards, J. C., & Lockhart, C. (1994). *Reflective teaching in second language classrooms*. Cambridge University Press.

Sangani, H. R., & Stelma, J. (2012). Reflective practice in developing world contexts: A general review of literature and a specific consideration of an Iranian experience. *Professional Development in Education*, *38*(1), 113-129.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. NY: Basic Books.

Simon, R. (1984). Signposts for a critical pedagogy. *Educational Theory, 34*(4), 379-388.

Simon, R. (1987). Empowerment as a pedagogy of possibility. *Language Arts, 6*, 370-383.

Soodmand Afshar, H., & Farahani, M. (2018). Inhibitors to EFL teachers' reflective teaching and EFL learners' reflective thinking and the role of teaching experience and academic degree in reflection perception. *Reflective Practice*, *19*(1), 46-67.

Sowa, P. A. (2009). Understanding our learners and developing reflective practice: Conducting action research with English language learners. *Teaching and Teacher Education*, *25*(8), 1026-1032.

Stern, H. H. (1992). *Issues and options in language teaching*. Oxford University Press.

Taghilou, M. R. (2007). From reflective teaching to effective learning: A new class order. *Iranian Journal of Language Studies, 1*(2), 15-26.

Valencia, S. W., & Killion, J. P. (1988). Overcoming obstacles to teacher change: Direction from school-based efforts. *Journal of Staff Development, 9*(2), 168–174.

Wallace, M. J. (1991). *Training foreign language teachers: A reflective approach*. Cambridge University Press.

Eurasian Journal of Educational Research 77 (2018) 145-162

Eurasian Journal of Educational Research
www.ejer.com.tr

Missions of Future Curricula for Realizing the Visions of Iranian Higher Education on the horizon, 2025

Hamid ABDI[1], Seyed Ebrahim Mirshah JA'FARI[2], Mohammad Reza NILI[3], Saeid RAJAEIPOUR[4]

ARTICLE INFO

Article History
Received: 25 Dec. 2017
Received in revised form: 05 May. 2018
Accepted: 03 Sept. 2018
DOI: 10.14689/ejer.2018.77.8

Keywords
Higher education, missions of future curricula, sustainability, upstream resources, visions of higher education

ABSTRACT

Problem Statement: To Iranian policy makers, higher education plays a key role in realizing the country's development visions. This has led to the mapping of visions of higher education in upstream resources. In this regard, curriculum is an essential tool for higher education to fulfil its functions optimally. However, despite its significance, the clarification of the missions of future curricula is almost entirely neglected in Iran as the subject of research. **Purpose of Study:** This study aimed to clarify the missions of future curricula of Iranian higher education based on the visions of the country's higher education on the horizon of 2025 (Iran's 20-Year Vision Plan). **Research Methods:** The present research was developmental in terms of purpose, and was conducted through a combined exploratory method in the academic year 2014-15. The qualitative method was used to analyse the qualitative content of the upstream resources (e.g., artefacts and policy documents) as well as interviews with 14 experts from higher education. In addition, the quantitative method was used to collect data from 338 faculty members and PhD students. In this research, the data obtained from qualitative content analysis of the interviews was used to build the questionnaire. **Findings:** Findings indicated that the emphasis on research and technological functions, alongside that of education and service, pursues the goal of translating the knowledge acquired in the country into product. The results also revealed that, the approach to future curricula is society-oriented, and the accountability to the society should be at the centre of strategies of curriculum development. **Implications for Research and Practice:** The present study emphasized making Iranian universities more mission-oriented and aligned with the realization of higher education perspectives as well as the realization of sustainable development through following the established missions for the curriculum.

[1] Department of Education, University of Isfahan, IRAN, e-mail: Habdi63@Gmail.com,ORCID: https://orcid.org/0000-0003-0568-7123
[2] Corresponding author, Department of Education, University of Isfahan, IRAN, e-mail: Jafari@edu.ui.ac.ir, ORCID: https://orcid.org/ 0000-0002-9137-4336
[3] Department of Education, University of Isfahan, IRAN, e-mail: m.nili.a@edu.ui.ac.ir,ORCID: https://orcid.org/ 0000-0003-2265-9810
[4] Department of Education, University of Isfahan, IRAN, e-mail: S.rajaipour@edu.ui.ac.ir,ORCID: https://orcid.org/0000-0002-0232-6616

Introduction

Today, governments are aware of the crucial and vital role of higher education in advancing the national and international goals and pay special attention to the quality of the programs of higher education. As they consider higher education as the most important system for realizing a desired future, they formulate visions for this system. These visions are regarded as indicators to ensure the effectiveness and efficiency of higher education (Antonakis & Hooijberg, 2007). Without a clear vision, higher education institutions lose their concentration, which in turn makes it difficult to move towards the path of improvement (Waas, Verbruggen & Wright, 2010; Wright, 2010).

In order to understand vision, a clear definition would be useful. A vision can be defined as a picture of what an organization wants to become and what it finally wants to achieve (Hitt, Ireland & Hoskisson, 2011). It is not only an estimation of the future but also decision-making for the future. It indicates an appropriate and desirable future to which an organization can direct its studies and activities (Yoon, 2006). To realize its visions, an organization also needs to decide on the required instruments.

An essential instrument for a higher education organization to realize its vision is curriculum (Ratcliff, 1996). It is one of the main sub-systems of higher education, and it naturally undergoes changes when universities change their main topics of interest (Khaghanizadeh & Fathi Vajargah, 2008). Curriculum as the heart of a higher education system follows the policies taken by universities and helps to realize them. As a tool in the hands of higher education leaders, it is used to plan either to meet future changes or to change the future. The adopted purpose affects the approach taken to curriculum planning (Darden, 2009). Thus, a curriculum planner in higher education needs to be familiar with curriculum planning research to recognize the future possibilities depicted through visions of higher education as well as to consider them in the process of curriculum planning and development.

Before dealing with implementation procedures, a curriculum planner should decide on the components of the curriculum, such as, objectives, content, learning activities, teacher's role, materials and resources, grouping, location, time and assessment. Akker (2010) also adds "rationale" to the components of a curriculum is important. The rationale makes all the other components of the curriculum connect to each other around a major orientation point. It answers the question of why each component should be included in the curriculum. From this viewpoint, the rationale serves as the major mission of the curriculum (Thijs & Akker, 2009), acting as a component that gives orientation to the process of decision-making in curriculum planning and development.

The clarification of the missions of future curricula of higher education toward realizing the ideals and visions of higher education is a fundamental issue, especially for those involved in the field of higher education in Iran. On the one hand, because of the social demand for higher education from the younger generation in Iran, higher education is supposed to play a vital role in realizing the country's development visions. Thus, the planning of effective curricula should be based on the visions of higher education. On the other hand, pursuant to the regulations of the Iranian

Ministry of Science, Research and Technology (MoSRaT, 1999), some higher education institutions have the authority to review or modify the curricula approved by the ministry. This might cause inconsistencies among the higher education institutions, so clarification of the missions could prevent these inconsistencies by providing the higher education institutions with a general principle and framework for curriculum planning.

However, despite its significance, the clarification of the missions of future curricula is almost entirely neglected in Iran as a subject of research. There are just a few studies that have examined the general aspect of future higher education (Mehdi, 2013; Ferasatkhah, 2013), and there is no research that deals directly with the future study of curricula based on the visions of higher education. Therefore, the present research intends to answer the following questions:

1. What are the Iranian visions of higher education on the horizon of 2025?
2. What are the missions (e.g., rationales) of future curricula in Iranian higher education based on the orientations of upstream resources?
3. How do faculty members and PhD students prioritize the missions (e.g., rationales) of future curricula for higher education?

Method

Research Design

The present study was developmental in terms of purpose (Desai and Potter, 2006: 3), and was conducted through a combined exploratory method. Through mixed method research, qualitative and quantitative tools are used and in its exploratory type, qualitative data was used to build a quantitative scale (Creswell & Plano Clark, 2007). In this regard, in the first stage, by analysing the qualitative content of the upstream resources, higher education perspectives were extracted. In the next stage, by interviewing experts from higher education, the mission of the future higher education curriculum based on the perspectives was clarified. In the third step, a quantitative (e.g., descriptive-survey research) method was used to collect data from faculty members and Ph.D. students concerning the mission of future higher education curriculum. In this research, the data obtained from the qualitative content analysis of the interviews was used to build the questionnaire.

Population and Sampling Method

The first statistical population for this present research included the upstream resources that had been oriented toward the visions of higher education. From this population, seven upstream resources were selected using the purposive sampling technique and then analysed qualitatively. These were Iran's 20-Year Vision Plan (2005), Science and Technology Development Document (2009), Comprehensive Scientific Map (2011), General Policies of the Government for Development of Science and Technology (2004), Islamic University Document (2013), General Policies for Science and Technology (2014), and the Sixth Plan of Development (2015). These

resources were chosen because they could provide a more accurate answer to the first research question (e.g., clarification of the visions of higher education).

The second statistical population of the research consisted of Iranian experts in higher education and curriculum development. From this population, 14 experts were purposefully selected because they had valuable information about the subject of the research, and often had a position in management, policy-making of science and technology, higher education planning and curriculum development within the field of higher education. They participated in a semi-structured interview regarding the orientation of future curricula in order to realize the visions of Iranian higher education, and a theoretical saturation was obtained.

The third statistical population of the research was full-time faculty members and PhD students during the 2015-16 academic years at the University of Isfahan, which consisted of 2699 people (e.g., 2042 PhD students and 657 faculty members). From this population, 338 people were determined as the sufficient sample size according to the Morgan table. Then using stratified random sampling and according to the proportion of the faculty members and PhD students in the population, a total of 256 PhD students and 82 faculty members were selected to participate in the research and answer the research questionnaire.

Instrumentation

A content analysis form and an interview form were used to collect the qualitative data. The content analysis form of upstream resources contained the components of vision as well as the related aspects to examine them, and the interview form included questions about the missions of future curricula based on the visions of higher education. The content and face validity of the forms were evaluated by using six experts' comments. To this end, the primary drafts of the forms were modified and corrected by the experts, and then they confirmed the final forms. The reliability of the forms was also evaluated via the inter-coder reliability method. To this end, the summary of the materials and the categories obtained from analysis of the upstream resources and semi-structured interviews were examined and confirmed by five people who were familiar with qualitative research methods. The extracted codes and categories, in the next phase, were corrected according to the comments of six higher education experts who had also evaluated the validity of the forms. The corrected version was again reviewed and confirmed by the experts.

To collect the quantitative data, an 8-item researcher made questionnaire on the missions of future curricula of Iranian higher education was compiled based on the findings of the qualitative content analysis from the interviews. The questionnaire asked the respondents to rate each item in terms of its priority for future curricula based on the visions of Iranian higher education. The validity of the questionnaire was evaluated and confirmed by six higher education experts who had also evaluated the validity of the forms. The final Cronbach's alpha coefficient for the questionnaire was equal to 0.77.

Data Collection

In the first qualitative part of the research, the content of the upstream resources was analysed in order to extract the codes and categories. In the second qualitative part of the research, 14 experts of higher education and curriculum planning were asked to answer the questions on the orientations of future curricula based on the visions of Iranian higher education on the horizon of 2025.

The quantitative data was collected through the questionnaires, and because there was a possibility of not returning or not completing the questionnaires, the questionnaires were distributed among the greater number of respondents than the sample size. By setting the unreturned and uncompleted questionnaires aside, 338 fully completed questionnaires (e.g., equal to the sample size) were obtained.

Data Analysis

The method of qualitative content analysis was used to analyse the qualitative data and to extract the categories. For analysing the interviews, the texts of the interviews were first explored in order to find the meaningful sentences. Then the major categories of the missions of future curricula of higher education were determined. Finally, descriptive statistics (e.g., mean and standard deviation) and inferential statistics (e.g., Friedman test for ranking) were used to analyse the quantitative data.

Results

In this section, the findings related to the three research questions are presented and discussed under three main headings. The findings are illustrated by using tables and incorporating selected excerpts from the interviews.

The Visions of Iranian Higher Education on the Horizon of 2025

To identify the visions of Iranian higher education, the content of the upstream resources that had orientations towards the visions of higher education were subjected to analysis. To this end, the texts of the documents and policies were explored accurately, and 69 codes were extracted in the first level. After analysing the content of the codes and combining the duplicated codes of a resource with one another, 52 codes and 43 codes were obtained in the second and third levels, respectively. Accordingly, the major categories of the visions (e.g., education, research and service) were obtained based on three functions of higher education. In each category, more important and general issues were specified separately and considered as the subcategories of the visions of higher education. Table 1 indicates the results of the qualitative content analysis from the upstream resources with respect to the visions of higher education.

Table 1
Qualitative Content Analysis of The Upstream Resources With Respect to The Visions of Iranian Higher Education on The Horizon of 2025

Category	Subcategory	Code
Education	1. To develop lifelong learning, 2. To achieve educational equity, 3. To develop and promote Human Sciences, 4. To consider cultural values, 5. To benefit from efficient professors.	1. Lifelong learning opportunities (1), 2. Access to information and knowledge for all people (1), 3. To develop the higher education system qualitatively and quantitatively (7), 4. To develop and promote Human Sciences (2, 5 & 7), 5. To clarify and develop the Islamic world culture (3), 6. To benefit from wise, religious, justice-wanting and open-minded professors educated in the school of Islam and the Islamic Revolution of Iran (3 & 7), 7. Responsible professors in political, social and economic arenas (3), 8. Professors able to educate religious and committed experts and top scientists (3), 9. Professors advocating the Islamic Revolution of Iran (3 & 7), 10. Professors active in research (3), 11. Professors producing beneficial knowledge (3), 12. Sciences based on religious and divine teachings and the principles of the Islamic Revolution of Iran (2 & 3), 13. To recruit talented and motivated faculty members (5 & 7), 14. Professors capable of producing educational content based on Islam (3), 15. To promote the professors' status and to improve their quality of life (7), 16. To consider Persian language and literature (7), 17. To educate world's top scientists (4).
Research	1. To consider religious and cultural values in the production and development of technology, 2. To lead the frontiers of knowledge and technology in the world, 3. To benefit from efficient human resources in the arena of research and technology, 4. To benefit from efficient scientific and technological institutions and networks, 5. To develop the software movement, 6. To emphasize developmental and applied research in higher education.	1. Capable of producing and developing science, technology and innovation (4, 6, 5 & 7), 2. To lead the frontiers of science and technology with scientific authority in the world (4), 3. Efficient scientific and technological institutions and networks (1), 4. The first status of science and technology in the Middle East (1 & 7), 5. Universities and research institutes leading in the production of knowledge (3), 6. To expand applied knowledge and sciences based on divine attitude (3), 7. To lead the software movement (3), 8. To educate and recruit creative researchers capable of resolving scientific and international challenges (3), 9. To interact with the seminary (3 & 7), 10. To strengthen the links between the higher education system and applied and developmental research (7), 11. To lead the new technologies (1 & 6).

Table 1 Continue

Category	Subcategory	Code
Service	1. To benefit from rich social and cultural capitals, 2. To improve the quality of people's lives, 3. To create positive changes in people's attitudes to life.	1. To benefit from competent humans educated in the school of Islam and the Islamic Revolution of Iran (3 & 4), 2. Graduates generating wealth and national sovereignty (1), 3. A society benefiting from rich social and cultural capitals (1), 4. Rational, open-minded and creative graduates (3), 5. Graduates with high scientific and national self-confidence (3), 6. Graduates capable of providing Iran with academic independence and self-sufficiency (3), 7. Graduates benefiting from the Iranian-Islamic civilization-making identity (3, 6 &10), 8. Graduates committed to the ideals of the Islamic Revolution and the Islamic Republic of Iran (3), 9. A model society of the Iranian-Islamic lifestyle (3), 10. A society relying on the contribution of human resources and social capital to the national production (6), 11. A society relying on its own ethical principles and Islamic values (6), 12. To promote religious democracy (6), 13. To expand social justice (6), 14. To develop Iran (6 & 7), 15. To benefit from social security (6).

1. Science and Technology Development Document 2009, 2. The Sixth Plan of Development 2015, 3. Islamic University Document 2013, 4. Comprehensive Scientific Map 2011, 5. General Policies for Science and Technology 2014, 6. Iran's 20-Year Vision Plan 2005, 7. General Policies of the Government for Development of Science and Technology 2004.

As can be seen in Table 1, the categories, subcategories and codes are presented separately in each column. The categories in fact refer to three arms of higher education for realizing its objectives. The subcategories represent the more important and general issues of the codes or a combination of several codes. The codes reflect the statements from the upstream resources. The number in front of each code in parentheses refers to the number of the upstream resources listed beneath the table.

The Missions (e.g., Rationales) of Future Curricula of Iranian Higher Education

To clarify the missions of future curricula of Iranian higher education, 14 experts of higher education were interviewed. The texts of the interviews were explored several times to identify the meaningful sentences, and 78 statements (e.g., codes) were extracted. After analysing the contents of the statements, 56 and 39 statements were obtained in the second and third levels, respectively. Accordingly, four major categories were identified as the missions of future curricula. Table 2 indicates these categories and the related statistics.

Table 2
The Most Important Categories of The Missions (Rationales) of Future Curricula of Iranian Higher Education

Variable	No.	Category	Frequency	Percentage
Missions (Rationales)	1	The social missions	14	100
	2	The economic missions	12	85
	3	The cultural missions	10	71
	4	The environmental missions	9	64

In the following, the viewpoints of the interviewees regarding each of the categories of the missions of future curricula of Iranian higher education will be briefly presented.

The Social Missions

All the interviewees (e.g., *n*=14/100 percent) considered the social missions as the most important missions for the future curricula of Iranian higher education. The higher education system has been involved in major social changes because of the necessities of the present era (e.g., the era of information explosion). To cope with these changes, it has relied on its curricula. In this regard, one of the interviewees said:

> *The huge amount of knowledge and information and the rapid changes of science and technology have had an enormous impact on the society. Thus, the higher education system should resort to its curricula in order to manage this amount of information and knowledge, to utilize them efficiently, and to educate the correct way of using the new technologies. One of the missions of future curricula of higher education is to prepare the learners for facing the future challenging and competitive environment. The higher education system, via its curricula, should provide the learners with the kind of education required to cope with the process of globalization and social communication networking.*

The experts believed that future curricula of higher education should create a learning community in order to keep in line with the global developments in the field of science and technology. For instance, one of the interviewees noted:

> *Future curricula of higher education should make people familiar with the skills and values of continuous and lifelong learning and institutionalize the culture of such learning. They should provide equal opportunities of learning for all members of the society, enable the equalization of the quality of education at various universities and finally pave the way for social justice.*

From the perspectives of the participants of the research, the other mission of future curricula is to develop social capital. This is important because social capital is latent in the relationships between individuals and requires the participation and cooperation of the members of the society. It is thus regarded as one of the fundamental factors in the formation and growth of development and thus promotion of the quality of people's life. In this line, one of the interviewees stated:

> *By educating the general skills such as teamwork and social participation and trust via its curricula, the higher education system can act as a very important institution in creating a sense of collective identity and citizenship as well as a sense of belonging to a shared future, all of which are the manifestations of social capital.*

Also another participant who had many publications in Iranian higher education, suggested:

> *One of the missions of future curricula for higher education is to raise the intellectual level of people. Due to the social changes caused by the requirements of the present era, people must have a wide understanding and insight into the social problems in order to analyse them in an appropriate manner.*

All the interviewees considered the above-mentioned missions as top priorities, and from their views, it can be perceived that one of the important missions of future curricula of higher education is to address the emerging social issues as well as the major issues concerning the future of the society.

The Economic Missions

Twelve interviewees (e.g., 85 percent) addressed the economic missions of future curricula in Iranian higher education. From the viewpoints of the research participants, one of the principal missions of future curricula is to educate and prepare students for job requirements of the future labour market. In this regard, one of the interviewees said:

> *To keep pace with the changes of the future labour market, the higher education system should review its courses and curricula in order to promote up-to-date technical and specialized knowledge and skills. In addition to providing education that lead to university degrees, the higher education institutions should offer skill-learning and educational courses needed for specific jobs.*

Other participants of the study believed that people need to gain an understanding that their individual interests should be in line with the economic interests of the society, and this requires the higher education system to provide the appropriate education in this regard via its curricula. To their views, developing a knowledge-based economy could be considered as one of the missions of future curricula toward realizing the visions of higher education. In this respect, one of the participants maintained:

> *In order to realize the resistive economy and to emphasize the domestic economy, we should appreciate the process of translating science into product and the utilization of our own knowledge. This is made possible by creating a knowledge-based economy and considering its principles in future curricula of the country's higher education.*

According to the concerns expressed by the participants of the present research, it can be said that one of the missions of future curricula is to synchronize higher education with the economic developments of the society and to improve the economic condition of the society.

The Cultural Missions

Ten interviewees (e.g., 71 percent) referred to the cultural missions of future curricula of Iranian higher education. Above all, the education offered by the society affects the values, beliefs and behaviours of the people more than anything else does. According to the participants of the research, cultural values confirmed by the society as well as cultural innovations are transferred in the society through education, especially higher education via the curricula. For instance, one of the participants said in this respect:

> *The wide range of students at different levels provide higher education with the best opportunity to influence the people's attitudes with respect to values, beliefs and behaviours as well as the cultural and historical continuity of the society which are regarded as the cultural grounds for sustainable development.*

Another participant of the research suggested:

> *The roles of the curricula are manifested through their contribution to higher education in fulfilling its tasks with respect to major cultural and value needs of the society. Higher education should be active in institutionalizing and educating expert human resources committed to ethical and Islamic values, and it should contribute to cultural unity and consensus. This is primarily made possible through the existence of efficient curricula throughout higher education.*

One of the major features in the remarks above is the role of the curricula in creating a sense of national identity and moral solidarity and order in the society. Higher education can also contribute to the cultural power of the society in the international arena through the presentation of efficient curricula. In this connection, another participant who had several years of management and executive experience in the field of culture in the Iranian higher education, asserted:

> *In order to stay dynamic and to make progress on the global stage, higher education should address cultural interaction with other cultures of different nations. The cultural interaction through the curricula is considered an opportunity for higher education to promote and expand indigenous culture and values in the global arena. In addition to promoting scientific exchanges on the international stage and adapting modern sciences, higher education should not overlook the maintenance the local cultural values.*

With careful consideration of the statements by the experts, it seems that it is vital to synchronize higher education with the changes of cultural forces of the society, and the experts agreed that the curricula has a crucial role in this regard.

The Environmental Missions

Nine interviewees (e.g., 64 percent) noted the environmental missions of future curricula of Iranian higher education. The education offered through the curricula could change students' attitudes towards the environment and help them to understand its value. In this respect, one of the participants believed:

> *Incorporating educations about the environment in future, curricula could be considered an opportunity to shape the students' views toward achieving the goals of sustainable development. Currently, environmental issues are not addressed in the curricula of higher education. However, health and the environment are closely interdependent. In order to improve the health of the society, the materials on ecosystems should be included in future curricula of higher education.*

Another participant who was a member of the group responsible for formulating the Iranian Comprehensive Scientific Map, said in this regard:

> *The higher education has a fundamental mission to offer educations related to the preservation of natural resources. This role of higher education is often overlooked. The society expects higher education to provide the appropriate ground for using clean technologies and reducing the environmental pollutants by offering the related educations through its curricula.*

Based on what these two experts expressed, it seems that environmental issues were absent in the current curricula of Iranian higher education. Thus, from the perspectives

of the participants of this study, one of the missions of future curricula is to pay special attention to the environmental issues.

The prioritization of the Missions (e.g., Rationales) of Future Curricula of Iranian Higher Education

Based on the qualitative content analysis of the interviews, an 8-item questionnaire was compiled and 338 faculty members and PhD students from the University of Isfahan were asked to rate the eight missions of future curricula in view of their priority for realizing the visions of Iranian higher education. After gathering the data from the questionnaires, the Friedman test was used for ranking the missions. The results of this test are shown in Table 3.

Table 3
Friedman Test Results for The Ranking of The Missions of Future Curricula of Iranian Higher Education (n=338)

Rank	Missions of Future Curricula	Mean	Standard Deviation	Mean Rank	Chi-square
1st	To develop social capital	4.86	0.37	5.10	
2nd	To realize major cultural and value needs of the society	4.79	0.44	4.83	
3rd	To develop a knowledge-based economy	4.75	0.51	4.74	
4th	To educate the learners for job requirements of the future labour market	4.75	0.47	4.72	
5th	To pay special attention to the environment	4.74	0.47	4.64	186.854* Sig: 0.000
6th	To create equal and continuous learning opportunities for all members of the society	4.58	0.60	4.07	
6th	To emphasize the international scientific and cultural exchanges while maintaining and expanding the local Islamic and cultural values	4.58	0.57	4.07	
7th	To prepare the learners for facing the future technological and challenging environment	4.52	0.59	3.85	

*ρ<0.05

As Table 3 indicates, the value of Chi-square (= 186.85) is significant at the level of 0.05 (ρ<0.05). According to the results, "to develop social capital", " to realize major cultural and value needs of the society", and "to develop a knowledge-based economy" are of the highest priority, and "to prepare the learners for facing the future technological and challenging environment" is of the lowest priority from the viewpoints of the faculty members and PhD students. "To create equal and continuous learning opportunities for all members of the society" and "to emphasize the international scientific and cultural exchanges while maintaining and expanding the local Islamic and cultural values" were jointly prioritized at the 6th rank.

Discussion, Conclusion and Recommendations

With regard to the visions of Iranian higher education on the horizon of 2025, the results showed that the upstream resources put special emphasis on the development of science and technology as the vision of higher education. This vision could play an important role in higher education planning. The Iranian society has concerns about holding a proper scientific position in the region and the world as well as contributing to the production of knowledge in the global arena. Thus, the emphasis on research and technological functions, alongside with education and service, pursues the goal of translating the knowledge acquired in the country into product. Indeed, translation of science into product is the focal point of the Iranian society, and many efforts are being made in this respect.

As for the missions of future curricula in Iranian higher education based on the visions of the country's higher education on the horizon of 2025, the results indicated that, from the viewpoints of Iranian higher education experts, the missions can be considered from four perspectives; social, economic, cultural and environmental. In other words, future curricula need to address the social, economic, cultural and environmental aspects of the society. The results also revealed that the experts paid more attention to the social missions of future curricula than in the other missions.

In this regard, it should be noted that Iran is a country that has experienced an Islamic revolution in 1979 and is in the process of strengthening the modern state. Social justice, liberty, focusing on social capital, social cohesion, and in general, the establishment of a civil society are among the fundamental demands of this revolution, which fit into the form of social development. Therefore, attention to the social aspect is a priority and is of high importance in Iranian society, which has been emphasized by higher education professionals in this research as well as reflected in the curriculum of higher education. Since the social aspect was given more importance by experts than other aspects, such as economic, cultural and environmental aspects, it seems to provide the context for the realization of other aspects. For example, the growth of social capital was one of the most important factors in the formation, development and improvement of life quality of individuals as expressed by experts in the present study. Social capital can be seen as the result of trust-based relationships in the society. Without social capital, other capitals do not seem to be used optimally, and the realization of the ideals of 1979 revolution, which is the concern of Iranian community, will not be possible. In general, and on the international scene, social capital can in fact afford all the requirements that are necessary for the development, in particular, the rapid development of society. Therefore, that proper utilization of social capital in the development process will boost the country's political, economic, social and cultural dimensions.

The ranking of the missions of future curricula of Iranian higher education based on the views of the faculty members and PhD students revealed that the first priority was "to develop social capital". The first priority was also considered by Iranian science and technology policy-makers as one of the visions of Iranian higher education on the horizon of 2025, so that higher education can be considered as the most important

indicator of social capital. The development of social capital; however, requires the all-encompassing development of cognition, values and skills, and thus the education of general skills and competencies. In present day Iranian society, while the education of expertise and professional skills has become increasingly prevalent, the education of general skills has been neglected. Hence, the education of general skills and competencies should be emphasized in future curricula of higher education. Moreover, it should be noted that the ranking of the missions does not suggest that the missions with lower ranks are not important. Rather, all the missions are of significance and should be considered by Iranian higher education policy-makers. The ranking only indicates the order of priorities, from the perspectives of the Iranian faculty members and PhD students, based on the conditions and requirements of Iranian higher education and the expectations from the Iranian higher education system.

Given that, in the eyes of the experts, the missions of future curricula of higher education involve a comprehensive consideration of the society in its various aspects, it can be said that the approach to future curricula is society-oriented, and the accountability to the society should be at the centre of strategies of curriculum development. Indeed, the accountability of higher education to the society is regarded as one of the quality indicators of higher education. In the same line, Garraway (2016) argues that one of the attributes of the modern university is increasing the expectation that according to which the curriculum should be more responsible to the society. Also in a research project in Walden University, Yob et al., (2016) attempted to develop a curriculum guide for social change. To this end, they aligned university curriculum with a mission of creating positive social change. The guide provides a strong analysis of when and how to include social change in the curriculum of different levels.

Moreover, considering the links between the social, economic and cultural aspects and the environment, it can be said that the most important mission of future curricula within Iranian higher education is, "to realize sustainable development". In other words, future curricula could facilitate the realization of the visions envisaged for Iranian higher education on the horizon of 2025 through the realization of sustainable development. Sustainable development and sustainability is a plan for thinking about the future and addresses the qualitative development with respect to the environment and social justice (Barlett & Chase, 2004). In this present research, sustainable development refers to the all-embracing national development in social, economic, cultural and environmental aspects. Undoubtedly, sustainable development is an issue of concern among higher education institutions around the world. Many universities worldwide have made a commitment to sustainable development (Lozano et al., 2013), and as a result, have been recognized as vital organizations for the growth of sustainable development (Waas, Verbruggen & Wright, 2010; Shephard, 2010). According to Krizek et al., (2012), during the last two decades, sustainable development has been a central issue of higher education globally. Glasser, Calder and Fadeeva (2005) believe that as higher education institutions are complex systems, integrating sustainable development is essential across all of their activities and missions.

Regarding the missions of higher education curriculum in Iran, an important point to be taken into consideration by policymakers and practitioners of higher education is a special focus on the environment, which has to be considered in the curriculum along with social, economic and cultural missions. In Iran's current higher education curriculum, despite the high importance of the environment in sustainable development, no proper attention has been paid to it. However, from the viewpoint of the experts in this study, according to the current needs of Iranian society, more importance has been devoted to other missions, including the social one, but the situation of biological disasters and its future crisis is a serious issue not only for Iran, but also for the international community. Today, in advanced higher education systems in the world, emphasis on the environment is prioritized in higher education curricula. For example, in universities and colleges in the United States, there is a high commitment to the environment and its inclusion in the curriculum for sustainable development. However, the comparison between the higher education systems of Iranian society with other societies is not correct in terms of the social, cultural and economic conditions in each society, but paying attention to international policies is essential for internationalization of higher education and curriculum as well as keeping pace with the developments of the world. In fact, today in the global arena, the effects of higher education on the environment provide key points in the formulation of policies and higher education activities in line with the principles of sustainable development (Ragazzi & Ghidini, 2017).

As the halfway point of the 20-year perspective (e.g., 2005 to 2025) elapses, although the impact of upstream resources on the curriculum of higher education has always been low, it should be acknowledged that this impact has appeared well in some areas. The most important examples which are mentioned in upstream resources of higher education and its policies are; paying attention to Islamic and national values in the curriculum, the orientation of curriculum towards developmental and technological research (e.g., converting science to product), the expansion of higher education and the organization of theses towards applied research, production and enrichment of educational environments with technological equipment, using software and hardware in curriculum, teaching citizenship rights, and promoting people's insight and awareness towards issues in the present situation of the society and the international situation. Another major influence of upstream resources on Iran's higher education curriculum during the last decade was the popularization of educational opportunities. The popularization of educational opportunities is one of the major political goals that, in most countries of the world, the ruling powers accept it at least in the principles. The development of awareness and insight of the people is a means of realizing social justice that can be achieved through higher education. This is possible, as the experts in the present study have argued, through the creation of learning community and accessibility to all. The realization of social justice through equal opportunities for access to higher education is a key element in achieving the ideals of the Iran horizons of 2025 and is one of the basic concerns of Iranian society and their priority for sustainable development. Iran's higher education system has taken strong steps to provide appropriate ground for positive impact of upstream resources on higher education curricula by adopting measures such as:

Authorizing the establishment of new disciplines and training courses based on the orientations of upstream resources and realization of sustainable development of the country; decentralization and further empowerment of universities in the formulation of their curriculum in other parts of the country, taking advantage of all national experts` views to develop a general framework for higher education curriculum and accommodation of curriculum with the latest scientific developments in disciplines.

The findings of this research have several implications for Iranian higher education policy-making. Firstly, the Iranian universities should be appropriately directed toward realizing the visions of higher education by following the specified missions of curricula. Secondly, research and educational universities should be specified in the Iranian higher education system, and the missions of curricula as well as research areas of each research university should be clearly specified. Finally, the Iranian higher education system with its various university systems needs fundamental reform. Various university systems, including State, Islamic Azad, Payam-e Noor, Applied Science and Technology, and Vocational should be organized based on the specific missions of curricula in order to avoid the confusion of missions.

References

Akker, J. V. D. (2010). Curriculum design research. In J. V. D. Akker, B. Bannan, E. Kelly, N. Nieveen, & T. Plomp, (Ed.), *An introduction to educational design research* (3rd print). Enschede: Netzodruk.

Antonakis, J., & Hooijberg, R. (2007). Cascading vision for real commitment. In R. Hooijberg, J. G. Hunt, J. Antonakis, K. B. Boal, & N. Lane, (Eds.), *Being there even when you are not: Leading through strategy, structures, and systems*, (Vol. 4) (pp. 235-249). Elsevier Science: Amsterdam.

Barlett, P. F., & Chase, G. W. (2004). *Sustainability on campus: Stories and strategies for change*. MIT Press: Cambridge.

Creswell, J., & Plano Clark, V. (2007). *Designing and conducting mixed methods research*. Thousand Oaks: Sage.

Darden, M. L. (2009). *Beyond 2020: Envisioning the future of universities in America*. Rowman & Littlefield Education: New York.

Desai, V., & Potter, R. B. (2006). *Doing development research*. SAGE Publication Ltd, p. 3.

Expediency Discernment Council. (2004). *General policies of the government for development of science and technology*. Retrieved

http://ppc.alzahra.ac.ir/Portals/0/siyasathaeh%20koli.pdf

Expediency Discernment Council. (2005). *Iran's 20-year vision plan based on the policies issued by the supreme leader*. Retrieved from http://vceducation.kums.ac.ir/kums_content/media/image/2016/11/94249_orig.pdf

Ferasatkhah, M. (2013). A conceptual framework for future thinking-based planning at university. *Quarterly Journal of Research and Planning in Higher Education*, 69, 1-26.

Garraway, J. (2016). Future-orientated approaches to curriculum development: Fictive scripting. *Higher Education Research & Development, 36*(1), 102-115.

Glasser, H., Calder, W., & Fadeeva, Z. (2005). *Definition: Research in higher education for sustainability*. Halifax, Nova Scotia, Halifax Consultation: Canada.

Hitt, M., Ireland, R., & Hoskisson, R. (2011). *Strategic management*. Mason, South-Western Cengage Learning: US.

Khaghanizadeh, M., & Fathi Vajargah, K. (2008). University curriculum patterns. *Scientific Journal of Education Strategies in Medical Sciences*, *1*(2), 10-18.

Krizek, K., Newport, D., White, J., & Townsend, A. (2012). Higher education's sustainability imperative: how to practically respond? *International Journal of Sustainability in Higher Education*, *13*(1), 19-33.

Lozano, R., Lukman, R., Lozano, F., Huisingh, D., & Lambrechts, W. (2013). Declarations for sustainability in higher education: Becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, *48*, 10-19.

Management and Planning Organization of Iran. (2015). *The sixth plan of development based on the policies issued by the supreme leader (under review)*. Retrieved from https://www.yjc.ir/fa/news/5248717.

Mehdi, R. (2013). The future of research in the higher education of the Islamic university, a university consistent with the context and environment. *Iranian Journal of the Knowledge Studies in the Islamic University*, *17*(4), 697-710.

Ministry of Science, Research and Technology. (1999). *The by-law governing the delegation of power on curricula to universities*. Retrieved from https://vpap.um.ac.ir/images/84/baeneme_rizi_darsi/aeen_name/barnamerizi-vagozari1.pdf

Ministry of Science, Research and Technology. (2009). *Science and technology development document based on the policies issued by the supreme leader*. Retrieved from https://strategic.iut.ac.ir/sites/strategic/files/ufiles/t_Sanade%20Tahavol%20%28%2088-6-28%20%29.pdf

Ragazzi, M., & Ghidini, F. (2017). Environmental sustainability of universities: critical analysis of a green ranking. *Energy Procedia*, *119*, 111-120.

Ratcliff, J. L. (1996). What is a curriculum and what should it be? In J. G. Gaff, & J. L. Ratcliff (Ed.), *Handbook of the undergraduate curriculum: A Comprehensive guide to purposes, structures, practices, and change* (pp. 9-10). Jossey Bass Publisher: US.

Shephard, K. (2010). Higher Education's role in education for sustainability. *Australian Universities' Review*, *52*(1), 13-52.

Supreme Council of the Cultural Revolution. (2011). *Iranian comprehensive scientific map based on the policies issued by the supreme leader*. Retrieved from http://www.urmia.ac.ir/sites/www.urmia.ac.ir/files

Supreme Council of the Cultural Revolution. (2013). *Islamic University Document*. Retrieved from http://gbta.sazmansama.org/my_doc/gbtasazmansamaorg/Document%20Islamic%20University%20.pdf

Thijs, A., & Akker, J. V. D. (2009). *Curriculum in development*. Retrieved April 21, 2015, from http://www.slo.nl/downloads/2009/curriculum-in-development.pdf

Waas, T., Verbruggen, A., & Wright, T. (2010). University research for sustainable development: definition and characteristics explored. *Journal of Cleaner Production*, *18*(7), 629-636.

Wright, T. (2010). University presidents' conceptualizations of sustainability in higher education. *International Journal of Sustainability in Higher Education*, *11*(1), 61-73.

Yob, I. M., Danver, S. L., Kristensen, Sh., Schulz, W., Simmons, K., Brashen, H. M., Krysiak, R. S., Kiltz, L., Gatlin, L., Wesson, S., & Penland, D. R. (2016). Curriculum alignment with a mission of social change in higher education. *Innovation Higher Education*, *41*, 203–219.

Yoon, J. (2006). How team leaders use salient vision and self-sacrifice to enhance team effectiveness. In Lawler, E. J., & Thye, S. R. (Ed.), *Social psychology of the workplace* (pp 63- 87). Bingley: Emerald Group Publishing.

Eurasian Journal of Educational Research 77 (2018) 163-184

Eurasian Journal of Educational Research
www.ejer.com.tr

The Possible Effects of 4th Industrial Revolution on Turkish Educational System*

Zeynep Meral TANRIOGEN[1]

ARTICLE INFO

Article History:
Received: 15 Nov. 2017
Received in revised form: 17 Jan. 2018
Accepted: 4 Sept. 2018
DOI: 10.14689/ejer.2018.77.9

Keywords:
Industry 4.0, Autonomous Robots, Internet Of Things, Education 4.0, Big Data, Augmented Reality

ABSTRACT

Purpose: We can see by reviewing the relevant literatüre that only half of the eight characteristics of Industry 4.0 have been studied for education and the other four characteristics still need to be investigated such as "internet of things", "autonomous robots", "cyber physical systems", "vertical and horizontal integrations". The purpose of this research was to determine the possible affects of the eight characteristics of Industry 4.0 on the Turkish Educational System.

Research Method: This research was a qualitative case study designed as a holistic-single case. The data of this study were collected through focus group interviewing. In order to better determine the study group, the maximum variation sampling technique was used as a purposive sampling method. For this purpose, the study group was formed by experienced school managers, assistant principals, teachers working in the education system, and candidate teachers who have yet to experience the teaching profession. It is preferred to use content analysis procedures for understanding the data. **Findings:** Participants' opinions about the possible effects of Industry 4.0; for academic achievement is concentrated mostly on the "Internet of things, Big Data and Cyber Physical Systems"; for the teaching profession is affected greatly by Autonomous Robots and Cyber Physical Systems. **Implications for research and practice:** For the participants' estimations, the eight characteristics of Industry 4.0 will affect communication in school, academic achievement of students, school concept, teaching profession and the future of society. The candidate teachers made further predictions. Researchers need to further study the eight characteristics of Industry 4.0 regarding the effects on academic achievement.

*This study was partly presented at the IVnd International Eurasian Educational Research Congress in Denizli, 11-14 May 2017

[1]Pamukkale University, TURKEY, e-mail: zatogen@gmail.com, ORCID: https://orcid.org/0000-0001-6300-9457

Introduction

The world has witnessed three industrial revolutions. The first improved efficiency with hydropower, steam power and machine tools. The second brought electricity, mass production and assembly lines. The third came with automation through electronics and IT. The fourth industrial revolution is underway and affects how we work and communicate as well as how we express, inform and entertain ourselves. Schwab says (2015) the changes are historic in terms of their size, speed and scope. Governments, institutions, systems of education among many others are being reshaped.

What does Industry 4.0 emphasize? Industry 4.0 emphasizes the idea of consistent digitization and linking of all the productive units in an economy (Blanchet et al., 2014). According to Brettel et al. (2014), the upcoming industrial revolution will be triggered by the Internet, which allows communication between humans as well as machines in Cyber-Physical-Systems (CPS) throughout large networks. New business models will arise. These changes will also strongly influence society and people. Family life, globalization, markets, etc. will have to be redefined (Jazdi, 2014). This is the point where we need to know more about the new revolution.

The 2016 World Economic Forum (WEF) focused on the Fourth Industrial Revolution and described the new generation of technological advances such as robotics, artificial intelligence coming together defining the next wave of progress. These new technologies have the potential to change our lives and to solve many real-world problems. By using technology that is more intelligent, we could connect billions of people and things to the internet.

The discussion at the WEF focused on the negative impacts (e.g., job losses) of these technologies, rather than their positive potential (e.g., connecting billions of people and things). For Schwab (2016) a fearful theme was the potential for job losses. As automation continues to replace manufacturing or blue-collar jobs, artificial intelligence will do the same for skilled, white-collar jobs in banking, law or medicine. Advances in technology at the same time create new jobs, most of which we cannot even dream of today.

Another concern at the WEF was the "dehumanization" of our lives, which is driven by robotics and artificial intelligence. Another issue centred on the ethical and moral challenges of many advances; for example, could machines make positive decisions regarding human lives, such as, a self-driving car making a choice between hitting a pedestrian or sacrificing its passenger? Schwab (2016) says we should figure out how to avoid, or address, the negative, unintended consequences of these changes.

The eight characteristics of Industry 4.0 (Schwab, 2016):

1. Cyber – Physical Systems: Cyber-Physical Systems (CPS) is defined as transformative technologies for managing interconnected systems between its physical assets and computational capabilities, Lee (2015). A cyber-physical structure describes the relationship between humans and a Cyber-Physical System, which is again divided into a physical component and a virtual/digital component (Zamfirescu

et al., 2011). In Industry 4.0, systems will be far more connected to all sub-systems, processes, internal and external objects, as well as, the supplier and customer networks (Blanchet et al., 2014).

2. *Vertical & Horrizontal Integration*: There will be no hierarchy and everything will be equally distributed. It speeds up the flow of information from bottom to top. Everything will have an IP number. The process of production will be made easier.

3. *IoT "Internet of Things"*, (Services, Humans & Everything): At the beginning of the 21st century connectivity was only among the digital world, in Industry 4.0 the digital and real worlds are connected. For Gubbi et al. (2013) in the Internet of Things (IoT) paradigm, many of the objects that surround us will be on the network in one form or another. Machines, systems and human beings will exchange digital information via internet protocol. This means physical things will be linked to their data footprint. Production with interconnected machines becomes virtually seamless. Machines automatically adapt to the production steps. Even the product may communicate when it has been produced and ask to be picked up by a conveyor or send an e-mail to the ordering system.

4. *Autonomous Robots*: Robots already replaced human workers in the last industrial revolution. A number of multipurpose industrial robots have been developed in the Industry 4.0 since 2004. In the future, they will become intelligent, adapt, communicate and interact. In Industry 4.0, robots and humans will work together on interlinking tasks and use smart sensors with human-machine interfaces. These can be controlled remotely and if a problem occurs, the worker will receive a message on his mobile phone, so he can remotely review the problems and provide instructions in order for production to continue until they return to the work site. No more night shifts (Blanchet et al., 2014).

5. *Big Data and Analytics*: Big data analytics is the process of examining large and varied data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful information that can help organizations make more-informed business decisions. Data is often referred to as the raw material of the 21st century. Indeed, the amount of data available to businesses is expected to double every 1.2 years (Blanchet et al., 2014).

6. *The Cloud*: An industrial plant of the future will be producing a huge amount of data that needs to be saved, processed and analysed. The means employed to do this will significantly change. In France, 63% of plant managers consider cyber security crucial to their competitiveness. Innovative methods to handle big data and to tap the potential of cloud computing will create new ways to leverage information (Blanchet et al., 2014).

7. *Augmented Reality*: An enhanced version of reality where direct or indirect views of physical real-world environments will be augmented with superimposed computer-generated images over a user's view of the real world, thus enhancing one's current perception of reality. Augmented reality (AR) can be defined as a technology which overlays virtual objects (augmented components) into the real world (Akcayir,

2017). Manufacturing instructions, real-time reports, messages, quality checks with cameras, and emergency directives will be included.

8. *Cyber Security*: Cyber-security is the protection of internet-connected systems including hardware, software and data, from cyber-attacks (Von Solms, 2013). A more comprehensive security framework, increased communication with access problems, vulnerable to cyber-attacks, and data privacy is critical.

A research review carried out by the National Thesis Centre of the Turkish Council of Higher Education under the heading of Education and Training has been determined that only three out of the eight characteristics of Industry 4.0 defined by Schwaub (2016) have been adequately studied by researchers. Past studies related to "augmented reality" have mostly been studied by researchers from different areas of education including; "computer education and instructional technology" (Akcayir, 2016; Akkus, 2016; Baysan, 2015; Erbas, 2016; Gun, 2014; Kucuk, 2015; Sirakaya, 2015; Yildirim, 2016; Yilmaz, 2014), "physics education" (Abdusselam, 2015; Dilek, 2016) and "science education" (Sahin, 2017). Research related to the Cloud under the title of "education and training" has been carried out by different disciplines including; "Computer Education and Instructional Technology" (Erdemir, 2014; Kaymak, 2015); "Teaching of English" (Yıldız, 2015), and "Distance Education" (Kayabaş, 2017). Only one research in social sciences was determined to be related to Big Data under the heading of "education and training" (Bayrakci, 2015). Although there are some studies related to Cyber Security in the fields of Law, computer Engineering, International Relations and Forensic Medicine, there was no research found associated with "education and training". It has been determined that there are no studies related to the characteristics of Industry 4.0 such as "internet of things", "autonomous robots", "cyber physical systems", "vertical and horizontal integrations" in any subject matter.

Every industrial revolution has changed the social structures of countries around the world. They created their own societies that exhibited the specific characteristics of their own natures. Industry 4.0 will also be expected to create its own society with the before mentioned eight dimensions of itself. The road to education 4.0 could be long and often very difficult. Many students, instructors, parents and stakeholders will choose to stay within the familiar confines of Education. Augmented reality, *Cyber – Physical Systems* etc. will be essential for the success of the teaching profession as well as in the production sectors. This is especially concerning, as the future of education, systems are associated with intellectual imagination, creativity, knowledge production, and innovation. Therefore, researchers should study these eight characteristics in order to anticipate what kind of societies we will exposed in our future lives. As we see by reviewing the relevant literature, only half of these characteristics have been studied and the other four characteristics need to be investigated. The research questions are:

1 - What are the probable effects of Industry 4.0 on the educational system according to the perception of participants?

2 - According to the perception of participants, how the eight characteristics of Industry 4.0 are connected with which characteristics of the education system?

Method

Research Design

This research was a qualitative case study designed as a holistic-single case. Qualitative research studies allow the qualitative processes for realistically and holistically propounding perceptions and events in the natural environment (Yildirim, 2016). The purpose of a case study is to conduct in-depth research on a particular case and to draw conclusions. That is, the factors related to a situation are examined through a holistic approach and focused on how they affect and how it is affected by the related situation. This approach has different forms (e.g., single case, multiple cases). The cases that no one works on or cannot work can be studied using a holistic single case design (Yildirim, 2016). The study of such cases is also important for later investigators in order to uncover a specific topic that was not previously known and to form or guide the work to be done later (Yildirim, 2016). For this purpose, a "holistic single case" design was used in this study.

One of the data-gathering methods, which can be employed within the framework of qualitative research, is the focus group interview. Focus group methodology is a way of collecting qualitative data, typically engaging a small number of people in an informal group discussion focused around a particular topic or a set of issues (Silverman, 2016). In other words, understanding what people think and feel about a topic is the main purpose of focus group interviews. Groups are more creative than individuals, can solve problems faster and can generate more alternatives in a shorter time (Yildirim, 2016). In the focus group process, the participants hear the responses and answers of the other participants, so they add something new to their previously stated views. For this reason, the data collected for this study utilizing the focus group interview technique.

Study Group

The maximum variation (e.g., heterogeneity) sampling technique was used as the purposive sampling method in order to determine the study group. For this purpose, the study group was formed by experienced school managers, assistant principals, teachers working in the education system and prospective teachers who have yet to experience the teaching profession. The study group was selected from the Faculty of Education and Institute of Educational Sciences students who took the course of Educational Administration in the spring semester of 2016-17 academic year. The data for this study were collected through focus group interviewing with 18 randomly selected candidate teachers from Pamukkale University, Faculty of Education, Department of Social Sciences Teaching during the spring semester of the 2016-17 academic year. In addition, 15 randomly selected principals, vice-principals and teachers working for the primary schools in the spring semester of the 2016-17 academic year in Denizli, Turkey. These 15 principals, vice-principals and teachers were also graduate students of the Institute of Educational Sciences at Pamukkale University and had attended several courses related to educational administration. The data were collected from the students of the Department of Social Studies Teaching because, when compared with other departments of Faculty of Education,

social studies teaching was seen as a collection of multiple disciplines. Social studies teaching includes various disciplines as geography, history, values education and so forth. Therefore, the students of this department may have a more sophisticated point of view related to the subject of this research.

Research Instrument and Procedure

A qualitative research model was used for this study and the data of this study were collected through focus group interviewing. The first three industrial revolutions, classical and neo-classical management theories and their effects on educational systems were explained to the 18 candidate social studies teachers, 15 principals, assistant principals and teachers during an educational administration class that lasted for 14 weeks. Afterwards, the class discussed the 4th Industrial Revolution. First of all, the eight characteristics of the 4th Industrial Revolution used by Schwab (2016) including; (1) Cyber physical systems, (2)Vertical-Horizontal Integration (3) Internet of things (4) Autonomous Robots, (5) Big data and Analytics, (6) I-cloud based solutions, (7) Augmented reality and (8) Cyber Security were explained by the researcher. Secondly, the participants were asked to guess the probable effects of these eight characteristics on the educational system. At this stage the focus group were allowed to discuss all dimensions and to exchange their opinions. Finally, the focus group was asked to specify their opinions about the possible effects of 4th Industrial Revolution on educational systems by considering the previous revolutions and their effects. Each member of the focus group was given a number and his or her opinions were registered separately.

The participants' predictions about the effects of these eight characteristics on the educational system have been categorized and organized as tables.

Validity and Reliability

According to Erlandson et al., (1993, cited in Yildirim and Simsek, 2013), in order to provide validity and reliability, some procedures like expert investigation were used. The studies regarding improving the reliability and validity of this research are mentioned below.

In order to increase the internal validity of this research it benefited from an expert with knowledge about the topic and competence of qualitative research methods. All documents about research process (e.g., data, analysis, results) were sent to the expert and some changes were made concerning the expert's feedback.

In order to increase the internal validity of the research, data was re-coded by another expert. The instances where both experts used the same codes were considered as consensus, the situations that the experts used different codes were considered as dissensus. The reliability coefficient for principals, vice-principals and teachers coded answers was 71% and for the candidate teachers coded answers was 70% according to the [Consensus/(Consensus+Dissensus) x 100] (Miles and Huberman, 1994).

Data Analysis

There are many ways of analysing focus group data, for example, through content, thematic, ethnographic, phenomenological, narrative, experimental, biographical,

discourse or conversation analysis. In this study, it was preferred to use content analysis procedures for understanding the data. Content analysis produces a relatively systematic and comprehensive summary or overview of the data set as a whole, sometimes incorporating a quantitative element (Silverman, 2016). In this study, the analysis technique of "content analyse technique" was used.

Data were entered into a computer and all expressions of the participants were coded. When analysing the data a code number was given to each participant. After the coding process, experts determined the themes and categories together. Each characteristics of Industry 4.0 were accepted as themes of the study. Based on the characteristics of Industry 4.0 the following categories emerged, "Communication, School concept, Academic achievement, Teaching profession, and Future of the society". The findings of the research were interpreted under these themes and categories.

Results

In this section, all the findings are provided. The predictions of the participants related to the first characteristic of Industry 4.0, "cyber physical systems" are given in Table 1.

Table 1

The Predictions of The Participants Related to The Theme of "Cyber Physical Systems"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate teachers*
The cooperation will increase among teachers (borders between teachers will collapse; communication will be more effective and faster).	4	Communication	3	The faster feedback will be able to be given.
			2	The teacher will be connected to the classroom by hologram.
The school concept will change (schools will be socializing institutions; the concept of compulsory education will change).	4	School concept	5	There will be no books.
Simulations will help the effectiveness of values education.	6	Academic achievement	10	Simulations make teaching easier.
Personal training will be easier.	5		2	There will be no idle class session.
More time will be given to thinking and the creativity will increase.	3		1	The attention deficit will increase because of the excessive stimulus.
			1	Education will be carried out much easier
Teachers' roles will change	6	Teaching profession	2	Artificial intelligent will end the teaching profession.
The teachers will have less drudgeries.	4		1	The teachers' salaries will decrease due to robots.
We will move away from nature and human beings.	5	Future of the society	1	The empathic skills will develop by means of simulations.

For Table 1 it can be said that the common view of participants about possible effects of Industry 4.0 for cyber physical systems were positive. They estimated that the academic achievement of students will increase with the aid of this dimension in the educational process.

The predictions of the participants related to the second characteristic of Industry 4.0, "vertical-horizontal integration" are given in Table 2.

Table 2

The Predictions of The Participants Related to The Theme of "Vertical-Horizontal Integration"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate Teachers*
The feedback will be very fast and effective; this will ensure that students know themselves more rapidly and education will be more transparent.	5	Communication	5	The horizontal organizational structure will accelerate the communication.
Faculties of education and schools will be restructured.	2	School concept	1	Principals' authority will be decrease.
The measurement and evaluation system in education will be changed and it will be easy to follow all stages of education.	3	Academic achievement	6	The students will be tractable more than ever before.
Teachers will be able to know students better.	3		4	The classroom will have a flexible structure (They can turn into a laboratory and curriculum will be flexible).
Student mistakes will decrease.	2		2	Everybody will be equal.
The gap between rural and urban students will be closed.	2		1	Individual differences will be able to be addressed.

For table 2 the views of the participants about "vertical-horizontal integration" are generally made on the acceleration of communication and academic achievement in the school process. Their opinions on the possible effects of this dimension were positive.

The predictions of the participants related to the third characteristic of Industry 4.0, "internet of things" are given in Table 3.

Table 3

The Predictions of The Participants Related to The Theme of "Internet Of Things"

Principals, Vice principals, Teachers	n	*Categories*	n	*Candidate Teachers*
Because of free communication (without barriers), the effectiveness will increase to 100% among teachers, parents and students.	2	Communication		
All types of documents about students will be recorded and saved.	1	School concept	1	The schools will be unfashionable and everywhere will be school.
School concept will be digitalized.	1		1	The schools will be safer places and students' stuff will not be lost anymore.
The dependability on school will decrease.	1			
Examinations will be removed.	1	Academic achievement	5	The teacher will be able to manage the time in classrooms more effectively.
The speed and depth of learning will increase.	1		4	Students' follow up will be easier for teachers and parents.
			3	There will be no more problems in terms of reaching books.
			2	The written exam will be outdated.
			1	The students will not waste their time taking notes.
			1	The smart tables will be used besides the smart boards.

In table 3, the estimations of the participants about "Internet of Things" were generally made on academic achievement and school concept. The opinions of participants regarding the possible effects of Internet of Things were in positive direction.

The predictions of the participants related to the fourth characteristic of Industry 4.0, "autonomous robots" are given in Table 4.

Table 4

The Predictions of The Participants Related to The Theme of "Autonomous Robots"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate Teachers*
		School concept	12	The robots will replace school employees and some professions will be ended (canteen, cleaning, managing jobs, medical room, nurses, security, and school manager).
			7	The school will begin providing faster services.
			2	The scope of control over students and things will be narrower (tight control, instant detection and intervention).
Unimaginative teachers will lose their jobs	4	Teaching profession	4	The drudgeries of teachers will decrease.
The robots will transfer knowledge but teachers will always exist for the emotional and creative sides of people.	3		4	The robots will do many things better than teachers.
			1	The teaching profession will continue.
Human skills will decline.	4	Future of the society	3	The problem of robot protection will emerge.
People will use their brains rather than their bodies; this will ensure that future generations be more intelligent, a revolution will happen, human beings will move to a higher level and the life span of people will be longer.	3		2	Creativity will be very important for all professions.
Some groups of jobs will disappear.	1		1	Things will not be thrown away because robots will fix them all.
			1	Population will decrease; government will support the reduction of population; education will be free of charge.
			1	The ethics problems between robots and human beings (We will have to protect humans from robots).
			1	We will be longing the life without electricity (The demand of these sectors will increase; a new economy will be created).

In table 4, the estimations of the participants about "autonomous robots" were generally made on the future of the society, teaching profession and school concept.

The predictions of the participants related to the fifth characteristic of Industry 4.0, "big data and analysis" are given in Table 5.

Table 5

The Predictions of The Participants Related to The Theme of "Big Data And Analysis"

Principals, Vice principals, Teachers	*n*	*Categories*	*N*	*Candidate Teachers*
The new jobs will emerge (Directorates of data processing security)	1	School concept	2	It will be possible to adjust courses according to the levels of students; courses will be more flexible.
			2	All courses will evolve.
			1	The importance of mathematics and computer engineering will increase.
			1	Schools will not exist
The truth of knowledge will be the greatest difficulty (right according to whom?),	4	Academic achievement	3	Students will begin to invent new things; they produce the knowledge; their creativity will improve.
It will be very easy to access knowledge. People will not have problems for being expert.	2		1	The synchronization in education will increase (same education in same time).
There will be no textbooks.	1		1	The problem solving skills of students will improve.
			1	The repetition of an unlearned subject in classrooms will be easier.
			1	The anxiety related to knowledge will end.
Teachers' roles and teacher training systems will change (thinking, analysing and inquiring teachers) Teachers need to make knowledge more useful.	9	Teaching profession		

For table 5 the common view of the participants about big data and analyses was related to academic achievement and the positive effects of new industrial revolution. Only the candidate teachers had opinions about the possible effects of big data and analyses on the school concept.

The predictions of the participants related to the sixth characteristic of Industry 4.0, "cloud" are given in Table 6.

Table 6

The Predictions of The Participants Related to The Theme of "Clouds"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate Teachers*
Parents will be able to follow the school day of the students and teachers	7	Communication		
By means of saved data, students will be oriented more effectively.	5	Academic achievement	9	To forget something (memories, courses) will be difficult.
			5	The effectiveness of courses will increase (to complete course deficiencies will be easy; courses will be more flexible)
			4	The improvement of students will be able to be followed step-by-step.
		Future of the society	1	Private life will end.
			1	The nostalgia will increase.

In table 6 the common view of the participants concerning the dimension of Industry 4.0, "clouds" was about the academic achievement of students.

The predictions of the participants related to the seventh characteristic of Industry 4.0, "augmented reality" are given in Table 7.

Table 7

The Predictions of The Participants Related to The Theme of "Augmented Reality"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate Teachers*
Communication between teacher and student will be very fast and instant feedback will be supplied.	3	Communication		
		School Concept	1	The books will evolve.
			1	The school will not stay
Equity of opportunity in education will be achieved	4	Academic achievement	10	Lessons will be supported with 3D (3D makes students see the world in a multi-dimension frame, teachers will save their time)
			7	Permanence will increase
The perception of reality will change; innovations will increase; there will be no material problems.	2	Future of the society	1	The population will decrease.
			1	Ethical problems will arise.

The common view of the participants concerning the dimension of Industry 4.0, "augmented reality" is being about fast communication, which makes teachers save their time and academic achievement of the students.

The predictions of the participants related to the eight characteristics of Industry 4.0, "cyber security" are given in Table 8.

Table 8

The Predictions of The Participants Related to The Theme of "Cyber Security"

Principals, Vice principals, Teachers	*n*	*Categories*	*n*	*Candidate Teachers*
		Academic achievement	1	The mistakes in education will fall farthest (In university entrance exams the number of students who earn zero points in mathematics will be very low)
Security will be achieved by humans and robots together	1	Future of the society	3	The World Wars will begin due to captured information. (not with artillery and rifles)
Above all, there must be a tight control and the security of everything should be controlled.	1		2	People will organize the robots as terrorist groups.
The problem of security will emerge; knowledge theft and cyber terrorism will increase.	1		1	No private life
There will be security engineering.	1			
Universal security rules will be developed.	1			

The common view of the participants concerning the dimension of Industry 4.0, "cyber security" regarded the moral and ethical problems related to educational and social systems.

Discussion, Conclusion and Recommendations

The first question of this research was; "What are the probable effects of Industry 4.0 on the educational system according to the perceptions of participants?" Participants both estimated that academic achievement, school concept, society, teaching profession, and effectiveness of communication in the educational system would be greatly affected by Industry 4.0.

The second question of this research was; "According to the perceptions of participants, how are the eight characteristics of Industry 4.0 connected with which characteristics of the education system?" It has been found that the participants'

opinions about the possible effects of Industry 4.0 on academic achievement concentrated mostly on the Internet of Things, Big Data and Analyses, Cyber Physical Systems, and Augmented Reality. It was seen in the literature that the teacher and students suggested that augmented reality applications increased academic achievement (Akcayir, 2016; Akkus, 2016; Baysan; 2015; Erbas, 2016; Kucuk, 2015; Sahin,2017; Sirakaya, 2015; Yildirim, 2016). The four characteristics of Industry 4.0, which were seen as factors for academic achievement for students by the participants as well as in the literature, only augmented reality and cloud, were seen as a factor for academic achievement. The effect of Internet of Things, Cyber Physical Systems, Big Data and Analyses on the academic achievement of students needs further study by researchers.

Participants' opinions related to changing and affecting the school concept concentrated on the Internet of Things and Big Data. For the social sciences, "Big Data and Analysis" have been used much more post-2012 in comparison with pre-2012 period (Bayrakci, 2015). Participants indicate that, "School concept will be digitalized", because of IoT (Internet of Things). Industry 4.0 emphasizes the idea of consistent digitization and linking of all productive units in an economy (Blanchet et al., 2014). For the participants, school concept will be especially reshaped by the Internet of Things. As seen in the literature, researchers have some results about Big Data and Internet of Things, but the results are not related with school concept. The relationship between school concept and the characteristics of Industry 4.0 need to be studied by future researchers.

Besides academic achievement and school concept, participants estimated that society will change because of Industry 4.0. The estimates of the participants regarding this situation can be found in the literature about Industry 4.0. New business models, work processes and development methods that are currently unimaginable will arise and these changes will strongly influence the society and people. Family life, globalization, markets, etc. will have to be redefined (Jazdi, 2014; Gorecky, 2014; Buhr, 2015). Governments and institutions are being reshaped, as are systems of education, healthcare and transportation, among many others (Schwab, 2015). It has been identified from the results that the predictions of the participants about the future of society, that they believe there will be a remarkable increase in autonomous robots and cyber security.

According to the opinions of the participants about the probable changes in the teaching profession, they also believe it will be affected greatly by Autonomous Robots and Cyber Physical Systems. A consensus regarding the relationship between the teaching profession and Autonomous Robots and Cyber Physical Systems has not been reached in the literature, but Schwab (2015), says governments and institutions are being reshaped, as are systems of education, healthcare and transportation, among many others. These changes are historic in terms of their size, speed and scope. The participants' predictions regarding potential changes in these areas were similar to Schwab (2015).

Participants also predicted the negative effects of Industry 4.0 on systems; such as, humans will move away from nature, the problem of robot protection will emerge, ethics problems between robots and human beings will emerge (e.g., protecting humans from robots), the truth of knowledge will be threatened (e.g., right according to whom?), private life will end, nostalgia will increase, ethical problems will arise, the World Wars will start due to captured information (e.g., not with artillery and rifles), people will organize robots as terrorist groups, the problem of security will emerge, knowledge theft and cyber terrorism will increase, and there will be no private life. These negative effects are generally emphasized by the participants in relation to Cyber Physical Systems, Autonomous Robots and Cyber Security. Schwab (2016), stated we should figure out how to avoid, or address, the negative, unintended consequences of these changes. Global society – governments, business, academia, and civil society – have a responsibility to work together to better understand the emerging trends. How technology is changing our lives and those of future generations, and how it is reshaping the economic, social, cultural and human context in which we live.

The participants also asserted that the eight characteristics of Industry 4.0 would increase the effectiveness of communication in the educational system. Students stated that augmented reality learning materials would increase the communication between teacher and other students (Sirakaya, 2015). According to experts from industry and research, the upcoming industrial revolution will be triggered by the internet, which allows communication between humans as well as machines in Cyber-Physical-Systems (CPS) over large networks (Brettel et al., 2014). The results showed that cloud-computing technology eases communication (Erdemir, 2014). The two characteristics of Industry 4.0, which were most often mentioned by participants, related to communication effectiveness in schools, and were the cyber physical systems and vertical horizontal integrations. Perceptions of the participants about the relation between communication and characteristics of Industry 4.0 matched with the results from the literature.

The opinions of participants about the "Cloud", such as, "To forget something (e.g., memories, courses) will be difficult", and "The effectiveness of courses will increase" are similar to the results from Yildiz (2015) and Kaymak (2015). The Cloud was also seen as a motivator for academic achievement by the participants as well as in the literature. The participants have made some estimates about the effects of the fourth industrial revolution on education systems and our lives that were not seen in the literature of Industry 4.0.

In conclusion, the predictions of the principals, vice principals, teachers and candidate teachers related to the possible effects of Industry 4.0 on the education system were generally made regarding communication in education, academic achievement of students, the school concept, the teaching profession and future of the society. The candidate teachers made more predictions about the probable effects of Industry 4.0 on the educational system than school principals, vice-principals and teachers. A noticeable finding in this research was that teacher candidates apparently have expressed more foresight related to all dimensions of 4th Industrial Revolution than the group composed of principals, assistant principals and teachers. In order to find out the reason for this finding, the interviewing process and proceedings were re-examined. It was identified that in the group composed of principals, assistant principals and teachers; after specifying the

foresights, the members had stated that "these changes happen, but we cannot see" about the dimensions of "cyber physical systems", "autonomous robots" and "augmented reality". The teacher candidates never made expressions related to all dimensions. It seems that 4th Industrial Revolution is being perceived as very close in the near future by candidate teachers, yet as in the very distant future by the other groups.

Participants did provide positive opinions about the possible effects of Industry 4.0 on the education system. Participants speculated the probable effects of the eight characteristics of Industry 4.0 on the educational system would most likely be focused on academic achievement, school concept and the teaching profession respectively. Participants have a new point of view from the literature of industry 4.0, that empathic skills will develop by means of simulation and equity of opportunity in education will be achieved.

In conclusion, we have learned that he first, second and third Industrial Revolutions' social outcomes and their effects on educational systems can be understood by reading or experiencing them personally. It has not yet been more than ten years since the world took the 4th industrial revolution as a point of consideration. The work on this subject is mostly based on the increases in the automation and production sectors. Studies of what the effects of the 4th Industrial Revolution might have on the education system are very limited. In this study, participants were asked to give their opinions on the future effects of this new revolution. Truth is about the mind; for example, the one in the mind and the one that the mind produces, so technically speaking… the "proposition" (Arslan, 2017). The validity of the suggestions made by participants; such as, "many professions will come to an end", will ultimately be tested in our lifetimes and the future beyond. Reality is about the subject of proposition (Arslan, 2017). The fourth Industrial Revolution, which is the subject of the participants' suggestions, is real and accepted by the perceptions of the participants, and as a result, their foresight may help us to shape our future.

Educational philosophies form the basis of educational systems. Educational philosophy answers people's questions about how and what to be taught. It is obvious that any educational philosophy will be based on an opinion of what is good for human beings (Arslan, 2017). It seems that the autonomous robots, augmented reality, and cyber physical systems that will enter our life because of the 4th Industrial Revolution, will cause changes to the answers about what and how to teach people, and as a result, an emerging philosophy of education will be expected to redefine school, the teaching profession and offer new models of education.

Recommendations

The effect of Internet of Things, Cyber Physical Systems, Big Data and Analyses to academic achievement of students needs further study by both current and future researchers. The relationship between school concept and the characteristics of Industry 4.0 also needs further study by researchers. Importantly, global society – governments, business, academia, and civil society – have a responsibility to work together to better understand these emerging trends.

References

Abdusselam, M. S. (2015). *Artırılmış gerçeklik ortamı kullanılarak fizik dersi manyetizma konusunda öğretim materyalinin geliştirilmesi ve değerlendirilmesi* [Development and evaluation of an instructional material for physic lesson magnetism subject based on augmented reality environment]. (Unpublished Doctoral Dissertation), Karadeniz Technical University, Institute of Educational Sciences, Secondary Education Science and Mathematics Teaching, Physics Education, Trabzon.

Akcayir, M. (2016). *Fen laboratuvarında artırılmış gerçeklik uygulamalarının üniversite öğrencilerinin laboratuvar becerilerine, tutumlarına ve görev yüklerine etkisi* [The effect of augmented reality applications on university students' laboratory skills, attitudes and task loads]. (Unpublished Doctoral Dissertation), Gazi University, Institute of Educational Sciences, Computer Education and Instructional Technology, Ankara.

Akcayir, M., & Akcayir, G. (2017). Eğitimde artırılmış gerçekliğin avantajları ve dezavantajları: Literatüre sistematik bir bakış [Advantages and challenges associated with augmented reality for education: A systematic review of the literature]. *Educational Research Review*, *20*, 1-11.

Akkus, I. (2016). *Bilgisayar destekli teknik resim dersinde artırılmış gerçeklik uygulamalarının makine mühendisliği öğrencilerinin akademik başarısına ve uzamsal yeteneklerine etkisi* [Effects of augmented reality applications on mechanical engineering freshmen's level of academic achievement and spatial ability in computer aided technical drawing]. (Unpublished Master Thesis), Inonu University, Institute of Educational Sciences, Computer Education and Instructional Technology, Malatya.

Arslan, A. (2017). *Felsefeye giris* [Introducing Phylosophy]. 25. Basım. Ankara: BB101 Yayınları.

Bayrakci, S. (2015). *Sosyal bilimlerdeki akademik çalışmalarda büyük veri kullanımı* [The use of big data in academic researches in social sciences]. (Unpublished Master Thesis), Marmara University, Institute of Social Sciences, Department of Journalism, Information Sciences, İstanbul.

Baysan, E. (2015). *Arttırılmış gerçeklik kitap (AG-kitap) kullanımının öğrencilerin akademik başarısına etkisi ve ortamla ilgili öğrenci görüşleri* [The impact of augmented reality book (AR-book) usage on the students' academic achievements and students' reviews on it]. (Unpublished Master Thesis), Gazi University, Institute of Educational Sciences, Computer Education and Instructional Technology, Ankara.

Blanchet, M., Rinn, T., Von Thaden, G., & De Thieulloy, G. (2014). Industry 4.0: The new industrial revolution-How Europe will succeed. *Hg. v. Roland Berger Strategy Consultants GmbH. München. Abgerufen am 11.05. 2014, unter http://www.rolandberger. com/media/pdf/Roland_Berger_TAB_Industry_4_0_2014 0403. pdf*.

Brettel, M., Friederichsen, N., Keller, M., & Rosenberg, M. (2014). How virtualization, decentralization and network building change the manufacturing landscape: An Industry 4.0 Perspective. *International Journal of Mechanical, Industrial Science and Engineering,* 8(1), 37-44.

Buhr, D. (2015). Social innovation policy for industry 4.0. Friedrich-Ebert-Stiftung, *Division for Social and Economic Policies*, Bonn.

Dilek, U. (2016). *Kinematik deneylerinde kullanılmak üzere bir mobil uygulamanın geliştirilmesi* [Development of a mobile application for use in kinematics experiments]. (Unpublished Master Thesis), Dokuz Eylul University, Institute of Educational Sciences, Secondary Education Science and Mathematics Teaching, Physics Education, İzmir.

Erbas, C. (2016). *Mobil artırılmış gerçeklik uygulamalarının öğrencilerin akademik başarı ve motivasyonuna etkisi* [The effects of mobile augmented reality applications on students' academic achievement and motivation]. (Unpublished Master Thesis), Suleyman Demirel University, Institute of Educational Sciences, Computer Education and Instructional Technology, Isparta.

Erdemir, T. (2014). *Uzaktan eğitimde bulut bilişim teknolojileri ile proje tabanlı öğrenme uygulaması* [The application of project-based learning with cloud computing technologies in distance education]. (Unpublished Master Thesis), Karadeniz Technic University, Institute of Educational Sciences, Teaching of Computer and Teaching Technologies, Trabzon.

Gorecky, D., Schmitt, M., Loskyll, M., & Zühlke, D. (2014, July). Human-machine-interaction in the industry 4.0 era. In 2014 12th IEEE *International Conference on Industrial Informatics* (INDIN) (pp. 289-294). IEEE.

Gubbi, J., Buyya, R., Marusic, S., & Palaniswami, M. (2013). Internet of Things (IoT): A vision, architectural elements, and future directions. *Future Generation Computer Systems*, *29*(7), 1645-1660.

Gun, E. (2014). *Effects of augmented reality applications on students' spatial abilities.* (Unpublished Master Thesis), Gazi University, Institute of Educational Sciences, Computer Education and Instructional Technologies, Ankara.

Jazdi, N. (2014, May). Cyber physical systems in the context of Industry 4.0. In Automation, Quality and Testing, Robotics, *2014 IEEE International Conference* on (pp. 1-4). IEEE.

Kayabas, I. (2017). *Açık ve uzaktan öğrenmede öğrenme analitikleri kontrol panelinin geliştirilmesi: Öğrenme Bulutu* [Development of learning analytics dashboard in open and distance learning: Learning Cloud]. *(*Unpublished Doctoral Dissertation), Anadolu University, Institute of Social Sciences, Department of Distance Education, Eskisehir.

Kaymak, Z. D. (2015). *Bulut bilişim araçlarının, çalışma türünün ve görev zorluğunun bilişsel yük ve öğrenme üzerindeki etkisi* [Effects of cloud computing tools, study type and task difficulty on cognitive load and learning]. (Unpublished

Doctoral Dissertation), Sakarya University, Institute of Educational Sciences, Computer Education and Instructional Technologies Sakarya.

Kucuk, S. (2015). *Mobil artırılmış gerçeklikle anatomi öğreniminin tıp öğrencilerinin akademik başarıları ile bilişsel yüklerine etkisi ve öğrencilerin uygulamaya yönelik görüşleri* [Effects of learning anatomy via mobile augmented reality on medical students' academic achievement, cognitive load, and views toward implementation]. (Unpublished Doctoral Dissertation), Ataturk University, Institute of Educational Sciences, Computer Education and Instructional Technologies Erzurum.

Lee, J., Bagheri, B., & Kao, H. A. (2015). A cyber-physical systems architecture for industry 4.0-based manufacturing systems. *Manufacturing Letters*, *3*, 18-23.

Miles, M.B. & Huberman, M.A. (1994). *An expanded sourcebook qualitative data analysis*. London, Sage.

Sahin, D. (2017). *Artırılmış gerçeklik teknolojisi ile yapılan fen öğretiminin ortaokul öğrencilerinin başarılarına ve derse karşı tutumlarına etkisi* [Effect of science teaching with the augmented reality technology on secondary school students' achievement and their attitude towards the course]. (Unpublished Master Thesis), Ataturk University, Institute of Educational Sciences, Department of Mathematics and Science Education, Erzurum.

Schwab, K. (2015, December 12). The Fourth Industrial Revolution: What It Means and How to Respond? *University of Denver, Forreign Affairs*. https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution

Schwab K. (2016, February 2). Could the Fourth Industrial Revolution help us reach the Global Goals? *GlobalAgenda, Davos*. http://www.weforum.org/agenda/2016/02/davos.

Silverman, D. (2016). *Qualitative research*. Sage Publications Inc., California.

Sirakaya, M. (2015). *Artırılmış gerçeklik uygulamalarının öğrencilerin akademik başarıları, kavram yanılgıları ve derse katılımlarına etkisi* [Effects of augmented reality applications on students' achievement, misconceptions and course engagement]. (Unpublished Doctoral Dissertation), Gazi University, Institute of Educational Sciences, Computer Education and Instructional Technologies Ankara.

Yildirim, A., & Simsek, H. (2016). *Sosyal bilimlerde nitel arastırma yontemleri* [Qualitative research methods in the social sciences]. Ankara, Seçkin.

Yildirim, S. (2016). *Fen Bilimleri dersinde artırılmış gerçeklik uygulamalarının öğrencilerin başarısına, motivasyonuna, problem çözme becerilerine yönelik algısına ve tutumlarına etkisi* [The impact of augmented reality to student's success, motivation, and their perception and behavior related to problem solving abilities in science classes]. (Unpublished Master Thesis), Ankara University,

Institute of Educational Sciences, Department of Computer Education and Instructional Technologies, Educational Technologies, Ankara.

Yildiz, D. (2015). *Ortaokul yedinci sınıf İngilizce dersinde okuma öncesi etkinliklerde sözcük bulutu kullanımının kelime öğrenmeye etkisi* [The effect of word cloud on learning vocabulary at pre-reading activities in the seventh grade English course]. (Unpublished Master Thesis), Afyon Kocatepe University, Institute of Social Sciences, Department of Educational Sciences, Afyon.

Yilmaz, R. M. (2014). *Artırılmış gerçeklik teknolojisiyle 3 boyutlu hikâye canlandırmanın hikâye kurgulama becerisine ve yaratıcılığa etkisi* [Effects of three-dimensional storytelling developed with augmented reality technology on narrative skill and creativity]. (Unpublished Doctoral Dissertation), Ataturk University, Institute of Educational Sciences, Computer Education and Instructional Technologies Erzurum.

Von Solms, R., & Van Niekerk, J. (2013). From information security to cyber security. *Computers & Security*, *38*, 97-102.

Zamfirescu C.B., Pirvu B.C., Schlick J. & Zühlke D. (2011). Preliminary insides for an anthropocentric cyber-physical reference architecture of the smart factory. *Studies in Informatics and Control* Vol. 22 No. 3.

4. Endüstri Devriminin Türk Eğitim Sistemi Üzerine Olası Etkileri

Atıf:

Tanriogen, Z. M. (2018). The possible effects of 4th industrial revolution on Turkish educational system. *Eurasian Journal of Educational Research*, *77, 163-184,* DOI: 10.14689/ejer.2018.77.9

Özet

***Problem Durumu*:** Endüstriyel devrimler sonrası ülkeler küresel boyutta yaşanan değişimlere ayak uydurmak zorunda kalmış ve bazı stratejiler geliştirmişlerdir. Almanya'da gündeme gelen dördüncü endüstri devrimi de bu stratejilerden birinin adıdır.Önceki endüstri devrimleri; insanoğlunu hayvan gücü kullanımından özgürleştirmiş, büyük miktarlarda üretimi mümkün kılmış ve milyonlarca insana dijital olanakları ulaştırmıştır. Ne var ki dördüncü endüstri devrimi esasen farklıdır. Öyle bir devrimin başlangıcında oluduğumuz öngörülmektedir ki bu temel olarak bizim yaşama şeklimizi, işimizi ve diğerleriyle kurduğumuz ilşetişimimizi değiştirecektir. Yeni icat edilen teknolojilerin geliştirilmesi ve adaptasyonu etrafındaki köklü belirsizlikler, bunların karmaşıklığı ve sektörler arasındaki bağlantı eksikliği global toplumun – hükümetler, işletmeler, üniversiteler ve sivil toplumlar- tüm paydaşlarının ortaya çıkan yeni eğilimleri daha iyi anlamak için birlikte çalışma sorumluluğuna sahip olmaları

gerektiğini düşündürmektedir. Türkiye Yüksek Öğretim Kurumu, Ulusal Tez Merkezi'nde, Eğitim ve Öğretim başlığı altında 2014 ve 2017 yılları arasında tarama yapıldığında Schwab (2016) tarafından tanımlanmış Endüstri 4.0'ın sekiz karakteristik özelliğinden üçü "artırılmış gerçeklik, bulut ve büyük veri" hakkında araştırma yapıldığı tespit edilmiştir. Siber güvenlik ile ilgili diğer alanlarda (adli tıp, uluslararası ilişkiler vb.) çalışmalar yapılmış fakat eğitim ve öğretim başlığı altında bir çalışmaya rastlanmamıştır. Nesnelerin interneti, özerk robotlar, siber fiziksel sistemler, vertical and horizontal integrations ile ilgili eğitim ve öğretim alanı da dahil olmak üzere hiçbir alanda yapılmış çalışma bulunmamaktadır. Araştırmanın cevap aranan soruları:

1-Katılımcıların algılarına göre Endüstri 4.0'ın eğitim sistemi üzerine olası etkileri nelerdir?
2-Katılımcıların algılarına göre Endüstri 4.0'ın sekiz karakteristik özelliği ile eğitim sisteminin hangi özellikleri arasında ilişki kurulmuştur?

Araştırmanın Amacı: Bu araştırmanın amacı Endüstri 4.0'ın Türk Eğitim Sistemi üzerine olası etkilerini; müdürlerin, müdür yardımcılarının, öğretmenlerin ve öğretmen adaylarının görüşlerine göre ortaya koymaktır.

Araştırmanın Yöntemi: Araştırma nitel araştırma desenlerinden durum çalışması deseninde olup, bütüncül tekli durum çalışmasıdır. Araştırmada çalışma grubunu belirlemek için amaçlı örnekleme yöntemlerinden maximum çeşitlilik örneklemesi kullanılmıştır. Bu amaçla çalışma grubu eğitim sisteminde çalışan deneyimli müdür, müdür yardımcısı, öğretmenler ile henüz öğretmenlik mesleğinde deneyimi olmayan öğretmen adaylarından oluşturulmuştur. Araştırmanın verileri rastgele seçilen 2016-2017 öğretim yılında Denizli'de görev yapmakta olan 15 müdür, müdür yardımcısı, öğretmen ve 2016-2017 öğretim yılı Bahar döneminde Pamukkale Üniversitesi Eğitim Fakültesi Sosyal Bilgiler Öğretmenliği Bölümü'ne devam etmekte olan 18 öğretmen adayından odak grup görüşmesi yöntemi kullanılarak toplanmıştır. Araştırma sırasında Endüstri 4.0'ın sekiz anahtar kavramı katılımcılara açıklanmış ve bu anahtar kavramların Türk Eğitim Sistemine olası etkilerinin neler olabileceği sorulmuştur. Daha sonra katılımcıların cevapları kategorize edilmiştir.

Araştırmanın Bulguları: Öğretmen adaylarının Endüstri 4.0'ın eğitim sistemine olası etkileri ile ilgili okul müdürleri, müdür yardımcıları ve öğretmenlere göre tahminleri daha fazla olmuştur. Katılımcılar Endüstri 4.0'ın eğitim sistemine olası etkilerine ilişkin daha çok olumlu yönde görüş bildirmişlerdir. Katılımcılar Endüstri 4.0'nun sekiz karakteristik özelliğinin eğitim sistemine olası etkilerine ilişkin sırasıyla en çok akademik başarı, okulun yapısı, toplumun geleceği ve öğretmenlik mesleği hakkında tahminlerde bulunmuşlardır. Katılımcıların Endüstri 4.0'ın akademik başarı üzerine olumlu etkisine ilişkin görüşlerinin Nesnelerin İnterneti'nde yoğunlaştığı Büyük Veri ve Siber Fiziksel Sistemler'in de takip ettiği görülmektedir. Katılımcıların okulun yapısının etkileneceği ve değişeceğine ilişkin görüşlerinin daha çok Nesnelerin İnterneti ve Büyük Veri için ortaya çıktığı görülmektedir. Toplumun geleceğine ilişkin tahminlerin ise Özerk Robotlar ve Siber Güvenlik için gözle görülür bir şekilde arttığı tespit edilmiştir. Katılımcıların öğretmenlik mesleğinde ortaya çıkabilecek değişimlere ilişkin görüşlerinin Özerk Robotlar ve Siber Fiziksel Sistemler'de toplandığı görülmektedir.

Katılımcılar Endüstri 4.0'ın eğitime olumsuz etkilerini de görmektedir. Bu görüşlerin daha çok Siber Fiziksel Sistemler, Özerk Robotlar ve Siber Güvenlik için ifade edildiği anlaşılmaktadır. Ayrıca katılımcılar Endüstri 4.0'ın, sekiz karakteristik özelliğinin eğitim sisteminde iletişimin etkililiğini artıracağına ilişkin de görüş bildirmişlerdir. Siber fiziksel sistemler ve Dikey-Yatay bütünleşme okuldaki iletişimin etkililiği ile ilgili en fazla görüş bildirdikleri iki özellik olmuştur. Katılımcıların diğer görüşlerine göre değerler eğitimi ve empati becerisini geliştirmek hiç olmadığı kadar kolay olacak. Fırsat eşitliği sağlanabilecek, dünya nüfusu azalacak, geçmişe ve elektriksiz hayata özlem artacaktır.

Araştırmanın Sonuçları ve Önerileri: Bu araştırmada müdürlerin, müdür yardımcılarının, öğretmenlerin ve öğrencilerin görüşlerine göre Endüstri 4.0'ın Türk Eğitim Sistemi üzerine olası etkileri ortaya konmaya çalışılmıştır. Katılımcılar ındustry 4.0'nun 8 characteristic özelliğinin eğitim sistemine olası etkilerine ilişkin sırasıyla en çok akademik başarı, okulun yapısı, toplumun geleceği ve öğretmenlik mesleği hakkında tahminlerde bulunmuşlardır. Öğretmen adaylarının ındustry 4.0 nun eğitim sistemine olası etkileri ile ilgili okul müdürleri, müdür yardımcıları ve öğretmenlere göre tahminlerinin sayıca daha fazla olduğu görülmüştür. Katılımcılar Industry 4.0'nun eğitim sistemine olası etkilerine ilişkin daha çok olumlu yönde görüş bildirmişlerdir. Katılımcıların tahminlerine göre Endüstri 4.0'ın karakteristik özellikleri akademik başarıyı olumlu yönde etkileyecektir. Katılımcıların Endüstri 4.0'ın siber fizksel sistemler boyutuna ilişkin görüşleri simülasyonların öğretimi kolaylaştıracağı, öğretmenlik rolünün ve okul kavramının değişeceği yönünde olmuştur. Dikey-Yatay bütünleşme boyutu için katılımcıların görüşü okul sürecinde iletişimin hızlanacağı şeklinde olmuştur. Birbirlerinden farklı olarak şeffaf eğitim ve esnek sınıf yapısı üzerinde durmuşlardır. Şeylerin interneti boyutunda katılımcılar okuldaki iletişimin etkililiği ve yazılı sınavların son bulacağı konusunda görüş birliğine varmışlardır. Özerk robotlar boyutunda bazı meslek gruplarının ortadan kalkacağı ve yaratıcılığa olan ihtiyaç konusunda ortak görüş bildirmişlerdir. Aday öğretmenlerin elektriksiz hayatın özleneceği, nüfusun düşeceği, nesnelerin robotlar tarafından tamir edileceği hiçbir şeyin atılmayacağı konusundaki görüşlerine literatürde rastlanmamasına karşın dikkat çekici bulunmuştur. Büyük veri ve analizi boyutuna ilişkin bilginin üretimi ve kullanışlı hala getirilmesi ortak görüş olarak ortaya çıkmıştır. Okulların ve ders kitaplarının varlığı konusundaki endişeleri dikkat çekici bulunmuştur. Bulut boyutuna ilişkin katılımcıların ortak görüşü öğrencilerin yüzsek düzeyde izlenebilirliği olmuştur. Arttırılmış gerçeklik boyutuna ilişkin ortak görüş öğretmenlerin zamandan tasarruf etmelerini sağlayacak hızlı iletişim üzerinedir. Siber güvenlik boyutunda eğitim ve sosyal sistemler hakkındaki moral ve etik sorunlar ortak görüş olarak belirmiştir. Endüstri 4.0'ın sekiz karakteristik özelliğinin herbiri ile akademik başarı arasındaki ilişkiler anlaşılmaya çalışılmalıdır. Nesnelerin interneti, Siber Fiziksel Sistemler, Büyük veri ve analizi'nin öğrencilerin akademik başarılarına etkilerinin araştırmacılar tarafından ortaya konmasına ihtiyaç olduğu düşünülmektedir. Okul kavramı ve Endüstri 4.0'ın karakteristik özellikleri arasındaki ilişkilerin gelecek araştımalarda çalışılmasına ihtiyaç bulunmaktadır.

Anahtar Kelimeler: Endüstri 4.0, Özerk Robotlar, Nesnelerin İnterneti, Bulut, Büyük Veri ve Analizi, Artırılmış Gerçeklik.

Submission Checklist

Makale Sunumu Kontrol Çizelgesi

Indicate that this submission is ready to be considered by this journal by checking off the following.

Aday makalenin değerlendirilmeye hazır olduğunu aşağıdakilerin her biri ile karşılaştırarak kontrol ediniz.

Manuscript Agreement:

I/We hereby accept that, the article after being accepted for publication in the Eurasian Journal of Educational Research (EJER), the author (s) as, all rights related to the article has been transferred to the ANI PUBLISHING under the laws of the, "copyright transfer".

Makale Eurasian Journal of Educational Research (EJER) dergisinde basıma kabul edildikten sonra, yazar(lar) olarak; makale ile ilgili tüm hakları, "Telif Hakkı Devir" yasaları uyarınca, ANI YAYINCILIK'A devrettiğimizi kabul ediyoruz.

Manuscript Submission:

I have prepared my manuscript based on the criteria listed below and I accept all submission conditions.

Makalemi aşağıda belirtilen kriterlere göre hazırladım ve makale gönderme koşullarının tamamını kabul ediyorum.

Indicate that this submission is ready to be considered by this journal by checking off the following.

Aday makalenin değerlendirilmeye hazır olduğunu aşağıdakilerin her biri ile karşılaştırarak kontrol ediniz.

1	☒	*The manuscript is a report of original educational research or a discussion article on research topics in education.*

		Aday makale, eğitim alanıyla doğrudan ilgili bir araştırma ya da tartışma yazısıdır.
2	☒	*The submission has not been previously published, nor sent to another journal for consideration.* Sunulan çalışma daha önce herhangi bir yerde yayınlanmamıştır, başka bir derginin incelemesinde değildir.
3	☒	*Within a year, I have not submitted a manuscript to EJER as an author or co-author for review other than this manuscript.* Son bir yıl içerisinde, yazarı olduğum ya da yazarları arasında bulunduğum başka bir çalışma değerlendirilmek üzere EJER'e sunulmamıştır.
4	☒	*All authors of this manuscript are subscribers of the EJER and accept to pay 3**00 EURO** for the cost of proofreading and 10 loose copies of their articles if the manuscript is accepted.* Aday makalenin kabul edilip basılması halinde makalelerinin İngilizce son okuma (proofreading) ve 10 serbest kopya gönderimi nedeniyle oluşan **1275 TL** maliyeti Anı Yayıncılık'a ödemeyi kabul ederler.
5	☒	*The entire manuscript is written in English.* Aday makalenin bütününün yazım dili İngilizce'dir.
6	☒	*The original manuscript is typed on A4 paper. The margins are 2.5 cm.* Aday makale kenar boşlukları 2.5 cm olan A4 kağıda yazılmıştır.
7	☒	*Each paragraph is longer than two sentences.* Her bir paragraf en az üç cümle içermektedir.
8	☒	*The entire manuscript - including quotations, references, author note, content footnotes, figure captions, and all parts of tables – is double-spaced.* Aday makalenin tamamı, alıntılar, kaynakça, şekil ve tablo başlıkları da dâhil olmak üzere çift aralıklı yazılmıştır.
9	☒	*The submission file is in Microsoft Word document file format. 12-point Times New Roman font is used in entire manuscript.*

		Aday makale, tamamında 12 punto Times New Roman yazı tipi kullanılarak hazırlanmış bir Microsoft Word dokümanıdır.
10	☒	*The text has had the authors' names removed. If an author is cited, "Author" and year are used in the bibliography and footnotes, instead of author's name, paper title, etc. The author's name has also been removed from the attached document.* **Aday makale, yazar adları çıkarılarak sunulmuştur**. Eğer yazar kendisine atıfta bulunduysa yazarın adına ve çalışma başlığına yer verilmeyecek, sadece "Author" yazılarak çalışmanın yılı belirtilecektir. Eklenen dosyada yazar adı belirtilmeyecektir.
11	☒	*The title is 10 to 12 words.* Aday makalenin başlığı 10-12 sözcük uzunluğundadır.
12	☒	*The maximum length of the manuscript-including structured abstract in English, tables, and references is 6000 words. This limitation does not include Turkish extended abstract (750-1000 words) which is placed after the references section.* Aday makale, İngilizce abstract, tablolar ve kaynakça vb. tüm ögeler dâhil olmak üzere en fazla 6000 sözcüktür. Kaynakça'nın ardından yer verilen uzun Türkçe özet (750-1000 sözcük) bu sayıya dâhil değildir.
13	☒	*The article is preceded by* ***English Structured Abstract of not more than 250 words*** *and not less than 200 using five required headings:* **Purpose***: State the problem in field. Then explain the purpose of the study.* **Method:** *Specify the research design, sample, and research instrument and data analysis in brief.* **Findings***: Highlight the significant, interesting or surprising results.* **Implications for Research and Practice**. (These headings may need some adaptation in the case of discussion papers: *Background, Purpose of Study, Sources of Evidence, Main Argument, and Conclusions).* More information available from http://www.tandf.co.uk/journals/authors/rereabstracts.asp Yapılandırılmış İngilizce öz 200-250 sözcük uzunluğunda olup, aday makalenin başında yer almakta ve **Purpose** *(İlk önce alanda karşılaşılan sorunu belirtelim. Daha sonra araştırmanın amacını bir cümle ile veriniz),*

		Method *(Araştırma deseni, örneklem, very taoplama aracı ve verilerin analizinini kısaca açıklayınız),* **Findings** *(En önemli ve çarpıcı araştırma bulgularını verelim)* **Implications for Research and Practice,** (*Uygulama ve ileriye dönük araştırmalar için olası çıkarımlarınız)* başlıklarını içermektedir. Bu başlıklar tartışma yazıları için: *Çalışmanın Temeli, Çalışmanın Amacı, Kanıt Kaynakları, Ana Tartışma ve Sonuçlar* şeklinde olabilir. Daha fazla bilgi için; http://www.tandf.co.uk/journals/authors/rereabstracts.asp adresine başvurunuz.
14	☒	*Following the structured abstract in English four to six keywords are included. They should* ***represent*** *the content of your manuscript and* ***be specific*** *to your field or sub-field. Avoid using keywords form the title of the paper.* Yapılandırılmış İngilizce özden sonra 4-6 anahtar sözcüğe yer verilmiştir. Anahtar kelimeler çalışmanızı temsil etmeli ve kendi alanınıza ya da alt alanlara özgü olmalıdır. **Makale adındaki kavramları anahtar kelime olarak seçmekten kaçınınız**.
15	☒	*An extended (750-1000 words) Turkish structured abstract is placed following the "References" section using five required headings: Problem Statement, Purpose of Study, Methods, Findings and Results, and Conclusions and Recommendations*. (These headings may need some adaptation in the case of discussion papers: *Background, Purpose of Study, Sources of Evidence, Main Argument, and Conclusions*). More information available from http://www.tandf.co.uk/journals/authors/rereabstracts.asp Kaynakça'dan sonra 750-1000 sözcükten oluşan Türkçe yapılandırılmış öze yer verilmiştir. Türkçe yapılandırılmış öz *Problem Durumu, Araştırmanın Amacı, Araştırmanın Yöntemi, Araştırmanın Bulguları, Araştırmanın Sonuçları ve Önerileri* başlıklarını içermektedir. Bu başlıklar tartışma yazıları için: *Çalışmanın Temeli, Çalışmanın Amacı, Kanıt Kaynakları, Ana Tartışma ve Sonuçlar* şeklinde olabilir. Daha fazla bilgi için; http://www.tandf.co.uk/journals/authors/rereabstracts.asp
16	☒	*Following the Turkish structured abstract, four to six keywords are included.*

		Uzun Türkçe özetten sonra 4-6 anahtar sözcüğe yer verilmelidir.
17	☒	*References are not cited in the structured abstracts in English and in Turkish.* İngilizce abstract ve Türkçe öz içerisinde atıfta bulunulmamıştır.
18	☒	*The format of headings, tables, figures, citations, references, and other details follow the **APA 6 style** as described in the Publication Manual of the American Psychological Association, 6th edition, available from http://www.apa.org* Aday makalenin başlıkları, tabloları, şekilleri, atıfları, kaynakçası ve diğer özellikleri tamamen APA altıncı baskıda belirtildiği şekildedir.
19	☒	*All illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.* Aday makalenin şekilleri ve tabloları metin içerisinde bulunmaları gereken uygun yerlere yerleştirilmiştir. Makale sonunda sunulmamıştır.
20	☒	Citations in the text of the document include the author's surname, the year of publication, and, when there is a specific quote from a source used, a page number where the quote is located in the text. **Example:** Nothing seemed so certain as the results of the early studies (Tatt, 2001, p. 445). It was precisely this level of apparent certainty, however, which led to a number of subsequent challenges to the techniques used to process the data (Jones & Wayne, 2002, p. 879). There were a number of fairly obvious flaws in the data: consistencies and regularities that seemed most irregular, upon close scrutiny (Aarns, 2003; West, 2003, p. 457). With studies by two authors, always include both author names: (Anderson & Bjorn, 2003) As Anderson and Bjorn (2003) illustrated in their recent study As recently as 2003, a prominent study (Anderson & Bjorn) illustrated When a study has 3, 4, or 5 authors, include the names of all the authors the first time the work is cited: (Anderson, Myers, Wilkes, & Matthews, 2003)

		For all subsequent citations of this work, use "et al.": (Anderson et al., 2003) When a work has 6 or more authors, use et al.: (Bell et al., 2003) For unsigned works, include the title, enclosed in parentheses. Put quotation marks for short work titles, and italicize the titles of reports, books, and other significant works: ("Recent Developments," 2004) (Dictionary of Tetrathalocigistic Diseases, 2004) Metin içindeki atıfları üstte verilen örneklere uygundur.
21	☒	Three levels of headings are used: Level 1, Level 3 and Level 4. The headings are formatted as follows: Centered Uppercase and Lowercase Heading (Level 1) *Flush Left, Italicized, Uppercase and Lowercase Side Heading* (Level 3) *Indented, italicized, lowercase paragraph heading ending with a period.* Start writing after the period (Level 4). Aday makale içerisinde üç farklı düzey başlık kullanılmıştır. Düzey 1, Düzey 2, Düzey 3. Başlıklar bu düzeylere uygun olarak aşağıdaki şekilde biçimlendirilmiştir: Ortalı ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık (Düzey 1) *Tam Sola Dayalı, İtalik ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık* (Düzey 3) *İçeriden, italik, tamamı küçük harflerle yazılmış ve nokta ile bitten başlık.* Noktadan sonra normal metin yazımına devam edilmeli (Düzey 4).
22	☒	References are listed in alphabetical order. Each listed reference is cited in text, and each text citation is listed in the References. Basic formats are as follows: Haag, L., & Stern, E. (2003). In search of the benefits of learning Latin. *Journal of Educational Psychology, 95,* 174–178. Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

		Johnson, D. W., & Johnson, R. T. (1990). Cooperative learning and achievement. In S. Sharan (Ed.), *Cooperative learning: Theory and research* (pp. 173–202). New York: Praeger. **Turkish References Only:** Çınkır, Ş., & Çetin, S. K. (2010). Öğretmenlerin okullarda mesleki çalışma ilişkileri hakkındaki görüşleri [Teachers' opinions about the professional working relationships in schools]. *Kuram ve Uygulamada Eğitim Yönetimi, 1 6*(3), 353-371. **Article in an Internet-only journal/Periodical, database** Fredrickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well being. *Prevention & Treatment, 3,* Article 0001a. Retrieved November 20, 2000, from http://journals.apa.org/prevention/volume3/pre0030001a.html More information is available from: http://citationonline.net/CitationHelp/csg04-manuscripts-apa.htm#references Kaynakça'nın yazımı üstte verilen örneklere uygundur.
23	☒	***Order of the main parts in the manuscript is as follows:*** *Main title in English (max. 12 words)* *Structured abstract (min. 200- max.250 words length)* *Keywords (in English, min. four-max. six)* *Main text* *References* *Main Title in Turkish (max. 12 words* *Extended structured abstract (min.750-max.1000 words length in Turkish)* *Keywords (in Turkish, min. four-max. six)* Aday makaleyi oluşturan ana öğeler aşağıdaki düzendedir: İngilizce Ana Başlık (En fazla 12 sözcük) Yapılandırılmış İngilizce Abstract (En az 200, en fazla 250 sözcük)

		Anahtar Sözcükler (İngilizce, en az dört, en fazla altı) Ana Metin Kaynakça Türkçe Ana Başlık (En fazla 12 sözcük) Yapılandırılmış Türkçe Öz (En az 750, en fazla 1000 sözcük) Anahtar Sözcükler (Türkçe, en az dört, en fazla altı)
24	☒	**Structure of the Manuscript should be as follows:** Manuscript Title **English Abstract (200-250 words) Sub-headings:** *Purpose:…* *Purpose of Study:…* *Method:….* *Findings:….* *Implications for Research and Parctice:…* *Keywords:...* **Introduction Method (sub-headings):** *Research Design* *Research Sample* ♦*Research Instrument and Procedure* *Data Analysis* **Results, Discussion and Conclusion, References** **Extended Turkish Abstract (750-1000 words) Sub-headings:** *Problem Durumu:…* *Araştırmanın Amacı:…*

♦ Reliability and the validity of the research instrument used or adapted in the work must be provided, and explained in detail.

		Araştırmanın Yöntemi:… *Araştırmanın Bulguları:…* *Araştırmanın Sonuçları ve Önerileri:…*
25	☒	***EJER editor reserves the right to reject manuscripts and not to publish it that do not comply fully with the EJER Manuscript Submission Guidelines.***

SUBSCRIPTION/ABONELİK

Annually / Yıllık

***Individual** / Kişi Aboneliği .....: 120 TL*

***Institution** / Kurum Aboneliği .....: 280 TL*

***Abroad** / Yurtdışı Aboneliği:.....: 250 $*

***Student** / Öğrenci Aboneliği:.....: 70 TL*

For single issue / Tek sayılar için

***Individual** / Kişiler .....: 25 TL*

***Institution** / Kurumlar.....: 75 TL*

Payment / Ödeme

İş Bankası Kızılay Şubesi, Anı Yayıncılık 4214-0962561

Account number/Numaralı hesap