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FROM THE EDITOR

Dear Distinguished Researchers and Readers,

We are having difficulty days due to COVID-19 pandemic. However, the team of JTES is still working for the academy. In these difficult days, JTES-KEG is honoured to publish the second issue of 2020 and the third issue in English.

This third issue in English will help us to fulfill the criteria for ERIC. The change in the medium of publication as English, as we expected, has shortened the review and publication process up to nine months. The average is also approximately 9 months in this issue. This nine-month process is even shorter due to our OnlineFirst system in which we publish articles earlier than its normal issue.

Furthermore, we have reinforced and diversified our editorial board with many members from different universities in Turkey and the world, and this editorial change is expected to augment the international visibility of our journal and the spread of our authors' articles. The quality of the manuscripts will increase day by day with the rigorous work of our new editorial board.

In this issue, we decided to publish 10 research articles of 23 authors. We hope that these articles published in the second issue of 2020 will contribute to the literature. Also, we will continue to show accepted manuscripts in OnlineFirst soon.

Finally, we should also express our sincere thanks to the Editorial Board, reviewers and authors for their invaluable contributions. We also look forward to receiving submissions of sufficient rigor and quality. We wish you good health and hope to meet again for the 2020 July issue!

Fatih GÜNGÖR, PhD
Afyon Kocatepe University
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Opinions of Primary School Teachers on Determination and Referral of Students with Learning Disabilities

Öğrenme Güçlüğü Olan Öğrencilerin Belirlenmesine ve Yönlendirilmesine İlişkin Sınıf Öğretmenlerinin Görüşleri

Tahsin FIRAT* **Duygu KOÇAK****

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ABSTRACT: The aim of this study is to examine the opinions of primary school teachers about what they pay attention to in determining students with learning disabilities and the ways they follow when they encounter with the students who are thought to be learning disabilities. Participants were 23 female and 26 male primary school teachers. Data were gathered using a semi-structured interview form consisting of two open-ended questions. In the analysis of the data, codes and categories were created by using content analysis technique. Four different themes (developmental features, academic features, personal characteristics and communication-based behaviors) were obtained in accordance with the teachers' opinions on identifying students with learning disabilities. In terms of teachers' opinions on what they do when they meet with students who are thought to be learning disabilities, the themes "social activity", "teaching methods", "directing to the relevant individual or organization", "cooperation" and ten different categories related to these themes were obtained. These results were discussed with regard to literature and implementations. Prospective primary school teachers should receive hands-on training on learning disabilities at university level and activities aimed at increasing the knowledge of in-service teachers on this subject through in-service training should be diversified.

Keywords: student with learning disabilities, primary school teachers, determination and referral.

ÖZ: Bu çalışmada, sınıf öğretmenlerinin öğrenme güçlüğü olan öğrencilerin belirlenmesinde nelere dikkat ettikleri ve öğrenme güçlüğü olduğunu düşündükleri öğrenci ile karşılaştıklarında izledikleri yolların belirlenmesine ilişkin görüşleri incelenmiştir. Çalışma, 23 kadın ve 26 erkek öğretmenin katılımıyla gerçekleştirilmiştir. Araştırmanın verileri, iki açık uçlu sorudan oluşan yarı-yapılandırılmış görüşme formu kullanılarak toplanmıştır. Verilerin analizinde içerik analizi tekniği kullanılarak kod ve kategoriler oluşturulmuştur. Öğretmenlerin öğrenme güçlüğü olan öğrencileri belirleme ile ilgili görüşleri doğrultusunda dört farklı tema (gelişimsel özellikler, akademik özellikler, kişisel özellikler ve iletişim temelli davranışlar) elde edilmiştir. Öğretmenlerin öğrenme güçlüğü olduğu düşünülen öğrenci ile karşılaştıklarında yaptıklarına ilişkin görüşlerinden ise sosyal aktivite, öğretim yöntemleri, ilgili kişi veya kuruma yönlendirme ve işbirliği temaları ve bu temalara bağlı on farklı kategori elde edilmiştir. Elde edilen bu veriler ilgili literatür ve uygulamalar açısından değerlendirilmiştir. Sınıf öğretmeni adayları üniversite düzeyinde öğrenme güçlüğüyle ilgili uygulamalı eğitimler almalı ve görev yapan öğretmenlerin ise hizmetiçi eğitimler yoluyla bu konu hakkındaki bilgilerin arttırılmasına dönük etkinlikler çeşitlendirilmelidir.

Anahtar kelimeler: öğrenme güçlüğü olan öğrenciler, sınıf öğretmenleri, belirleme ve yönlendirme.

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Learning disability continues to be a popular topic in special education for researchers, teachers and families. The main reasons for this intense interest are that students with learning disabilities (LD) form the largest group among children with special needs (Bender, 2004; Kavale & Forness, 2006) and their number increases rapidly (Graham & Ballert, 2005; Kılıç-Tüylü & Ergül, 2016). Although students with LD make up the largest group among students with special needs (Kavale & Forness, 2006), the process for determining and identifying these students is still a matter of debate. Various models are used for identifying LD which is encountered at significant levels among students. According to one of these models known as the IQ-Achievement Discrepancy Model, the discrepancy between the mental capacity and academic performance of the student is the main criterion for identifying LD (Vaughn & Fuchs, 2003). Based on this model, the student must be lagging significantly behind other students in order to benefit from special education services (Lyon et al., 2001). Thus, it can be said that this model is unsuccessful in supporting early intervention as nothing is done with the student until he/she has an academic failure (Fletcher, Coulter, Reschly, & Vaughn, 2004; Vaughn & Fuchs, 2003).

The most frequently used model for identifying LD in recent years is Response to Intervention (RTI) model. This model enables researchers to distinguish between students with LD and students with a low academic success by offering supports focusing on students with LD (Fuchs, Mock, Morgan, & Young, 2003). RTI examines the difference between, before and after the intervention (Gresham, 2005). All students (in nursery school or between the first, second or third grades) are surveyed for potential problems in academic and behavioral fields in this model. The students defined as "under risk" are effectively educated (for example language, reading, arithmetic/ maths, behavior) in order to decrease their risks in specified fields (Vaughn & Fuchs, 2003). Hereby, students with LD are identified and supported with suitable approaches without allowing them to fail during school education (IDEA, 2004). The number of students with LD has decreased in educational environment in the USA thanks to implementations providing the identification of students with LD before they progress within the educational system as well as the use of intervention programs within the scope of this approach. On the other hand, students identified with LD comprise 42% of students with special needs in the USA even if this number has been decreased. This ratio is 3% in Turkey (Çakıroğlu, 2017). This ratio is quite low given the fact that Turkey does not commonly take place in such early intervention programs. The ratio is low in Turkey because students with LD are not identified accurately or they are not identified at all (Fırat, 2018).

It can be observed when identification process of students with LD is investigated in Turkey that identifying students with LD is more difficult and complex than other fields of special education (Kargın & Güldenoğlu, 2016). Students with LD are not different from normal students in terms of physical appearance and they form a heterogeneous group (Melekoğlu, 2017). These factors prevent the easy and early realization of their problem. The hesitation of the parents who are aware of the situation of their children but who prefer to wait for requesting help, or who don't have any idea about where to apply to or whom they should contact for help is a significant problem for early identification in Turkey (Kargın & Güldenoğlu, 2016). In other respects, the lack of a standard screening tool developed in Turkey to measure pre-primary and

primary school children in terms of learning disabilities is also a major factor with regard to the inability to identify children with LD at early stages (Kançeşme, 2015).

About the identification of student with LD, Sakız (2018) demonstrated that: (a) school staff do not take into account the possible causes of failure of these children and do not take measures to prevent these reasons, (b) that the diagnosis is based on the difference between IQ and success; (c) obtaining inadequate information from the family and other stakeholders when making the diagnosis is another obstacle to the identification of these children. It is duly seen based on all the aforementioned reasons that students with LD are diagnosed during the primary school stage in Turkey when formal education begins (Diken, 2010). Intervention to students with LD is thus late and primary school teachers who shall play an important role for making the first determination with regard to the identification of students with LD due to the factors indicated earlier (Aladwani & Al Shaye, 2012). Primary school teachers have to plan, follow and monitor the evaluation process well (Kargın & Güldenoğlu, 2016).

Teachers must have knowledge on students with LD in order to follow this process. On the other hand, limited knowledge of teachers may result in forcing them to make erroneous evaluations with regard to students with LD (Scruggs & Mastropieri, 2002) and may also impact their perceptions of students with LD as well as the assistance they provide to such children (Brook, Watemberg, & Geva 2000; Kirby, Davies, & Bryant, 2005; Kocsis, 2016; Lingeswaran, 2013; Moothedath & Vranda, 2015; Wright, 2008). For instance, Kirby et al. (2005) determined that teachers do not have sufficient knowledge on how LD affects the individuals, the personal characteristics of students with LD and the educational strategies that should be applied for these students. Aladwani and Al Shaye (2012) reported in their study that majority of the teachers do not have enough knowledge on what LD is, the detection of the symptoms of LD as well as the proper education process that should be applied for students with LD. It was also observed in this study that teachers are not qualified on what the characteristic features of students with LD are and under which situations LD risk may occur. Similarly, Altun and Uzuner (2016) put forth that primary school teachers have limited information on LD; that they can recognize LD or various problems that students are going through; but that they do not have sufficient knowledge on the issue. It has been indicated in various other studies that teachers have insufficient knowledge on LD and that they must be trained to be well-informed on LD (Alkhateeb, 2014; Chideridou–Mandari, Padeliadu, Karamatsouki, Sandravelis, & Karagiannidis, 2016; DeSimone & Parmar, 2006; Ghimire, 2017; Kamala & Ramganesh, 2013; Kirby at. al., 2005; Moothedath & Vranda, 2015; Saravanabhavan & Saravanabhavan, 2010; Wright, 2008). Although there are few studies focusing on the opinions of Turkish teachers on LD (Altuntaş, 2010; Çakıroğlu, 2015; Doyran & Canca, 2013; Fırat & Koçak, 2018; Özabacı & Ergün-Başak, 2013; Polat, 2013; Yangın, Yangın, Önder, & Şavlığ, 2016), the number of studies focusing on the opinions of primary school treachers on LD and what they would do when they encounter a student with LD is limited.

Primary school teachers in Turkey obtain information on the education of the children with special needs from the special education lecture which they take during their undergraduate education as well as from the in-service courses they participate in throughout their professional lives. It can be said that education on LD provided by way

of the aforementioned processes may be inadequate for determining students with LD and for taking the necessary actions that should be carried out after identifying these students. On the other hand, early and accurate identification of students with LD will help them to receive an appropriate education and therefore to have fewer problems in school and daily life in the future. Thus, it is important to determine the knowledge of the primary school teachers with regard to the behaviors related to LD and the actions they should take when they encounter students with learning disabilities. Therefore, the present study aims at examining the opinions of primary school teachers about what they pay attention to in determining students with learning disabilities and the ways they follow when they encounter with the students who are thought to have learning disabilities.

Method

"Case study" which is one of the qualitative research designs was used in this study in which the opinions of the primary school teachers about the way they will follow for the determination of the students with LD are examined. A case study has been described as an intensive, systematic investigation of a single individual, group, community or some other unit in which the researcher examines in-depth data relating to several variables (Woods & Calanzaro, 1980).

Participants

Maximum variation sampling method was benefitted in order to determine the participants of the study. In order to provide data diversity, it was aimed to interview teachers with different characteristics. Maximum variation sampling is a purposeful sampling method and the purpose is to reflect the variation of the individuals who can be a party to the problem in a maximum level (Yin, 2011). Participants varied in accordance with the variable of gender, professional experience, faculty and department at which they studied, whether they had or have any students with LD. The study was conducted with 49 primary teachers working in eight different schools in Adıyaman. Table 1 presents the distribution of teachers who participated in the study in accordance with these variables.

Table 1

Features of Participants

		Gender		
		Female	Male	Total
Professional experience (year)	1-9	10	9	19
	10-19	7	12	19
	20-29	5	3	8
	30 and over	1	2	3
Graduated from	Faculty of Education	17	18	35
	Education Institute	4	5	9
	Faculty of Science and Literature	2	3	5
Whether he/she had a student with LD	Yes	12	10	22
	No	11	16	27
Whether he/she has a student with LD now	Yes	6	8	14
	No	17	18	35

During the study, opinions were collected from 49 teachers in total with 23 female and 26 male teachers working at schools within the body of Ministry of National Education.

Data Collection

Semi-structured interview form was used for gathering the data. A literature survey was carried out during the process of developing the semi-structured interview form and two questions were prepared as a result. The two main questions were: “How do you determine the students you think have learning disabilities?” and “What do you do when you have students with learning disabilities?”. Other questions were asked during the interview when necessary. Interviews were conducted with the participants in a quiet room in the school. Semi-structured face to face individual interviews were carried out with the teachers who took part in the research with each interview lasting about 15-20 minutes which were recorded after taking the consent of the participants. Coding was used for reportage in order to keep the identities of the prospective teachers with whom the confidential interviews were conducted. Abbreviations in the coding used in the reportage are as F3 (Third female teacher), M3 (Third male teacher).

Ethical Procedures

The permission was obtained from the school principals to carry out this study within the framework of ethical rules. It was also taken into account whether the teachers volunteered to participate in the study. It was seen that the participants felt eager and tried to participate in the study.

Data Analysis

The data obtained during the study were analyzed by way of "content analysis" technique comprised of basic patterns determination, coding and sorting into categories procedures (Yin, 2011). The audio recordings obtained from the interviews were first converted to text. Both researchers then read the texts. The coding rules were determined by the researchers and the texts were coded. The coding rules are: (1) to determine what the teacher focuses on as a problem or indicator of LD (2) to understand what the teacher wants to say on example case. The coding was done individually according to the rules. The categories and themes were then created individually by researchers. More than one researcher were used for forming the categories and for coding; with the content analysis process separately realized by two different researchers; and categories and themes were put forth after the results were compared and discussed. The relation between the coding results obtained by two different coders during the analysis process in accordance with coding rules was examined with the reliability between the researchers determined as 82%. The situation that one of the coders coded the data at different times in accordance with the same coding rules and the relation between the results were examined and the reliability in terms of time was found as 89%. The fact that reliability between the researchers and in terms of time is higher than 70% proves the reliability of the research (Miles & Huberman, 1994; Tavşancıl & Aslan, 2001).

Results

Research findings and comments are presented in this section. Table 2 presents the findings on the behaviors or features of the students that make the teachers think that the students have LD.

Table 2

Determination of Student with LD by the Teachers

Theme	Category	Participants	*f*
Developmental Features	Being unable to conform to norms	F8, F19, F20, F21, M1, M2, M3, M15	8
	Cannot distinguishing right-left	M11	1
Academic Features	Inadequate literacy	F1, F3, F4, F6, M4, M11, M18, M22, M25	9
	Not answering the questions	F11, F12, F14, F16, F18, M8, M7, M9, M17	9
	Learning late	F3, F8, F9, F10, F11, F13, F14, F6, F16, F17, F19, M6, M9, M10, M13, M14, M15, M17, M19, M24	20
	General academic failure	F5, F15, F23, M11	4
Personal Characteristics	Lack of interest	F2, F5, F10, F11, M4, M7, M12, M13, M14, M20, M21, M23, M26	13
	Carelessness	F2, F6, F7, F11, M16, M23	6
	Lack of self-confidence	F3	1

	Forgetfulness	F6, F7, F14, F22, M14, M25	6
	Shyness	M10	1
Communication based Behaviors	Speech defect	F4	1
	Not joining the games	M5	1
	Incompatible behavior	F15, F20	2

Table 2 presents four different themes obtained in line with the opinions of the teachers on the identification of students with LD; which are developmental features, academic features, personal characteristics and communication based behaviors; in addition to fourteen categories obtained under these themes. Findings and comments are presented below with which have been supported by examples on the opinions that are expressed respectively under each theme and category.

Developmental Features

Categories of being unable to conform to norms and failure to distinguishing right-left are included as part of the developmental features theme. Developmental features theme comprises the opinions that the student being unable to conform to norms his/her peers in terms of physical and cognitive skills shall indicate that the aforementioned student suffers from LD.

Being unable to conform to norms: According to being unable to conform to norms category students with LD have lower levels of cognitive and physical (psychomotor) skills in comparison with other students resulting in doubts in the teachers that these students have LD. Some exemplary statements are as follows:

"… lags way behind his/her classmates who are in the same position with him/her." [M2].

Cannot distinguish right-left: When providing opinions on the failure of distinguishing right-left, the teacher indicated that she/he thinks students who cannot distinguish right-left directions may have LD.

"These students cannot distinguish right-left." [M11].

Academic Features

The opinions mentioned in the academic features theme expressed issues related with the student as not being able to learn the learning outcomes included in education program, not being able to perceive them, having a low learning level equivalent to academic failure, not being able to answer the questions about the lesson in the class, having problems in reading and writing all of which are related to learning and refer to LD. In this theme it was generally expressed that problems about failure in acquiring the target behaviours of a lesson or lessons refer to LD. Inadequate literacy, not answering the questions, late learning and general academic failure categories were specified under this theme. Each category has been explained below with examples.

Inadequate literacy: it was expressed in the inadequate literacy category that they will have doubts related with the student having LD when they cannot recognize the letters, misread the words, cannot combine the syllables, cannot read fluently, forget some letters while writing, miswrite words, do not obey the orthographic rules; since all of the aforementioned issues are actually features of students with LD.

> "There is a problem in writing and reading of the students who have LD. For instance, they write letters deficiently and misread the words." [M18].

Not answering the questions: According to this category, students with LD cannot answer the questions about the lessons directed at; thus it was indicated that they will have doubts that students who cannot answer even easy questions on the lessons have LD.

> "They cannot answer even the very easy questions about the lessons." [F12].

Learning late: According to the opinions specified under this category, students who cannot learn the target behaviours of the lesson, who learn late and with frequent repetitions or who can never learn may have LD. It was expressed that they will have doubts that the students who display the above mentioned features may have LD.

> "They have a disability in understanding a lesson. He/she can learn it in no way even if it is very easy." [F3].

General academic failure: According to the opinions classified under the general academic failure of students with LD category, students have a low level of success in almost every lesson; thus it was expressed that they will have doubts that students who are unsuccessful in all lessons or in a few lessons may have LD.

> "A normal student can be unsuccessful in one or two lessons; but, students with LD are unsuccessful in more lessons, they cannot be successful even if they endeavor." [M11].

Personal Characteristics

According to the opinions under the category of personal characteristics, students who get bored quickly during the lesson or during the lesson activities, who lose their attention and forget the things they learned, their duties and their belongings, who do not participate in activities, lack self-confidence may have LD. Lack of interest, carelessness, lack of self-confidence, shyness and forgetfulness categories were specified under this theme. Each category has been explained below with examples.

Lack of Interest. According to the opinions classified under the lack of interest category, students with LD are easily bored with the lesson, lesson activities, their personal stuff or they never show interest in any of the above.

> "They are not interested in the lesson or in the book." [M20].

Carelessness. Opinions included under the carelessness category indicate that students with LD are easily distracted; and thus have deficiencies in their homework, problem solving process and activities and that they have a short attention span during the lesson.

> "They have a short attention span; so they cannot learn." [M16].

Lack of Self-Confidence. According to the opinions in this category, students with LD do not strongly believe they can be successful in the lesson, learn what is taught and complete the homeworks or duties successfully.

> "He/she is over diffident. He/she does not believe he/she can do and he/she cannot be convinced." [F3].

Forgetfulness. According to this category, students with LD forget their homework, belongings and the things they have to do.

"… he/she always forgets his/her stuff and loses them." [M25].

Shyness. When statements mentioned in the shyness category were examined, it was observed that students with LD shy away from making friends and conversing and that they abstain from expressing their ideas.

"These children show timid behaviors; they abstain from saying or doing something." [M10].

Communication Based Behaviors

It was expressed under the communication based behaviors theme that individuals who avoid communication and socialization may have LD. Speech defects, not joining the games and incompatible behavior categories were specified under this theme.

Speech Defects. Teachers who expressed opinions under the category of speech defects mentioned that the pronunciations of students they think have LD are worse than those of other students and that sometimes their speech cannot be understood.

"These students have a speech defect so people have difficulty in understanding what they are saying. We want them to repeat several times to understand what they are saying." [F4].

Not Joining the Games. It was observed when statements mentioned under the category of not joining the games were examined that students with LD do not join group games and/or cannot understand the game rules.

"He/She spends time alone during the breaks, does not play with other students. Sometimes he/she cannot even understand how the game is played." [M5].

Incompatible Behavior. It was observed when statements indicated under the incompatible behavior category were examined that students with LD display maladaptive and aggressive behaviors.

"They do not adapt to other students; he/she does not have many close friends." [F15].

It was concluded upon examining the opinions of the participants that teachers look for a few indicators when they consider if a student has LD or not; and that they think a student has learning disability if he/she displays more than one behavior. For instance, it is seen that the teacher coded as F6 doubts that students who display inadequate literacy, carelessness and forgetfulness and who cannot perceive what is taught may have LD. Findings on what teachers do when they think a student has LD are presented in Table 3.

Table 3

Actions Taken by Teachers when They Encounter Students with LD

Theme	Category	Participants	*f*
Social Activity	Directing to social activity	F4, F14, M18, M21	4
Teaching Methods	Making Repetition	F2, F17, M5, M26	4
	Explanation special to the person and providing additional time to him/her	F1, F5, F9, F10, F11, F12, F14, F18, F20, F22, M3, M4, M5, M6, M10, M11, M13, M22	18
		F3, F4, F6, F7, F8, F10, F11, F12, F13,	35

Directing to relevant a person or organization	Guidance Research Centers (GRCs)	F15, F16, F17, F18, F19, F20, F21, F22, F23, M4, M7, M8, M9, M10, M11, M12, M14, M15, M16, M17, M19, M20, M21, M24, M25, M26	
	Expert assistance	F4, F13, M17, M25	4
	Psychiatry	F4, M3, M11	3
Cooperation	Cooperation with family	F4, F6, F7, F8, F12, F18, F19, F16, M3, M15, M19, M23, M25, M26	14
	Cooperation with teacher	F7, F11, F21, M4, M10, M11	6
	Cooperation with counselling service	F5, F7, F8, F9, F10, F12, F13, F16, F17, F19, F23, M1, M2, M4, M7, M9, M10, M11, M13, M20, M24, M26	22
	Cooperation with school administration	E4, E19, E25	3

The themes and categories put forth in accordance with the opinions of teachers on the Actions Taken by Teachers when They Encounter Students with LD they take when they encounter students with LD are presented below. These themes and categories are explained below with examples.

Social Activity

The category of directing students towards social activities was formed under the social activity theme in accordance with the opinions indicated by the teachers. Opinions within the social activity theme put forth that teachers try to make the student to socialize by directing him/her to activities such as dance, art, music, sports when they suspect a student has LD.

Directing to Social Activities. It was specified that teachers direct students with LD to activities such as school clubs, sports activities, art and music activities which may draw their interest. Exemplary statements are presented below.

> "I direct the student to hobbies such as sports or playing a musical instrument." [F14].
>
> "I send him/her to the places where he/she can socialize." [M21].

Teaching Methods

It was determined when the opinions classified under this theme were examined that when teachers encounter a student with LD they use methods such as repeating the lecture on the subjects which the student has not understood, choosing subjects which are suitable to the level of the student and then lecturing the student on these subjects outside of class hours in the times other than lessons. Categories under this theme have been explained below separately.

Making Repetition. It was determined that when teachers encounter with students with LD, they repeat the lectures to the student again and again as they think the student shall grasp the learning outcomes included in the curriculum later than the other students or with frequent repetitions.

> "I have to repeat several times the things which I normally lecture once as he/she can not learn forthright." [F2].

Explanation Special to the Person and Providing Additional Time. Teachers stated that when they encounter students with LD, they do not apply the current curriculum but plan and apply an educational program which they think is suitable to the level of the student; and they allocate additional time to the student outside of the lessons.

> "These students cannot learn as the normal students, it is very difficult for them to learn the lesson completely in class or to be successful. …I pay attention to him/her during the breaks. Allocating time to these students outside of the regular lesson hours is a must." [F9]

Directing to Relevant a Person or Organization

It was observed when the opinions of teachers classified under directing to relevant a person or organization theme were examined that when they encounter students whom they think have LD, they direct the student to another person, institution or organization.

GRCs. According to the opinions classified under the GRCs category, it was determined that teachers shall send the student to GRCs if they encounter students who they think have LD.

> "I direct the student to GRCs or have the counselling service direct him/her to GRCs." [M15].

Expert Assistance. When opinions classified under expert assistance category were examined, it was determined that teachers who presented opinions in this category direct the student they suspect has LD in order to get expert assistance. It was also explained that the expert mentioned here is a special education expert.

> "Getting assistance from a special education expert shall be more beneficial for the student; I direct the student by taking this into consideration as well and also recommend this to his/her parents." [M17].

Psychiatry. Teachers presented opinions classified under psychiatry category expressed that when they encounter students with LD, they direct him/her to psychiatry.

> "I call his/her parents and tell them to take their child to psychiatry." [F4].

Cooperation

It was observed when the opinions classified under the cooperation theme were examined teachers who presented opinions within the scope of this theme prefer cooperation when they encounter students who they assume has LD. Accordingly, teachers exchange ideas and keep company with people who they believe are related to the education of the students as well as the actions that should be taken. Categories obtained under this theme are explained below.

Cooperation with Family. It was specified that if teachers encounter students with LD, they inform the family and include them in the education of the student by acting in unison with them. Teachers who put forth this opinion expressed that they think it is important for the education of the child that his/her family accepts the student's situation.

> "It is difficult for the family to accept their child's situation, so it is necessary to persuade the family and to get them pay attention to their child at home, too." [F19].

Cooperation with Teacher. According to the opinions classified under the cooperation with teacher category, teachers are of the opinion that children shall talk on their situation with other teachers and shall act in unison with them during the education process of the student if they encounter students with LD.

> "I talk with other teachers especially class guidance teachers about the student and act in unison with them." [M4].

Cooperation with the Counselling Service. According to the opinions included under the under cooperation with counselling service category, teachers expressed that if they encounter students who they think have LD, they shall cooperate with school counselling service with regard to the student's situation, education and the actions to be taken; and shall ask their opinion.

> "… I certainly consult to counselling. As such, that student also needs guidance and counselling. They also provide information on what activities I should be doing." [F23].

Cooperation with School Administration. Teachers expressed within cooperation with school administration category that if they encounter a student who they think has LD, they shall inform the school administration about this situation and shall exchange ideas with them upon what must be done. However, teachers see informing the school administration about these students as an obligation.

> "I inform administrators at school, director and vice-directors about the student. I take their guidance into consideration, too." [E4].

Discussion and Conclusions

In this study, it was aimed to find out what primary school teachers pay attention to while determining the students who are thought they have disabilities, and how the teachers follow a path for the students.

According to the findings of the research, some of the teachers doubted that students may have LD by recognizing the developmental features of students with LD. It is seen that teachers do not give many details about the developmental features of students with LD and that the answers are generally focused on being behind their peers. Only one of the teachers answered about not distinguishing right-left and one of them answered about showing itself during speech. Similarly, Balcı (2019) found that if primary teachers encounter a student with dyslexia; they do not have the necessary knowledge and professional skills to recognize and identify to student with dyslexia. On the other hand, when literature is examined, it is expressed that in terms of developmental features these students experience various disabilities/ deficiencies in developmental areas such as using written and verbal language (IDEA, 2004), psychomotor skills (Pieters, Desoete, Roeyers, Vanderswalmen, & Van Waelvelde, 2012; Westendorp, Hartman, Houwen, Smith, & Visscher, 2011), distinguishing right-left (Landerl, Bevan, & Butterworth, 2004; Stein, 2001), social skills (Grolnick & Ryan, 1990; Kavale & Mostert, 2004), attention and memory (Swanson & Berninger, 1995; Swanson, Howard, & Saez, 2006).

Another result inferred from the research is that majority of the teachers have used a general concept as failure for acquiring perceptions on the academic features of students with LD. Teachers did not provide any information about the field of the variable and how it occurs. This result supports the research results expressing that primary school teachers do not have enough information about the features of the students with LD (Aladwani & Al Shaye, 2012; Altun & Uzuner, 2016; Balcı, 2019; Doğan, 2013; Fırat & Koçak, 2018; Lingeswaran, 2013). For example, Başar and Göncü (2018) found that primary school teachers had misconceptions about learning disabilities. Besides, it was determined that a small number of teachers with information about learning disabilities had obtained their knowledge from the films they watched and the in-service training they attended. When the literature is investigated, it is mentioned that students with LD form a heterogeneous group and therefore the disability areas they suffer differ, too. Mainly these areas are viewed as speaking, listening, reading, reading comprehension, and arithmetic, mathematic and written expression (Lyon et al., 2001). Inadequacy in organizing and study skills may be added to these (Sakız, Sart, & Ekinci, 2016). Learning disability may occur in one or more of these areas. The fact that teachers do not exactly know what the disability the student goes through has negative impacts on the support services they shall provide them; thus it also negatively affects the increase of their success.

Knowledge of teachers on students with LD may affect their attitude towards these students. If it is thought that majority of the students with LD receive inclusive education, teachers' getting knowledge upon the features and needs of these students bear a key role for a successful inclusive education (Campbell, Gilmore, & Cuskelly, 2003). Researches have shown that teachers'experience and contact with the students with LD have increased and they have presented more positive attitudes towards these students thanks to their knowledge and education (Avramidis & Norwich, 2002; Avramidis, Bayliss, & Burden, 2000; Sharma, Forlin, Loreman, & Earle, 2006). On the other hand, insufficient knowledge of teachers on LD poses an obstacle for the inclusion of these students. For instance, Doğan (2013) indicated that students with LD get lonely in the class by being alienated due to the fact that teachers do not know which method they have to apply to these students. Similarly, teachers in Çakıroğlu's (2015) study were asked a question about increasing the reading success of students with disability in reading in their class; and it was determined in line with the answers that half of the teachers did not find themselves sufficient. Saravanabhavan and Saravanabhavan (2010) specified in their study that teachers cannot get adequate education on learning disability which makes them insufficient about students with LD and their education.

Another result of the study is that majority of the teachers shall direct students who they think have LD to GRCs. Similarly, Sakız (2018) determined that teachers acted hastily to refer these students without taking any precautions or implementing an intervention program in the school. Kargın (2007), defined that evaluation process of the with LD, it is observed that primary school teachers recognize the students in their classes who have disability in reading, writing and mathematics, apply intervention program by providing adaptations and support in areas in which these students have disability; and the student shall be directed to GRCs if he/she does not respond to applied intervention program. In addition, small group education, evidence-based interventions and differentiated education are important in this process for students

whom teachers think have learning disabilities before referring these students (Fuchs & Fuchs, 2006). Therefore, it can be said that teachers who participated in the research do not have much information on the necessity of intervention program applications. Whereas, it is important for teachers to identify the situations where the students have problems. For example, it should be determined via error analysis whether students have problems in reading and what their special problem is (for example to not recognise caracters) if they have problems in reading. For example, methods to improve reading fluency can be used if the student is having problems on fluent reading. The main purpose of this process is to provide the student with the necessary opportunities and support for learning. Since such supports are not provided, this situation causes a problem resulting in confusing students with LD with students who have mild mental deficiency and who have academic failure (Gresham, 2002). LD can occur due to either the reasons related with the individual or as a result of environmental factors. In order identify the effects of these, if any; it is important to apply the pre-sending process to the student before directing him/her to GRCs.

The cooperation of teachers with the family, other teachers, the counselling service and school administration is also significant for identifying students with LD and for supporting them in their respective areas of disability. Nearly half of the teachers who took part in the research accept to cooperate with the counselling service; however, they are less willing to cooperate with family, other teachers and school administration. Even though primary school teachers are the most responsible ones for determining and training the students with LD, other parties have important responsibilities for multidimensional evaluation of the student and for supporting him/her during the education process. It is inevitable that primary school teachers need support in subjects such as familiarizing with the child, adapting lesson content and materials, evaluating the child's success when he/she encounters students with different features and needs (Kargın, Acarlar, & Sucuoğlu, 2003). Thus, teachers need to involve family, other teachers, counselling service and school administration into this process.

The results of this study indicate that Turkish primary school teachers are not equipped with sufficient knowledge and training to recognize the characteristics of students with LD. They are also not equipped sufficiently with regard to the procedures that should be followed when they encounter such students. As such, pre-service teachers should receive training related to LD at college level and in-service teachers should receive these trainings through certificate programs.

Limitations and Implications

Various limitations can be identified for this study. (1) This study was conducted with 49 primary school teachers in only one city. This situation limits the generalization of the results. In this context, studies with larger samples are needed. (2) In the study, qualitative data were interpreted by taking only the opinions of primary school teachers. Participation of parents and other stakeholders in the data collection process is considered to be the collection of detailed qualitative data in these processes and it may play an important role in solving problems in the identification of these children. (3) In addition, in order to identify and support students with LD, primary school teachers should work in coordination with many people and institutions such as school management, guidance service, family, GRCs. and hospital. (4) Primary school teachers

should first implement more support, differentiated education and evidence-based interventions within the school for students who are thought to have learning disabilities. It will be important to start the referral process if the results are not positive.

Statement of Responsibility

Tahsin Fırat; conceptualization, investigation, resources, data curation, writing original draft, reviewing & editing, visualization, and project administration. Duygu Koçak; methodology, software, validation, formal analysis, and supervision.

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Student Retention in Turkish Higher Education through Lenses of Bio-Ecological Theory*

Biyo-Ekolojik Kuramın Gözünden Türkiye Yükseköğretiminde Öğrenciyi Okulda Tutma

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ABSTRACT: Higher education not only improves individuals academically, socially, and emotionally but also provides any capital for societies and states. In order to serve this purpose, retention of students in higher education is greatly significant. Higher education institutions have complex structures and processes. Thus, their ecosystems are affected by both inner dynamics and outside pressure. However, a gap exists in the literature since student retention studies in the literature focused on narrower perspectives neglecting multi-dimensional situations. Therefore, there is a need for extensive perspectives drawing big and comprehensive picture of student retention in Turkey. The current study aims to investigate student retention in higher education context of Turkey through the lenses of Bronfenbrenner's Bio-Ecological Theory and to compare and contrast with international literature. Considering layers of theory which are microsystem, mesosystem, exosystem, macrosystem, and chronosystem, retention concept was discussed in the context of core ideas of each layer. Finally, it was concluded that higher education system in Turkey should consider inclusion of multidimensional approaches to create an awareness about student retention.

Keywords: student retention, higher education, Bio-Ecological Theory.

ÖZ: Yükseköğretim sadece bireylerin akademik, sosyal ve duygusal olarak gelişmelerine değil toplum ve devlet için sermaye üretilmesine de katkı sağlamaktadır. Bu hedef için öğrencilerin yükseköğretim sistemi içinde kalıcı olmaları büyük ölçüde önemlidir. Yükseköğretim kurumları karmaşık yapı ve süreçlere sahiptir. Öyle ki, bu kurumların ekosistemleri hem iç dinamiklerden hem de dış baskılardan etkilenmektedir. Fakat alan yazındaki öğrenciyi okulda tutma çalışmalarının çok boyutlu durumları göz ardı etmesi önemli bir boşluk oluşturmaktadır. Bu yüzden, öğrencinin okulda tutulmasının büyük ve anlaşılır resmini ortaya koyabilecek kapsayıcı bakış açılarına ihtiyaç duyulmaktadır. Bu çalışma, Biyo-Ekolojik Kuramın gözünden Türkiye yükseköğretimindeki öğrenciyi okulda tutmayı incelemeyi ve uluslararası yazınla kıyaslamayı amaçlamaktadır. Kuramın katmanları olan mikrosistem, mezosistem, ekzosistem, makrosistem ve kronosistem bağlamında okulda tutma kavramı tartışılmıştır. Sonuç olarak, okulda tutma ile ilgili farkındalık oluşturmak için Türkiye'deki yükseköğretim sisteminin çok boyutlu yaklaşımları benimsemesi gerektiği önerilmiştir.

Anahtar kelimeler: okulda tutma, yükseköğretim, Biyo-Ekolojik Kuram.

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Education is a process affecting entire life of human beings. From pre-school to higher education, individuals spend most of time in the schools so that they develop biologically, emotionally, psychologically, and intellectually. Higher education deserves a special parenthesis among these periods because individuals in higher education period feel themselves free, competent, and capable.

Higher education system in Turkey had mainly three purposes which are to improve and train students, to produce human capital for state, and to conduct scientific research. It is possible to categorize higher education levels as follows: upper secondary education, undergraduate education, and graduate education. According to dataset of Council of Higher Education (CoHE, 2018), there are over 2.7 million students in upper secondary education, over 4.2 million students in undergraduate education, and over half million students in graduate education. On the other hand, there were nearly 300.000 graduates from upper secondary education, over 400.000 graduates from undergraduate education, and nearly 55.000 graduates from graduate education at the end of 2016-2017 academic years. Administration of higher education in Turkey is organized by the law no 2547. According to this law, higher education is managed by three units which are Council of Higher Education (CoHE), Inter-university Council (IC), and Higher Education Audit Board (HEAB). CoHE is responsible for establishment and development of higher education institutions, teaching and research activities, training of academicians, and resource distribution. IC organizes research and publication, education activities, and evaluation of academician titles. Lastly, HEAB supervises higher education institutions and academicians. From past to present, laws related to higher education system, established universities, opening of private universities, inducement of military coups, and classification of universities were important cornerstones in higher education history. In addition, traces of German, French, and American educational researchers in the history of higher education in Turkey is possible (Arap, 2010; Erdem, 2005, Namal, 2012). Higher education institutions are lifelines of the development of individuals, institutions, societies, and countries. In terms of individual-benefit, higher education provides many advantages to the students. Ishitani (2006) stated that individuals take better career and occupation options so that they gain economic earnings. According to OECD (2015, 2017) reports, people with higher level of education earn better money and job prospects. In terms of society-benefit, society takes advantage of higher education like life satisfaction and participation in activities related to democracy. Gölpek (2011) stated that intangible social returns of higher education were more positive care on children, lower crime rates, and more emphasis on women education and occupation. In terms of institution-benefit, higher education institutions get more opportunity to conduct research and development activities if they implement higher education activities in an effective way. CoHE selected 10 research universities by considering some criteria like Doctoral education, research culture, and training of strong researchers (Saraç, 2017a). Research universities will be rewarded with more academic staff position (Norm Staffing Regulation, 2018) and more resource support (Saraç, 2017b). In terms of country-benefit, economic development and efficient usage of resources are gains for the country. While Sevinç (2001) related graduate education to rise of human capital, Ünal and İlter (2010) found that graduate education is a key for development of country in terms of technological progress, cultural and economic benefit national science policy,

and modern life. To sum up, each fraction of the community takes the advantages of higher education.

In order to get optimum benefit from higher education, the critical thing is use of capacity of higher education in a more healthy way. For this reason, student retention is the key factor of the higher education capacity. In the literature, student retention was defined together with some terms such as on-time graduation, program completion, maintenance of enrollment, and persistence (Wild & Ebbers, 2002). Further, there are some activities improving student retention in the higher education institutions. To name a few, mentoring programs (Bean & Eaton, 2002), financial support (Chaney & Farris, 1991), institutional action (Tinto, 2017), and socialization (Gardner, 2008) are programs for improving student retention. On the other hand, relation of retention to other variables like background characteristics (Nandeshwar, Menzies, & Nelson, 2011) and social and institutional situations (Pleitz, MacDougall, Terry, Buckley, & Campbell, 2015) is frequently investigated in the literature.

Bio-ecological system in higher education was searched by researchers in higher education field. Elliot, Baumfield, and Ried (2016) examined the academic acculturation of international Ph.D. students from the Bio-Ecological Theory. The authors recommended a third space in addition to academic and social spaces such that a space was left for learning in relax and re-creative settings to develop academic acculturation of international students. In another study, Eriksson (2005) investigated relationship between school environment and participation for disable student from the bio-ecological perspective and found that specific environmental factors were more effective on participation than general environmental factors, which was consistent with bio-ecological model of Bronfenbrenner. Further, Ph.D. dissertation conducted by Cordell-McNulty (2009) showed that social context derived from Bio-Ecological Theory predicted academic achievement, social adjustment, and intention to persist. To sum up, bio-ecological perspectives are appropriate to analyze processes in higher education like student retention.

The current study was conceptualized to investigate student retention phenomenon in terms of bio-ecological system. Bio-ecological system mainly fitted in a trivet: individual characteristics, process and structure in higher education system, and interaction between individual and higher education. In this aspect, it was aimed to examine student retention in higher education of Turkey from the lenses of Bio-Ecological Theory of Bronfenbrenner. The sections below described firstly the ideas behind each layer of the theory and the findings from international studies. Next, higher education studies conducted in Turkey were examined to underline importance of student retention in the light of theory and previous studies. Finally, conclusion part summarized student retention in higher education system of Turkey by comparing and contrasting national and international literature.

Bio-Ecological Theory

According to Bio-Ecological Theory (Bronfenbrenner, 1977, 1986), the individual is influenced by its environment. There are five layers which are microsystem, mesosystem, exosystem, macrosystem, and chronosystem. All of these layers explain different types of interaction between individual and its environment.

Microsystem

Microsystem focuses on the basic relations between the individual and its environment. For the context of the current study, individual refers to student in higher education while environment refers to higher education institutions. To illustrate, persistence of a student may be influenced by department. More specifically, relation with peers and faculty members may be evaluated under microsystem. Fischer (2007) used a secondary data and found that there was a strong relationship between relatedness to peers and college retention. In addition to peer relations, the relation with faculty members has a role on student retention. Vogt (2008) examined importance of faculty on retention and performance in engineering programs and concluded that student-professor relationship and becoming available to students were conditions improving student retention and performance. On the other hand, study by Drake (2011) shows the power of advisor-student relationships on persistence to graduation.

By considering higher education context in Turkey, students are also in relation with peers and faculty members. Bülbül and Acar-Güvendir (2014) conducted a study to examine integration levels of students at freshman year and found that peer relation was related to satisfaction with continuing education. However, relation with faculty member is more visible separately as relation with advisor and instructor. In this aspect, relation between students and advisors draws attention. Sayan and Aksu (2005) found that problems in relation between students and advisors were caused by academic and social issues. Academic issues included lack of guidance, difficulties in time arrangement, and lack of time allocation while social issues were based on communication problem, uncomfortable relations, and lack of help. Although literature on relation between student and advisor was more visible, relation between faculty members and students was also examined. Aypay, Çekiç, and Boyacı (2012) conducted a qualitative study to investigate student retention and found that students had complaints about relation with the faculty member. In conclusion, student retention in Turkey depends predominantly on microsystem components, including relations with peers, instructors, and advisors.

Mesosystem

Mesosystem concentrates on the interaction among components of environment surrounding individual. In other words, mesosystem is representation of interaction of elements in microsystem. To name a few, interaction between schools and families, interaction among teachers, and interaction between teachers and peers are components of mesosystem. For the current study, the components of environment include departments, faculties, and other campus elements. More specifically, interaction patterns among faculty members may determine student behaviors. Biglan (1973) implied that informal social connections among faculty members have crucial importance for university outputs like academic performance and research activities including journal and technical report articles. Thus, interaction or cooperation among faculty members may influence academic achievement or retention of students. Umbach and Wawrzynski (2005) conducted a research examine the relation between faculty practices and student engagement. Their study shows that active and collaborative learning techniques empowered student engagement. In addition to curricular activities, extracurricular activities are significant for student retention in higher education. Role

of extracurricular activities on graduation probability (Mahoney, Cairns, & Farmer, 2003) and intention to persist (Fischer, 2007) were proved in the international literature.

Turkish studies in mesosystem level are generally about problems observed in institutional level in higher education. Roots of these problems are based on communication, coordination, or interaction problem between institutions like family and faculty or faculty and department (Kaya, Sungurtekin, & Deniz, 2017). Coordination and interaction problem in flow of decision-making process among institutions and inefficient resource allocation are two main reasons for mesosystem problems. The most visible coordination problem is related to balance between work requirements and school responsibilities. In other words, management of school, work, and family responsibilities at the same time makes student retention difficult. Şimşek and Adıgüzel (2012) investigated dropout tendencies of university students. The study shows that out-of-school work was one of the factors affecting dropout tendency. Lack of family support and organizational opportunities caused the students to work in a job. Further, Nayır (2011) conducted a research to analyze problems of teachers, administrators, and inspectors studying in graduate education and categorized problems as follows: program problems, school and ministry problems, and social and economic problems. In conclusion, problems observed in higher education occurred due to lack of interaction among institutions related to higher education. In other words, solution or appearance of problems in higher education does not depend on only one component such that problems are within at least one institution's area of interest. Therefore, interaction idea in mesosystem may be described by higher education problems.

Exosystem

Exosystem is a layer related to societal conditions and policies. Commonwealth welfare and higher education policies are included in the context of current study. To illustrate, persistence of students in higher education may be affected by recent higher education reforms or socio economic status of families. In this respect, the process and structure in higher education gains importance. In order to improve student retention, links between some interests were set by researchers and policymakers. Relation between education and marketization is one of these interests. Ackerman and Schibrowsky (2008) made an analogy on the relationship between with customer retention and student retention. They concluded that strengthening relationship bonds between students and higher education institutions through financial, social, and structural bonding activities improved the student retention. On the other hand, parental characteristics are determinants of student attrition. Adrogue and Fanelli (2018) examined predictors of persistence in Argentina. The study showed that students with higher per capita income, students from upper class, and students whose parents were higher education graduate had lower probability of dropping out. To sum up, higher education policies and parental backgrounds are related to student retention.

Administration and governance of higher education in Turkey has experienced great changes in the recent years. All of these changes have occurred in order to improve higher education institutions in different areas. In terms of structural changes, many public and private universities have been opened since beginning of millennium. According to Çelik and Gür (2014), higher education system has grown dramatically in recent years so that excessive centralized structure cannot carry this growth. Although

structure of higher education was not linked directly to student retention, it is possible to imply that centralized structure may put barriers to keep students in the system. In addition to structural situations, there were procedural changes in higher education policies. To illustrate, finance of universities has an important place in administration and governance of higher education. One of the most serious problems of the universities is finance (Aypay, 2003). Universities had a common concern to teach students and to do research in scarcity of resources. According to Aslan (2007), students could not involve in social and cultural activities due to lack of money. To summarize, policies related to economic situations and resource distribution had impact student retention.

Policies related to academician assignment, training and promotion are significant such that higher education in Turkey suffers from inadequacies in terms of both quality and quantity Bozan (2012) investigated the quality of graduate education in Turkey and reached four main conclusions. Firstly, in spite of developments in the number of scientific publication after year 1980, same development could not be achieved in terms of the quality of publications and impact factors. Secondly, the number of social science publications was much lower when compared to other fields. The third conclusion was that number of researchers or academicians in research and development activities were much lower than average of OECD countries. Lastly, high quality could not be provided since graduate education was far away from the freedom of thought and democratic environment. Therefore, student retention is influenced by academic quality coming from academicians.

One of the most important policies was Faculty Development Program training research assistants through graduate education. This program provided permanent academic position and many opportunities like budget, foreign language education, and study abroad for research assistants until 2016. However, with passing of time, opportunities were minimized. Also, permanent positions of research assistants in the program converted to temporary position. Apart from this program, the law of Council of Higher Education defined two type of research assistant. Research assistants with 33/a position continue with Ph.D. affiliation after Doctoral education whereas research assistants with 50/d position are fired from job despite Dr. title. However, a recent law (law no.7033, 1.07.2017) stopped to assign the permanent position of research assistants. Instead, each research assistant position would take at the form of 50/d. However, temporary position affected performance of research assistant in the job and their career perspective negatively (Korkut, Yalçınkaya, & Muştan, 1999). Therefore, staffing positions were closely related to student retention since even if research assistant thinks to give up graduate education, a student without financial support may give up more easily.

Considering parental conditions, family characteristics such as mother education, father education, and number of siblings determined access to education and student retention in higher education as well primary and secondary education. Ekinci (2011) investigated effects of socio economic status on higher education participation and found that educational level of parents was related to higher education participation. The study also showed that students with higher level of education and income were overrepresented in the programs which were prestigious. In conclusion, higher education policies including research assistants and academic promotions and parental

conditions may influence student retention in higher education. For this reason, exosystem focusing on higher education policies and parental backgrounds consists of critical ideas for student retention.

Macrosystem

Macrosystem focuses on the cultural interchanges and values. For the context of the current study, macrosystem is investigated in terms of culture and value issues in higher education. Student retention is linked to overarching values and beliefs like culture, commitment, gender, and ethnicity. Organizational culture is related to perceptions of individual in any organization. Organizational culture in higher education institutions describes the atmosphere in which university stakeholders react. The students who could not adapt to culture of higher education institution may leave the school. The literature showed that culture of higher education institutions was related to student persistence or attrition (Ehrenberg, Jakubson, Groen, So, & Price, 2007; Kuh, 2001; Stallone, 2014). As a special part of the organizational culture, organizational climate was linked to student retention in the literature (Yi, 2008). Commitment was another topic affecting student retention.

Commitment can be defined as willing to work or study. The students having higher commitment were less likely to leave higher education (Davidson, Beck, & Milligan, 2009). Gender and ethnicity are important values for individual. Although these values are at the center of unequal and unfair approaches, it is a reality that everyone from each gender and ethnicity is unique and deserves respect. Ferreira (2003) found that dropout of female students was higher than that of male student whereas Hassell, Seston, Eden, and Willis (2007) found that probability of graduation of female students were higher than that of male students. Stratton, O'Toole, and Wetzel (2007) investigated student retention in terms of ethnicity and found that racial or ethnic characteristics were linked to student retention for part-time students such that Hispanics were more likely to make dropout decisions. Reflections of macrosystem in Turkey in terms of student retention are more limited compared to international literature. To begin with, climate in higher education institutions were investigated by researchers. Kasırga and Özbek (2008) detected differentiations among three universities in terms of quality of research, support from senior academicians, social relations, and warmness of the institution. All of these dynamics are related to student retention. Considering gender issue, Aypay, Aypay, and Demirhan (2009) investigated academic and social integration and found that academic and social integration of the students differed by gender. Moreover, study by Ertem (2018) showed that female students were more likely to persist on graduate education than male students. In conclusion, macrosystem of higher education in Turkey in terms of student attrition included cultural and gender issues more.

Chronosystem

Chronosystem is related to the changes over time. This layer concentrates on differences occurred within passing time. For the context of the current study, student retention is analyzed in terms of change in years in higher education. Changes year by year may influence student retention. Especially, first year experiences are emphasized in student retention literature. ATTRACT (Enhance the Attractiveness of Studies in

Science and Technology) was a kind of student retention project considering whole Europe. Kairamo (2012) supported from the data coming from this project and concluded that most of the dropouts in Portugal, Italy, Belgium, Ireland, Finland, and Sweden were detected in the first year so that the first year experience is important for student retention. On the other hand, Fike and Fike (2008) conducted a study to analyze predictors of experience in the first semesters and found that there was a negative relationship between age of student and student retention. To sum up, first year experience and age are determinants for student retention.

Chronosystem in higher education system in terms of student retention in Turkey is mostly based changes in student attrition rates and student experiences. Ertem and Gökalp (2016) investigated student attrition rates in three public universities and found that student attrition rate in Master education was higher than that in Doctoral education. Moreover, their study showed that two of the universities had generally upward trend in terms of student attrition. Further, Ertem and Gökalp (2019) investigated student attrition from graduate education and concluded that student attrition rate in Masters was higher than that in Doctorate. On the other hand, Bülbül (2012) conducted a study in undergraduate level and pointed out that the changes in the job opportunities of the students caused them to leave university. In other words, changes in student experiences may be a reason for dropout. In conclusion, chronosystem of Turkish higher education in terms of student retention was related to changes in both rates and experiences.

Discussion and Conclusion

Bio-Ecological Theory describes important ideas for higher education in Turkey. First of all, relation with peers, instructors, and advisors as reflections of microsystem had an impact on student retention. In this aspect, dynamics in higher education system in Turkey coincided with the idea behind Bio-Ecological Theory. However, relation with faculty members which is mostly visible in international literature may be separated as relation with instructor and relation with advisor for higher education in Turkey. The reason of this separation may be related to structure of higher education system. Basically, graduate students attribute different meaning to their advisors and instructors. There are students focusing on the personal characteristics of the advisor (Seçkin, Aypay, & Apaydın, 2014) while instructors are generally accepted as knowledge transmitters (Ürü-Sanı, Çalışkan, Atan, & Yozgat, 2013). Relationship problems between students and advisors may be caused by ethical standards. According to Summak, Summak, and Balkar (2010), guidelines and regulations may prevent conflicts between advisors and students. Thus, they offered committees to determine and follow advisement standards. As a result, activities empowering relationships of students with their peers, faculty, and advisors are recommended. This situation will serve improvement of microsystem in higher education in terms of student retention.

Mesosystem of higher education depicted that although international literature presented a variety of curricular and extracurricular activities, national literature was only limited to course content. This situation remarks that curricular and extracurricular activities in Turkey are more superficial than those in international literature. It may be related to interaction in the faculties. Balcı-Bucak (2002) found that superior-subordinate relations in higher education institutions were in medium and sub-medium

level. On the other hand, roots of the problems in higher education were based on lack of communication, coordination, and interaction (Ölçer & Koçer, 2015). To sum up, curricular activities and attitudes of departments had an influence on attendance and so retention. Therefore, stakeholders in higher education should respect each other and re-organize situations to support students by improving communication channels and interactions ways.

The system in which student retention implementations are visible in the most intensive way was the exosystem. Societal conditions and higher education policies in Turkey influenced student retention since administration and governance of higher education was closely related to process and structure in higher education. Structurally, governance and administration of higher education is based on centralized structure so that decisions are made in a top-down way. This situation may affect student retention since students do not feel themselves valuable. Procedurally, financial constraints drew attention in higher education context. The reason why finance is so important for persistence of the students is related to educational expenses. Winston (1999) stressed that higher education is a place producing and selling educational services to the customers through business. According to Bair and Haworth (2004), problems related to economic and logistic opportunities are barriers to the progress of the students. The studies in Turkish literature also confirm the importance of economy (Bülbül, 2012; Özmen & Aydın-Güç, 2013; Sevinç, 2001). On the other hand, temporary position of research assistants had a negative impact on student retention. Because of lack of assurance, brilliant brains do not prefer academia so that retention is influenced negatively. In terms of societal conditions, socio economic status of parents is an important factor for student retention. Kiraz, Engin-Demir, Aksu, Daloğlu, and Yıldırım (2010) examined educational views of prospective teachers and pointed out that educational level of parents had a significant effect on educational views of participants. Therefore, the researcher of the current study recommends more decentralized structure, bottom-up decision making process, more resources for higher education, assurance for academic positions, and parent-university associations to improve exosystem of higher education in Turkey.

Macrosystem of higher education had a limited context in Turkey such that organizational climate and gender issues were examined in terms of student retention in higher education. The studies in both national and international literature pointed out that positive climate led to student retention while negative climate led to student attrition. In terms of gender, the reason of inconsistencies may be contextual factors. Johnes and McNabb (2004) concluded that male students were more likely for voluntary dropouts from larger universities while the female students were less probability for dropout from universities including academically more qualified students. On the other hand, Laws in Turkey gave a right to male graduates to delay their military duties providing that graduate education registration. The study by Çoruk, Çağatay, and Öztürk (2016) showed the effect of military issue on education. Additionally, tendencies of female towards academic career may be a determinant for female students' retention. Average number of women academician in Turkey was higher than that in Europe (Yirmibeşoğlu, 2016). In terms of ethnicity issue, researchers and policymakers do not prefer to touch on racial issues. It is clear there are visible ethnic differences in United States but people in Turkey cannot be differentiated in terms of color and any physical

appearance. Further, constitutional law in Turkey claims to guarantee rights of all citizens and provide equality for all classes of society. Moreover, social structure in the community encourages integration by disregarding all differences. In conclusion, military duty and tendencies of female may be situational factors affecting student retention. Therefore, improving organizational climate and considering expectations of both females and males are recommended for student retention in Turkey.

Chronosystem was reflected as changes in student attrition rates and student experiences in Turkey. Contextual factors are closely related to this situation. To name a few, unemployment, nature of M.S. and Ph.D. education, and organizational behaviors influenced student retention. According to Stratton, O'Toole, and Wetzel (2007), decrease in the employment opportunities may be resulted in dropouts. Moreover, high student attrition in the first years may be explained with low academic and social integration (Lassibille & Gómez, 2008). On the other hand, admission processes might be reasons for differentiation between Master and Doctoral education in terms of retention. To illustrate, application requirements for M.S. are easier and more flexible than those for Ph.D. in Turkey. By considering these situations, structure of graduate education should be reorganized as well as employment conditions. Moreover, higher education institutions should emphasize orientation more.

The current study has limitations and recommendations. Limitations are related to methodological issues such that the study was formed around theoretical or conceptual discussion. This study cannot be generalized to higher education context or any other context due to lack of empirical and randomly data collection procedure. Therefore, more empirical studies related to student retention were recommended. Further, student retention should be examined from theories of other fields like sociology or political economy. Finally, researcher of the current study recommend policy-makers to implement action plan based on results, implications, and recommendations of academic publications.

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Teacher and Student Perspectives on Safe Learning Climate in Gifted Education

Üstün Yeteneklilerin Eğitiminde Güvenli Öğrenme Ortamına İlişkin Öğrenci ve Öğretmen Görüşleri

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ABSTRACT: This study explored the views of the lower secondary gifted students in relation to the learning climate established in their regular schools and the gifted education centers, with a focus on their psychological safety, in the Turkish context. It also investigated what these students and their teachers expect from a potentially safe and desirable learning atmosphere. Therefore, a qualitative research approach was employed. The data were collected through one-to-one semi-structured interviews with the gifted students (*N*=12) and their teachers (*N*=5). Then, the interview data were transcribed and content analyzed. The findings show that gifted students had a positive description of the Art and Science Center (SAC) as a safe and desirable place compared to their regular schools. They felt happy and psychologically safe at the SAC, where they could disclose their opinions and ask questions without being subjected to embarrassment. The regular schools, however, were not described as fully safe from a psychological perspective, mostly because of the crowded classrooms. Students' expectations of a safe learning climate were in relation to teacher approachability, peer relationships, learning process and the physical characteristics of the learning environment. Teachers were also of similar opinions with regard to these findings.

Keywords: safe learning climate, gifted students, gifted education, regular school.

ÖZ: Bu çalışmanın amacı Türkiye'de öğrenim gören ve ortaokula devam eden üstün yetenekli öğrencilerin, normal okullarındaki ve Bilim Sanat Merkezlerindeki öğrenme iklimi ile ilgili görüşlerini güvenli öğrenme ortamı bağlamında belirlemektir. Çalışmada ayrıca, bu öğrencilerin ve öğretmenlerinin potansiyel olarak güvenli ve arzu edilen bir öğrenme ortamından ne bekledikleri de incelenmiştir. Bu nedenle çalışmada nitel araştırma yöntemi kullanılmıştır. Çalışmanın verileri, üstün yetenekli öğrencilerle (*N*=12) ve onların öğretmenleriyle (*N*=5) yapılan birebir yarı yapılandırılmış görüşmeler vasıtasıyla toplanmıştır. Elde edilen nitel verilerin çözümlenmesinde içerik analizi kullanılmıştır. Bulgular, üstün yetenekli öğrencilerin Bilim Sanat Merkezlerini normal okullarına kıyasla daha güvenli ve arzu edilen bir yer olarak gördükleri şeklinde olumlu bir görüşe sahip olduğunu göstermektedir. Yine bulgularda öğrencilerin Bilim sanat Merkezinde kendilerini psikolojik olarak güvende ve mutlu hissettikleri; orada düşüncelerini rahatça ifade edebildikleri ve suçlanmaya maruz kalmadan soru sorabildikleri ortaya çıkmıştır. Bununla birlikte öğrenci görüşlerinde normal okulların, çoğunlukla kalabalık sınıf mevcutları nedeniyle psikolojik açıdan tam olarak güvenli şeklinde tanımlanmadığı görülmüştür. Araştırmada öğrencilerin güvenli bir öğrenme ortamından beklentilerinin ise; "öğretmen yaklaşımı, akran ilişkileri, öğrenme süreci ve fiziksel ortamın özellikleri" ekseninde toplandığı belirlenmiştir. Aynı konudaki öğretmen görüşlerinin de buna benzer olduğu saptanmıştır.

Anahtar kelimeler: güvenli öğrenme ortamı, üstün yetenekli öğrenciler, üstün yeteneklilerin eğitimi, normal okul.

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Safe Learning Climate

When the word 'safe' is uttered, the only thing which goes through our mind is the physical safety. However, emotional and psychological safety also matter to the same degree as the physical safety does. The latter meaning of safety applies in many situations, more importantly in the classroom setting, which is the focus of this study. A safe space could be ensured when the learning climate is positive. Many definitions exist on positive learning climate in general. For instance, it is seen as a desirable learning atmosphere created by the teacher in the classroom with welcoming, encouraging and supportive characteristics (Meyer & Mao, 2014; Sriklaub, Wongwanich, & Wiratchai, 2015). According to Barr (2016), "The classroom climate is a reflection of students' opinions of their academic experience" (p. 1). This is accompanied by how students perceive the classroom atmosphere, their communication with their teachers and classmates as well as their engagement in the classroom activities. These characteristics also apply when the classroom is a safe haven for the students' engagement in learning. However, according to Turner and Braine (2015), the term 'safe' is not easy to interpret as it looks. In addition, there is no a specific definition of safe learning climate but interpreted in many ways in the existing literature.

Greene and Mitcham (2012), see the safe classroom as a community of learners and instructors, who work together ensuring mutual respect and sense of collaboration. They further argue that "When students feel valued and respected, they gain the confidence that they need to share their own experiences, to engage in authentic opportunities for learning, and to work in space that might be challenging and unfamiliar" (ibid, p. 14). Moreover, according to Holley and Steiner (2005), the 'safe classroom environment' is used as a metaphor to refer to a learning atmosphere, where students willingly and actively participate in their own learning process without being labeled or humiliated. In another word, "Classroom safe space refers to protection from psychological or emotional harm" (ibid, p. 50). Conversely, in an unsafe learning climate, students will think about how not to be subjected to embarrassment other than thinking about how to learn (Clapper, 2010).

Creating a safe learning climate in the classroom contributes to considerable positive changes in the way students see the teaching and learning process (Holley & Steiner, 2005). A sense of freedom, trust, and persuasion will be cultivated in their minds to socially interact with the classroom population on their own will. This, of course, would happen when they find themselves psychologically safe. Surely, the personal growth of students requires them to face their fear of the unknown and be ready to take creative risks. Therefore, it is the teacher's responsibility to eliminate the possible obstacles that nurture a sense of fear amongst the students and stop them interact with their peers or share their thoughts openly in the class. To reduce such kind of feelings, teachers could stop judging and punishing students at first hand on their own part comforting the existing stress-borne classroom atmosphere (Holley & Steiner, 2005). Teachers are required to set a learning space, where the students can get utmost benefit of the instructions with the purpose of maximum learning to be ensured. However, for the learning to take place efficiently, the classroom climate should be positive, safe, supportive, and friendly plus intellectually motivating (Falsario, Muyong, & Nuevaespaña, 2014).

As it appears from the above discussions, the safe learning climate seems to be partly synonymous with the positive classroom climate. Both share similar characteristics although the existing literature does not say so. As Schunk (2011) argues that a positive learning climate illuminates the condition where students are emotionally secure and they are not in a lurking fear or in a stressful position. Instead, they are relieved of stress and trust their teacher who sees their mistakes as a way of learning. Clapper (2010) emphasizes that "Errors are an opportunity to learn" (p. 3). However, some students might be afraid of being judged for their performance as lazy or smart by their teachers or peers. Such kind of beliefs in students can stop their risk-taking to express themselves to avoid judgment for their mistake in an unfavorable manner. When they do make mistakes, they prefer not to ask the teacher or their peers for help, but hide them. Building a trusted space between the students and also between the students and the teacher "requires a trustful atmosphere where people can make mistakes without worrying about suffering negative consequences" (Clapper, 2010, p. 2).

Moreover, the relationship between the teachers and students is another important issue to be focused upon in order to ensure quality learning. Maintaining a respectful and friendly gist in the classroom atmosphere contributes to the self-esteem of the students and serves the development of a positive learning climate thereafter (Falsario et al., 2014). In the meantime, maintaining a trusted relationship in the class increases the possibility of students' engagement by giving them a feeling of 'being accepted'. However, the experience of boredom and negligence of the student identity hinders their full participation in the learning process. They should be respected for what and who they are (Maryland Board of Education, 2015).

At the outset, the teachers should get down of their authoritarian positions and take the role of a facilitator instead. They are required to model good behavior, respect, and accept the individual students' identities and their personal values to produce critical thinkers out of them (Greene & Mitcham, 2012). Listening to the students, valuing their commitments, showing interest in them, supporting them, persuading them to actively participate in the activities, and positive reinforcement are a number of ways to build rapport with them (Barr, 2016).

This notion is supported by one of the prominent learning theories, constructivism, which emphasizes mental and emotional security of the students putting forward the learner-centered approaches to be followed in the class. Social interaction of the students in a stress-free classroom environment is of primary importance to the constructivists (Wang, 2007). It gives students a freedom of choice and a freedom of expressing themselves in the process of teaching and learning. The main aspiration of the constructivism is to create a safe and positive learning climate, where the students could construct knowledge being exposed to different interactive instructional approaches (Schunk, 2011).

Problems in Creating Safe Learning Climate

According to Holley and Steiner (2005), safe learning climate does not mean that there is no any tension and inconvenience in the class because they have to face things which make them feel uncomfortable. This happens when students feel vulnerable in the process of "self discovery and self-disclosure" (Garran & Rasmussen,

2014, p. 401). Therefore, psychological safety in the classroom is an inevitable necessity in order to decrease the level of discomfort and trouble the students experience in an unsafe learning climate.

Sometimes, misunderstandings could arise when trying to create a safe learning climate (Holley & Steiner, 2005). For instance, letting students to say whatever they want in the class without having any clue and without facing any academic challenges or their comfort not being disturbed to participate in the activities are not what could be assumed by the word 'safe'. It does not mean that they should remain uninformed about their ignorance. They should be made aware of their strengths and weaknesses in order to be critical of their actions and knowledge to grow successful individuals. The factors which cause students to feel troubled is the harassment, ridicule, being subjected to embarrassment or emotional harm and neglecting their identities as significant social individuals. These are the main problematic issues to be eliminated from the classroom environment and a psychologically safe space should be provided for students. Moreover, safe learning climate could be mistakenly seen as conflict-free when trying to create a stress-free environment (Holley & Steiner, 2005). Boostroom (1998) states that "If critical thinking, imagination and individuality are to flourish in [the] classrooms, teachers need to manage conflict, not prohibit it" (p. 407).

If there is no conflict in the class, it means that students are not being academically challenged and learning is not taking place as desired. Negative beliefs of the students are changed when they are encouraged to expose them and be aware of their inner self. It is not easy to do so, though. Creating a safe climate in a classroom comprised of the students with the multicultural or multilateral backgrounds is challenging to the teacher. It will be difficult for the teacher to help students to expose their personal identity and speak up without harming other students' feelings (Holley & Steiner, 2005).

Gifted Students and the Safe Learning Climate

Gifted students normally maintain a higher position in learning than their peers in a regular classroom. They even can learn complex things faster. The cognitive abilities and the problem-solving skills of these students develop dramatically faster at a younger age compared to their non-gifted counterparts. Their curiosity to learn things in details and critical thoughts often drive them to ask too many questions or talk excessively (Çitil & Ataman, 2018; Doğan & Kesici, 2015; Kazu & Şenol, 2012). Research indicates that such behavior can sometimes lead to misunderstanding. For example, asking questions, criticizing other students' opinions, demonstrating excessive desire to share their thoughts, and being overactive in the class are a few of many examples that teachers see them as behavioral problems and thus take preventive actions (Sezer 2015). Referring to literature, Özmen and Kömürlü (2013) argue that the educational needs of the gifted students are ignored at schools by being educated under the same circumstances with their non-gifted peers in Turkey.

Both their educational and psychological needs of the gifted students show differences from the normal students and if these needs are not met, they can develop emotional and psychological problems (Doğan & Kesici, 2015). In addition, the fast-paced learning capabilities of the gifted students and their intelligence level may cause their normal peers to take distance from them (Çitil & Ataman, 2018). However, they

can overcome such problems if they get proper emotional support (Doğan & Kesici, 2015).

With these issues in focus, an important job falls to the teacher to acknowledge the different needs and interests of the students in the classroom, especially when the gifted and non-gifted students are being schooled together. Or else, the gifted students will suffer more from the negative aspects of the classroom and develop negative behaviors. The classroom environment must be enjoyable and engaging to all students, where the lessons are delivered effectively using diverse teaching methodologies (Roberts, 2005).

For instance, Shaunessy (2005) introduces higher-order thinking skills by posing challenging questions for gifted students. However, for giving a sense of emotional security to the students in the process of asking and answering questions, she emphasizes creating "a safe, non-threatening, encouraging, mutually respectful environment" in the class (p. 7). More importantly, the ideas of the students should be respected and valued at an individual level to enable risk-taking and self-disclosure. Unlikely, when the students do not feel connected to their class, their peer group, and their teachers, they will be deprived of learning and feel isolated.

Talas, Talas, and Söznmez (2013) argue that the gifted students face many problems in the teaching and learning process in regular classrooms at schools. In their study, students said that the teachers are uninterested in them, the lessons are boring, the book contents are irrelevant and have many shortages, and the learning activities are unexciting. Some of them compared school to a prison with a chaotic classroom environment. Even the school administrators looked down on them. Likewise, teachers believe that gifted students find the "regular education boring" (Altıntaş and Ilgun, 2016, p. 961). Many other Turkish researchers have reported similar findings on the perceptions of the gifted students as regards the school or the SAC (e.g. Aslan & Doğan, 2016; Kunt & Tortop, 2013; Ülger, Uçar, & Özgür, 2014).

Gifted students are very curious to inspect things in details compared to other students. Their way of thinking is different. Besides, they learn faster than their peers do (Altıntaş & Ilgun, 2016). However, when the gifted students are taught at the same pace as their non-gifted peers in the regular classrooms and are not given proper attention, they may not get challenged or motivated. Therefore, it could be useful to incorporate some extracurricular materials according to the learning capacity of the individual students to keep them motivated in learning. Heitzmann (2009) investigated the impact of classroom climate on students' motivation through qualitative research. She reported that the teaching styles of the teachers, their interest in students and their subject plus the support they give, will stimulate the students' motivation by making them interested in learning and encouraging their active participation in the classroom activities.

However, the insincere teacher-student relationship, boring lessons, and unexciting activities might put a bad impact on students' learning. When the students do not feel valued and their needs are left unfulfilled, they may not feel safe in such a classroom environment. As discussed before, within-class relationships and approachability of the teachers are of primary importance in creating a safe learning climate, where the needs of the student with different levels of achievement are met. Apparently, no research has been done regarding the safe learning climate with the

school level gifted or non-gifted students, but only some exist with non-gifted students in tertiary education.

As noted elsewhere, safe learning climate does not mean that students should be allowed to say whatever they want to, either willingly or unwillingly by emotionally harming other students in the class. They must have the freedom of disclosure, but in a controlled manner into a "protective shell" where students can take a risk in "making errors" (Senior, 2001; p. 251).

This Study

Life conditions, social status, and education system seem to be different in different countries as well as the expectations from education in various degrees. Similarly, safe learning climate may also be perceived differently in different levels of school contexts with different student abilities. Since the students are vulnerable individuals in unsafe classroom environments, exploring the students' views about the nature of a safe and effective learning climate is necessary. Fonseca (2011) maintains that problems the gifted students experience with their peer group and emotional development at schools is more profound because of their giftedness.

As discussed earlier, there are various definitions of safe learning climate. However, all of them point to similar characteristics that a safe space in the class should have. The opinions about the safe learning climate could be diverse in different contexts according to the kind of biases students experience in the classrooms. However, when it is looked from the gifted students' perspectives, they might view the safe learning climate way different than non-gifted students. Gifted students are usually one step ahead of their non-gifted peers and in a higher level of thinking compared to their present age or grade level.

In a classroom where the gifted students are educated considering the same level of instruction to everyone, they could be in a more disadvantaged position. For instance, there might be only one are two gifted students in one class, and the teacher also has many other students to look after. Here, he might believe that the gifted students are already good and he must attend to underachievers in the class, but in reality this assumption is completely wrong. So doing they will be ignored and their gifted talent may not flourish, but feel alienated because of not being valued for their strength in higher-order thinking and learning. Every day, they may repeat the content that they already know and get bored. As a result, they will not get an opportunity for personal growth, get psychologically harmed, and remain passive (Fonseca, 2011).

Though the gifted students reveal their giftedness at a very young age, they might develop self-awareness or their identities at older ages like during their secondary education. Students at this level seem to be suitable for this study. Raising them as productive and creative critical thinkers from this very level can play a crucial role in what and who they could become in the future. Secondary education is the level, where students find the ability to discuss logically and critically. In addition, Beamon (1993) describes the middle school students as "young adolescents" whose "intellectual capacity is rapidly unfolding, the need to foster thinking ability is a critical one" (p. 92).

Therefore, the current study was planned to explore the views of the gifted students in relation to the learning climate in their schools and the SAC in terms of their

emotional or mental safety. It was also aimed to explore what these students and their teachers expect from a safe and desirable learning atmosphere as well as explore how the teachers view the learning atmosphere in the SAC. Therefore, three research questions were devised for the purpose of this research:

1) What are the views of the gifted students on the learning environment at school and SAC in terms of their emotional or psychological safety?
2) How do the teachers of the gifted students view the learning environment at SAC in relation to the mental safety of the students?
3) How do the gifted students view a safe learning environment?
4) How do the teachers of the gifted students view a safe learning environment?

Method

A qualitative research approach was employed in this study to do a detailed investigation with regard to the in-class safe learning climate in a SAC and the regular schools through one-to-one in-depth semi-structured interviews with the gifted students and their teachers. Prior to that, the interview questions were reviewed by at least four educationalists to ensure their validity and reliability. The questions were formulated according to the following definition suggested by the researchers:

A safe learning climate indicates an emotionally and psychologically safe learning environment, where the student queries, curiosities, creative thoughts and opinions are welcome, whilst the judgmental behaviors, ridicule, bullying, harassment, and alienation are impeded. The learning takes place in an authentic, encouraging, and challenging way. The teachers are trustworthy, approachable, and sincere who act as facilitators or co-learners in the learning process respecting the individual differences and cultural heterogeneity amongst the students. They build a good rapport with and between the students by encouraging them to work in collaboration and harmony with each other avoiding bias or discriminative actions.

Participants

A purposive sampling strategy was employed in this study since it allows the researchers to select a group of participants that hold specific characteristics or those who can provide the information required (Cohen, Manion, & Morrison, 2007). Hence, the sample was selected from a government-funded Turkish educational center established for the gifted students called *Science and Art Centers*, SAC in short throughout this paper. These students are given extra education alongside their regular schooling at public or private schools. Twelve students comprising of five boys and seven girls of lower secondary level (grade 6-8) volunteered to participate in the study. Eight of them represented *General Intellectual Ability* talent area, two *Visual Arts*, and two others the *Music*. These students were pursuing different educational periods in the SAC (Developing Special Skills, n = 5; Recognizing Individual Talents, n = 5; and Project Management and Production, n = 2). The second group of the participants included five teachers from SAC, comprising of two males and three females. They represented five different fields (Visual Arts, Mathematics, Physics, Music, and Information Technology). Each had two to four years of work experience in the SAC.

Data Collection and Analysis

The data were collected in the second half of the academic year 2017-2018 through semi-structured interviews conducted by one of the researchers. Abiding by the ethical rules of academic studies, the researchers secured necessary administrative permissions prior to the data collection. Besides, the purpose of the study was explained to the interviewees and their consent sought, all the interview sessions, each lasting 20-25 minutes, were audio-recorded. Any information about the participant identity and school whereabouts was kept confidential as the anonymity and confidentially ethics of the research requires (Creswell, 2012).

Seven main interview questions were directed to the students and the teachers, which focused on different aspects of a safe learning climate such as a) freedom of asking questions and self-disclosure, b) type of activities used in the classroom, c) suitability of the classroom context to the student characteristics and needs, d) students' emotional or psychological security in the classroom e) teacher characteristics, f) teacher-student relationships, and g) the peculiarities of an expected learning environment where students would feel safe and happy and learn joyfully.

After the completion of the data collection process, the interview sessions were transcribed for the content analysis. To ease the coding process, the interview data collected from the gifted students and their teachers were separately entered into QDA MINER LITE V2.0.5; computer software designed for qualitative data analysis. The raw data were reviewed several times and then coded under different sub-categories by at least two researchers. To ensure coding reliability, the retrieved codes were shared between the researchers and the final set of codes was approved with 100% consensus.

Findings

Learning Spaces Viewed by the Gifted Students

During the interview process, the gifted students mostly compared their regular schools with their free-time class at the SAC. Their enthusiasm could be read in their eyes when they described how happy they were when they came to the SAC. The SAC is established by taking their particular learning needs into account in addition to their normal classes at schools. Table 1 reflects how gifted students find their learning climate at SAC. Accordingly, the findings are summarized under three categories, that is, the identity safety, teacher approachability, and the learning process.

As seen in Table 1, the learning environment created at SAC ensures the identity safety of the students. Students usually found themselves happy and comfortable in the classroom as evidenced in a student's comment: "*Generally, I am comfortable and feel very happy"* (S4).

It was also found that there are a small number of students in the class with positive peer relationships, where they can express themselves without any restriction. For instance, one student said, *"our teachers here (SAC) allow us to speak out our opinions. It is more comfortable"* (S6). One of the students also explained that one of the things that make the SAC distinctive from the normal schools is the absence of exam pressure. Surely, one of the contributive factors to how students feel safe in the classroom could be the teacher approachability as the present study revealed. Students believed that the teachers valued their individuality and accepted them for who and

what they are without acting discriminatorily. Students also found their teachers sincere, flexible, and understanding.

Table 1

The Learning Atmosphere at SAC According to the Gifted Students (n=12)

Categories	Codes	*f*
Identity Safety	Feel happy	7
	Feel comfortable	6
	Small number of students	6
	Positive peer relationships	4
	Freedom of self-disclosure	2
	No exam pressure	1
Teacher Approachability	Teachers value students	7
	Teachers are sincere	6
	Teachers are nondiscriminatory	5
	Teachers are flexible	2
	Teachers are understanding	1
Learning Process	Feel free to ask questions	12
	Student-centered activities	10
	Teachers are supportive	7
	There is a democratic learning space in the class	6
	Joyful learning opportunities	1
	Critical thinking is encouraged	1
	No homework	1
	Educational trips	1

Teacher approachability at SAC can be evidenced in the following comment:

> "I think the teachers are flexible and value for who I am. They ask how I feel. When something is bothering me, they try to help me. Last year I had a conflict with one of my best friends. He wouldn't talk to me. During the break, my mathematics teacher asked what was bothering me and I told him the matter. Then, I noticed he had talked to my friend and made peace between us". (S12).

Moreover, they felt free to ask questions without a sense of fear or hesitation. The learning took place through participative learning activities, where students learned by doing and experiencing. The teachers also supported students throughout the learning process and established a democratic learning atmosphere to provide equal learning opportunities for everyone in the class. Some other individuals stated that SAC provides joyful learning opportunities, encourages critical thinking, lifts the burden of homework, and even organizes educational trips. One of the students stated that *"A lot of educational trips are organized and the education is enjoyable here (SAC). This does not exist at schools"* (S7).

As stated elsewhere, the students compared the classroom learning environments at normal schools and SAC. The findings in Table 2 indicate that there were some students who thought the learning climates at schools are also of desirable quality. Besides, some students thought that the normal schools do not establish a psychologically safe learning space in the classroom compared to that of SAC. They faced negative reactions like discrimination, humiliation, and ridicule, especially when they asked questions or shared their ideas during the classes at school. One student asserted that *"the unsuccessful students do not welcome successful ones. This is what annoys me a lot. I do express myself freely, but some of my successful friends cannot, which makes me upset" (S1*). Another one spoke of his school experience, saying "*I had a classmate. He was tall and the students used to ridicule by calling him a camel"* (S7).

Table 2

The Learning Atmosphere at Schools According to the Gifted Students (n=12)

Categories	Codes	*f*
Identity Safety	Negative reactions	6
	Crowded classrooms	4
	Feel happy	4
	Positive peer relationships	4
	Feel uncomfortable	4
	Feel bored	3
	Feel unhappy	3
	A democratic learning space is established	3
	Concerned of getting lower marks	3
	Not a democratic learning environment	1
	Hesitate to ask questions from the teacher	1
Teacher Approachability	Treat students equally	6
	Supportive	5
	Behave coldheartedly	4
	Act discriminatorily	3
	Values their students	2
	Not flexible	1
	Sincere	1
	Do not allow students to express themselves	1
Learning Process	Feel free to ask questions	12
	Teacher-centered	9
	Do off-campus investigative activities	3
	Annoying student behaviors	2
	Shortage of materials	2
	Critical thinking is hampered	1

Further, the students complained that the classrooms were crowded at school. They felt uncomfortable, bored, and unhappy. These findings are well reflected in the following comments:

> "Be it physically or psychologically, I don't ever feel comfortable at school. The classrooms are crowded with insufficient space. SAC is a better place in this respect due to having fewer students in each class" (S9).
>
> "Teachers see students as their enemies. This is what makes me irritated at school" (S7).

Besides, they worried about getting lower marks at the exams. One of them believed that the learning environment is not democratic, while another one stated that he feels hesitation when asking a question from the teacher. Nonetheless, some students had positive remarks about the classroom atmospheres at schools. Some of them felt happy in the class and had positive relationships with their peers at both schools. Their classmates treated them *"respectfully and equally"* (S4). A few others were of opinion that there is a democratic learning atmosphere in the school classrooms.

Likewise, the student views as regards the teacher approachability varied to some degree. They stated that their teachers treated them equally, supported them when needed valued their individual differences in both schools. According to S1, teachers *"value the students"* and *"treat everyone equally"*. One of them also said that teachers are sincere. However, some others added that the teachers are coldhearted and insincere as indicated in these comments:

> "Generally, the teachers are more sincere here (SAC), but some of our school teachers are cold-hearted" (S5). "They lose their temper after teaching several classes with more than 40 students in each and their anger erupts in the last class they enter" (S2).

A few also thought of the teachers as discriminative and unfair, who treat them differently by prioritizing one student to another in the class and in the examinations. The inflexibility of the teachers and their preventive actions against student self-disclosure were also among the comments made by two of the students respectively.

In the learning process, however, all the students felt free to ask questions no matter how others reacted. One of the students declared: *"Asking question is something between me and the teacher. I don't care what my classmates think of me"* (S1). Moreover, teacher-fronted instruction was found dominant in schools. A student put this way*: "Teacher is at the center at school, but here* (SAC) *the teacher introduces a topic and we learn in an empirical way"* (S2). Nevertheless, some students engaged in after-school investigative activities about the topics of their interest or the homework given by the teachers. The findings also indicate that gifted students find some student behaviors annoying during the class. Shortages of materials and hindrance of critical thinking were other examples of problematic issues in the learning process.

Learning Spaces Viewed by the Teachers

Students and teachers responded to similar questions and their responses were quite similar concerning the learning environment in the SAC. Teachers' descriptions of the kind of safe learning climate they created for the gifted students were affirmed in the findings obtained from the students reported above. As seen in Table 3, teachers claimed that they tried their best to acknowledge student identity by providing a safe ground to take risking and sharing their thoughts in the classroom.

Teachers claimed that they establish a learning environment for gifted students, where students feel comfortable to ask questions and do not get exposed to negative and annoying reactions. They felt happy and psychologically safe in the classroom, where they could disclose their opinions without any embarrassment and sense of fear.

Table 3

Identity Safety, Teacher Approachability and Relationships in the Classroom According to Teachers (n=5)

Categories	Codes	*f*
Identity Safety	Students feel comfortable to ask questions	5
	Students feel happy	4
	Students feel safe	3
	Students do not show negative reactions to the questions asked	2
	Students feel comfortable to express ideas	2
Teacher Approachability	Treat students equally	3
	Encourage students to ask questions	3
	Convince students that asking questions is normal	2
Relationships	Sincere student-teacher relationships	4
	Positive peer relationships	4
	Good communication between the teacher and students	3

Teachers maintained that they are approachable to the students displaying equal demeanor towards everyone in the class. Since the gifted students are curious and eager to ask a lot of questions, teachers did not stop but encouraged them by welcoming their queries. They broke the barriers that withheld students from asking questions and convinced them it is normal to ask questions. Teachers described the in-class student-teacher and student-student relationships as sincere and positive respectively. Moreover, their communication gateways were open with the students. Some of the teacher comments regarding these findings are given below:

> "The students who come from the public schools are kind of anxious at start because of having experienced strictly rule-governed situations, but we break such and any other barriers that make them feel so once we meet… None of the children in my group misses any of my classes. Generally, they feel safe and happy here… These children are full of love and are not judgmental like adults. That is why they get along well with each other right away" (T1).
>
> "They feel comfortable here (SAC) because of not experiencing any kind of fear.... but they might be wary of even asking questions from the teacher schools. Such a problem does not exist here. They are free to ask whatever question they have. I try to encourage them as much as I can" (T2).
>
> "If I notice the students are bored, I give a break. Go out together to take some fresh air or do an entertaining activity. I try to provide the kind of support they need (T4).
>
> "Each student's approach to himself and the other students is always constructive and respectful. They're incredibly supportive. They are more supportive of each other than competitive. Learning together, developing and advancing together is one of the best aspects of these students" (T5).

The teachers stated that learning takes place via participative learning activities and each student gets equally supported (See Table 4). There is no pre-determined formal curriculum at SAC. The courses are usually designed in accordance with the individual needs of the students through project-based teaching and learning process. Teachers also maintained that they turn the classrooms into ideal places for the gifted students, where they can learn joyfully and do not feel frustrated. The teachers did not see student differences as a limitation, but an opportunity for more learning. They allowed self-disclosure and student engagement in challenging activities as reported by two of the teachers respectively.

Table 4

The Learning Process and the Existent Problems According to the Teachers (n=5)

Categories	Codes	*f*
Learning Process	Participative learning activities	5
	Students receive support	4
	No specific curriculum is followed	3
	Courses are designed according to student needs	3
	Project-based learning	3
	An ideal place for gifted students	3
	Students learn joyfully	3
	Teachers see student differences an opportunity for more learning	2
	Students can express themselves freely	1
	Students can engage in challenging activities	1
Problems	Shortage of technological tools and other materials	2
	The programs need improvement	2
	Exam pressures affects their learning at the SAC	1

As shown in Table 4, teachers had encountered some problems, too, despite all those positive aspects of the learning climate at SAC. Shortages of technological tools and instructional materials were felt and the programs needed further improvement. Besides, one of the teachers asserted that exam pressures at schools negatively affect the learning quality of the gifted students at SAC. See the example quotes below regarding the findings in Table 4:

> "We are working with these kids by following an activity-based approach. We don't follow a specific curriculum here (SAC) as the nature of this place necessitates. We get acquainted with them over time. Then we prepare a number of special activities according to their talents and abilities. We first try to identify their weak points and then work with them to improve accordingly… there's a practical teaching process through activities" (T3).
>
> "I benefit from various teaching methods here such as group work, cooperative learning activities, project-based teaching and so forth. No matter what methods we try, the students should be in the center. I plan activities that will make them active participants in the learning process" (T5).
>
> "I value student difference and treat all students equally. However, from time to time I try to be more supportive and close to the students, who need more support. This is positive

discrimination, which continues until the problematic situation of these students is taken care of" (T3).

Expected Learning Atmosphere

Students' Perspectives. When the gifted students were asked to think of a learning atmosphere, where they would feel safe and comfortable, they had different expectations regarding the teacher approachability, peer relationships, learning process, and physical condition of the classroom.

Table 5

Expected Learning Atmosphere from the Gifted Students' Perspectives (n=12)

Categories	Codes	*f*
Teacher Approachability	Treats everyone equally	1
	Behave non-discriminatorily	1
	Flexible	1
	Friendly	1
	Provides freedom	1
Peer Relationships	Respectful	3
	Sensible	2
	United	1
Learning Process	Practical learning activities	7
	Equipped with technological tools	6
	Small number of students in the class	5
	Students support each other	3
	Effective teaching	3
	Organize educational tours	3
	Teachers support students overcome their problems in learning	2
	Activities are done outside the classroom	1
Physical Conditions	Airy	4
	Comfortable	3
	Colorful	2

Table 5 shows that students stated that teachers treat everyone equally in a safe learning environment. They will not discriminate between the students, but demonstrate flexibility and friendliness as well as provide freedom of self-disclosure to them. Similarly, there will be positive relationships with their peers such as respecting each other, trying to be understanding and sensible towards one another, and having solidarity in between them. Moreover, the learning process will be active and productive, where experimental and practical learning activities will be designed for them to learn by actually doing. The classrooms are equipped with technological tools.

There will be fewer students, and effective teaching in the class. Teachers will organize educational trips in order to promote their learning and the way they see the world. Moreover, they will support students with their problems when learning is taking place in the classroom. One of the students also added that the classroom activities will be done outside the boundaries of walls in an open space. According to the students, the physical conditions are also important for their motivation and learning. They expected an airy, comfortable, and colorful classrooms, where they can get fresh air, feel relaxed, and do not get sleepy when they look at the colors around. Some example comments about how students expected an ideal classroom are given below:

> "There would always be experiments and practical activities. I never wanted memorization. No need for memorization, we learn by doing and experiencing" (S12).
>
> "Teachers would be flexible and treat everyone equally. Students would be respectful and sensible. The curriculum should be practical as it is in SAC. Teachers wouldn't get angry or act discriminatorily" (S2).
>
> "I don't want my classmates to be jealous or selfish, but friendly, funny, and hardworking" (S9).
>
> "We can do different activities and experiments in the garden. There shouldn't be paper and pencil activities all the time" (S7).
>
> "We could have been free. There wouldn't be doors and walls. When tired, it would be very amusing if we could ask the teachers: we are tired. Let's do an activity outside the classroom…" (S7)
>
> "I would expect a colorful learning environment. When looking around, I wouldn't feel like suffocating. I don't want strict rules at school and when these rules get ignored, the reactions should not be harsh…If I forget do my homework, I wouldn't get scolded in the class, but informed not to forget again. I don't want the classroom to be crowded" (S9).

Teachers' Perspectives. On the other hand, when the teachers were asked to think of classroom with an emotionally safe and welcoming learning climate, they had somewhat similar responses to that of the students in terms of the learning process (See Table 6). They thought that such an environment provides rich learning experiences within a classroom that is fully equipped with essential instructional materials with fewer students. Besides, during the learning process, the students get encouraged to have a positive relationship with their peers. Some of the teachers, however, had their own individual remarks. They stated that a safe and welcoming learning climate provides a democratic learning atmosphere for the students, where they can work in cooperation with each other and receive support as needed. Besides, they can learn whatever they desire.

As indicated in Table 6, teachers had some remarks about the physical conditions of the classroom as a contributive factor to their learning process. They expected that there should be a small garden to do the learning activities outside the classroom. The classrooms are comfortable from a physical perspective and the students do not come tired and exhausted as they do now. One of the teachers suggested a policy change regarding the gifted children and stated that separate schools should be established for gifted students. Another also added that there should not be any exams for such students at all.

Table 6

Expected Classroom Atmosphere from the Teachers' Perspectives (n=5)

Categories	Codes	*f*
Learning Process	Rich learning spaces are created	2
	Classrooms are equipped with the essential teaching materials	2
	Classrooms are not crowded	2
	Positive relationships are encouraged	2
	Classroom has a democratic learning atmosphere	1
	Cooperative learning models are incorporated	1
	Students are supported	1
	Students can learn what they desire	1
Physical Conditions	A small garden for activities	2
	Classrooms are physically comfortable	1
	Students do not come exhausted	1
Policy Change	There are separate schools for the gifted students	1
	There are no exams	1

These findings are reflected in the following elaborative comments provided by the SAC teachers:

> "The education should be completely democratic in my opinion. Every student has to learn what s/he wishes or interested in. We are actually trying to do like this here. Since there is no specific curriculum, we think it should be more student-centered and freer. Besides, educational centers could be bigger and more equipped. We are short of robotic materials here. The number of students should be small as is now. This can be more efficient to deal with each student. Most importantly, there should not be any exam. Their energies will be wasted if they come with exam anxiety and concerned about what I will become in the future" (T5).
>
> "It should be a democratic environment…, where the students can share their opinions and make any kind of criticisms. There should be group work and cooperative learning models…and it is necessary to create suitable environments for cooperative learning models" (T2).
>
> "Respect and value is everything. First of all, this should be ensured. We have created such a relationship. Our students are respectful to us, so are their parents as we are to them" (T5).
>
> "A natural space could be created. We could have a big green garden and could do a variety of activities" (T3).

Discussion and Conclusion

Learning Climates at Schools and the Art and Science Centers

The findings of the present study indicate that the learning atmosphere at the SAC provides a desirable place for gifted students, where they feel safe and comfortable from both a physical and psychological perspective. The results show that students could better reveal their identity in the class since they felt happy and comfortable with their teachers or peer group in their less-crowded classrooms. They felt relaxed in self-disclosure and opinion exchange. Their teachers were nondiscriminatory, approachable, and sincere, who valued their individualities no matter who they are. Besides, they

created a joyful and democratic learning atmosphere, where the students could ask questions about their topics of interest and take active participation in student-fronted activities in the learning process by getting effective teacher support. Similarly, Kunt and Tortop (2013), in a metaphoric study of 112 gifted students, found that SAC provides a safe learning atmosphere with joyful learning opportunities for the students. They feel free to express themselves and acquire knowledge based on their individual needs.

Shaunessy (2005) emphasizes the students' emotional security in the classroom to enable them to function well in the learning process by responding to and asking higher-order questions or disclosing their opinions. However, a study in an American gifted education program revealed that teachers often find it difficult to deal with the individual gifted students because of their different needs and their never-ending questions (Kaya, 2015). This situation put them in a difficult situation, but they admitted that it is their responsibility to create suitable learning opportunities for these students and overcome the existing problems. Actually, teacher support in a learner-centered learning atmosphere contributes to the student outcomes by improving participation in the learning process (Kearney, Smith, & Maika, 2016). However, if they feel unsupported and psychologically unsafe, they will withdraw from the learning activities.

The students in the present study had a different description of their regular schools compared to the SAC. The negative reactions, crowded classrooms, annoying student behaviors, and exam anxiety undermined their identity safety. They felt uncomfortable, bored, and unhappy in the classroom. Some also believed that the teachers are insincere and discriminatory. Besides, teacher-fronted instruction and shortage of teaching materials were other problems that affected students' feelings and their learning. In contrast, some students believed that both school and SAC make them feel mentally safe since they feel happy in both places and have good peer relationships. They thought the teachers treated them equally by supporting them in their learning process although the teacher-fronted teaching was dominant. One thing that did not negatively affect them at all was their ability to ask questions both at school and the SAC. In line with these findings, a case study of 47 gifted students by Aslan and Doğan (2016) revealed that these students prefer SACs to regular schools. Their metaphoric descriptions reflected that school encourages competition and therefore holds back their thinking abilities. It is an undesirable place where they do not feel comfortable. Contrarily, they see the SAC as an exciting place where they feel comfortable, learn joyfully, and develop their thinking abilities. Moreover, Talas et al. (2013) had similar findings concerning the negative perceptions that gifted students had of their regular schools which were later supported by another study conducted with teachers by Altıntaş and Ilgun (2016) as elaborated in the introduction of this paper. In contrast, one study partly rejected the findings of the current study on student perception of regular schools and schoolteachers. The gifted students thought of school as "peaceful and protective" and their teachers as "supportive and protecting person" (Ogurlu, Öpengin, & Hızlı, 2015, p. 67).

Fonseca (2011) argues that gifted students are sensitive to conventional learning strategies. They get easily frustrated by the repetitive or monotonous tasks in the classroom and get disengaged from the learning process thereafter. Therefore,

establishing collaborative and rich learning opportunities by considering the needs of the gifted students may increase the likelihood of their engagement to the learning environment. Acknowledging their identity and individuality during the learning process and showing friendly behavior may provide a safe ground for them to disclose their thoughts and queries. Although the logical reasoning ability of the gifted students is believed to be high (Fonseca, 2011), they tend not to disclose their personal thoughts to their peers (Shechtman & Silektor, 2012).

Furthermore, the teachers at the SAC claimed that they put every effort to establish a learning environment, where the students feel psychologically safe and happy. This is important because these students "naturally possess strong emotions that can fluctuate easily between very happy and very sad" (Fonseca, 2011, p. 29). Herewith, teachers encouraged the gifted students to put their thoughts and questions forward without a sense of fear or hesitation. The sense of fear hampers student participation in the learning process, badly affecting their behaviors and academic success (Frisby, Berger, Burchett, Herovic, & Strawser, 2014). Therefore, trusted teacher-student relationship and good communication need to be fostered to reduce participation apprehension and abolish students' fear by ensuring their psychological safety. Findings from the present study indicate that when these students come to the SAC, they are kind of shy and hesitant in asking questions or expressing themselves at the start. However, teachers break such barriers by paying them equal attention and encouraging them not to leave their queries unasked by convincing them that it is normal to ask questions. Besides, they tried to establish good relationships with and between the students by keeping the communication doors open. Good communication positively influences the in-class relationships and student behavior (Ming-tak & Wai-shing, 2008). It also cultivates a sense of respect, trust, and acceptance in students, which will help them, in turn, feel safer in the class. However, these qualities can be ensured when the teacher is willing to listen to the students' voice in a non-judgmental manner by respecting their individual differences.

The findings also revealed that no specific curriculum is followed in the SAC. Instead, the courses are designed according to the student needs through student-fronted and project-based teaching and learning strategies. Kazu and Şenol (2012) maintain that educational programs, in these centers, are run based on the individualistic learning principles to develop the cognitive and affective capacities of the gifted students within different discipline areas. Other findings from this study revealed that teachers support these students in the learning process by creating a desirable learning atmosphere with joyful learning opportunities. In addition, they see individual differences as opportunities for better learning and let the students express themselves or engage in challenging activities. Nonetheless, they thought that the program still needs improvement and require attention considering the shortage of technological resources and teaching materials. Teachers in Kazu and Şenol's (2012) study addressed similar problems in terms of the physical features of the SACs including the shortages of instructional materials and equipment. Another problem was the exam pressure at schools that negatively affected students' learning at the SAC. Worrying about the exam result is natural in gifted students since they often have a tendency towards perfectionism. They rarely accept making mistakes as a normal part of the learning process (Fonseca, 2011).

Expected Learning Atmosphere

Both the gifted students and their teachers resembled their expected learning environment just like the SAC, where these students feel mentally safe compared to their regular schools. Students described teachers, in a safe learning climate, as approachable, friendly, and flexible, who will treat them equally. Besides, the peer group will have a respectful and positive relationship valuing unity and sensibility. The learning will be participatory in a classroom that is equipped with technology and accommodate fewer students, who are supportive of one another in the learning process. Students also emphasized the effectiveness of instruction, teacher support in solving their problems, and even the organization of educational tours. They even pointed out the physical features like classroom comfort, airing, and coloring. That is to say a place, where they do not feel suffocated and bored. In line with these findings, a case study of experienced teachers and postgraduate trainee teachers on the concept of 'safe' in instruction by Turner and Braine (2015) indicated that respect and sense of comfort in the class contribute to a feeling of safety in students. Their findings indicated that students feel safe in a learning environment where they do not feel embarrassed, but confident enough to ask questions or share ideas. Not being exposed to bullying or excessive criticism, but being happy and feeling comfortable are also conducive to emotional safety in the classroom. Similarly, Capern and Hammond (2014) found that Australian secondary gifted students treasure friendly gesture and sense of humor reflected in teacher behavior. They prefer teachers, who avoid discrimination in terms of their racial background, capacity level, and so forth, but maintain respectful conduct and allow equal participation in activities.

Likewise, teachers' opinions on a potentially safe learning climate were in congruence with that of the gifted students. They also underlined the establishment of rich learning opportunities to these students within less crowded and fully equipped classrooms. They believed a safe and desirable learning space would promote good relationships, provide democratic learning opportunities, incorporate cooperative learning models, provide support to the students, and lets them learn, as they desire. Likewise, teachers were of similar opinions about the physical features as students. These findings are supported by the existing literature. For example, Holley & Steiner (2005) conducted a mixed study to investigate the undergraduate and master of social studies students' perspectives on safe learning space. They found that nearly all of the students believed that creating a safe learning climate is important in their learning. Exposure to a safe learning climate helped most of the students to learn more in both quality and quantity. They had the opportunity to learn from their peers and so doing improved their cognitive abilities. Majority of them also admitted that the challenging atmosphere in the safe learning climate contributed to their personal progress. More than half of them said that the teachers in such an environment were not judgmental, but respectful and helpful nurturing student learning by incorporating participative activities in the class. However, they described the teachers in an unsafe learning climate as discriminative, judgmental, and not valuing student opinions. The same also applied to their peer group. Participation was low and the students were unconfident or did not feel safe to be part of the learning in unsafe classrooms.

Last but not least, to deliver effective education to the gifted students, teachers thought a policy change would be necessary. Attending both their regular schools and

gifted education can be exhaustive to these students as teachers contemplated. Therefore, founding a gifted school without a summative examination policy was envisaged. This is in parallel with the existing research findings (Ülger et al., 2014). Ülger et al. (2014) reported the tendency of some teachers and administrators towards establishing separate schools for gifted and talented students. They suggested converting the SACs into gifted schools. Ogurlu et al. (2015) argue that school curricula and the SAC programs are implemented differently. School-based education is mostly theoretical while SAC-based education is mostly experiential. Students usually worry about their school lessons and examination and this may decrease student participation in SAC enrichment programs.

Scholars entertain different ideas about the education of gifted students (Bakioğlu & Levent, 2013). Some believe that these students should be educated in separate schools, while others believe it is against democratic norms and they should be schooled with normal students in heterogeneous classes to promote their socialization. In spite of this controversy between the scholars, many countries like USA, Russia, Germany, England and South Korea, have established separate schools with many enrichment programs for the gifted students. In Turkey, however, there is only one such school, that is, Beyazit Ford Otosan Primary School in Istanbul. This number could be increased throughout the country to offer school choices for the highly gifted students as Bakioğlu and Levent (2013) suggest.

To sum up, ensuring the emotional and psychological safety of the gifted students is seemingly one of the main factors in establishing an effective teaching and learning environment. This environment will not tolerate bias and discriminatory behaviors, but encourage risk-taking and creativity amongst the students as a community of learners where they get respected for who and what they are. It is the right of every student to be valued and supported in discovering his/her identity. Therefore, considering the needs and expectation of gifted students is essential in helping them flourish in an individual and academic level. They appreciate less crowded classrooms with well-behaved students and approachable teachers who acknowledge their identities, considering their individual differences. Therefore, teachers are required to exhibit friendly intimacy by establishing good relationships with and between the gifted students to allow these students to reveal their individuality through self-disclosure and questions.

This study limited in scope since it only investigated the opinions of the gifted students and their teachers at a SAC. Besides, the literature review, carried out by the authors, showed that apparently no research has been done on psychologically safe learning environment in Turkey except some metaphoric studies where the gifted students provide general descriptions of regular schools, the SAC, or both of them. Therefore, further research is recommended to investigate the learning spaces at the SACs and the regular schools concerning the emotional or psychological safety of both the gifted and non-gifted students. Herewith, obtaining both qualitative and quantitative data from the students, teachers (who work at school and SAC), and the school administrators, would be worthwhile to provide a clearer picture with regard to the education of these students in the learning climate of the sort described. To validate the findings of this study further, parents' opinions could be sought in that they may

provide a different evaluation of the learning spaces at school and the SAC in line with the individual needs of their gifted children.

Statement of Responsibility

Sayeed Masood Haidari; conceptualization, software, formal analysis, writing – original draft, writing-reviewing & editing, visualization, and project administration. Fazilet Karakuş; methodology, validation, resources, writing-reviewing & editing, visualization, and supervision. Ayhan Koçoğlu; validation, investigation, data curation, writing-reviewing & editing, and project administration.

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Attitudes of the Students Attending Out-of-School STEM Workshops towards STEM Education

Okul Dışı STEM Atölye Çalışmalarına Katılan Öğrencilerin STEM Eğitimine Yönelik Tutumları

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ABSTRACT: In this study, the attitudes of students toward STEM education were examined according to various demographic characteristics and mixed research method was used. 170 students ranging between 7 and 14 years old participating municipalities in a province outside of school STEM workshops in Turkey constituted the sample of the study. The sampling was determined by non-random sampling method. Data were collected by STEM Attitude Scale adapted to Turkish by Yıldırım and Selvi (2015) and semi-structured interviews with students were conducted in order to get the opinions of the students in detail. Results indicated that out-of-school STEM workshops improve students' attitudes towards STEM. In addition, STEM attitude scores of the students did not differ by gender. It was also investigated whether the scores of the students from STEM attitude scale differ according to mother and father education level. There was only significant difference in engineering sub-dimension of the STEM attitude scale in terms of mother education status. On the other hand, it was determined that STEM attitude scale scores of the students did not differ according to father education status. Semi-structured interviews showed that students had lack of knowledge about STEM education and, also concluded that the achievement of a concrete result for children learning by doing affects their attitudes positively.

Keywords: STEM, workshop, attitude, out-of-school learning.

ÖZ: Araştırmada okul dışı STEM atölye çalışmalarına katılan öğrencilerin STEM eğitimine yönelik tutumları çeşitli demografik özelliklere göre incelenmiştir. Araştırmanın örneklemini Türkiye'deki bir ilin belediyesinde okul dışı STEM atölye çalışmalarına katılan yaşları 7 ile 14 arasında değişen 170 öğrenci oluşturmaktadır. Örneklem seçkisiz olmayan örnekleme yöntemi ile belirlenmiştir. Veri toplama aracı olarak; Yıldırım ve Selvi (2015) tarafından Türkçeye uyarlanmış STEM Tutum Ölçeği ve öğrencilerin görüşlerini detaylı bir şekilde alabilmek için yarı-yapılandırılmış görüşmeler yapılmıştır. Sonuçlar, okul dışı STEM atölyelerinin öğrencilerin STEM'e yönelik tutumlarını geliştirdiğini göstermiştir. Ayrıca, öğrencilerin STEM tutum puanlarının cinsiyete göre değişmediği tespit edilmiştir. Öğrencilerin STEM tutum ölçeğinden aldıkları puanların anne ve baba eğitim düzeyine göre farklılık gösterip göstermediği de araştırılmıştır. STEM tutum ölçeğinin mühendislik alt boyutunda annenin eğitim durumu açısından istatistiksel olarak anlamlı bir farklılık bulunmuştur. Öte yandan, öğrencilerin STEM tutum ölçeği puanlarının baba eğitim durumuna göre farklılık göstermediği belirlenmiştir. Yarı yapılandırılmış görüşmeler öğrencilerin STEM eğitimi hakkında yeterince bilgi sahibi olmadıklarını ve aynı zamanda yaparak öğrenen çocuklar için somut bir sonuç elde etmenin onların tutumlarını olumlu yönde etkilediği de tespit edilmiştir.

Anahtar kelimeler: STEM, çalıştay, tutum, okul dışı öğrenme.

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STEM takes its name from the first letters of Science, Technology, Engineering, and Mathematics. The general purpose of STEM education is to integrate the fields of science, technology, engineering and mathematics and to direct students to these fields by including in-class and extra-curricular activities to all levels of education from kindergarten to university (Dugger, 2010). STEM education brings together these different disciplines and enables learning to be more effective and multidimensional (Smith & Karr-Kidwell, 2000).

STEM originated in the 1990s as an abbreviation of science, technology, engineering and mathematics at the National Science Foundation (NSF) (Bybee, 2013). There are many definitions of STEM education in literature. For instance;

> "for most, it means only science and mathematics, even though the products of technology and engineering have so greatly influenced everyday life. A true STEM education should increase students' understanding of how things work and improve their use of technologies. STEM education should also introduce more engineering during precollege education. Engineering is directly involved in problem solving and innovation, two themes with high priorities on every nation's agenda. Given its economic importance to society, students should learn about engineering and develop some of the skills and abilities associated with the design process." (Bybee, 2010, p. 996)

The overall objective of STEM education in US schools is to prepare all students for post-secondary and 21st century labor force (Kennedy & Odell, 2014). According to Kennedy and Odell (2014), the curriculum that incorporates students into STEM encourages teaching strategies that promote students to innovate and invent. Technology should be integrated into culture, curriculum, teaching strategies, and daily operations of courses to improve learning. High-quality STEM training programs also offer teachers the opportunity to collaborate in combined efforts aimed at integrating four subjects into a single teaching and learning method. When this goal is achieved, students are provided with access to meaningful curriculum opportunities that develop critical thinking skills that can be applied to their daily lives as well as their academic lives. STEM in K-12 education system offer students opportunities to master their skills and content of knowledge for today's age. Students are given opportunities to reach challenging learning depths using a variety of activity-based learning models. Learning is facilitated to encourage students to learn more deeply about topics that concern them. Developing students' reasoning skills, critical thinking skills, creativity and innovation through integrated and connected STEM curriculum and pedagogical practices ensure equality among students from different backgrounds (Meyrick, 2011). However, it is not easy to implement research-based reform on a large scale in STEM. Despite intense efforts to develop and disseminate curriculum products and ideas, progress has been slow (Henderson & Dancy, 2011)

Even though it has been transformed and changed in line with needs and opinions in the course of time, it continues to be developed. Worldwide interest with allocated high budget to STEM studies attracted the attention of researchers in Turkey. In order for countries to develop, to make leaps in the field of technology and economy, the necessity of raising a generation that is interested in STEM, entrepreneurial and creative thinking has emerged in schools. There was a need for an education culture that developed a sense of responsibility among the students, encouraged them to think, equipped them with technological information such as computer programming from an early age, emphasized the importance of solidarity and collaboration, and instilled an entrepreneurial spirit (Akgündüz, Ertepinar, Ger, Kaplan Sayi & Turk, 2015).

Global economic competition and technological changes in science and technology have accelerated since the second half of the twentieth century (Aydın, 2011). Due to the fact that we are living in the information age, the state of economic structure and technological developments have determined the status of the states in the international arena. School and education adapt to changing political, social, economic and global contexts. To be a leader among countries is possible by following the current education policies and making innovative reforms in education (Blackley & Howell, 2015). STEM reform is a new phenomenon of education that aims to increase students' understanding of science, technology, engineering and mathematics. The aim is to educate individuals in STEM literacy, which can solve complex problems by using the existing knowledge of students by developing their high-level thinking skills (Fan & Ritz, 2014). It has been seen that the basic knowledge needed for national development consists of science, mathematics and technical concepts since World War II. The rapid technological developments in the first half of the 21st century have a direct impact on the economy, and the reports indicating that the existing training was not sufficient in building the skilled labor force for the sustainability of engineering skills and technological developments attracted the attention of STEM employees (Aerospace Industries Association [AIAA], 2008; Business Roundtable, 2005; Bybee, 2013; Fan & Ritz, 2014; Toulmin & Groome, 2007). These reports emphasized that that the current system was insufficient to educate future generations in science, technology, engineering and mathematics.

In the United States, students' tendency towards science, mathematics, and engineering has gradually declined, and therefore United State has begun to lose competitiveness in technology and engineering. In order to increase the quality of education in these areas and the number of people, United States has initiated a reform movement called STEM education (Dugger, 2010). The European Commission has focused to STEM policy since the 1990s. Asian countries (such as Korea, Japan, China and Taiwan) with very high-performance education systems and growing economies, have conducted broader national policies and research and development studies on science and technology. Western countries have put STEM work on the agenda, and it has become one of the professional and economic objectives funded by governments and supported by politicians (Williams, 2011).

STEM training is an integrated approach that enables students to adopt creative problem-solving techniques (Akgündüz et al., 2015; Gülhan & Şahin, 2016; Gökbayrak & Karışan, 2017). For a productive generation and a thriving economy, there is an obligation to raise an innovative, entrepreneurial, creative thinking generation that is interested in STEM fields in schools (Akgündüz et al. 2015). STEM-based workshops are gaining importance day by day by private educational institutions and especially by institutions that function as out-of-school learning environments in education. In Turkey, many studies have been conducted in the field of STEM recently, but there is no study recorded regarding the workshop practices carried out in out-of-school learning environments. The aim of this study is to investigate the attitude of the students attending the workshop practices conducted in out-of-school learning environments towards STEM. For this purpose, four research questions guided this study:

- Does the practice of workshops in out-of-school learning environments have an impact on students' attitudes towards STEM?

- Do the students' attitudes towards STEM differ according to gender?
- Do the students' attitudes towards STEM differ according to the level of mother educational status?
- Do the students' attitudes towards STEM differ according to the father education status?
- What are the students' opinions on the practices in STEM workshops?

Method

In this study, students who participated in extracurricular workshop activities were examined about their attitudes towards STEM education. In this study, both qualitative and quantitative methods were utilized. The descriptive research method, which is one of the quantitative research methods, was carried out based on cross-sectional scanning model. Case study method was used as a qualitative research method.

Sample of the Study

The sample of the study consists of students aged ranging between 7 and 14 who have never participated in a STEM workshop. The sample was determined by random sampling method.

Data Collection Tools

Ethical rules were followed while collecting research data. The research participants participated in the research on a voluntary basis. Demographic characteristics of students such as gender, maternal education status, father education status was asked. Moreover, STEM Attitude Scale developed by Faber et al. (2013) and adapted into Turkish by Yıldırım and Selvi (2015) was used to measure the attitudes of the students attending out-of-school stem workshops towards STEM education. The Turkish version of the STEM Attitude Scale is a 5-point likert type scale including 37 items from 'strongly agree' to 'strongly disagree'. This scale has four factors; these are science (9 items), engineering (9 items), 21st century skills (11 items) and mathematics (8 items). Validity and reliability studies of the scale were conducted by Yıldırım and Selvi (2015) and the reliability of this instrument was found to be .94. The cronbach alpha values of the 4 factors of the test were found to be over .80. In addition, semi-structured interviews with students were conducted in order to get the opinions of the students in detail.

Data Analysis

The demographic characteristics of students were interpreted with descriptive analysis methods. The data obtained from the research were analyzed with SPSS. The t-test was used to investigate whether the participants' attitude scores towards STEM differ according to their participation in STEM workshops and gender. In addition, one-way analysis of variance-ANOVA was conducted to determine whether the scores of the students from STEM attitude scale change according to mother and father educational status. Descriptive analysis was used in the analysis of the interview questions. Apart from the researcher, two assistant researchers coded the data. For the validity and reliability of the data Miles and Huberman (1994) formula was used. With the help of this formula, the consensus between the first and second researchers was

calculated as .81. That is to say, the resulting inter-rater agreement was 81% (Cohen's κ=.81).

Implementation of the Research

The STEM workshops, which started from October until the end of May, proceeded as modules. The three-dimensional design program Tinkercad, followed by the block-based coding program Scratch, the electronic circuit design set consisting of snaps that attract attention thanks to its simple use, Arduino sets that enable the use of code-writing and block-based coding features constitute the steps of these modules. The modules were implemented starting from Tinkercad application by adopting the Stem approach. Students were asked to design the objects associated with various courses with Tinkercad application and the designed objects were printed from 3D printers. The module has been completed with planning that will allow students to create their own designs. For example, students were provided to learn Tinkercad program by designing the bottle opener. They were shown practical examples (e.g. square, circle) of how to make the cavity in the mineral water bottle opener by selecting ready-made objects on the computer. Scratch program can be called to give life to any object. In this study, cat puppet was chosen in the Scratch program. It is practically shown how the puppet is selected, how the puppet is shaped, how its color changes, how its background is selected, how it is moved on the coordinate system, how to add multiple puppets and how to combine them to produce a product. Arduino is an open-source electronics platform based on easy-to-use hardware and software. The working principle of the Arduino and the parts of the Arduino set are introduced before practicing. Providing the electrical transition to Arduino board, the working principle of the traffic lights with the help of led lighting on the Arduino board was explained. In addition, the operating principle of sensors used in vehicle parking with the help of motion sensors, the use of moisture detection sensor, the use of light sensor, the temperature sensor and its application areas were also shown. All modules were planned to be completed between October and May following this process. In each completed module, students were able to prepare a project by combining it with the previous module. At the beginning of the next October (at the beginning of the new semester), the STEM Attitude Scale adapted to Turkish by Yıldırım and Selvi (2015) was applied to the students. The same scale was applied to the students in the city center where there was a school with students who had never participated in STEM workshops. The evaluation steps were then followed.

Results

In addition to the interview findings, students' STEM attitude scale scores according to their participation in STEM workshop, gender and mother-father educational status were presented in this section.

STEM Attitude Scale Score Analysis of Students

Table 1 shows the t-test results of students' STEM attitude scale scores according to their participation in STEM workshops.

Table 1

T-Test Results of Students' STEM Attitude Scale Scores according to Their Participation in STEM Workshops

Sub-Scale	SWPS*	*n*	$\bar{X}$	*sd*	*df*	*t*	*p*
Science	Yes	67	36.92	6.97	168	2.43	.016
	No	103	34.07	7.78			
21st Century Skills	Yes	67	47.23	5.18	168	2.96	.003
	No	103	44.10	8.58			
Engineering	Yes	67	37.84	6.10	168	2.72	.007
	No	103	34.66	8.16			
Mathematics	Yes	67	24.66	3.20	168	-.17	.86
	No	103	24.77	4.40			
Total	Yes	67	146.67	16.78	168	2.66	.008
	No	103	137.61	24.30			

*SWPS: STEM Workshop Participation Status

According to Table 1, t-test results obtained from the attitude scale of STEM indicated that there is a significant mean difference between the attitude scores of students according to their STEM participation status [$t(168)=2.66$; $p<.05$]. The mean scores of the students who participated in STEM workshop ($\bar{X}=146.67$) were higher than those who did not ($\bar{X}=137.61$). In addition, when the sub-dimensions of the attitude towards STEM scale were examined, significant differences were found in all sub-dimensions of the scale in favor of the participants of STEM workshops except mathematics sub-dimension [$t(168)=-0.17$; $p>.05$]. Table 2 indicates the t-test results of students' STEM attitude scale scores according to gender.

Table 2

T-Test Results of Students' STEM Attitude Scale Scores according to Gender

Sub-Scale	Gender	*n*	$\bar{X}$	*sd*	*df*	*t*	*p*
Science	Girl	72	34.79	7.09	168	-.589	.557
	Boy	98	35.48	7.95			
21st Century Skills	Girl	72	45.72	6.21	168	.571	.569
	Boy	98	45.05	8.440			
Engineering	Girl	72	35.16	6.23	168	-1.10	.269
	Boy	98	36.47	8.39			
Mathematics	Girl	72	24.41	4.29	168	-.893	.373

	Boy	98	24.96	3.71			
Total	Girl	72	140.10	18.36	168	-.547	.585
	Boy	98	141.97	24.46			

In Table 2, it was determined that the stem scores of the students did not differ according to gender in total and for all sub-dimensions of the scale. It was also investigated whether students' attitudes towards STEM differ according to mother and father educational status. Table 3 indicated the one-way ANOVA test results of students' STEM attitude scale scores according to mother educational status. As seen in the below table, there was no significant difference in science, mathematics and 21st century sub-dimensions in terms of students' STEM scores with respect to mother education status apart from engineering sub-dimension (F=2.517, p=.032<.05). Table 3 demonstrates the one-way ANOVA test results of students' STEM attitude scale scores according to mother educational status.

Table 3

One-Way ANOVA Test Results of Students' STEM Attitude Scale Scores according to Mother Educational Status

Sub-Scale		Sum of Squares	*df*	Mean Square	*F*	*p*	Sig
Science	Between groups	490.99	5	98.19	1.743	.128	-
	Within groups	9239.82	164	56.34			
	Total	9730.82	169				
21st Century Skills	Between groups	251.03	5	50.20	.873	.501	-
	Within groups	9430.58	164	57.50			
	Total	9681.62	169				
Engineering	Between groups	688.50	5	137.70	2.517	.032	Bachelor's degree-Master of Science degree
	Within groups	8974.00	164	54.72			
	Total	9662.50	169				
Mathematics	Between groups	101.73	5	20.34	1.303	.265	-
	Within groups	2560.07	164	15.61			
	Total	2661.80	169				
Total	Between	4844.41	5	968.88	2.055	.074	-

	groups						
	Within groups	77316.03	164	471.43			
	Total	82160.44	169				

All possible pairs of groups were compared in order to see the groups with significant difference between them for engineering sub-dimension with respect to mother education status. Tukey test results related to the engineering sub-dimension showed that there was a significant means difference between STEM attitude scores of the students whose mothers has bachelor's degree and Master of Science degree.

Table 4 indicated the one-way ANOVA test results of students' STEM attitude scale scores according to father educational status. As clearly shown in the Table 4, STEM attitude scale scores of the students did not differ according to father education status. In other words, it was found that there was no significant mean difference between the STEM attitude scale scores of the students according to father educational status.

Table 4

One-Way ANOVA Test Results of Students' STEM Attitude Scale Scores according to Father Educational Status

Sub-scale		Sum of Squares	*df*	Mean Square	*F*	*p*	Sig
Science	Between Groups	626.64	5	125.32	2.258	.051	-
	Within Groups	9104.17	164	55.51			
	Total	9730.82	169				
21st century skills	Between Groups	501.21	5	100.24	1.791	.117	-
	Within Groups	9180.40	164	55.97			
	Total	9681.62	169				
Engineering	Between Groups	200.60	5	40.12	.695	.628	-
	Within Groups	9461.90	164	57.69			
	Total	9662.50	169				
Mathematics	Between Groups	39.45	5	7.89	.493	.781	-
	Within Groups	2622.35	164	15.99			
	Total	2661.80	169				

Analysis of Students' Answers to the Interview Questions

The interview questions prepared based on expert opinions consist of 7 questions.

1st Question: What do you know about STEM education? Where did you get the information about STEM? How do you evaluate the information you get in your daily life?

Table 5 indicates the students' opinions about the STEM education.

Table 5

Students' Opinions about the 1st Question

Student Opinions	*f*	*%*
I don't know. I have no idea.	13	43
STEM stands for science, technology and engineering. STEM means that they are all integrated into the course. I learned this information in the robotic-maker workshop. I haven't seen a contribution in my daily life yet.	2	7
Engineering, science, etc. things. I learned this from my teacher. I can apply this information later.	1	3
I know it is related to science, mathematics, computer and engineering.	14	47

According to the Table 5, more than half of the students associate STEM with mathematics, engineering, computer and science, while about half of them did not have enough information about the subject matter. On the other hand, a few of them (7%) stated that they could not relate STEM to daily life.

2nd Question: What are your opinions on Coding, Robotics and Maker Workshop? Did you enjoy being in the workshop? What is the reason you would like to join this workshop?

The opinions of the students about the second question were given in Table 6.

Table 6

Students' Opinions about the 2nd Question

Student Opinions	*f*	*%*
Yes, it is beautiful and pleasant because the future depends on coding and robotics and is very enjoyable to do.	13	43
I think it's a nice workshop, I'm glad to come. I like being in the workshop. I like to learn new things and I can do something about it in the future.	7	23
I think it is funny. A place where we learned something about the computer, I think it is useful.	10	33

As seen in Table 6, almost all the students expressed their pleasure to attend the STEM workshop. They said that the technology of the future would be on coding and robotics. In addition to having fun in the workshop, they expressed that they learned new things about technology. They also specified that coding and robotics allowed them

to acquire knowledge in innovative areas and thought that they would be useful for them.

3rd Question: Are you interested in designing your own story and moving it to a virtual environment with Scratch program? What kind of story do you design?

The opinions of the students about the third question were presented in Table 7.

Table 7

Students' Opinions about 3rd Question

Student Opinions	*f*	%
Yes, I was interested in designing an adventurous and action games.	14	48
I am not very interested.	9	31
No, I think it's boring.	1	3.5
Actually, I am not really interested but I had a game and a story that I did before, and I couldn't finish it, but it sounded fun.	1	3.5
In fact, I am always interested. I made the game of Harry Potter's life story.	1	3.5
I designed the Minecraft game. I would like to be a footballer in the future, but I would like to design a game and let me know everyone.	1	3.5
I was interested. I'd like to make a story about stop-motion.	1	3.5
Great. I have 210 projects and 310 followers.	1	3.5

As can be seen in Table 7, while the Scratch program attracts most students, some of them are also not interested. Most of them (48%) would like to design adventurous and action games. Those who want to design stories, action game, film characters, would like to design their stories. They would like to make a name for themselves with their designs and expressed that they wanted to be recognized in this way.

4th Question: What would you like to design with the web-based Tinker cad application?

The opinions of the students regarding the fourth question were given in Table 8.

Table 8

Students' Opinions about the 4th Question

Student Opinions	*f*	%
Actually nothing. In my opinion, the Tinker cad app is boring and does not give me pleasure.	1	3
I'm doing designs right now, nothing I want to do.	1	3
Everything. I would like to design robot, mechanical circuit, game character, race car, Harry Potter scepter, key chain.	25	78
I would like to design wings to fly.	1	3
I would like to make wand and do things for decoration.	1	3
I would like to make an artificial intelligence prototype.	1	3

I do not want to design.	1	3
I would like to make musical instruments.	1	3

Table 8 indicated that most of the students (78%) would like to make designs for their interests such as game character, racecar, mechanical circuit, key chain, musical instrument. In addition, a few of the students (3%) stated that they found Tinker cad program boring and did not give them pleasure. In addition to these, although there were few, there were students who would like to design wings to fly, those who would like to make wand and do things for decoration, those who would like to make an artificial intelligence prototype, and those who would like to make musical instruments.

5th Question: What kind of project would you like to design if you had your own Arduino set? Why would you design such a project?

The opinions of the students regarding the fifth question were given in Table 9.

Table 9
Students' Opinions about the 5th Question

Student Opinions	*f*	%
I would design a robot that would imitate me and make friends.	4	14
I would design an advanced radar or sonar system.	1	3
I would design a bell that rings when the door is opened.	2	7
I would like to design a controlled maid, which I can ask to direct from the phone when I'm tired.	1	3
I would like to design a system with led light.	2	7
I would like to design a self-recharging battery to avoid running out of charge.	1	7
I have difficulty waking up in the morning, so I want to design an alarm.	2	7
I want to make a camera system.	2	7
I would like to make a robot that will make my life easier.	4	14
I didn't want it to be an Arduino and I didn't want to do it.	3	10
Launch system.	1	3
I do not know.	4	14
I would like to make a smart home.	1	3
Arduino sounds fun. I'd like to design.	1	3

Arduino sets enable the use of electronic circuit design set, code writing and block-based coding features. Students stated that they would like to make robot design that would be friends for them and make their lives easier. Students who have difficulty waking up in the morning declared that they would like to design an alarm system to find a solution to a problem in their daily lives. There are students who want to make a smart home system and an alarm system that is activated when the door is opened. Furthermore, there are some students indicating that they do not want to have an Arduino. There are also students who have no knowledge of Arduino (See Table 9).

6th Question: Do you think it is fun to learn to build electrical circuits with electronic circuit design? What kind of circuits would you make if you had such a set?

The opinions of the students regarding the sixth question were given in Table 10.

Table 10

Students' Opinions about the 6th Question

Student Opinions	*f*	%
Yes, good, enjoyable and fun.	18	60
I don't think it's fun.	3	10
I think it's fun to install a working circuit because it's very encouraging. Unfortunately, nothing comes to my mind.	1	3
Yes, it is fun. If I had a set, I'd love to do something about Led again.	2	6
Yes, it is fun. I would like to make a computer circuit.	1	3
Yes, it is funny. I would love to make helicopters, lights and songs.	1	3
Very fun I would like to make the robot by myself.	2	6
I do not know this.	2	6
I don't want to do anything.	1	3

Table 10 showed that most of the students stated that it is pleasant, nice and fun to learn to design electrical circuits with electronic circuit design, and that it is encouraging to build a working circuit. A few of the students said that they would want to work with Led if they have electronic circuit set. In addition, there are also students who want to make a computer circuit and make a robot. There is a student who wants to make circuits that can play helicopters, lights and melodies with the parts in the circuit set. There are two students who do not know about this set and one student who does not want to build any circuit.

7th Question: Which of these courses can help you better learn the lessons/courses you are studying at school? What do you think about this?

The opinions of the students about the seventh question were given in Table 11.

Table 11

Students' Opinions about the 7th Question

Student Opinions	*f*	%
I think it is related to Information Technologies course.	6	21
It can provide a better understanding of Science and Mathematics courses.	12	43
I think none of them because there is no question about these course subjects in exams.	1	4
I could not connect with any courses.	3	11
All courses except music and physical education.	1	3
Any lessons because there is no course related about it in our school.	2	7
All lessons.	2	7
I think it will be very useful for me in technology design class.	1	4

As it is seen in Table 11, most of the students (43%) stated that they thought they would provide a better understanding of Science and Mathematics courses. There are six students who think that they are related to Information Technology course, a student who associates with Technology design course, a student who associates them with all courses except music and physical education courses, and there are two students who associate them with all courses. In addition, there are students who stated that they would not benefit from any of the courses in the school because there was no question in the exams, and that there were no similar studies in their school and therefore no lessons would be of benefit to their learning.

Discussion and Conclusion

In this study, attitudes of the students attending workshop practices conducted in out-of-school learning environments towards STEM were investigated and statistically significant mean difference was found in terms of STEM attitude scale scores of students in favor of the STEM workshop participants. Similar to the current study, out-of-school time has a positive effect on student interest in STEM (Cooper & Heaverlo 2013; Young, Ortiz, & Young, 2017). When the subscales of the STEM attitude scale were examined; there are significant mean differences in terms of STEM attitude scale scores in the sub-dimensions of science, engineering and 21st century skills except for mathematics sub-dimension in favor of STEM participants. Sahin, Ayar, and Adiguzel (2014) stated that STEM related activities have the potential to promote collaborative learning and inquiry as well as to contribute to the development of 21st century skills. In addition, Gülhan and Şahin (2016), who examined the effects of STEM education on students 'attitudes, concluded that STEM education positively affected students' attitudes.

In the current study, it was determined that the scores of the students from STEM attitude scale did not change by gender. Cooper & Heaverlo (2013) stated that girls interested in problem solving could be interested in all four STEM subject areas. They emphasized that interest in creativity and design is also an important predictor of interest in computer and engineering issues. Greenfield (1997) assessed students' attitudes toward and participation in science, and how they might vary by gender and grade. The results of the study showed that both girls and boys expressed similar attitudes toward science but younger students were more positive than older ones. Girls and boys did not differ in their perceptions of scientists and science careers, except that it is more likely that boys believe that science is basically a masculine field of study and requires high levels of intelligence. In addition, girls and boys did not differ in their level of using science materials. It has also been investigated whether the scores of the students from STEM attitude scale differ according to mother and father education level in the present study. There was a significant mean difference only in engineering sub-dimension of the STEM attitude scale in terms of mother educational status. On the other hand, it was determined that STEM attitude scale scores of the students did not differ according to father educational status.

Semi-structured interviews in the current study showed that students had lack of knowledge about STEM education. Students stated that they enjoyed being in the coding, robotics and maker workshops, and they generally liked the Scratch application.

Considering the students who want to design games with scratch, it can be concluded that they have the desire to play games in the foreground. It was concluded that students had general knowledge about the web-based Tinkercad application which provides three-dimensional design. There are students who want to design by associating them with other robotics programs, and it can be said that students can establish and use them among each other. When the analysis of the answers given to the question about Arduino robotic application was examined, it was concluded that the students would like to make projects to find solutions to daily problems. Students, who stated that electronic circuit design is enjoyable to create a working circuit, said that it is motivating to build a working circuit. Based on the data obtained from the study, it was concluded that the achievement of a concrete result for children who learn by doing by doing has a positive effect on their attitudes towards that course. The study of Baran, Bilici, Mesutoglu, and Ocak (2016) implemented an integrated out-of-school STEM education program for 6th grade students to identify students' perceptions on the content and skills gained, the challenges and limitations faced and suggestions for improvement. The students in this study stated that this approach contributes to their cognitive, design, engineering and computer skills. The results of the research showed also that the integration of STEM activities into the out-of-school education programs could support the development of students' interest in STEM-related careers. Likewise, Baran, Canbazoglu Bilici, Mesutoglu, and Ocak (2019) and Guzey, Tank, Wang, Roehrig, and Moore (2014) stated that STEM training programs are important in improving student attitudes towards STEM. Duran and Sendag (2012) indicated that technology/inquiry and design-based collaborative learning strategies and technology-supported IT/STEM experiences have a significant effect on the development of critical thinking of urban high school students. Mahoney (2010) pointed out that the male students did display a statistically significant more positive attitude for STEM when compared to the female students for the content areas of technology and engineering unlike science and mathematics. In another study, students mentioned in interview that they had a positive attitude towards STEM. They also thought that having professional science knowledge would be beneficial for their future careers and that this technology can improve their lives and societies by making the world a more comfortable and productive place. Despite the positive thoughts, there were some students mentioned the negative effects of technology on society and environment (Tseng, Chang, Lou, & Chen, 2013). In addition to these, teachers believe that students require more opportunities to engage with technology however, it was also observed that schools are lacking technology resources. They also consider that problem solving ability and previous knowledge related to science and mathematics are important for students to understand in order to be successful in STEM integration. Teachers believe that this way of teaching encourages student learning and student confidence in mathematics and science courses. Furthermore, teachers think that STEM integration is a natural way of thinking about teaching, because many problems in the real world go beyond disciplinary boundaries (Wang, Moore, Roehrig, & Park, 2011). In addition, National Research Council (2011) stated that integrated teacher training programs train teachers to implement STEM training so that they can increase the innovation capacity of students.

It was also concluded that the students who stated that the programs and practices used would enable them to learn science and mathematics courses at school

better relate the subjects to these courses more easily. Mohr-Schroeder et al. (2014) stated that many students have a lack of interest and proficiency in mathematics and science. They investigated middle level students' attitudes, perceptions, and interest in and toward STEM fields and careers changed after participating in an informal learning environment of a five-day camp organized on the campus of a major university in the mid-south. The results revealed an increase in students' motivation and interest in STEM. In addition, most of the STEM training participants found the STEM content sessions 'fun' and 'engaging' especially based on their practical experience. Sahin (2013) specified that engaging students with STEM-related clubs in early years of their secondary education promotes STEM interest in students, thus they were more likely to choose a STEM-related field as a career. When the negative and false answers given to the semi-structured interview questions are taken into consideration, it can be concluded that the majority of them are due to lack of knowledge about the subject matter and students' interests. More applications can be made for information deficiencies identified by examining training programs. Vennix, Brok and Taconis (2018) emphasized that outreach learning environments certainly creates opportunities to increase students' motivation in STEM and attitude towards STEM. The subjects that will keep the interests of the students alive can be identified and related projects can be made with students. As a result of the current study, it was concluded that STEM applications had positive effect on students' attitude. Similarly, Yıldırım and Selvi (2017) concluded that students 'attitudes improved positively with STEM education. Despite consistent evidence of the benefits of STEM programs, further research is needed to make generalizable decisions about the factors that differentiate the success of STEM programs.

Statement of Responsibility

Serkan Timur; conceptualization, methodology, software, formal analysis, writing - reviewing & editing, supervision, and project administration. Betül Timur; conceptualization, validation, investigation, resources, data curation, writing - original draft, and writing- reviewing & editing. Eylem Yalçınkaya-Önder; formal analysis, and writing- reviewing & editing. Didem Küçük; software, validation, investigation, resources, data curation, and writing - original draft.

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Adaptation of the Scale of the Factors Affecting Argumentation Instruction into Turkish*

Argümantasyon Öğretimini Etkileyen Faktörler Ölçeğinin Türkçe'ye Adaptasyonu

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ABSTRACT: The aim of this study is to adapt the scale of the factors affecting argumentation instruction into Turkish. A total of 143 preservice science teachers studying in two different universities located in the east and west of Turkey participated in this study. In the process of adaptation firstly, structure, method and item biases were elimanated. After that the construct validity of the scale was determined by exploratory and confirmatory factor analysis. The results of the analysis confirmed that the 21-item scale had a three-factor-structure. Then, the cronbach's alpha value was measured for the whole scale and its sub-dimensions, and these values were found to be within satisfactory limits. It is thought that this study provides a valid and reliable measurement tool that can be used in the process of determining the factors affecting the argumentation instruciton of teachers and preservice teachers. Thus, it can be stated that the data obtained with the adapted scale will contribute to the further use of argumentation in science classes.

Keywords: adaptation, reliability, the factors affecting the argumentation instruction, validity.

ÖZ: Bu çalışmanın amacı, argümantasyon öğretimini etkileyen faktörler ölçeğinin Türkçe'ye uyarlanmasıdır. Çalışmaya Türkiye'nin doğusunda ve batısında yer alan iki farklı üniversitede öğrenimlerine devam etmekte olan toplam 143 Fen Bilimleri öğretmen adayı katılmıştır. Adaptasyon sürecinde ilk olarak yapı, yöntem ve madde yanlılıkları giderilmiştir. Daha sonra ölçeğin yapı geçerliği açımlayıcı ve doğrulayıcı faktör analizi ile ortaya konmaya çalışılmıştır. Analiz sonuçları, 21 maddelik ölçeğin 3 faktörlü bir yapıya sahip olduğunu doğrulamıştır. Ardından ölçeğin bütünü ve alt boyutları için cronbach alfa değeri hesaplanmış ve bu değerlerin, tatmin edici sınırlar içerisinde olduğu tespit edilmiştir. Mevcut çalışmanın, öğretmenlerin ve öğretmen adaylarının argümantasyon uygulamalarını etkileyen faktörlerin tespit edilmesi sürecinde kullanılabilecek geçerli ve güvenilir bir ölçme aracını literatüre kazandırdığı ifade edilebilir. Böylece uyarlanan ölçek ile elde edilen verilerin, argümantasyonun fen sınıflarında daha fazla kullanılmasına katkıda bulunacağı düşünülmektedir.

Anahtar kelimeler: argümantasyon öğretimini etkileyen faktörler, geçerlik, güvenirlik, uyarlama.

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Argumentation has recently emerged as an important educational objective (Erduran, Ozdem, & Park, 2015). It is defined as the process of combining ideas with appropriate knowledge and reasons (Toulmin, 1958), which requires reasoning (van Eemeren & Grootendorst, 1996) in order to increase the acceptability of an existing perspective. In the process of argumentation, students engage in the process of presenting claims, defending them by using evidence, and criticizing arguments presented by others (McNeill, Katsh-Singer, González-Howard, & Loper, 2016). Since these processes are the ones which scientists experience to reach a common decision (Tippett, 2009), argumentation is also expressed as the language of science (Duschl, Ellenbogan, & Erduran, 1999). This definition makes argumentation an essential application of science education (McNeill & Pimentel, 2009; Wang & Buck, 2016), and requires its use in science teaching and learning (Ruiz-Ortega, Alzate, & Bargallo, 2015).

Osborne, Erduran, and Simon (2004) argue that using argumentation as a central element of science courses has two important functions. The first function was stated as supporting students' achievement of the set of conceptual and epistemological goals, and the second as making students' scientific thinking and reasoning processes more suitable for assessment. In addition to this, many outputs provided for education by argumentation have been reported in the literature. Some of these are specified as understanding scientific processes and concepts better (Sampson & Blanchard, 2012), developing reasoning skills (Rebello & Barrow, 2013), understanding how scientific knowledge is produced and supporting decision-making processes (Pallant, Lee, & Pryputniewicz, 2013), and developing reasoning and justificaiton skills in the environment outside the classroom (McNeill & Krajcik, 2009).

When and how to incorporate reforms such as argumentation into classroom practice is affected by teachers' beliefs and perceptions (Knight-Bardsley & Mcneıll, 2016). Although the results of teaching activities depend on many factors, teachers' perceptions of their own teaching methods play an important role in this process (Hung, 2011). Therefore, in the process of argumentation instruction, teachers' opinions about the importance of argumentation in science teaching, what they understand from scientific argumentation and how they can support argumentation are important (Ruiz-Ortega et. al., 2015). However, little is known about how science teachers perceive argumentation and their views on using argumentation in science teaching (Sampson & Blanchard, 2012). The reason for that may be attributed to the fact that the factors affecting teachers' argumentation practices have not been investigated sufficiently (McNeill & Pimentel, 2009). The literature reviews made in the study have also shown that there is no scale for defining the factors affecting the argumentation instruction of teachers or preservice teachers in Turkey. However, different scales used in the field of argumentation are available in Turkey. One of them is the "Determining Argumentation Skills" scale developed by Evren-Yapıcıoğlu and Kaptan (2018). This scale was developed to determine the pre-service teachers' argumentation skills and consists of 6 unstructured open-ended questions. Daily life scenarios and case studies are presented in the scale. Pre-service teachers are asked to defend their opinions about the situations in these scenarios and case studies by using argument elements (claim, data, backing, warrant, qualifier, rebuttal). The pre-service teachers' argumentation skills were evaluated according to their usage of argument elements.

Other scales used in Turkey in the field of argumentation were adapted into Turkish by Kaya, Cetin, and Erduran (2014). These scales are the Argumentation Test developed by Sampson and Clark (2006) and the Argumentation Perceptions Test developed by Chin (2008). The Argumentation Test consists of a total of 6 open-ended questions designed to determine what students think is a good scientific argument and what is a good objection to a scientific argument. Argumentation perceptions test, on the other hand, aims to determine students' perceptions of argumentation. The test consists of two parts, the first part consists of the questions about the importance and quality of a scientific classroom environment and the classroom activities that support such a classroom environment. In the second part of the scale, there are open-ended and closed-ended questions about the importance of argumentation in science education, supporting argumentation, activities that support argumentation in science lessons and students' attitudes towards these activities.

Considering the scales used in the field of argumentation in Turkey, it is seen that there are scales to determine argumentation skills, usage of argumentation elements and the perceptions about argumentation.We can say that the present study differs from these studies in terms of adapting a scale to determine the factors affecting teachers' argumentation instruction (self-efficacy of teachers / pre-service teachers, context and policy, objectives and outcomes). Therefore, this study aims to contribute to fill this gap in the literature. The findings obtained from using this scale are thought to shed light on the process of supporting teachers' use of argumentation in science classes or overcoming the obstacles in using argumentation. Thus, many educational outcomes obtained by using argumentation more in science courses will be benefited.

Factors Affecting Argumentation Instruction

Many factors play role in the process of integration of argumentation into classes. McNeill et al. (2016) revealed that teachers 'self-efficacy, ways of determining the aim of the course, country policies and curriculum contents and teacher beliefs about students' competences affect the argumentation practices. Therefore, researching these factors identified by McNeill et al. (2016) and affecting teachers' argumentation practices is important in terms of using argumentation more in classrooms.

Teachers play a key role in integrating argumentation into science classes (McNeill & Knight, 2013). For an effective teaching of argumentation, teachers are primarily supposed to be convinced that argumentation is a fundamental part of science learning (Osborne et al., 2004) because one of the factors affecting the level of teachers' use of teaching strategies is related to what they value and how they decide to use it (Sampson & Blanchard, 2012). The ways of determining the aims of the course will affect the instructional support provided by teachers in the argumentation process (McNeill & Pimentel, 2009). If the aim of the course is regarded as teaching science concepts and contents, it may be preferable to use more traditional approaches (McNeill & Pimentel, 2009). Besides, if it is aimed to teach argumentation, it should not only be focused on explaining theories, laws, models and concepts, but also on applications that serve for producing scientific knowledge, and on argumentation activities as one of them (Sampson & Blanchard, 2012). In addition to learning objectives, teachers' self-efficacy towards science content and scientific inquiries is another factor affecting their classroom practices (Mcneill, Pimentel, & Strauss, 2013). Self-efficacy is the

confidence and belief in ourselves that we can perform a task (Bandura, 1977). Therefore, teacher beliefs are an important factor affecting when and how reforms such as argumentation are included in classroom practice (Knight-Bardsley & McNeill, 2016). As described by McNeill et al. (2016), it means that if teachers feel comfortable in supporting students' engagement with argumentation and generating arguments or modeling argumentation, this feeling will affect their practices pozitively. Therefore, a better understanding of teachers' beliefs about argumentation might provide different perspectives and support for new studies to design and implement such new strategies (Katsh-Singer, McNeill, & Loper, 2016). The first thing that should be done to improve the teaching quality of teachers is to determine their perceptions and beliefs about the teaching methods (Hung, 2011).

Teachers' beliefs related to students' ability to participate in the argumentation process also affect their instructional practices. Prime and Miranda (2006) found that teachers perceive science as a set of content that requires special skills, and define their students as lacking the qualifications required to be successful in science. Teachers with such ideas may avoid engaging all students in high-level practices such as argumentation. Teachers who believe that students can participate in argumentation can support them to participate in the argumentation process, while teachers with contradictory beliefs on all students can participate in argumentation may accept lowering their expectations as a support (Katsh-Singer et al., 2016). Such contradictory considerations may result in the fact that teachers do not use argumentation in their classes or they do not set high-level objectives for argumentation.

For example, in a study conducted by Wang and Buck (2016), a teacher stated that argumentation is only suitable for certain students, and that these students must be specialized in prerequisite knowledge or skills. Besides, the same teacher added the ideas that argumentation is only suitable for teachers, and it may cause misunderstanding and confusion among students. Teachers with such ideas cannot be expected to integrate argumentation into their classes. Therefore, firstly, teachers should accept that all students have the ability to participate in the argumentation. (Katsh-Singer et al., 2016).

Another important factor affecting the process of inclusion of argumentation in classes by teachers is contents of curriculum. Time and curriculum limitations make it difficult for teachers to integrate argumentation in their lessons (Newton, Driver, & Osborne, 1999). The practices emphasized in the curriculum are more likely to be carried out by teachers. For example, in Turkey, it is highlighted that lessons based on argumentation as one of the student-centered practices should be carried on with a change made in 2013 (Ministry of National Education [MoNE], 2013). Furthermore, in the curriculum, the statement that "In order for students to express their ideas easily, to support their ideas for different reasons, and to refute their friends' arguments, opportunities should be provided where they can discuss the profit-loss relationship for scientific phenomena to develop opposing arguments" (Ministry of National Education [MoNE], 2018, p. 11) is included.

This emphasis on argumentation in the curriculum is likely to raise awareness of teachers about the argumentation process, and to increase the possibility of this practice being integrated in lessons by teachers in their lessons. Political decisions are also important for teachers' practices. For example, Ministry of National Education

evaluates students by national exams in Turkey. Teachers can focus on learning of the content by students during this busy period of preparing students for such exams, and so might avoid allocating time to different practices. As a matter of fact, the teachers state that they see national exams as a pressure for themselves in the process of using argumentation (Katsh-Singer et al., 2016).

In the process of teaching argumentation, it is seen that teachers' opinions about the importance of argumentation, what they understand from scientific argumentation, and their opinions about the factors that affect their support in argumentation are important (Ruiz-Ortega et al., 2015). However, little is known about how science teachers understand argumentation and their views on using argumentation as a part of teaching and learning science (Sampson & Blanchard, 2012). Therefore, researches about the factors affecting the argumentation practices of teachers are important (McNeill & Pimentel, 2009). The absence of an instrument for this purpose in Turkey is the starting point of this study.

Method

In this quantitative study, it was aimed to adapt the scale of the factors affecting the teachers' argumentation instruction into Turkish.

Participants

The sample of the study consists of 143 preservice science teachers. Preservice teachers study at the two state universities located in the east and west of Turkey. 110 (77%) of the participants were female, and 33 (23%) were male. In addition, 34 (24%) students study in 1st grade, 45 (32%) in 2nd grade, 47 (33%) in 3rd grade, and 17 (12%) in 4th grade. The students' ages ranged between 17 and 25. The reason for the high number of female students is that the study is voluntary, and girls are more willing to participate in the study than boys.

Data Collection Tool

The Scale of "The Factors Affecting Teachers' Argumentation Instruction" used in the study was developed by McNeill et al. (2016) in order to investigate the factors affecting the science teachers' argumentation practices. The original version of the scale consists of four dimensions: self-efficacy, context and policy, objectives and outcomes, student background and ability. In the original scale, there are 8 items for the self-efficacy dimension, 7 items for the context, policy, objectives and outputs dimensions and 4 items for the student background and ability subdimension. The scale consisting of 26 items is a four-point likert type. The researchers who developed the scale measured the cronbach alpha coefficients of these dimensions as .90, .89 and .87, respectively.

In this study, a three-factor-structure was preserved. The student background and ability subdimension was not considered in this study. Because this subdimension had been created based on feedback that some teachers seemed to feel that some students (i.e. academically advanced) were more capable of engaging in argumentation that other students (English language learners, students with special needs). In this subdimension teachers were wanted to evaluate four different students as capable or not capable for argumentation. Teachers evaluated students according to their background

including family relationship, living conditions, academic achievement or speaking language. Since there no implementation in this study, there are no students to be evaluated. Therefore, student background and ability subdimension was eliminated in the present study. Other three factors were named with the same name as the original scale: self-efficacy, context and policy, objectives and outcomes. In the adapted version of the scale, there are 6 items for the context and policy dimensions, and the same number of items for the other dimensions as the original scale. The scale, which consists of 21 items in its adapted form, is a four-point likert type as the original scale. Cronbach's alpha values of three factors were measured in the adapted scale, and these values were presented in the findings section.

Data Collection and Ethical Process

The data of the study were collected in the spring semester of 2017-2018 academic years. Firstly, informative explanations were given to the preservice teachers studying in Science Education Department about the purpose and importance of the study. Before the scale was distributed to preservice teachers, it was stated to them that they were free to fill the scale and volunteering was important. Afterwards, volunteer preservice teachers were determined to participate in the study, and they were provided to fill the scale of the factors affecting the argumentation instruction. The preservice teachers completed the scale between 10 and 20 minutes.

Translation of the Scale into Turkish

In the process of translating the scale into Turkish, the permission was taken for the adaptation study through e-mail from the researchers who developed the scale. Afterwards, the studies were carried out considering the three main biases that may arise during the adaptation processes of the scale. These three biases can appear as construct, method and item biases.

Construct bias can occur if there are unacceptable differences between the cultural features of the original language and adaptation language of the scale (Hambleton, 1996). Construct bias can be handled with multicultural and multilingual teamwork. In the present study, there is a specialist who has lived in the United States and Turkey, and has knowledge on education systems and cultural values of two countries. Since the education specialist had knowledge on the teacher training systems of USA and Turkey, the scale could be adapted by taking two systems into consideration. In addition, an English language teacher, three specialists in science and mathematics education and a research assistant in Turkish teaching department collobarated during the adaptation process. The presence of different specialists as a working team also contributed to the elimination of item biases. Item bias appears when original and adapted scale items are not equivalent (Bayık & Gurbuz, 2016). In order to measure behaviors and concepts properly in the scale according to specialists' opinions, the changes were made in a sub-dimension since the original scale was developed for teachers unlikely to this study. In this study, it was aimed to provide a valid and reliable scale that can be used to determine the factors affecting the argumentation instruction of not only teachers but also preservice teachers. In this respect, the items under the subdimension of "context and policy" were amended to make them applicable for preservice teachers. For example, in the original scale, "Teaching scientific argumentation is a priority for my school or district" is amended as "Teaching scientific

argumentation is a priority for the schools in my district or country". In addition, the item "Teachers in my school support one another in teaching argumentation" was removed from the scale in accordance with the opinions of the specialists because it was not suitable, and could not be adapted for preservice teachers. The specialists argued that this item could be replaced by the phrase "Teachers in the school of my district or country support one another in teaching argumentation." However, it was decided to remove this article by considering that preservice teachers may not have the chance to make sufficient observations about the supportive actions performed by teachers, and in this case they cannot make an objective assessment. Hambleton and Patsula (1999) stated that additions and subtractions can be made to the items in the adaptation studies. The Turkish form of the scale was re-translated into English by an English teacher by back-translation method, and the two forms were compared and the necessary corrections were made. After the translation of the scale was completed, the pre-application was made. At the end of the pre-application with 10 preservice science teachers who were not among the participants of the study, the minor changes were made related to expression of some items.

Method bias, another bias that may arise in the scale adaptation process, is a general term used for factors threatening the validity of the measurement tool (Hambleton, 1996). The various factors that cause method bias can be listed as follows: Familiarity with stimulants, biased selection of sample, response of the participants to the measurement tool, physical conditions in which the scale was applied and communication problem between the participants (Önen, 2009). In order to eliminate method bias, scales can be applied in a non-standardized way, and respondents may be asked to interpret instructions, items, response alternatives, and motivation to respond (van de Vijer & Hambleton, 1996). For this purpose, in this study, the feedback was obtained from 10 preservice science teachers who were not among the participants in a non-standard way for the items, alternative answers and motivation for the answers. In this respect, the minor changes were made for some sentences. Preservice teachers stated that they were pleased to answer the questions; they found the questions useful because they were required to give feedback about their fields, and the items were clear.

Data Analysis

Three steps were followed during the adaptation process. These steps include adapting the scale into Turkish, ensuring the construct validity of the scale and performing reliability analyses. In the process of translating the scale into Turkish, there were 3 field specialists, two language specialists speaking English and Turkish, and one Turkish teacher. In order to ensure the construct validity of the translated scale, it was decided to perform the exploratory factor analysis. In this respect, firstly, the assumptions of the exploratory factor analysis were investigated. The assumptions of the factor analysis are listed by Can (2016) as follows:

- Data in at least minimum interval scale should be normally distributed and linear.

-The sample should be homogeneous.

- Correlated relations should be sufficient.

Before performing the analyses, the missing data were replaced with the average data. Then, the descriptive statistics based on the scores obtained from the scale are given in Table 1.

Table 1

Descriptive Statistics of Scale Items

Item no	Mean	Standart Deviation	Minimum Scores	Maximum Scores	Skewness	Kurtosis
1	2.89	.60	1	4	-.93	2.4
2	3.05	.51	1	4	.22	2.21
3	2.95	.56	1	4	.24	.93
4	2.83	.69	1	4	-.28	.12
5	2.99	.65	1	4	-.29	.30
6	2.93	.68	1	4	-.17	-.19
7	3.00	.63	1	4	-.17	.08
8	2.86	.74	1	4	-.17	-.35
9	2.67	.84	1	4	-.18	-.52
10	2.51	.82	1	4	.27	-.51
11	3.02	.73	1	4	-.48	.19
12	2.65	.77	1	4	-.03	-.41
13	2.58	.76	1	4	.01	-.35
14	2.47	.81	1	4	.05	-.45
15	3.18	.63	1	4	-.50	.89
16	3.26	.62	2	4	-.27	-.61
17	3.17	.68	1	4	-.37	-.31
18	3.16	.63	1	4	-.65	1.52
19	3.25	.66	1	4	-.62	.58
20	3.20	.70	1	4	-.67	.51
21	3.18	.80	1	4	-.84	.38

As shown in Table 1, the skewness and kurtosis values of all data were found between +3 and -3 values, which are the range required to meet normal distribution criteria (Bentler, 2006). In this respect, the first assumption of the factor analysis was accepted. The assumption that the sample is homogeneous is about collecting data from a sample with similar features (Can, 2016). In the current study, only working with preservice science teachers shows that this assumption was met. The final assumption is that correlation-based inter-relationships should be sufficient. Correlation coefficient of 0.33 and above is considered sufficient for these relationships (Can, 2016). When the correlation matrix values were examined, it was observed that the number of items with acceptable relationships (r>.30) was quite high. Therefore, it is assumed that this assumption is also met.

After the assumptions were checked, the exploratory factor analysis was realized. The confirmatory factor analysis was used to check the accuracy of the factor structure determined as a result of the exploratory factor analysis. Subsequent to controling the validity of the scale, the reliability analyses were made. For this purpose, the alpha values of all subscales and total scores obtained from the scale were calculated. The followed steps are explained in detail in the results section.

Results

This section provides information about translation of the scale into Turkish and validity and reliability analysis.

Construct Validity of the Scale

In order to ensure the construct validity of the scale, the exploratory and confirmatory factor analyses were made. These analyses are explained below.

Exploratory Factor Analysis

The exploratory factor analysis was made to determine the factor structure of the adapted scale. For this purpose, Bartlett's Test of Sphericity and Kaiser Meyer Olkin (KMO) values were measured. The statistical significance of Bartlett's Test of Sphericity value (p<.001) showed that the variance and distribution characteristics of the data were suitable for the factor analysis. KMO value was measured as greater than .5 (.80), and this finding was considered as sufficient sample size for the factor analysis (Can, 2016).

Orthogonal varimax rotation was selected for rotation in order to examine the items in the factors separately. The principal component extraction analysis revealed 3 factors, and these three factors explained 48% of the total variance.

Table 2 shows the factors under which each item is loaded, and the factor loadings.

Table 2

Factor Loadings of Items

	Factor Loadings		
Item Number	1. Factor	2. Factor	3. Factor
16	.79		
15	.76		
17	.70		
19	.69		
20	.68		
21	.68		
18	.67	.36	
3		.71	
4		.68	

8	.66	
5	.62	
6	.62	
1	.62	
2	.58	.33
7	.52	
13		.70
14		.68
12		.61
10		.56
11		.45
9		.35

According to the findings in Table 2, the first 8 items are in the second factor, the 9th, 10th, 11th, 12th, 13th and 14th items are in the third factor, 15, 16, 17, 18, 19, 20, and 21st items is included in the first factor. Among the items, it was seen that items 18 and 2 loaded in two factors. In such a case, if the difference between the correlation levels of the items in different factors is less than 0.1, there is no need to remove the items from the scale (Büyüköztürk, 2006) and the items with which a greater correleation is observed should be placed under that factor. Therefore, it was accepted that item 18 must be included in factor 1, and item 2 in factor 2. The factors were named the same as in the original scale, since the same items on the adapted and original scale were loaded under the same factors. Therefore, the first factor was named as objectives and outputs, the second factor as self-efficacy, and the third factor as context and policy. Table 2 shows that, the factor loads of the items in the self-efficacy subdimension range from .52 to .71, the items in context and policy subdimension range from .36 to .70, and the items of objectives and outputs subdimension range from .68 to .79.

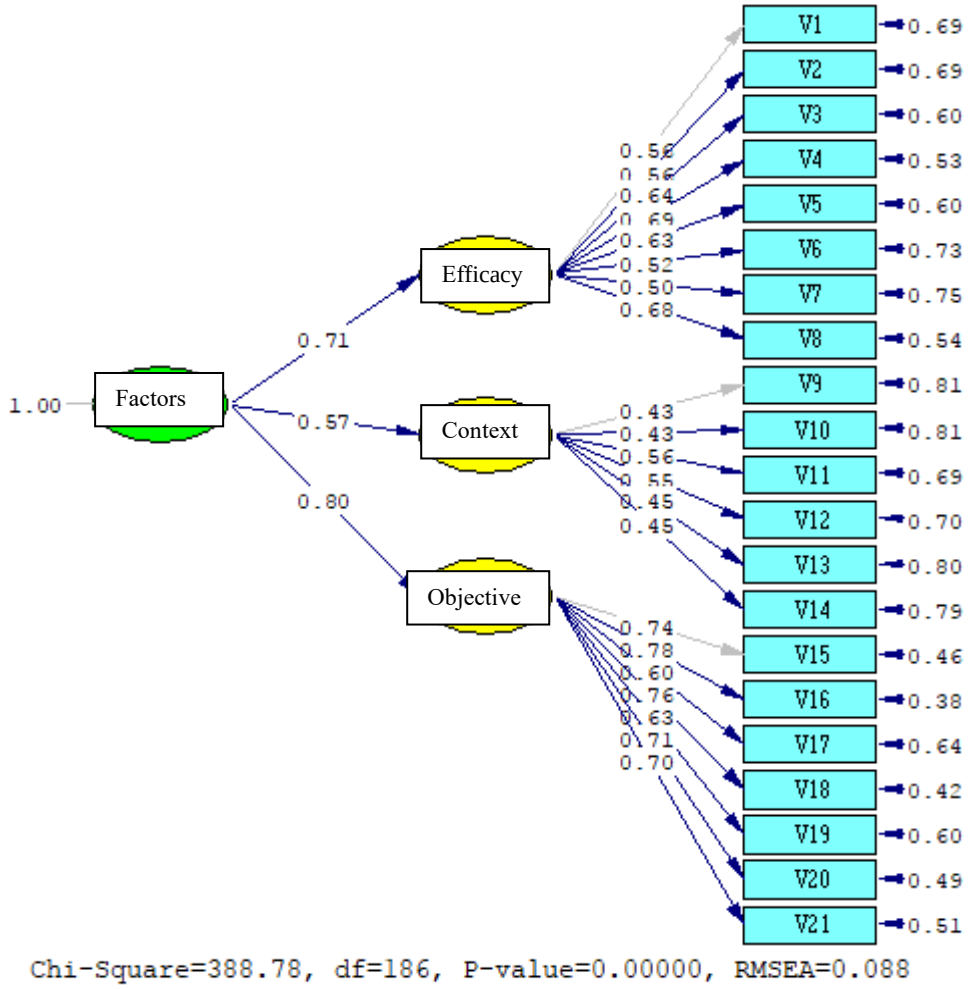
In order to check the accuracy of the structure determined in the exploratory factor analysis, the confirmatory factor analysis was also made. The findings of confirmatory factor analysis are presented below.

Confirmatory factor analysis

According to the results of confirmatory factor analysis, it can be said that the scale was 3-dimensional, including self-efficacy, context and policy, objectives and outputs. Self-efficacy subdimension consists of 8 items, context and policy subdimension consists of 6 items, and objectives and outcomes subdimension consists of 7 items. Factor loads of the items range from .36 to .79. The calculated multiple fit values were determined as follows: x^2 / sd = 2.09, RMSEA = .088, GFI = .79 CFI = .90, NFI = .82, NNFI = .88, AGFI = 0.74. A value of x^2 / sd less than 5 is considered as an acceptable value (Schermelleh-Engel, Moosbrugger, & Müller, 2003). While the RMSEA value of less than .05 represents good model fit, it is noted that there are serious problems for models with a value greater than 0.1 (Browne and Cudeck, 1993) and that these models are unacceptable (MacCallum, Browne and Sugawara, 1996). It is stated that the CFI value is between .00 and 1.00, and that approaching 1 indicates good

model fit (Brown, 2006). In the present study, considering that x^2 / sd value is less than 5, RMSEA value is less than 0.1 and CFI value is close to 1.00, it can be said that RMSEA, x^2 / sd, CFI values confirm triple factor structure. Considering that the acceptable values for NNFI, NFI and AGFI as .95 ≤ NNFI ≤ .97, .90 ≤ NFI ≤ .95 and .85 ≤ AGFI ≤ .90 (Schermelleh-Engel et. al., 2003), it can be stated that AGFI, NFI and NNFI values are of critical value. The figure of the confirmatory factor analysis is presented in Figure 1.

Figure 1. Confirmatory Factor Analysis Results



Reliability of the Scale

The reliability of the scale was determined by the internal consistency values. For internal consistency, the alpha values of each scale and the whole scale were calculated. The alpha value of the whole scale was .85. The alpha value of the items in the self-efficacy subdimension was .81, the value of the items in the context and policy subdimension .64, and the value of the items in the objectives and outputs subdimension .87, respectively. Alpha values between .60 and .80 are considered as highly reliable (Uzunsakal & Yıldız, 2018; Yıldız & Cimete, 2011) and acceptable (Gamble, 1999). Accordingly, the scale can be accepted as a reliable measurement tool. The final version of the measurement tool is presented in Appendix-1.

Conclusion and Implications

The aim of this study is to adapt "The Scale of the Factors Affecting' Argumentation Instruction" into Turkish. The results of exploratory factor analysis made after the elimination of structure, method and item biases showed that the scale had a 3-factor-structure, similar to its original form: self-efficacy, context and policy, objectives and outputs. Besides, the results of the confirmatory factor analysis showed that many model coefficients were within acceptable limits. Moreover, the Cronbach's alpha values indicated that the internal consistency of the scale was statistically acceptable. To sum up, the analyses show that the Turkish version of the scale is a three-dimensional, valid and reliable measurement tool. Therefore, it is thought that this study provides a scale, which can be used in studies carried out in Turkey and aim to identify the factors that affect the argumentation instruction of teachers and preservice teachers.

It was found that the adapted and the original scales have a similar structure. The same items were loaded under the same factors both in the original and the adapted scale. The original scale consists of 22 items, and the adapted version consists of 21 items. The item in the original scale "Teachers in my school support one another in teaching argumentation" was removed from the scale because it could not be adapted for preservice teachers. In addition, the items under the context and policy factors were adapted to be applicable for pre-service teachers. Hambleton and Patsula (1999) stated that items in scales can be changed, removed, or new items can be added when the specialists regard as necessary. It was found that there was no problem in using the 4-point Likert type (totally disagree, disagree, agree, totally agree) and scoring between 1 and 4 in the adapted scale as in the original scale.

In Turkey, despite the use of scales for evaluating the argumentation skills and perceptions of argumentation (Evren-Yapıcıoğlu & Kaptan, 2018; Kaya et al., 2014), it is thought that the lack of a scale to determine the factors affecting the argumentation instruction, the present study will contribute to the literature at this point and support the development of future argumentation instruction. The data collected by using this scale in the future studies can be supported with qualitative data, and so extensive information can be gathered on the factors affecting the argumentation instruction of teachers/preservice teachers. Thus, it can be contributed to identify the supporting reasons of the argumentation instructions of teachers/preservice teachers or the obstacles in using argumentation. The data obtained from scale can be used as a guide for support for instruction of argumentation or for measures to be taken against the factors preventing its use. Thus, argumentation can be used more in classrooms and this make possible to benefit from the many outputs of this strategy as understanding scientific processes and concepts better (Sampson & Blanchard, 2012), developing reasoning skills (Rebello & Barrow, 2013), understanding how scientific knowledge is produced and supporting decision-making processes (Pallant et al., 2013).

Statement of Responsibility

Nejla Atabey; conceptualization, methodology, validation, formal analysis, investigation, resources, writing – original draft, visualization, supervision, and project administration. Mustafa Sami Topçu; conceptualization, methodology, software,

validation, data curation, and writing- reviewing & editing. Ayşe Çiftçi; conceptualization, methodology, validation, and investigation.

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Ek1- Argümantasyon Uygulamalarını Etkileyen Faktörler Ölçeği

Ad/Soyad:

Yönerge: Bu ölçek, argümantasyon uygulamaları ile ilgili faktörleri ölçmek amacıyla hazırlanmıştır. Bu ölçekte 21 madde bulunmaktadır. Her bir ifadeyi okuduktan sonra buna ne derece katıldığınızı ya da katılmadığınızı işaretleyiniz. **Lütfen hiçbir maddeyi boş bırakmayınız ve her biri için tek yanıt veriniz. Bu çalışmaya yaptığınız katkılardan dolayı teşekkür ederim.**

Özyeterlik	**HiçKatılmıyorum**	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
1. Öğrencilere argümantasyon için önemli olan savunma ve ikna becerilerini öğretme konusunda kendime güveniyorum.				
2. Fen içeriklerini keşfetme ve anlamanın bir aracı olarak öğrencilerin argümantasyon yapmalarını destekleme konusunda kendime güveniyorum.				
3. Bireysel olarak veya küçük gruplar gibi çeşitli öğrenci ortamlarında öğrencilerin argüman oluşturmalarını kolaylaştırma konusunda kendime güveniyorum.				
4. Öğrenciler için sözlü argümantasyon etkinliklerini modelleme konusunda kendime güveniyorum.				
5. Öğrencilerin dil becerilerinin (okuma, yazma ve konuşma) gelişimini argümantasyon aracılığıyla destekleme konusunda kendime güveniyorum.				
6. Öğrencilerin argümanları eleştirmelerini kolaylaştırma konusunda kendime güveniyorum.				
7. Öğrencilere argümantasyon öğelerini (iddia, kanıt ve muhakeme) öğretme konusunda kendime güveniyorum.				
8. Okuma ve yazma için argümantasyon uygulamalarını modelleme konusunda kendime güveniyorum.				

Bağlam ve Politika	**HiçKatılmıyorum**	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
1. Ülkemdeki okul veya ilçeler için bilimsel argümantasyonu öğretmek öncelik taşır.				
2. Ülkemdeki okul ve ilçe yönetimleri, bilimsel argümantasyonu uygulama konusunda öğretmenleri destekler.				
3. Argümantasyon, ülkemin fen öğretiminin önemli bir parçasıdır.				
4. Üniversitelerde ve/veya okullarda, fen eğitiminde bilimsel argümantasyonun rolü bilinir.				
5. Ülkemde, fen eğitimindeki müfredat hedefleri bilimsel argümantasyonun öğretimiyle uyumludur.				
6. Argümantasyon ülkemdeki fen sınavlarında değerlendirilir.				

Hedefler ve Çıktılar	**HiçKatılmıyorum**	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
1. Argümantasyon, öğrencilerin eleştirel düşünme becerilerini geliştirmek için etkili bir yoldur.				
2. Argümantasyon, öğrencilerin muhakeme ve problem çözme becerilerini geliştirmek için etkili bir yoldur.				
3. Argümantasyon, öğrencilerin dil becerilerini (okuma, yazma ve konuşma) geliştirmek için etkili bir araçtır.				
4. Argümantasyon, öğrencilerin okur-yazarlık stratejilerini öğrenmeleri ve uygulamaları için etkili bir yoldur.				
5. Öğrencileri kanıtı açıklamak için bilimsel ilkeleri kullanmaya teşvik etmek, fen öğretiminin önemli bir parçasıdır.				
6. Argümantasyon tartışmaları esnasında öğrencilerin birbirleriyle doğrudan konuşmaları önemlidir.				
7. Öğrencileri argümantasyona teşvik etmek, feni öğrenmenin önemli bir parçasıdır.				

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The Effect of Feeling of Loneliness on Burnout Levels in University Students

Üniversite Öğrencilerinin Yalnızlık Duygularının Tükenmişlik Düzeylerine Etkisi

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ABSTRACT: Feeling of loneliness is a matter that is commonly encountered among adolescents and young adults and should be taken into consideration. This study was conducted for the purpose of determining whether or not there was a correlation between the feeling of loneliness and burnout levels in university students. The purpose of the study is to determine whether or not the feeling of loneliness of university students affects their burnout levels. The sample group of the study consisted of 376 students receiving education in Harran University Vocational School of Healthcare Services. The data were collected using a questionnaire between 01 - 31 May 2019. UCLA Loneliness Scale and Maslach Burnout Inventory – Student Form (MBI-SF) were applied to the study group. The data was analyzed using descriptive statistics and linear regression analysis (ANOVA) in the SPSS 20.0. The acquired results show that the scales used in the study has a higher reliability. Similarly, the results of the linear regression analysis ANOVA show that the feeling of loneliness has a significant effect on burnout. In the results of the linear regression analysis ANOVA, it is found out that the feeling of loneliness has a significant effect on the sub-dimensions of burnout. With regard to the standard regression coefficient, it is expected that 1-unit increase in the feeling of loneliness variable causes 0.279-unit increase in the perception of exhaustion variable. The higher the loneliness levels of students are the more the levels of exhaustion increase.

Keywords: loneliness, burnout, university students.

ÖZ: Yalnızlık duygusu, ergenler ve genç yetişkinler arasında yaygın olarak yaşanan ve dikkate alınması gereken bir sorundur. Bu araştırma, üniversite öğrencilerinin yaşadığı yalnızlık duygusu ile tükenmişlik düzeyleri arasında bir ilişki olup olmadığını tespit etmek amacıyla yapılmıştır. Bu araştırmanın amacı, üniversite öğrencilerinin yalnızlık duygularının tükenmişlik düzeylerine etkisinin olup olmadığını tespit etmektir. Bu araştırmanın örneklem grubu, Harran Üniversitesi Sağlık Hizmetleri Meslek Yüksekokulu'ndaki 376 öğrenciden oluşmaktadır. Veriler 01 – 31 Mayıs 2019 tarihleri arasında anket aracılığıyla toplanmıştır. Araştırma grubuna UCLA Yalnızlık Ölçeği ve Maslach Tükenmişlik Envanteri - Öğrenci Formu (MTE-ÖF) uygulanmıştır. Verilerin analizi, SPSS 20.0 kullanılarak tanımlayıcı istatistikler ve doğrusal regresyon analizi (ANOVA) ile incelenmiştir. Elde edilen sonuçlara göre araştırmada kullanılan ölçeklerin güvenirliği yüksektir. Doğrusal regresyon analizi ANOVA sonuçlarında yalnızlık hissinin tükenmişlik üzerinde anlamlı etkisi olduğu sonucuna varılmıştır. Standart regresyon katsayısına göre yalnızlık duygusu değişkenindeki 1 birim artışın tükenmişlik değişkeninde 0,279 birim artışa neden olması beklenmektedir. Öğrencilerin yalnızlık düzeyleri arttıkça, tükenmişlik seviyeleri de artmaktadır.

Anahtar kelimeler: yalnızlık, tükenmişlik, üniversite öğrencileri.

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Today, loneliness is one of the most important problems that affect the quality of life of people. There is an increase in the number of people who have trouble in their social relationships, and fall in loneliness (İçer, 2016). The definition of loneliness, generally accepted in the literature, is "it is a disturbing psychological phenomenon which arises from the difference and conflict between the social relationships that a person has and the social relationships that a person wants to have" (Peplau & Perlman, 1982). In other words, the feeling of loneliness, emerging from having important deficiencies in the social relationships of a person in terms of quality and quantity, is related to the several disorders such as unhappiness, anxiety, depression (Demir, 1989). As the feeling of loneliness affects the mental health, it has also serious results that may affect the physical health (Dahlberg, Agahi, & Lennartsson, 2018).

Loneliness cannot be explained as being alone physically in a place; a person may still feel lonely even though several relationships are established in the society (Koçak, 2003). In addition, a person may not want to socialize within his own choice; this should not be assessed as loneliness (McKay, Konowalczyk, Andretta, & Cole, 2017). It is important to prevent temporary loneliness periods from turning into serious and chronic loneliness (Arslan, Hamarta, Üre, & Özyeşil, 2010). When analysed the factors that cause the loneliness, it can be seen that there are several variables. Especially, experiencing separation or exclusion from close people or group, which may leave traumatic effects; inadequate social relationship as a result of being poor at communicating with someone; and the belief that s/he cannot belong to a group because of the cognitive distortions regarding being dislikeable at the lower-self of him/her may cause the loneliness (İçer, 2016). In the studies, some symptoms of loneliness are determined emotionally and cognitively. In the emotion side, it is generally related to dissatisfaction, unhappiness, anxiety, hostility, emptiness, boredom and easiness. In the cognition side, people, experiencing loneliness, are highly sensitive to the acceptance or rejection in the interpersonal relationships or steadily controlling people in order to see whether his/her personal need are met (Arslan et al., 2010)

The concept of burnout was brought in the literature by Freudenberger in 1970s (Tümkaya & Çavuşoğlu, 2010). Freudenberger defines the concept of burnout as getting into a position that cannot carry out duties as necessary because of overworking (Freudenberger, 1974). Later, Maslach and Jackson, stating that long-term stress leads to burnout, define the burnout as "breaking off of a professional from its genuine meaning and objectives, not being able to taking care of people, s/he serves" and analyse it under three sub-dimensions as emotional exhaustion, depersonalisation and personal accomplishment (Kaçmaz, 2005). The factor of emotional exhaustion is the determinant of burnout and a person, experiencing emotional exhaustion, moves psychologically away people and causes to the emergence of the depersonalisation dimension. In the last factor, personal accomplishment factor, a person tends to self-evaluate negatively and lives the feeling of inadequacy. The relationship between the concept of burnout and the sub-dimensions is as the increase in the emotional exhaustion sub-dimension and depersonalisation sub-dimension and the decrease in the competency sub-dimension (Ardıç & Polatcı, 2008).

The studies regarding burnout was initially limited to human services, it is expanded to the all occupational groups now, in other words; the assumption that the burnout is common among the workers who directly provide services to people is seen

as invalid. For example, it is shown that students also experience burnout. The burnout among the students means feeling exhausted, inadequate and incompetent because of the intensive work program (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). When the body of literature analysed, while there are few studies on the burnout of students, it is observed that the burnout is the most common among the medical faculty students and the burnout rate of university students is 50% in the available studies (Çam, Deniz, & Kurnaz, 2014).

There are intensive syllabuses and exams to be passed in the education life of students in Turkey (Akıl & Yazar, 2014). Many researchers state that the activities of students such as attending class, submitting homework, studying with a deadline and studying long hours can be accepted as work (Cazan, 2014). Fatigue because of the demands, expected from students regarding their education, developing negative and reckless attitudes towards school and school activities, not giving necessary attention their homework, the perception of inadequacy and the decline in the success are the important indicators of the burnout that students experience (Seçer, 2015). In addition, studies show that students, having experience burnout throughout their education life, would experience burnout in their business life. A study supports that the burnout of students in the teacher-training program is an indicator in the burnout of teacher after the graduation and the estimation of their working competencies (Yang & Farn, 2004).

As mentioned before, the loneliness is one of the emotions that affect the psychosocial well-being of people (Arslantaş & Ergin, 2011). One of the most important reasons that lie behind the equivalent indications like self-accusation, depression, dullness, collapse, despair is that they emerge as a reaction to the loneliness (Akbağ, Sayıner, & Sözen, 2005). Studies have found out that there is a positive close relation between depressive indications and burnout (Sağır, 2015; Tel & Ertekin-Pınar, 2013). Therefore, it is highly possible that loneliness affects the level of burnout. When analysed the researches regarding this relationship, it is seen that Aşık (2016) has found a high positive relationship between loneliness and burnout. In this study, the question of the research is to determine whether there is a statistical and significant relationship between the feeling of loneliness and the level of burnout throughout the period of university in which personal and social development of a person as well as mental development continue.

This study is expected to be one of the pioneer studies since only one study regarding the effect of loneliness feeling of students on the burnout level is encountered when reviewed the literature,. When considered the negative effects of the loneliness and burnout syndromes on the students, it is agreed that it should be given weight and studied more. Taking into consideration that students are the majority of the society and represent the future of the society and the effect of their productivities throughout the university period on their whole life, the importance of this study will be understood better.

The aim of this study is to determine the effect of loneliness feeling of students, studying in Harran University Vocational School of Healthcare Services, on the sub-dimensions of burnout level and develop a suggestion related to the measures to be taken.

Method

The Problem of Study

Throughout the university period in which personal and social development continue in addition to the mental development of individual, determining whether there is a statistically significant relationship between the feeling of loneliness and the level of burnout or not forms the problem of study.

The Population and Sample of the Study

The population of the study consists of 2000 students in Harran University Vocational School of Healthcare Services. With simple random sampling method, the sample group is determined as 350 and it is applied to 376 students.

Data Collection Tools

This study is a descriptive study; data collecting with questionnaire method is used as data collection tool. Before the study, the approval is received from Harran University Social and Human Sciences Ethics Committee with the decision numbered 2019/46. Ethical rules were followed while collecting data in this study. In addition, the permission for the study is received from the Directorate of Harran University Vocational School of Healthcare Services on 29/04/2019. After the necessary permissions are received, the necessary data collection for the research was conducted 1st-31st May 2019. In the questionnaire, Maslach Burnout Inventory – Student Survey (MBI-SS) scale and UCLA Loneliness Scale are applied in order to measure the burnout levels of students.

Maslach Burnout Inventory – Student Survey (MBI-SS) Scale is developed by Schaufeli, Martinez, Marques-Pinto, Salanova, and Bakker (2002) to measure the academic burnout levels of students. MBI-SS has a 3-factor structure, consisting of exhaustion, depersonalisation and personal accomplishment items. Schaufeli et al. applied this scale to Dutch, Spanish and Portuguese students and reported that the scale is seemed to have adequate psychometric features in terms of 3-factor structure. The Turkish adaptation of the scale, its validity and reliability tests are carried out by Çapri, Gündüz, and Gökçakan (2011). A confirmatory factor analysis is made for the structure validity of adapted scale, it is found out that the correlation coefficients, acquired from the scale, are significant at .01 level. For the criterion-relevant validity study, the Burnout Scale Short Version (BS-SV) was applied and it was found out that the correlation coefficients between the total score of BS-SV and sub-factors of MBI-SS are statistically significant at .01 level. For the reliability of the scale, total item test correlation, test-retest correlation and Cronbach alpha internal consistency coefficients are calculated. While, calculated total item test correlation of the scale is between .42 and .62 for the first sub-factor, it is between .61 and .69 for the second sub-factor and it is between .32 and .46 for the third sub-factor. In addition, while Cronbach alpha internal consistency coefficients of the scale is found as .76 for the first sub-factor, .82 for the second sub-factor and .61 for the third sub-factor, test-retest reliability results are found respectively as .76, .74 and .70. All these results show that the scale is reliable.

For the expressions regarding the burnout in the MBI-SS Scale, participant students are asked to make scoring with 5-score Likert scale and the given scores

constitute the scores of exhaustion, depersonalisation and personal accomplishment, the sub-dimensions of burnout. In the scale, there are 13 items in total, 5 items for the exhaustion sub-dimension, 4 each for both the depersonalisation and the personal accomplishment sub-dimensions. The results of questionnaire, applied to the students, were interpreted with regard to the sub-dimension analysis criteria of Maslach Burnout Inventory – Student Survey. There is a positive relationship between burnout and exhaustion and depersonalisation sub-dimensions and there is a negative relationship between burnout and personal accomplishment sub-dimension.

UCLA Loneliness Scale was developed by Russell, Peplau, and Ferguson (1978). Russell et al. thought that loneliness was a common and serious problem and developing a scale in order to measure it was necessary. The correlation (r=.67) with Beck Depression Inventory is found as significant in the validity test of the scale. Internal consistency coefficient, measured for the reliability of the scale, is found as α=.94. In order to analyse the stability of the scores, acquired from the scale, tests, carried out bimonthly, shows that the scale is significant (r=.73). Similar results were acquired from tests, carried out for the reliability of the scale in different countries. The Turkish adaptation, the reliability and validity tests of the scale was carried out by Demir (1989). For the reliability test, the scale was applied to two groups, divided into whether they were complaining about loneliness or not, the difference between the means of scores was compared with the t-test and the mean of the group, complaining about the loneliness, was found as 47.5, its standard deviation was found as 11.5. On the other hand, the mean of the group, not complaining about the loneliness, was found as 26.44 and the standard deviation was found as 10.8. It was observed that there is a significant (t=6.29; p<.0001) relationship between the two groups. This result supports the results acquired in the original study. Besides, its relationship with Beck Depression Inventory and the Social Introversion sub-scale was analysed, Pearson product-moment correlation coefficient is found significant for both the Beck Depression Inventory (r=.77; p<.0001) and the Social Introversion sub-scale (r=.82; p<.01). For the reliability of the scale, internal consistency and test-retest tests were carried out by considering every item and the Cronbach alpha coefficient and its coefficients is calculated as .94 (p<.001). Consequently, the validity and reliability levels of UCLA Loneliness Scale are adequate.

UCLA Loneliness scale consists of 20 items, 10 of which are coded straight and 10 of which are coded inversely. A case, indicating thoughts regarding the feeling of loneliness, is presented in every item of the scale and it is asked to make scoring with the 4-Likert scale for how often they experience it. While answering the positive cases, never corresponds to 4, rarely to 3, sometimes to 2 and often to 1, the scoring is the exact opposites of them while answering the negative cases. In the scoring, the lowest score is 20 and the highest score is 80. It is accepted that high score indicates that the level of loneliness is high (Demir, 1989).

Data Analysis

Data was analysed with SPSS 22 packaged software. In order to make statistical analysis of the data, acquired from the study, descriptive statistics were used. In addition, Student t-test, one-way variance analysis (ANOVA) and Tukey test were used in order to determine if there is a significant difference between the groups. Linear

regression analysis is used in order to determine the relationship between the variables of the study. The reliability coefficient of burnout scale, used in the study, is found as .763 and the reliability coefficient of loneliness scale is found as .861. These results indicates that the reliability of the study is high.

Findings

According to the answers of the students, participating in this study, to the scales in the study, the means of scale is shown in Table 1.

Table 1

The Means of the Answers of the Students to the Scales

	Mean	Standard Deviation
Exhaustion	2.87	.965
Depersonalisation	2.59	1.011
Personal accomplishment	3.27	.836
Loneliness	47.64	13.038

For the expressions regarding the burnout in the Maslach Burnout Inventory – Student Form, participant students are asked to make scoring with 5-score Likert scale. With their scoring, the score averages for the sub-dimensions of burnout which are exhaustion, depersonalisation and personal accomplishment are created. In the scale, there are 13 items, 5 items for exhaustion sub-dimension and 4 items for the other dimensions. While exhaustion and depersonalisation affect positively burnout, there is a negative relationship between personal accomplishment and burnout. The burnout levels of students are interpreted according to the sub-dimension evaluation criteria of Maslach Burnout Inventory – Student Form in Table 2. According to this, the students are evaluated as "burnout at moderate level" when analysed the exhaustion sub-dimension, as "burnout at low level" when analysed the depersonalisation sub-dimension, as "burnout at moderate level" when analysed the personal accomplishment sub-dimension (Çelik, Bağrıaçık, & Oral, 2012).

Table 2

Maslach Burnout Inventory – Student Form Evaluation Criteria

Score	Lower - Upper Limit	The Interpretation, corresponding to the Score
1.00	1.00-1.80	Very low burnout
2.00	1.81-2.60	Low burnout
3.00	2.61-3.40	Moderate burnout
4.00	3.41-4.20	Mostly burnout
5.00	4.21-5.00	Highly burnout

There are 20 items, half of which is coded positively and half of which is coded negatively, in the UCLA Loneliness Scale. For the expressions regarding the loneliness participant students are asked to make scoring with 4-score Likert scale. The lowest score in the scoring is 20, the highest score is 80. It is accepted that the higher score is what the higher loneliness level is (Demir, 1989). In the study, the mean of scoring for UCLA Loneliness Scale are taken into account and it is accepted that students above this mean have high level of loneliness. The loneliness mean of study sample is measured as $\bar{X}$= 47.64 ± 13.038. When analysed the loneliness score of 376 students in the study, it is observed that 192 students (51%) have scores above the average. According to this data, it is found out that at least 1 out of 2 students have the feeling of loneliness in the study population.

Table 3

The Frequency Distribution of Demographical Information of Participant Students

		n	%
Age Groups	18-19 years	125	33.2
	20-21 years	192	51.1
	22 or older	59	15.7
Gender	Female	254	67.6
	Male	122	32.4
Class	1st Grade	255	67.8
	2nd Grade	121	32.2
Emotional Relationship	Yes	226	60.1
	No	150	39.9
Close Friend Status	Yes	319	84.8
	No	57	15.2
The Status of Finding Adequate University's Social Opportunities	Yes	21	5.6
	No	213	56.6
	Partly	142	37.8
Family Income	2000 TL and less	21	5.6
	Between 2001 TL and 5000 TL	213	56.6
	5001TL and more	142	37.8

When analysed the results in the Table 3, it is seen that 33.2% of students are 18-19 years old, 67.6% of them is female, 67.8% of them is at the first grade, 39.9% of them has never been in an emotional relationship, 56.6% of them finds the social opportunities of university inadequate and the family income of 56.6% of them is between 2000TL and 5000TL.

The Relationship between Loneliness and the Sub-Dimensions of Burnout

In this part of the study, the correlation coefficients between the perception of loneliness and the sub-dimensions of burnout will be firstly analysed, then the effect of the perception of loneliness on the sub-dimensions of burnout will be analysed with the linear regression model.

Table 4

The Correlation Coefficients between the Perception of Loneliness and the Sub-Dimensions of Burnout

	Exhaustion	Depersonalisation	Personel Accomplishment	Loneliness
Exhaustion	1	.731**	-.134**	.279**
Depersonalisation		1	-.165**	.297**
Personal Accomplishment			1	-.315**
Loneliness				1

(**: it shows the significant relationship for $p<.01$.)

The correlation coefficients are given in Table 4 for the relationship between the perception of loneliness and the sub-dimensions of burnout and for the relationship within themselves. All correlation coefficients are found statistically significant. When analysed the relationship between the perception of loneliness and the sub-dimensions of burnout, it is seen that there is a positive relationship with exhaustion and depersonalisation, a negative relationship with personal accomplishment. Accordingly, it is expected that there is direct proportional relationship between the perceptions of exhaustion and depersonalisation and the perception of loneliness and an inversely proportional relationship between the perception of loneliness and the perception of personal accomplishment. Another finding is that the loneliness has the highest correlation (as absolute value) with personal accomplishment.

Table 5

The Findings of Linear Regression Analysis for the Effect of the Perception of Loneliness on the Burnout Level

	Regression Coefficient	Standard Regression Coefficient	*t*	*p*
Constant	1.89		10.418	.0000
Loneliness	.021	.279	5.61	.0000
R	*R* Square	Corrected *R* Square	*F*	*p*
.279	.078	.075	31.472	.000a

The regression model, in which the explanatory variable (independent variable) is determined as the perception of loneliness and the response variable (dependent

variable) is determined as the perception of exhaustion, is given in Table 5. In the analysis, ANOVA is used, a statistically significant relationship between loneliness and exhaustion variables is found out. The determination coefficient of the model (modified) is found as .075. According to this data, 7.5% of the variability of the burnout variable is explained with the perception of loneliness variable via the linear regression model. According to the student-t test, used for the coefficient significance of the regression model, each coefficient is analysed and it is found that they are statistically significant. As can be seen from the positive coefficient of the loneliness variable, there is a positively linear relationship between the loneliness and burnout variables. According to the standard regression coefficient, it is seen that 1 unit increase in the perception of loneliness variable is expected to cause *0*.279 unit increase in the perception of exhaustion variable.

Table 6

The Findings of Linear Regression Analysis for the Effect of the Perception of Loneliness on the Perception of Depersonalisation

	Regression Coefficient	Standard Regression Coefficient	*t*	*p*
Constant	1.89		10.418	.0000
Loneliness	.021	.279	5.61	.0000
R	*R* Square	Corrected *R* Square	*F*	*p*
.297a	.088	.086	36.071	.000a

The regression model, in which the explanatory variable (independent variable) is determined as the perception of loneliness and the response variable (dependent variable) is determined as the perception of depersonalisation, is given in Table 6. In the analysis, ANOVA is used, a statistically significant relationship between loneliness and depersonalisation variables is found out. The determination coefficient of the model (corrected) is found as .086. According to this data, 8.6% of the variability of the depersonalisation variable is explained with the perception of loneliness variable via the linear regression model. According to the student-t test, used for the coefficient significance of the regression model, each coefficient is analysed and it is found that they are statistically significant. As can be seen from the positive coefficient of the loneliness variable, there is a positively linear relationship between the loneliness and depersonalisation variables. According to the standard regression coefficient, it is seen that 1 unit increase in the perception of loneliness variable is expected to cause .297 unit increase in the perception of depersonalisation variable.

Table 7

The Findings of Linear Regression Analysis for the Effect of the Perception of Loneliness on the Perception of Personal Accomplishment

	Regression Coefficient	Standard Regression Coefficient	*t*	*p*
Constant	4.236		27.265	.0000
Loneliness	-.020	-.315	-6.413	.0000
R	*R* Square	Corrected *R* Square	*F*	*p*
.315	.099	.097	41.125	.000

The regression model, in which the explanatory variable (independent variable) is determined as the perception of loneliness and the response variable (dependent variable) is determined as the perception of personal accomplishment, is given in Table 7. The linear regression model, in which the independent variable is the perception of loneliness, the dependent variable is the personal accomplishment, is shown in Table 7. In the analysis, ANOVA is used, a statistically significant relationship between loneliness and personal accomplishment variables is found out. The determination coefficient of the model (modified) is found as .097. According to this data, 9.7% of the variability of the depersonalisation variable is explained with the perception of loneliness variable via the linear regression model. According to the student-t test, used for the coefficient significance of the regression model, each coefficient is analysed and it is found that they are statistically significant. As can be seen from the negative coefficient of the loneliness variable, there is a negatively linear relationship between these variables. According to the standard regression coefficient, it is seen that 1 unit increase in the perception of loneliness variable is expected to cause .315 unit increase in the perception of exhaustion variable.

Discussion and Conclusion

In this study, it is aimed to find out the effect of loneliness levels of students in vocational school of healthcare services on their burnout levels. It is found out that the loneliness levels of students are high, their burnout levels are medium. In this study, when analysed the loneliness scores of 376 students, it is observed that 192 students (51%) have scores above the average. According to this data, at least 1 out of 2 students, having participated in this study, experiences the feeling of loneliness. In addition, the relationship between the perception of loneliness and the sub-dimensions of burnout was analysed in the study. It is seen that the perception of loneliness has a positive relationship with exhaustion and depersonalisation, a negative relationship with personal accomplishment. Accordingly, it is expected that there is direct proportional relationship between the perceptions of exhaustion and depersonalisation and the perception of loneliness and an inversely proportional relationship between the perception of loneliness and the perception of personal accomplishment. When analysed the studies regarding the loneliness levels of students, it is seen that there are similar results with the findings of this study. According to the study, carried out by Özdemir and Tuncay (2008) in Ankara University, 60.2% of the students experience loneliness.

In the study, carried out by Seçim, Alpar, and Algür (2014) in Akdeniz University, 54% of the participant students have scores above the average. In other words, 1 out of 2 students experiences loneliness. In the study regarding the loneliness levels of university students, carried out by Diehl et al. (2018), it is found out that 32.4% of the students feel lonely.

When considered the results of the study, analysing the prevalence of burnout among the university students, it is seen that students generally experience high burnout level (Balkıs, Duru, Buluş, & Duru 2011; Brownlow & Reasinger, 2000; Çapulcuoğlu & Gündüz, 2013; Güdük, et al., 2005; Tümkaya & Çavuşoğlu, 2010). When analysed the results of this study in terms of the burnout level, they are different from the findings in the literature. In the study, carried out by Balkıs et al. (2011), it is found out that 75% of the participant teachers experience burnout. In the study, carried out by Çapulcuoğlu and Gündüz (2013), it is found out that the burnout levels of high school students are high. Contrary to this study, there are studies, in which the burnout level is found low, in the literature. In the study, carried out by Çelik et al. (2012) in order to find out the burnout levels of architecture students, it is found out that the burnout levels of students are low.

When analysed separately the body of literature for loneliness and burnout syndromes, although there are several studies, there is not any study regarding the effect of the feeling of loneliness on the level of burnout. In the studies, it is seen that the relationship of loneliness is generally analysed with the variables such as perceived social support, peer and family relationships, social personal accomplishment, psychosocial harmony, satisfaction with life, self-respect (Dost Tuzgöl, 2007; Güloğlu & Karaırmak, 2010; Karahan, Sardoğan, Özkamalı, & Menteş, 2006; Oktan, 2005; Oruç, 2013; Yılmaz, Yılmaz & Karaca, 2008; Zorbaz & Dost, 2014).

In the study named "Investigating the relationships between loneliness and learning burnout", carried out by Lin and Huang (2012), it is found out that there is a high correlation between the loneliness and burnout of students, the burnout levels of students increase when their loneliness levels increase. In the study on the university students at the first grade, carried out by O'Donovan and Hughes (2007), they state that loneliness has effects on the stress and psychosocial interventions are required to prevent the stress. In the study, Seppala and King (2017) state that burnout in the workplace is not arisen from the loneliness or social isolation but the emotional exhaustion. They emphasise that the more a person burn out, the more s/he feels lonely.

In the study, carried out by Özodaışık (1989) among the university students, it is found out that there is negative relationship between loneliness and assertiveness and positive relationship between loneliness and anxiety and depression. A negative relationship between loneliness and academic achievement is found out. In the study of İçer (2016), it is found out that the feeling of loneliness affects significantly self-respect in a negative way. By and large, when considered these studies, it can be said that the feeling of loneliness is a syndrome which affects negatively the psychological state of a person. In this sense, the finding of this study complies with the literature.

Only one study regarding the effect of loneliness on burnout, carried out by Aşık (2016) about the effect of loneliness in the workplace on burnout, stands out in the literature. Aşık found out that there is a positive and high correlation between loneliness in the workplace and exhaustion in the correlation analysis. Results of the study show

that loneliness in the workplace is a serious problem and the perception of loneliness affect significantly the burnout levels of staff. In this sense, the results of this study coincide with the results in the study of Aşık (2016).

The effect of loneliness status of students in Harran University Vocational School of Healthcare Services on their burnout perceptions is analysed. According to the results of statistical analyses, the reliability of the study is high. There is a positive linear relationship between the loneliness and burnout variables. According to the standard regression coefficient, it is seen that 1 unit increase in the perception of loneliness variable is expected to cause .279 unit increase in the perception of exhaustion variable.

Implications

Students, who have started to university, pass through an important transition which requires high adaptation period. Hence, it can be recommended an orientation program for the first grade students. According to the findings of this study, it is important to have psychological counselling and guidance services in universities, and if available, informing student about them, their awareness of the importance of this service and being easily accessible are necessary. In order to promote the socialization of student, creating social groups and organising activities for this purpose can be recommended. On the other hand, students, separating from their families and studying in a different city, can face with the serious problems such as accommodation and nutrition that affect negatively their life qualities. In terms of decreasing the loneliness and burnout feeling, it is an important factor to determine which student has these problems, support them with scholarship and some social opportunities.

Due to the fact that there are not enough psychosocial support and counselling services for the students in the universities, the psychological state and the loneliness levels of university students are uncertain and they should be researched.

Statement of Responsibility

Hüseyin Eriş; conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing – original draft, writing- reviewing & editing, visualization, supervision, and project administration. Sinem Barut; conceptualization, methodology, validation, investigation, resources, data curation, writing – original draft, writing- reviewing & editing, and visualization.

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An Investigation into In-service and Pre-service English Teachers' Conception of Assessment*

İngilizce Öğretmeni ve Öğretmen Adaylarının Ölçme ve Değerlendirme Kavrayışına Yönelik Bir Araştırma

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ABSTRACT: Although the importance of assessment on education is undebatable, the intentions of assessors while conducting assessment haven't been studied yet in detail. To this end, this study aimed to disclose pre-service and in-service English teachers' conceptions of assessment. In the study, conception of assessment was categorized under four main titles; improvement, school accountability, student accountability and irrelevance. A total of 97 pre-service and in-service teachers participated in the study. Descriptive results indicated that conception of improvement held the highest agreement level among participants. On the other hand, school accountability got the lowest agreement level. Correlation results showed that improvement, school and student accountability conceptions were positively correlated. A MANOVA analysis was applied to scrutinize any effects of gender and grade level/teaching differences on participants' conceptions. Analysis results indicated that both gender and grade level/teaching factors made significant difference on participants' conceptions of assessment. A follow up ANOVA analysis indicated significant gender difference on school accountability, with males had higher value than females. Also, there was a significant difference among grade level/teaching groups on school and student accountabilities. Teachers held the highest value for school accountability, and fourth graders held the highest mean value for student accountability.

Keywords: assessment, conception of assessment, in-service teacher, pre-service teacher.

ÖZ: Ölçme ve değerlendirmenin eğitim üzerindeki önemi tartışılmaz olsa da, ölçme ve değerlendirme yaparken ölçmecilerin niyetleri henüz ayrıntılı olarak incelenmemiştir. Bu amaçla, bu çalışma hizmet öncesi ve hizmet içi İngilizce öğretmenlerinin ölçme değerlendirme kavrayışlarını açıklamayı amaçlamıştır. Çalışmada ölçme ve değerlendirme kavramı dört ana başlık altında toplanmıştır; gelişim, okul sorumluluğu, öğrenci sorumluluğu ve önemsizlik. Çalışmaya toplam 97 öğretmen ve öğretmen adayı katılmıştır. Betimsel sonuçlar, gelişim kavrayışının katılımcılar arasında en yüksek anlaşma düzeyini sağladığını göstermiştir. Öte yandan, okulun sorumluluğu en düşük anlaşma düzeyine sahiptir. Korelasyon sonuçları gelişme, okul ve öğrenci hesap sorumluluğu kavramlarının pozitif korelasyon gösterdiğini göstermiştir. Cinsiyet ve sınıf düzeyi/öğretim farklılıklarının katılımcıların kavrayışları üzerindeki etkilerini incelemek için çoklu bir varyans analizi uygulanmıştır. Analiz sonuçları, hem cinsiyet hem de sınıf düzeyi/öğretim faktörlerinin katılımcıların değerlendirme kavrayışları üzerinde önemli bir fark yarattığını göstermiştir. Takip eden tek yönlü varyans analizi, erkeklerin kadınlardan daha yüksek değere sahip olduğu, okul sorumluluğu üzerinde önemli cinsiyet farklılığı olduğunu göstermiştir. Ayrıca, sınıf ve öğretim grupları arasında okul ve öğrenci sorumluluğu arasında anlamlı bir fark vardır. Öğretmenler okul sorumluluğu için en yüksek değere sahiptir ve dördüncü sınıf öğrencileri öğrenci sorumluluğu için en yüksek ortalama değere sahiptir.

Anahtar kelimeler: değerlendirme, değerlendirme algısı, öğretmen, öğretmen adayı.

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In the language learning and teaching process, the importance of assessment has gained more attraction since all the constituents in the process such as teachers, learners, administrators, and families wish to see concrete outcomes of the whole processes. Assessment, as one of the core elements of any educational activity, holds a significant place on both teaching and learning processes. It is not used not only to measure the outcomes of students' learnings but also to improve the quality of teaching to check, and finally reach desired outcomes.

As stated by Shing and Fai (2007), "assessment has a salient influence on student learning" (p. 185). In this regard, it is used both to improve the quality of learning and teaching (formative), and to check learning outcomes of learners at the end of any educational activities (summative). Assessment, in this regard, comprises all the procedures conducted by teachers or students to evaluate themselves (Black & William, 1998) and it "involves making assumptions about what exists, what it is like and how we might know about it" (Knight, 2002, p. 279). In this sense, many assessment techniques have been vastly used in language process and mainly in language classrooms. Various assessment techniques (such as summative, formative, alternative, formal and informal) have been applied in the process of language teaching and learning to assess the language outcomes and foster the teaching-learning process.

Conception of Assessment

In 2002, Brown came up with a new brand term named conception of assessment. In his context, conception of assessment was used as the mental representation of purposes of assessment. He conceptualized four different purposes of assessment from the literature and theory, and categorized them as improvement, school accountability, student accountability and irrelevance. Harris and Brown (2009) emphasized that conception of assessment is important since it forms how teachers utilize from assessment practices. Furthermore, Wang, Kao, and Lin (2010) stressed that the relation between assessment, program, education and learning should be disclosed and restructured in order to improve in-service teachers' conception about assessment.

Improvement conception entails that assessment should be used for the unique and ultimate purpose of improving students' learning and learning outcomes. Brown (2002) advocated that improvement conception demands that assessment should not only enlighten students about their improvements of individual learning, but also progress the effectiveness of teaching.

School accountability conception requires assessment to be used to evaluate performance outcomes of schools and to decide how good schools are doing on their sides. Brown (2002) explained two dimensions of school accountability; the first one is to indicate the quality of education in a school and the second one is the improvement of quality of instruction.

Student accountability brings about the necessity to check learners own learning by assessment procedures (Brown, 2004). In this regard, assessment is seen as a tool to check learners' learning outcomes through meaningful assessment techniques to make students accountable so that they can decide on their levels and make further decisions accordingly. Likewise, it is used to assign scores to learners' performances based upon predetermined criteria, and categorize them into different success groups (Brown, 2004).

Irrelevance conception entails that since assessment is considered as a formal and systematized procedure to assess learners' outcomes, it does not have a valid structure in teaching and learning process (Brown, 2004).

Studies on Conception of Assessment in Different Settings

Conception of assessment is a new research area that aims to disclose purposes of assessment. A number of studies in different countries have already been conducted to see conception of assessment in distinct settings (Azis, 2012, 2015; Brown, 2002, 2004; Brown & Hirschfeld, 2008; Brown & Michaelides, 2011; Peterson & Irving, 2008; Shing & Fai, 2007; Vardar, 2010; Yetkin, 2018).

In New Zealand context, Brown and Hirschfeld (2008) conducted a research on 3469 secondary school students to uncover their conceptions of assessment. They used a self-report inventory and results of standardized reading comprehension examinations. The study results pointed out that student accountability conception was mostly related to achievement by the participants. They proposed that students' conceptions over teaching and learning process was essential because there is evidence that these conceptions affect students' learnings and related activities (Brown & Hirschfeld, 2008).

In Chinese context, Shing and Fai (2007) applied a survey method to disclose 97 college lecturers' conceptions of assessment in Mainland China. The outcomes of the study indicated that lecturers showed agreement with the idea that assessment advances both the quality of teaching and students learning. It also revealed that assessment made schools accountable. Consequently, they found positive correlation between improvement and school accountability.

In Hong Kong context, almost 300 teacher participants from 14 different primary and secondary schools were studied to discover their conceptions of assessment by Brown, Kennedy, Fok, Chan, and Yu (2009). A Chinese translation of Teachers' Conceptions of Assessment inventory and a Practices of Assessment inventory were utilized as data collection instruments. The statistical analysis unfolded strong and positive correlation between improvement and student accountability conceptions. In this regard, if students think that assessment is for their personal improvement, they likely to believe that assessment is also for evaluating their learning outcomes properly.

Azis (2012) conducted a review process in order to disclose teachers' conceptions, purposes and practices of assessment in six different countries. He reviewed a number of international articles written on conception of assessment in different contexts. He mainly aimed to unearth teachers' conceptions over purposes of assessment. The study results indicated that assessment was mostly attached to improvement conception. He also revealed that assessment process and procedures should be supported by a number of different tools and strategies.

In Indonesian context, Azis (2015) conducted a mixed method study to reveal participants' conceptions of assessment. 107 junior high teachers participated to the study. Qualitative and quantitative analysis results demonstrated that assessment should be used for improvement of learning and teaching with a very high agreement level. School and student accountabilities returned very similar results. On the other hand,

participants mostly disagreed with the conception of irrelevance and they rejected to see assessment as useless, and purposeless.

Several studies on conception of assessment have been conducted in Turkish context so far. Uncovering students and teachers' conceptions of assessment is an important aspect since testing plays a key role in Turkish education system. One of the latest studies on teachers' conceptions of assessment was conducted by Yetkin (2018) on a university context in Turkey. 204 pre-service English teachers on a teacher education program were asked for their conceptions through Teachers Conceptions of Assessment inventory. The study results made it clear that pre-service teachers mostly believe assessment ought to be used to improve the quality of teaching and learning. On the other hand, seeing assessment as irrelevant and aimless were held the lowest value among all the conceptions. Likewise, improvement and irrelevance conceptions were negatively correlated with each other.

Even though conception of assessment has been studied in many different contexts, further studies are still needed for more in depth results. At first, very few studies have already been conducted in Turkish context. Secondly, almost all of the studies have researched teachers or students' conceptions of assessment for general education or other field areas such as mathematics, and there is a need to study language teachers'/ teacher candidates' conceptions of assessment to be able to further analyze their assessment purposes and behaviors from their conceptions.

The present study in this regard, aimed to describe language teachers'/ teacher candidates' conceptions of assessment in the local context and to examine the relation between teachers' and teacher candidates' conceptions. Originating from a quantitative approach, the present study was designed to formulate following research questions;

1. What is the participants' conception of assessment?
2. Is there any difference between males and females' conception of assessment?
3. Is there any difference between in- service English teachers' (teaching) and pre-service English teachers' (grade level) conception of assessment?
4. How are different levels of conception of assessment related to each other?

Methodology

The aim of the present study was to reveal pre- and in-service English teachers' conceptions of assessment. By understanding their conceptions, assessment based activities and processes could be altered, varied or renewed.

Research Design

The research was designed around cross-sectional study design and based upon survey study. It was conducted by concerning quantitative research procedures. The data were collected through a 6-point Likert-type scale and all the obtained data were analyzed and interpreted quantitatively.

Setting and Participants

This study was carried out at a state university and a couple of state schools in Turkish context. A total of 97 in-service and pre-service English language teachers; 31

teachers, 34 fourth grade students and 32 first grade students participated in the study. The pre-service teacher participants were from first and fourth grade students of ELT department of Hacettepe University and English teacher participants were working at schools in Ankara, Adıyaman and Istanbul. 23 of the participants were male and 72 of the participants were female with 2 missing. Their ages ranged from 18 to 45.

Table 1

Demographic Information of the Participants

Participants	Age min.	Age max.	*N*
Teachers	18	45	31
1st graders	18	45	32
4th graders	18	45	34
Missing Value	18	45	2
Total			97

Instrumentation

The data were collected by using an instrument called "Teachers' conceptions of assessment inventory--Abridged (TCoA-IIIA Version 3-Abridged)" developed by Brown (2006). The inventory including 27 items under four main variables (improvement, school accountability, student accountability, and irrelevance) was in 6-point Likert-scale format ranging from strongly disagree to strongly agree. The participants were expected to rate from 1 to 6 according to their agreement level with a specific statement. All the validity and reliability checks were already computed for the inventory. In the current study, Cronbach's alpha coefficients were computed as 0.83. Student demographics information such as age, gender and experience were collected through a questionnaire attached to inventory.

Data Collection Procedures

The data were collected in different phases through convenient sampling. After getting necessary permission from the possessor of the inventory, the consent of participants was asked through verbally and a "Consent Form" attachment attached to front page of each inventory. The data collection process was accomplished with voluntary participants. For the first and fourth graders, the inventory was delivered before each class time after getting necessary permission from each instructor beforehand. Before delivering the inventory, the students were provided with necessary information on the inventory, how they fill it out and timing. For the English teachers, the inventories were converted into online version in order to collect data from different education settings. For the teachers, the necessary information about the inventory was also provided before the main instrument in the online version. For the ethical conduct, necessary permissions were taken from the head of the department and school principals at first. Then, all the participants were informed about the process of data collection, purpose of the study and confidentiality. Their voluntary participations were quarantined by not only through consent forms, but also through verbal instructions

before each data collection session. When any of the participants wished not to take or complete the survey, they were released from the data collection session.

Data Analysis Procedures

The data were inserted into Statistical Package for the Social Sciences (hereafter SPSS 23) software program for further analysis. Firstly, the data were subjected into descriptive statistics to look for any missing or uncorrected values. Respectively, the data were subjected to test of normality in order to see distribution of the data. Normality test results indicated that the data were normally dispersed, so parametric tests were applied accordingly. After that, reliability of the scale was computed.

Later, the data were analyzed through descriptive and inferential statistics. Mean values for each item were computed and interpreted. Then, the data were examined by using Pearson product-moment correlation coefficient in order to see the magnitude of relations among each dependent variable and to reveal the direction of the relations.

These analysis steps were followed by a multivariate analysis of variance (MANOVA) test. All the assumptions of MANOVA were investigated for each independent variable. Then, MANOVA analysis was applied to explore participants' gender and experience differences. For the variables yielded significant difference after Bonferroni correction, a follow up ANOVA test was conducted to reveal where the difference was.

Results

Conception of Assessment (COA)

Participants' conceptions of assessment were analyzed through descriptive statistics. The higher mean value indicated the higher agreement level for each variable as presented in the Table 1.

Table 2

Participants' Overall Conceptions of Assessment

Conception of Assessment	*N*	*M*	*SD*
Improvement	97	3.94	.83
School Accountability	97	3.48	.97
Student Accountability	97	3.89	.82
Irrelevance	97	3.92	.56

As shown in the Table 2, four levels of conception of assessment were presented in the TCoA- IIIA Scale. Improvement conception (*M*=3.94, *SD*=.83) had the highest rank among all variables and was followed by irrelevance (*M*=3.92, *SD*=.56). Improvement and irrelevance conceptions had a moderate agreement level. School accountability conception also had moderately agreement level (*M*=3.89, *SD*=.97). Conception of student accountability (*M*=3.48, *SD*=.56) held the lowest mean value of all variables.

Effect of teaching/grade level difference on COA

A one way between groups multivariate analysis of variance was performed to scrutinize teaching/grade level differences in conceptions of assessment. Preliminary assumptions were tested for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted. It was seen that there was a statistically significant difference between sophomores, seniors and in-service teachers on the combined dependent variables, F (8, 182) = 3.12, p = .002; Wilks Lambda = .77; partial eta squared = .12.

Table 3

Wilks' Λ for Differences in Conceptions among 1st and 4th Grade Students, and Teachers

	Wilks' Λ	F (8, 182)	p	Partial eta^2
Teaching/Grade	.771	3.162	.002	.122

*p= .05

Table 4

MANOVA for Differences in Conceptions of Assessment Based on Teaching/Grade Difference

Purposes	M_1	M_4	M_T	F(2,94)	p	Partialeta^2
School A.	3.052	3.696	3.699	5.12	.00	.098
Student A.	3.448	4.196	4.027	8.14	.00	.152

A separate ANOVA was computed for each dependent variable, with each ANOVA assessed by applying Bonferroni adjusted level of .012. There was a significant difference between different teaching/grade groups on school accountability, F (2, 94) = 5.12, p= .00, partial eta squared = .098, with teachers (M = 3.699) slightly higher than 4th graders (M = 3.696) and higher than 1st graders (M = 3.052). There was also a statistically significant difference on student accountability, F (2, 94) = 8.14, p= .00, partial eta squared = .152, with 4th graders (M = 4.196) slightly higher than teachers (M = 4.027) and higher than 1st graders (M = 3.448). There was not a significant difference between different teaching/grade groups on improvement conception, F (2, 94) = 1.45, p= .23, partial eta squared = .030, and irrelevance conception, F (2, 94) = 2.91, p= .059, partial eta squared = .058.

Effect of Gender on COA

A one way between groups multivariate analysis of variance was performed to investigate gender differences in conceptions of assessment. Preliminary assumptions of MANOVA were checked with no serious violations noted. There was a statistically significant difference between males and females on the combined dependent variables, F (4, 90) = 2.89, p = .026; Wilks Lambda = .88; partial eta squared = .114.

Table 5

Wilks' Λ for differences in conceptions between genders

	Wilks' *Λ*	*F* (4, 90)	*p*	Partial eta^2
Gender	.886	2.894	.026	.114

*p= .05

Table 6

MANOVA for differences in conceptions of assessment based on gender

Purposes	M_m	M_f	F(1,93)	p	Partial eta^2
School A.	3.97	3.30	8.99	.00	.88

A separate ANOVA was conducted for each dependent variable, with each ANOVA evaluated by applying Bonferroni adjusted level of .012. There was a significant difference between males and females on school accountability, F (1, 93) = 8.99, p= .00, partial eta squared = .88, with males (M = 3.97) higher than females (M = 3.30). There was not a significant difference between difference between males and females on improvement conception, F (1, 93) = 4.85, p= .03, partial eta squared = .05, student accountability conception, F (1, 93) = 4.10, p= .04, partial eta squared = .04, and irrelevance conception, F (1, 93) = 1.52, p= .22, partial eta squared = .016.

Relationship between Conceptions

The relation among assessment conceptions was analyzed through bivariate correlation. Positive and significant correlations indicated that when participants' agreement level increases for one purpose of assessment, the other purpose is also likely to increase its agreement level.

Table 7

Relationship between levels of conception of assessment

Inventory Subscales	1	2	3	4
Improvement	-			
School Accountability	648**	-		
Student Accountability	.542**	.577**	-	
Irrelevance	.061	.060	-.111	-

** p < 0.01 level (2-tailed).

* p < 0.05 level (2-tailed).

The relationship among different levels of conceptions of assessment was investigated by using Pearson product-moment correlation coefficient. There were large, positive correlations between improvement and school accountability levels, r = .64, n = 97, p< .01 with a 40, 96% variance of the coefficient of determination, and between improvement and student accountability conceptions, r = .54, n = 97, p< .01

with a 29, 16% variance of the coefficient of determination. There was also a large, positive correlation between school accountability and student accountability, r = .57, n = 97, p< .01 with 32, 49% variance of the coefficient of determination. None of the variables were significantly correlated with irrelevance conception. Even though improvement and school accountability conceptions had very small degree of relationship with irrelevance conception, student accountability and irrelevance conceptions were negatively correlated with a small degree of relationship, r = -.11, n = 97, p< 0.5 with a 01.21% variance of the coefficient of determination.

Discussion and Conclusion

The present study was mainly designed to uncover not only in-service English teachers but also pre-service English teachers' conceptions of assessment, purposes to conduct assessment during the language learning and teaching process. The study also aimed to disclose their views on the purposes of assessment and their possible interactions based on their grade level/teaching experience and gender differences. Participants' conceptions of assessment were investigated through descriptive statistics regarding improvement, school and student accountability, and irrelevance conceptions. Statistical analysis indicated that improvement conception/purpose held the highest mean value (M=3.94) and participant moderately agreed that assessment should be use for the purpose of improving teaching and learning process and outcomes. As stated by Brown (2002), this conception entails denouncing not only students' private learnings but also advancing the worth of teaching. In this regard, many previous studies yielded similar results with the current study on improvement conception. For example, Yüce (2015) indicated participants as moderately agreed with conception of improvement. Similarly, Yetkin (2017) also found out that pre-service English teachers agreed favorably with the conception of improvement. Brown and Hirschfeld (2008) proposed that when students consider assessment is to account their own learning, then their results are likely to rise positively. In that sense, it is clear to withdraw that not only teachers but also pre-service teachers are willing to use assessment as a tool for improvement of language learning and teaching process.

Interestingly, conception of irrelevance took the next stage and participants also moderately agreed that assessment is irrelevant (M=3.92). This result opposed many research outcomes in the literature with some exceptions. Remesal (2009) indicated that conception of irrelevance was the most frequent conception among Spanish student teachers. Remesal (2009) suggested that "there is an urgent necessity of teaching future teachers how to assess in a way that promotes the improvement of teaching and learning" (p.11). Many other studies indicated low acceptance rates for conception of irrelevance, though. Brown (2004) said that participants refused seeing assessment as irrelevant. Similarly, Azis (2015) revealed that conception of assessment got the lowest response (M=1.94) and participants mostly disagreed to see assessment as useless.

School accountability (M=3.89) had very close acceptance rates to improvement and irrelevance conceptions. Student accountability (M=3.48), on the other hand, had the lowest response rate among all the purposes. The reason for high response rate for irrelevance and low response rate for student accountability could be because of the fact that participants consider assessment as not measuring their qualifications comprehensively.

Multivariate test of variance results showed that there was no statistically significant difference among males and females concerning their conceptions of assessment (Wilks' Lambda=.97, *p*=.31). Similar results were yielded by Zaimoğlu's (2013) study in which she found out statistically no difference between males and females as well (Pillai Trace=.20, *p*=.17). Descriptive analyses indicated slightly different values for males and females for their conceptions of assessment, but their agreement levels for each conception were the same according to descriptive results. It was seen that both males and females were inclined to see assessment as a tool for improvement of teaching and learning with a moderate agreement level. In this respect, Zaimoğlu (2013) concluded that "whatever teachers' gender is, they give importance to the function of assessment, which improves teaching and students' learning" (p.55). In the light of above results, it is clear that participants were inclined to assessment as a tool to improve and account their learning regardless of gender. This could be due to the fact that both males and females focused on the learning, not the way assessment was used to.

Participants' grade level/teaching differences and its relation to their conceptions of assessment were explored through multivariate test. Statistical results showed significant difference for first and fourth grade pre-service teachers and in-service teachers. Both fourth graders and in-service teachers indicated moderately agreement level with school and student accountabilities and first graders presented slightly agreement level for both purposes. The results indicated statistically significant difference for in-service teachers on school accountability conception, and statistically significant difference for fourth graders on student accountability conception. The former result- school accountability- could be arisen from the fact that good schools tend to yield good outcomes. Martin and Loeb (2002), on this regard, indicated that "focusing on higher standards and how well schools do on tests may also improve higher level skills" (p. 320). Moreover, since in-service teachers completed their school-based accountabilities, they may incline to focus on their schools rather than their own accountabilities. Another point could result from experience. Moinvaziiri (2015) found out meaningful correlation between teaching experience and school accountability (*r*=.16, *p*=.05). Moinvaziiri (2015) also proposed that teaching experience and school accountability is positively correlated. The latter result -student accountability-, on the other hand, unearthed the fact that pre-service teachers have not yet teachers (Brown & Remesal, 2012). As indicated by Brown and Remesal (2012), the same validity factor is understood as improvement by in-service teachers, but it is understood as means of accountability by pre-service teachers. In this regard, fourth grade pre-service teachers are inclined to focus on their accountability, since they are still students and they are still bound to many assessment processes.

The relationship among different purposes of assessment was explored through correlational analysis. The correlational analysis indicated robust and affirmative correlation between improvement, school and student accountabilities; whereas, none of the purposes were significantly correlated with irrelevance conception. Moreover, student accountability and irrelevance conceptions were negatively correlated. These results could indicate that either pre-service or in-service teachers would prefer to benefit from assessment in their teaching or learning processes. Brown (2004) signified that participants complied with improvement and school accountability conceptions;

however, they refused to see assessment as irrelevant. The author also asserted that when teachers believe that assessment is for improvement, then they are unlikely to see assessment as irrelevant (r=-.69), but they will probably relate assessment to school accountability (r=.58). Eric, Hanushek, and Raymond (2005) found out that presenting accountability system into school leads to improvement and schools with accountability systems tend to be yielding better growth than schools without accountability. Similarly, Martin and Loeb (2002) found out positive and significant relation between accountability and participants' achievement. In this regard, negative correlation between student accountability could be explained with formative assessment 'assessment for learning' that means students prefer to conceive assessment as a tool of improvement instead of seeing as an invalid process.

Limitations to the Study

Firstly, current research was conducted through quantitative research design and procedures. A mixture of qualitative and quantitative research design can unearth more in-depth results. Secondly, splitting teachers as novice teachers (e.g. less than three years of experience) and experienced teachers (e.g. more than three years of experience) can detect the effect of experience over conceptions in more detail. Lastly, instead of just including one group of pre-service English teachers as the study sample, participants from different universities as well as from different faculties of education and graduates can help to better understand different reasons and intentions toward assessment procedures and practices.

Statement of Responsibility

Ramazan Yetkin; conceptualization, methodology, validation, formal analysis, writing–original draft, writing-reviewing & editing, visualization, supervision, and project administration. Zekiye Özer; conceptualization, methodology, validation, investigation, resources, data curation, writing–original draft, writing- reviewing & editing.

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The Investigation of the Effectiveness of Applying Group Investigation Method at Different Intervals in Teaching Science Courses*

Fen Bilimleri Dersinin Öğretiminde Grup Araştırması Yönteminin Farklı Zamanlarda Uygulanmasının Etkililiğinin İncelenmesi

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ABSTRACT: The aim of the study was investigation the effect of twice application the Group Investigation method at different intervals on improvement of the students' academic achievement and science process skills in teaching the science lesson. Method of the study was a quasi-experimental design. The study used Solomon Four-group Experimental Design in the first year, and an experimental design in the second year which was created by adding a new experimental group to involve three experimental and two control groups. It was applied the Group Investigation method in the experimental groups and current methods on the curriculum of the secondary school science curriculum of Ministry of National Education in the control groups. Data collection process were used qualitative interview, preliminary information, science process skills and academic achievement tests. Applying the Group Investigation method for two years proved positive contributions to students' academic achievement and science process skills in science lessons. The researchers believe that experimental model developed this stduy will be used in different research areas in long-term studies in the future, and these studies will also make a great contribution to the literature.

Keywords: group investigation method, science education, science process skills, Solomon experimental design.

ÖZ: Çalışmanın amacı, Fen bilimleri dersinin öğretimde Grup Araştırması yönteminin farklı zamanlarda uygulanmasının öğrencilerin akademik başarılarını ve becerilerini geliştirmede etkisini incelemektir. Araştırmanın yöntemi, ön test- son test kontrol gruplu yarı deneysel desendir. Araştırmada ilk yıl Solomon Dört Gruplu Deneysel Deseni, ikinci yıl ilave bir deney grubu eklenerek üç deney ve iki kontrol gruplu yeni bir deneysel desen kullanılmıştır. Deney grubunda Grup Araştırması yöntemi, kontrol grubunda Milli Eğitim Bakanlığı fen bilimleri dersi öğretim programına ait mevcut yöntem uygulanmıştır. Veri toplama süreçleri ve araçları olarak yarı yapılandırılmış görüşmeler yapılmış; ön bilgi, bilimsel süreç becerileri ve akademik başarı testleri kullanılmıştır. Çalışmada Grup Araştırması yöntemini iki yıl boyunca uygulamanın fen derslerinde öğrencilerin akademik başarı ve bilimsel süreç becerisine olumlu katkılar sağladığı ortaya çıkmıştır. Araştırma geliştirilen deneysel desenin gelecekte yapılacak uzun vadeli araştırmalarda farklı araştırma alanlarında kullanılabileceği ve bu çalışmaların da alanyazına büyük katkılar sağlayacağı düşünülmektedir.

Anahtar kelimeler: bilimsel süreç becerileri, fen eğitimi, grup araştırması yöntemi, Solomon deneysel deseni.

* This study is derived from the doctoral dissertation titled “Investigation of effectiveness of application of Solomon research design to cooperative learning model in teaching science lesson” written by Fulya ZORLU.

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In today's educational approach, researchers often prefer constructivist teaching theories considering that learning is a socially oriented process and that knowledge is formed in people's mind (Schunk, 2011). Use science concepts and the relationships between them in a meaningful way, to share ideas critically through social interaction, to question and to construct a common meaning by using constructivist teaching theories is aimed in science teaching (Köseoğlu & Tümay, 2015; Mehalik, Doppelt, & Schuun, 2008). In addition, this process is aimed students to gain science process skills. Because, science process skills, which enable individuals to use knowledge are critical for improving the skills needed in the qualified humanprofile (Güler & Şahin, 2015). According to Çepni, Ayas, Johnson, and Turgut (1996), science process skills; are the basic skills that help students to learn topics, gain research methods and enable students to take responsibility, be active, and learn permanently. In some studies in our country, the secondary school students' science process skills have shown low (Aydoğdu & Ergin, 2009; Sezek, Zorlu, & Zorlu, 2015; Sinan & Uşak, 2011; Zorlu, Zorlu, Sezek, & Akkuş, 2013). This is possible with students active participation in the teaching process. Cooperative learning that support the active participation of the students to learn is helpful to reach a common goal through mutual interaction of the students (Avcı, 2002).

For the first time, the cooperative learning process, which was put forward in order to increase social communication and academic success in the classes with high ethnic diversity, has been regarded as one of the major and most successful innovations in the history of education and has become a standard part of the educational process in today's education (Slavin, 1999). The Cooperative learning model help students to involve in a learning environment in order to reach mutual benefits and changing the nature of the class from the product/content-oriented process into a process-oriented teaching (Johnson, Johnson, & Holubec, 1994; Sharan, 2015). studies on cooperative learning model are not only on academic success (Bilgin & Karaduman, 2005; Ergin, 2007; Rabgay, 2018; Şimşek, Doymuş, & Bayrakçeken, 2006) but also on attitudes, social interactions (Ebrahim, 2012), science process skills (Bozdoğan, Taşdemir, & Demirbaş, 2006; Chatila & Al Husseiny, 2017), macro-micro level comprehension skills (Şimşek, 2007), laboratory work skills (Bıyıklı, 2015), contribution to scientific writing (Bahadır, 2011) and contribution to academic writing (Jalilifar, 2010; Okur-Akçay, & Doymuş, 2012).

One of the methods used in the Cooperative learning model is the Group Investigation (GI) method. The GI method places students into small groups to research pre-determined issues. These small student groups prepare a study plan a research on the subjects assigned to them, implement the plan and collect data, use the collected information to solve a multidimensional problem and synthesize the information, and present the results to their classmates (Bayrakçeken, Doymuş, & Doğan, 2013). The group members' take advantage of the diversity of the other group members while planning how to research the subject together. Students gain critical experiences for their social, psychological, and mental improvement throughout the process (Sharan & Sharan, 1992). The teacher has a facilitator, guide, and collaborator role in the student's questioning process (Hertz-Lazarowitz & Calderon, 1994). Therefore, important results are achieved in terms of improving positive mutual dependence and internal motivation for the teachers and the students (Damini, 2014). According to Mitchell, Montgomery, Holder, and Stuart (2008), through the GI method not only the lower or moderately

successful students improve, but also higher achieving students increase their performance.

When the related literature on GI method were investigated, the applications generally provided a positive contribution to the students' academic achievement (Aksoy & Gürbüz, 2013; Mitchell, Montgomery, Holder & Stuart, 2008; Sangadji, 2016; Sancı & Kılıç, 2011; Şimşek, Doymuş & Karaçöp, 2008; Şimşek, Doymuş, Doğan, & Karaçöp, 2009; Tan, Sharan, & Lee, 2007; Zorlu, 2016). Additionally, there are studies that show positive effects on the student's learning process and learning outcomes (Astra, Wahyuni, & Nasbey, 2015: Hosseini, 2014), motivation and perceptions (Tan, Sharan, Lee, & Christine, 2007), attitudes toward the environment (Lazarowitz, Hertz-Lazarowitz, Khalil, & Ron, 2013), the teachers' attitudes toward the diversity of the individuals (Damini, 2014), understand the particulate structure of matter (Doymuş, Şimşek, & Karaçöp, 2009), and motivation (Tan, Sharan, & Lee, 2007) by applying GI method only once. There is no such study that was conducted to determine the effect of the GI method that applied twice. However, considering the level of education of primary and secondary school students, by applying the GI method once may not be possible to see the full effects of the model. This situation may be related to the factors such as the lack of sufficient time, lack of being able to deal with students one-on-one, and lack of the students' ability to fully adapt to the GI method. In addition, it is thought that the effectiveness of GI method cannot be fully revealed due to the students' inability to get used to the method and the applications are performed in certain time periods. Because, when a subject is tried to be taught to the students by a learning method that they are not familiar with, they may need to learn the subject and the learning method at the same time. This is considered a major obstacle in measuring the actual impact of the learning method. For this, the methods used in the learning-teaching process should be provided to the students to become fully familiar with the method. After the students to become fully familiar with the method, the students' improvement can be measured with an application of the learning method.

According to Iswardati (2016), GI method is one of the effective methods that a teacher can apply when its effects and characteristics are considered. The GI method is based on interpersonal dialogue and focuses on the effective and social aspects of learning. In GI method, students get prepared for the given subject and they are prepared to synthesis new knowledge (Bayrakçeken, Doymuş, & Doğan, 2013). The subjects can be learned by enabling students to reach to the synthesis stage. In this study, carried out in this context; GI method was preferred in order to encouraging students of different characteristics to cooperative in and outside the classroom to create a common product, to ensure the active participation of each student in the learning process, so that social, group and personal benefits can be created. In addition, this study will guide the future studies in terms of investigating how a learning method can be applied to the same group at different times and how to investigate the effects of improvement.

In recent years, when we look at the studies on the science course, the students had difficulties in learning in micro level subjects such as particle structure, heat, heat conduction, temperature, structure of matter (Bischoff, 2006; Çepni, Aydın, & Ayvacı, 2000; Er Nas, 2013; Jacobi, Martin, Mitchell, & Newell, 2004). It was observed that students had misconceptions about the "States of Matter and Heat" and "Structure and

Properties Particle of Matter" subjects in the science courses including these concepts and difficulties in learning these issues (Ayas & Özmen, 2002; Bischoff, 2006; Çepni, Aydın, & Ayvacı, 2000; Jacobi, Martin, Mitchell, & Newell, 2004; Lubben, Netshisaulu, & Campbell, 1999; Stephan, 1994). When the studies in related literature were investigated there are many studies revealing the effects on the cooperative learning model (Damini, 2014; Mitchell, Montgomery, Holder, & Stuart, 2008; Şimşek, 2007; Tan, Sharan, Lee, & Christine, 2007). In the GI method, there is a goal of gaining high-level cognitive skills and there are difficulties in achieving this goal (Bayrakçeken, Doymuş, & Doğan, 2013; Schunk, 2011).

Attention should be paid to the frequency and time dimension of the application of learning methods (Johnson & Christensen, 2004). Especially in studies where the effects of a learning method are investigated, there may be situations where participants take time to get used to the method and may have indirect or indirect effects on the results to be achieved. The effects of these conditions can be minimized by performing the same applications at different times with the same students. Because after the first application, students have an idea of the method and application process and know what needs to be done to achieve the goal. The changes that arise as a result of the second application serve the purpose of revealing the effects of the applied method. The researchers and teachers has become knowledgeable of the level and qualifications of the students according to the method of learning applied and can carry out the guidance in this direction. Therefore, the second application enabled more qualified findings to be obtained in revealing the effects of the learning method In this study, it has been aimed to investigate the effects of twice application the GA method at different intervals on improvement of the students' academic achievement and science process skills in teaching the "States of Matter and Heat" and "Structure and Properties Particle of Matter" subjects. The problem of research:

Are there any effects of applying the GI method at the different intervals on improvement of the students' academic achievement and science process skills in teaching the Science course?

1. Are there any effects of the GI method first application on the students' academic achievement and science process skills in teaching the "Structure and Properties Particle of Matter" unit?

2. Are there any effects of the GI method second application on improvement of the students' academic achievement and science process skills in teaching the "States of Matter and Heat" unit?

Method

In this study, a quasi-experimental pre-test- post-test control group design was used. In the study, a revised form of the Solomon Four-Group Experimental Design was used since it is the strongest model among the experimental designs that secure internal and external validity at the same time (Karasar, 2016).

A control process is implemented in studies to minimize the effects on the dependent variable other than the independent variable effect (Gay, Mills, & Airasian, 2012). Control groups are included in experimental designs to make this process successful (Kala, 2014). Control groups are groups that do not affect the results of the

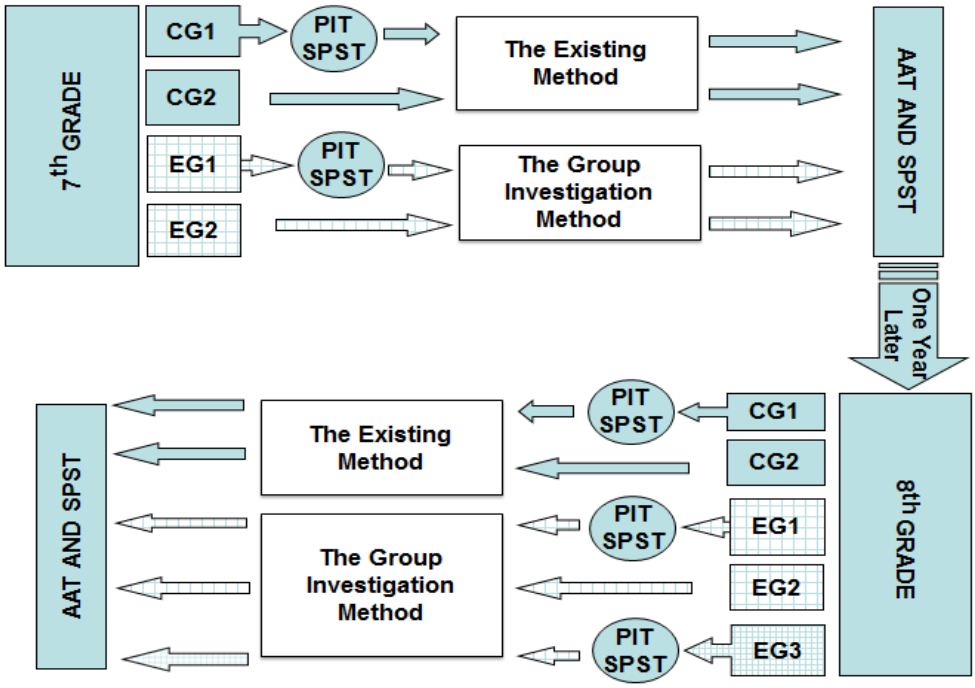
pretested independent variable because they do not participate in the practice being performed. According to Creswell (2003, 2012), an assessment without a control group may cause the observed effects to look stronger or weaker than they really are. Therefore, studies conducted with control groups enable researchers to evaluate their implementation, detect the factors that affect the results and make comparisons. In experimental studies that are designed based on these points, typically two groups are included an experimental and a control group. However, these two-group comparisons may lead to biased assessments (Ertosun, Erdil, Deniz, & Alpkan, 2015). For this reason, researchers created Solomon Four-group Experimental Design, which tests four groups (Solomon, 1949). Solomon Four-group Experimental Design involves four groups formed by random (unbiased) assignment. Two of them are experimental groups, and two are control groups (Karasar, 2016). In scientific studies, the groups' knowledge about the practice in question is assessed by pretest before the implementation. Thus, researchers attempt to determine the current condition of the groups before the implementation. On the other hand, Sawilowsky, Kelley, Blair, and Markman (1994) believes that the pre-test processes are potentially weak, since the presence of a pre-test may have a considerable effect on the study result by stimulating the participants regarding the element to be assessed in the dependent variable (Holdnak, Clemons, & Bushardt, 1990; Solomon, 1949). In Solomon Four-group Experimental Design, only one experimental group and one control group are given a pretest, so researchers can observe the effect of the lack of a pre-test on the experimental and control groups' posttest scores and attempt to determine the effect of the implementation on both groups (Karasar, 2016; Neuman, 2014; Solomon, 1949).

Solomon Four-group Experimental Design makes it possible to make deeper comparisons and a wider range of interpretations by removing the effect between the implementation and the test since control groups are not subjected to the implementation, and one experimental and one control group do not take the pre-test (Babbie, 2013; Solomon & Lessac, 1968). Ayres, Hopf, and Will (2000) stressed the importance of considering other factors that may influence the participants in Solomon Four-group Experimental Design studies and focused on the possibility that repeated tests may have certain effects. This design also eliminates all of the internal validity issues mentioned by Campbell and Stanley (1980) (testing, regression, selection and interaction) (Weinrich, Seger, Curtsinger, Pumphrey, NeSmith, & Weinrich, 2007). Thus, the researcher believes that Solomon Four-group Experimental Design allows for deeper comparisons and assures studies' internal and external validity. A review of the studies conducted with Solomon Four-group Experimental Design showed that it requires at least three or four groups and is rarely used due to the fact that it takes a lot of time to create tests to analyze the inter-group correlations precisely (Braver & Braver, 1988; Harwell, 2011; Solomon & Lessac, 1968). Solomon Four-group Experimental Design eliminates these problems, allows for deeper comparisons and assures studies' internal and external validity. The relevant literature also shows that the methods in the cooperative learning model as well as the implementations that use Solomon Four-group Experimental Design are administered to the same sample only once (Andrews, Tressler, & Mintzes, 2008; Dirlikli, Aydın, & Akgün, 2016; Şimşek, Doymuş, & Şimşek, 2008).

Application of the Research Experimental Design

In this study, the research design was applied at different times for two years based on Group Investigation (GI) method. In GI method which is based on a person-to-person dialogue, students who divide into groups of five to six heterogeneous persons work in a manner that is responsible for the learning of each other in the determined academic subject. The resulting product is presented to the class as a whole and evaluated (Johnson, Johnson, & Holubec, 1994; Sharan & Sharan, 1992). The experimental design of the research is given in Figure 1.

Figure 1. Experimental Design of Research



In the first year, Solomon Four-group Experimental Design and the GI method are administered to the seventh grade students in the unit, Structure and Properties Particle of Matter. The implementation was conducted in two secondary schools under MEB with volunteer teachers because in the first year of the implementation four classes would participate while in the second year five classes would be needed. The four classes were determined by means of simple random sampling, two were identified as the experimental group (EG1 and EG2) and the remaining two were identified as control groups (CG1 and CG2). The pretest was administered to one experimental group (EG1) and one control group (CG1).

In the GI method, heterogeneous groups were divided into the Preliminary Information Test (PIT) in the EG1 while they were divided into according to their success in Science class in the EG2. The heterogeneous groups in the classes were divided into two parts identified as PART 1 and PART 2. The group members were seated close to each other to establish and facilitate face to face communication. The groups chose their leader and determined the name of their group. Each student in the groups was identified by a code (e.g. the students in group A could be A1, A2, A3, and A4). The students were informed that they were responsible for each other's learning. Each group made plans according to the objectives of the "The Structure and Properties

of Matter" unit and shared in the tasks. They conducted their research on the unit inside and outside of the classroom. The numbers of groups which would make presentations was determined based on allocation of time. During a class period, one group presented while the other group watched and tried to correct any observed errors. Additionally, questions were collected from the other students in the class and asked to the presenting group. Throughout the process, the students were diligently observed by the researcher and feedback was provided. After the presentations, a classroom assessment was conducted. Seventh Grade-Academic Achievement Tests (SG-AAT) and Seventh Grade-Scientific Process Skills Tests (SG-SPST) were administered.

In the control groups, the courses were processed according to the current learning method. In the current learning method, the application is based on the curriculum of the secondary school science curriculum of MEB and is usually explained by the teacher of the course. After the instruction, the researcher made an effort to eliminate the students' deficiencies by doing evaluation exercises in the textbook together with the students. After the implementation, the post-test was administered to all four groups, which concluded the study's first year (Table 1).

Table 1

The First Year Application Process

Application	Hours of Lessons
Pre-test (Groups: EG1, KG1; Tests: PIT, SPST)	
Elements and Their Symbols	4
Atomic Structure	4
Compounds and Their Symbols	4
Electron Distribution and Chemical Characteristics	4
Chemical Bond	4
Mixtures	4
Post-test (Groups: EG1, EG2, KG1, KG2; Tests: AAT, SPST)	

In the second year, Solomon Four-group Experimental Design was revised with the purpose of precisely determining the effectiveness of the GI method practices. The researcher added another group (EG3) to the eighth graders to see the difference between the students that studied with the GI method twice and those that studied with it only for once. Finally, the researcher obtained a research design that involved two control groups and three experimental groups. In the second year, the implementation was held in the unit, States of Matter and Heat. The GI method was implemented to the experimental groups, while the control groups were taught using the current teaching method. In the second step, the GI method which had been administered in the experimental groups in the first year and the traditional learning method used in the control groups were repeated. The heterogeneous groups in EG3 were formed according to the Preliminary Information Test (PIT) scores (Table 2).

Table 2

The Second Year Application Process

Application	Hours of Lessons
Pre-test (Groups: EG1, EG3, CG1; Tests: PIT, SPST)	
Heat and Temperature	4
Heat Exchange and Change of Temperature	4
Heat Exchange and Change of State	4
Post-test (Groups: EG1, EG2, EG3, CG1, CG2; Tests: AAT, SPST)	

Participants

Students attending 7th and 8th grades in two public secondary schools composed the sample of the study. First year (First application), it was four classes in the 7th grades. The four classes were randomly selected as experimental and control groups. In total, 111 seventh graders participated in the first application. It was consist of 56 students (22 Female and 34 Male) the experimental groups and 55 students (23 Female and 33 Male). Second year (Second application), it was five classes in the 8th grades that the four classes from first year (first application). Of them, 84 were students from the first year, and 25 were from the experimental group added afterwards. In the second year of the implementation, 10 students from the experimental groups of the first year as well as 17 students from the control groups of the first year did not participate in the second year implementation since they changed either their schools or classes. In the second year, 109 students participated in the research. It was consisted of 71 students (31 Female and 40 Male) the experimental groups and 38 students (15 Female and 23 Male). Two science teachers (1 female, 1 male) participated in the study.

Data Collection Process

A detailed presentation was made before the data was collected. The data collection tools were introduced. The research is a scientific study and it is explained that any information of their own will not be used for other purposes was stated to the students. Attention was paid to collect data within the framework of ethical rules.

Quantitative data collection process and tools

Preliminary information tests (SG-PIT and EG-PIT). It was taken from the TUBITAK (Scientific and Technological Research Council of Turkey) project (Number of project: 110K252). The researcher also created tests to be informed about the preliminary knowledge levels of the seventh and eighth grade students in the science and technology course (SG-PIT and EG-PIT). The reliability levels of the tests (KR 20) were .63 for SG-PIT and .65 EG-PIT (Doymuş, 2012). Before the study, the researcher conducted a pilot study with a group that was not included in the implementation or the control groups to see whether the scales and tests used in the study suited the participants' levels. This study, the reliability levels of the tests (KR 20) were .67 for SG-PIT and .61 for EG-PIT.

Science process skills tests (SG-SPST and EG-SPST). The science process skills test used for the seventh grade students (SG-SPST) was the Science Process Evaluation Test. The original form of this test was created by Smith and Welliver (1990), and it was translated and adapted to Turkish by Başdağ (2006). This test evaluates 13 science process skills: observation, classification, making inferences, estimation, assessment, data registration, building correlations between numbers and space, functional description, establishing hypotheses, making experiments, determining variables, interpreting data and creating models. The test has 40 questions. Başdağ (2006) found its reliability to be .81. Before the study, the researcher conducted a pilot study with a group that was not included in the implementation or the control groups to see whether the scales and tests used in the study suited the participants' levels. This study was found its reliability to be .78.

The science process skills test used for the eighth grade students (SG-SPST) was created by Okey, Wise, and Burns (1982) and adapted for Turkish use by Geban, Aşkar, and Özkan (1992). The alpha reliability coefficient of the test was .85. The subsections of the test were the ability to recognize the variables in problems (12 questions), establishing and describing hypotheses (8 questions), the ability to make operational explanations (6 questions), designing the steps required for solving problems (3 questions), and drawing and interpreting charts (7 questions). Prior to the study, the researcher conducted a pilot study with a group that was not included in the implementation or the control groups to see whether the scales and tests used in the study suited the participants' levels. This study was found its reliability to be .86.

Academic achievement tests (SG-AAT and EG-AAT). It was taken from the TUBITAK (Scientific and Technological Research Council of Turkey) project (Number of project: 110K252). These tests consisted of 30 multiple-choice questions about the unit, The Structure and Properties Particle of Matter, on the seventh grade academic achievement test (SG-AAT), and 25 multiple-choice questions about the unit, States of Matter and Heat, on the eighth grade academic achievement test. According to KR-20, the reliability coefficient of the tests were .75 (seventh grade) and .69 (eighth grade) (Doymuş, 2012). Prior to the study, the researcher conducted a pilot study with a group that was not included in the implementation or the control groups to see whether the scales and tests used in the study suited the participants' levels. This study, the reliability levels of the tests (KR 20) were .77 for SG-AAT and .65 fot EG-AAT.

Qualitative data collection process and tools

A qualitative interview was used to collect data when using the guidance-interview approach. Interviews were conducted at the end of the application in order to reveal feelings, motivations, beliefs, and reflections regarding the application (Kutluca, 2014). The interview protocol consisted of three open-ended questions—developed by the researcher—on the students' characteristics it improved, the difficulties in the application, and the suggestions made. The interview sessions were held face-to-face with the two participating teachers for 30–35-minute periods. All interviews were recorded with the permission of the teachers and were transcribed afterwards.

Data Analysis

Analysis of quantitative data

The Shapiro-Wilk test was conducted to determine whether the GI method tests were parametric, and the test results were given in Table 3.

Table 3

Shapiro-Wilk Analysis Results of the Data Obtained for the Eighth Grades of the Group Investigation (GI) Method

Tests	Shapiro-Wilk			Tests	Shapiro-Wilk		
	Statistic	*Sd*	*p*		Statistic	*Sd*	*p*
SG-PIT	.973	55	.262	EG-PIT	.956	78	.008
$SG\text{-}SPST_{Pretest}$	.976	55	.002	$EG\text{-}SPST_{Pretest}$	.958	78	.011
SG-AAT	.978	111	.046	EG-AAT	.960	109	.008
$SG\text{-}SPST_{Posttest}$	.976	111	.041	$EG\text{-}SPST_{Posttest}$	.967	109	.009

Table 3 concluded that the Preliminary Information Test for the Seventh Grade was parametric, while the other tests were non-parametric. The researcher did the relevant analyses based on these results. The quantitative data of the study were analyzed using SPSS software. The SG-PIT was used the independent t-test for analysis. The other tests were used Mann-Whitney U and Kruskal-Wallis tests for analysis.

Analysis of qualitative data

A content analysis was used to analyze the teachers' perspectives. Sub-themes were formed according to the teachers' answers to the three questions posed; namely, positive aspects, negative aspects, and suggestions regarding main theme. Teachers' perspectives were presented in tables according to these sub-themes.

Practices for Validity and Reliability of the Research

In the first year implementation, the researcher used Solomon Experimental Design to ensure the internal and external validity of the study. In the second year implementation, the researcher revised the Solomon Experimental Design and added another experimental group, which was administered an implementation that served the objective of the study. The researcher also attempted to finalize the new experimental design by consulting two faculty members who specialize in this field of study. Prior to the study, the researcher conducted a pilot study with a group that was not included in the implementation or the control groups to see whether the scales and tests used in the study suited the participants' levels. Student groups that were heterogeneous in terms of academic achievement were chosen for the research. The standard deviation and range values of the data collected in the pretest confirm this (Table 4 and 6). Before the implementation, the researcher informed the students and teachers participating in the research about the implementation, which involved the collaboration of the researchers and the sciences' teacher. The course teacher was asked to behave objectively and

interfere in the process when necessary. The researchers also paid attention to the physical suitability of the classroom. It was ensured that the students responded to the tests and scales individually and that all groups had the same amount of time to do them.

Results

In order to administered to see the students' preliminary knowledge levels in the science course, the SG-PIT independent-t test and the SG-SPST$_{Pretest}$ were analyzed with Mann-Whitney U test and given in Table 4.

Table 4

Descriptive and Estimated Statistical Results of SG-PIT and SG-SPST (Pre-test) of Seventh Grades Applied for the First Time by GI method

Tests	Groups	*n*	$\bar{X}$	*Sd*	*t*	*p*
SG-PIT	EG1	29	46.48	11.68	1.097	.277
	CG1	26	43.08	11.27		
SG-SPST$_{Pretest}$	EG1	29	26.31	7.087	341.000	.543
	CG1	26	25.96	5.188		

Table 4 shows that there was no significant difference between the groups pre-test scores for the seventh and eighth grades (SG-PIT: t=1.097; p=.277. SG-SPST$_{Pretest}$: U=341.000; p=.543). The students in experimental and control groups were equal to each other in terms of their preliminary knowledge and science process skills in the sciences course.

When the first year implementation was completed, applied to students SG-AAT and SG-SPST$_{Posttest}$ were analyzed with Kruskal-Wallis test and given in Table 5.

Table 5

Descriptive and Estimated Statistical Results of SG-AAT and SG-SPST (Post-test) of the Sixth Grades for the First Time of GI Method

Tests	Groups	*n*	$\bar{X}$	*Sd*	X^2	*p*	η^2	Difference*
SG-AAT	EG1	29	66.92	17.61	14.48	.002	.13	EG1-CG1, CG2
	EG2	27	63.04	17.62				EG2-CG1, CG2
	CG1	26	50.62	18.69				
	CG2	29	51.03	18.75				
SG-SPST$_{Posttest}$	EG1	29	29.31	3.96	14.909	.002	.14	EG1-CG1,CG2
	EG2	27	29.00	5.64				EG2-CG1,CG2
	CG1	26	25.96	5.19				
	CG2	29	24.55	5.91				

*Statistically significant groups are indicated.

Table 5 shows that the mean scores of the students in EG1 and EG2 on the Seventh Grade Academic Achievement Test were higher than the mean scores of the students in CG1 and CG2. The researchers used the Kruskal-Wallis test to see whether that difference was statistically significant. The results of the analyses indicated that there was a statistically significant difference between the arithmetic means of students' academic achievement test scores [$X^2_{(3)}$=14.48; p=.002]. The first year model's effect size (eta-squared-η^2) showed that it explained 13% of the difference between the academic achievement levels of the experimental and control groups. The researchers used the Mann-Whitney U test to examine this difference. There was no significant difference between EG1 and CG1, EG2 and CG2, and CG1 and CG2. The study concluded that the GI method made positive contributions to students' achievement.

The Table 5 shows that the post-test scores of the students in EG1 and EG2 were higher than the mean scores of the students in CG1 and CG2. The researchers used the Kruskal-Wallis test to see whether that difference was statistically significant. The results of the analyses indicated that there was a statistically significant difference between the arithmetic means of the students' post-test scores [$X^2_{(3)}$=14.909; p=.002]. The first year model's effect size (eta-squared-η^2) showed that it explained 14% of the difference between the science process skills levels of the experimental and control groups. The researchers used the Mann-Whitney U test in double groups to see the groups that had differences between them. There were significant differences between EG1 and CG1, EG2 and CG2, and CG1 and CG2 (p<.05). The study concluded that the GI method made positive contributions to the students' science process skills. The study also used the Kruskal-Wallis test for each skill to see the science process skills that correlated with the groups. The results indicated that there were significant differences between groups regarding “Observation”, “Estimation”, “Assessment”, “Building Correlations Between Numbers and Space”, “Establishing Hypotheses and Doing Experiments” [Observation: $X^2_{(3)}$=18.037; p=.000. Estimation: $X^2_{(3)}$=8.354; p=.039. Assessment: $X^2_{(3)}$=9.170; p=.027. Building Correlations Between Numbers and Space: $X^2_{(3)}$=16.503; p=.001. Establishing Hypotheses: $X^2_{(3)}$=6.731; p=.001. Doing Experiments: $X^2_{(3)}$=10.172; p=.017]. The researchers used the Mann-Whitney U test in double groups to see the groups that differed significantly in science skill. The results showed that there were significant differences between EG1 and/or EG2, and CG1 and/or CG2 in the skills of observation, estimation, assessment, building correlations between numbers and space, establishing hypotheses and doing experiments (p<.05). In these skills, the GI method made positive contributions to the students' skills.

In the second year of the study, in order to determine the students' preliminary knowledge and the level of science process skills in sciences course, applied EG-PIT and EG-$SPST_{Pretest}$ were analyzed with Kruskal-Wallis test and given in Table 6.

Table 6

Descriptive and Estimated Statistical Results of EG-PIT and EG-SPST (Pre-test) of Eighth Grades for the Second Time of GI Method

Tests	Groups	*n*	$\bar{X}$	*Sd*	X^2	*p*
EG-PIT	DG1	31	52.74	15.05	2.432	.296
	DG3	27	49.26	19.05		
	KG1	21	56.43	14.76		
$EG\text{-}SPST_{Pretest}$	DG1	30	13.43	5.022	2.982	.225
	DG3	27	12.22	3.866		
	KG1	21	14.43	4.342		

It was observed that the students in the experimental group and the control group had similar levels of preliminary knowledge in sciences and science process skills in Table 6 [EG-PIT: $X^2_{(2)}$=1.656; *p*=.296. $EG\text{-}SPST_{Pretest}$: $X^2_{(2)}$=2.982; *p*=.225).

When the second year practices were completed, applied to students EG-AAT and $EG\text{-}SPST_{Posttest}$ were analyzed with Kruskal-Wallis test and given in Table 7.

Table 7

Descriptive and Estimated Statistical Results of EG-AAT and EG-SPST (Post-test) of Eighth Grades for the Second Time of GI Method

Tests	Groups	*n*	$\bar{X}$	*Sd*	X^2	*p*	η^2	Difference*
EG-AAT	EG1	26	59.04	14.97	14.980	.005	.154	EG1-CG1, CG2
	EG2	20	61.00	15.27				EG2-CG1, CG2
	EG3	25	54.80	12.46				EG3-CG1
	CG1	20	45.00	14.42				
	CG2	18	48.00	15.06				
$EG\text{-}SPST_{Posttest}$	EG1	26	17.15	4.09	11.161	.025	.107	EG1-CG2
	EG2	20	16.95	3.73				EG2-CG2
	EG3	25	15.16	3.59				
	CG1	20	14.75	4.25				
	CG2	18	13.72	3.20				

* Statistically significant groups are indicated.

The Table 7 shows that the students in EG1, EG2, and EG3 had higher mean scores on the academic achievement test that the students in CG1 and CG2. The study used the Kruskal-Wallis test to determine whether this difference was statistically significant. The results of the test indicated that there was a significant difference between students' academic achievement means scores [$X^2_{(4)}$=31.15; *p*=.005]. The second year model's effect size (eta-squared-η^2) showed that it explained 15.4% of the difference between the academic achievement levels of the experimental and control

groups. The Mann-Whitney U test was performed in double groups to examine this difference. There were statistically significant differences between EG1 *and* CG1 and CG2, and CG1 and CG2 *and* EG3 and CG1 (p<.05). The results of the Solomon Research Design showed that the experimental groups were equal to each other and the control groups were also equal statistically. The internal and external validity of the study was also ensured since the experimental groups had higher achievement than the control groups. These outcomes prove that the GI method made positive contributions to the students' achievement.

The groups' scores on the posttest (Science Process Skills for Eighth Grade) ranked EG1, EG2, EG3, CG1 and CG2. The researchers used the Kruskal-Wallis test to determine whether the score differences between the groups were statistically significant. The results showed that there was a significant difference between the mean rank of the students' scores on the posttest [$X^2_{(4)}$=11.161; p=.025]. The second year model's effect size (eta-squared-η^2) showed that it explained 10.7% of the difference between the science process skills of the two groups. The study also used the Mann-Whitney U test to see the groups that differed. There was a statistically significant difference between EG1 and CG2, and EG2 and CG2. The researchers used the Kruskal-Wallis test for each of the science process skills to see the groups' significant differences. They found that the groups had statistically significant differences in the skill of "Determining the Variables" [$X^2_{(4)}$=10.633; p<.05]. The Mann-Whitney U test was performed in double groups to determine the groups that had significant differences between them. There were statistically significant differences between EG1 and KG2, and EG2 and KG1 and KG2 (p<.05), which implies that using the GI method for two years made positive contributions to the students' achievement.

The two science teachers' views about the application who participated in the application were taken. The views are given in three themes: positive, difficulties and recommendations.

Table 8

Teachers' Positive Perspectives on the Application

Teachers' Perspectives	İlhan	Bengisu
Come to courses preparedly	✓	✓
Active participation	✓	✓
Increase achievement	✓	✓
Governing/managing skills attainment	✓	✓
Performed more comfortable courses (without time constraints)	✓	✓
Providing to see themselves valuable	✓	✓
Improve their self-confidence	✓	✓
Providing to be guide of teacher	✓	
Providing sharing	✓	

As seen in Table 8, teachers stated that applications of group investigation provided students to help them come to courses preparedly, active participation,

improve their self-confidence, performed courses easier, and increase their achievement, governing/managing skills attainment and self-esteem. Teachers highlighted that the course was performed more comfortably, that students learned the subject better without teachers, that the course was taught more efficiently, and that students were improved in terms of both knowledge and skills since students were familiarized with the process due to the application being carried out twice.

> "The application was provided students so that they could more actively participate in the course and increase their achievement. It even facilitated participation from those students who were not interested in the course and increased their achievement. (…) The group heads encouraged their peers, a situation requiring them to put in extra effort to increase their group mates' achievement. In conclusion, the achievement of the low-achieving students was increased per this application. During the process, each group designed materials independently of one another, the groups then contributed to each other through the materials designed at the end of the process. (…) Students experienced some difficulties at certain points, though managed to overcome them, either through their own research or with the teacher's guidance. (…) Students saw themselves as more valuable because they were given the chance to make a presentation and express their thoughts; this increased their self-confidence. I caught some indicators such as 'I can do it now' in the behavior of students who never participated in the course. (…) Students' high achievement in the application that has been carried out twice provided their learning be permanent. Almost all the students gave correct answers to the questions for the unit in the written examination of the 7th-grade in which in particular, the application was carried out twice."(Teacher İlhan)

> "I noticed that students participated in the course by holding a file and preparing for the topics through group discussions because they were going to teach the course. (…) I observed that students participated in the course more, that the students who had previously had a low-participation history in the course also tried to participate (…), and that these students learned the topic without the help of the teacher; however, some of these students missed certain key points. I observed that the students had control over the topic in a general sense. (…) I also observed that students comprehended the topic when the teacher provided guidance by addressing these missing points (…), and that the application assigned students responsibility. It also made it easier for students to know which part of the topic was more important. (…) This model provided students to comprehend the course. (…) I observed that the group heads acquired governing and directing skills at the end of the application due to their increased responsibility during the process itself. (…) Students already had the prerequisites since the model was carried out for the second time. They knew what to do on their own without needing any help or further in-depth information about the process." (Teacher Bengisu)

Table 9

Teachers' Perspectives about the Difficulties Encountered During the Application

Teachers' Perspectives	İlhan	Bengisu
Familiarizing students with the method applied	✓	
Destruction of Old Habits	✓	
Course preparation process	✓	
Classroom management		✓
The crowd of classrooms for the group study		✓

As seen in Table 9, teachers had difficulties when familiarizing students with the method applied, destructing the habits related to teacher-centered educational understanding, the course preparation process, and with classroom management when

dealing with crowded classes. Teachers indicated that—since the students did not know how to prepare for the lesson or how to manage the process—they encountered difficulties with those classes wherein the application was being carried out for the first time, and that they experienced difficulties regarding classroom management due to the number of students during the group study and the inappropriate physical design of the classrooms.

> "There were some deficiencies in the 7th-grade wherein the application was being carried out for the first time. The students on the board occasionally taught the topic by reading from the text or else could not answer the questions. Another deficiency I noticed is that the topic was assigned to the group members equally… I think that it would be a better strategy to assign low-achieving students a relatively lower-responsibility task instead of assigning responsibility equally because this can cause problems for those groups wherein a low-achieving student is responsible for a difficult topic. Such a case was encountered in one of the groups of 8th-graders, wherein the model had been applied to for two years; some troubles were encountered in this group since the student developed a sense of hate towards both the course and the application itself." (Teacher İlhan)

> "I think that the classes were too crowded for a group study. Therefore, we experienced some trouble. I observed that in such applications, certain difficulties were encountered to ensure classroom management in crowded classrooms." (Teacher Bengisu)

Table 10

Teachers' Suggestions for the Application

Teachers' Suggestions	İlhan	Bengisu
Should be in all educational levels	✓	✓
Should be applied different methods in primary school	✓	✓
Should attainment the prerequisites of the method when application process	✓	✓
Should comprise fewer students of the groups		✓

As seen in Table 10, teachers suggested to apply such applications by using different methods throughout all educational levels, particularly starting from primary education and to provide the prerequisites as in this application. Teachers also indicated that groups should be comprised of fewer students if such applications are to be performed more comfortably and efficiently in the future.

> "The applied model should be understood very well. As this application suggested, such studies should not be limited to a single course. I think that the application can be carried out successfully alongside with other courses… I believe that students can be more successful by applying this model from 5th-grade to 8th-grade of middle school, to even into university education. In fact, the greatest problem is that students attend courses without undertaking the necessary research regarding the relevant topic. One way to eliminate this problem would be to improve students' research skills by using different methods and shifting their understanding of teacher-centered education."(Teacher İlhan)

> "Students had the prerequisites and awareness regarding the topic since the application had been carried out twice; they were able to run the process on their own without being told what to do. These applications require consideration. (…) If such applications are occasionally carried out regarding all the appropriate topics within those grades starting from primary education, future applications will be designed more efficiently. (…) I think that these applications would be better performed in groups consisting of several students in non-crowded groups."(Teacher Bengisu)

Discussion, Conclusion, and Implications

A review of the findings obtained from the pre-tests (the Preliminary Knowledge and Science Process Skills Tests for Seventh Grade) for Solomon Research Design and GI method in the first year showed that there were no statistically significant differences between the groups (Table 4). The data obtained from the Academic Achievement Test for Seventh Grade and Science Process Skills Test for Seventh Grade in the GI method practices showed that there was a significant difference to the advantage of the experimental groups (EG1 and EG2) (Table 5). In other words, the GI method affected students' academic achievement positively in the unit, The Structure and Properties Particle of Matter. The results obtained are in line with the results of the literature on the GI method (Astra, Wahyuni, & Nasbey, 2015; Mitchell, Montgomery, Holder, & Stuart, 2008; Sancı & Kılıç, 2011; Şimşek, Doymuş, & Karaçöp, 2008; Şimşek, Doymuş, Doğan, & Karaçöp, 2009; Tan, Sharan, & Lee, 2007; Zorlu, 2016; Zorlu & Sezek, 2016). There were significant differences to the advantage of the experimental groups in the science process skills of observation, assessment, building correlations between numbers and space, establishing hypotheses, and doing experiments. Examining the research subject comprehensively is one of the features of the GI method. While trying to solve problems, students establish their own knowledge based on what they have learned about the subject (Bayrakçeken, Doymuş, & Doğan, 2013; Efe, Hevedanlı, Ketani, Çakmak, & Efe, 2008). In this regard, there is a relation between this aspect of the GI method and the science process skills that students acquire.

The pre-tests of experimental designs can cause negative effects on the results by stimulation, causing psychological sensitivity and creating a competitive environment (Ayres, Hopf, & Will, 2000; Babbie, 2013; Holdnak, Clemons, & Bushardt, 1990; Sawilowsky, Kelley, Blair, & Markman, 1994; Solomon, 1949). The post-tests found no significant difference between the experimental or control groups that did or did not take the pretest (Table 5 and Table 7). Based on these findings, the researchers concluded that the pretest did not have any effect on the results of this study.

Creswell (2003) believed that the lack of additional control groups in experimental designs made methods look either stronger or weaker. Büyüköztürk (2014) also noted that the behaviors displayed by subjects may differ from their natural behaviors since they are aware of being included in an experimental study, which reduces the generalizability of research results. On the other hand, there are many studies claiming that an increase in the number and period of the implementations made with the same subjects will also improve the causal relation and make the implementation results more generalizable (Creswell, 2003; McMillian, 2008; Solomon, 1949). Solomon designed the Four-group Experimental Design to see whether subjects are affected by this, and rectified it by observing the equivalence of results from experimental and control groups that do or do not take the pretest. This improved the internal and external validity of scientific studies (Christensen, Johnson, & Turner, 2015; Weinrich et. al., 2007). This study added an extra experimental group to the eighth grade groups, which participated the implementation once, with the aim of observing students' improvement after two years of GI method implementation.

✓ This both increased the number of participants in the sample and made it possible to examine the new aspects that students gained through the GI method

(academic achievement and science process skills) by comparing the study results with the results of this group.

✓ It also provided results that were more suitable for generalization since it improved the correlation between the dependent and independent variables (Table 7).

✓ Finally, in the studies conducted by Campbell and Stanley (1980), Solomon Four-group Experimental Design helped them better meet the interval validity criteria of maturation, testing, regression, selection and interaction (Weinrich et. al., 2007).

The findings from the pre-tests (Preliminary Knowledge Test for Seventh Grade and Science Process Skills Test for Seventh Grade) in the GI method practices performed in the sciences course in the second year of study proved that there were no statistically significant differences between the groups (Table 6). The results of the Academic Achievement Test for Seventh Grade in the GI method practices showed that there was a statistically significant difference between the groups to the advantage of the experimental groups (Table 7). Furthermore, it was determined that the experimental groups that participated in the practice for twice had a higher academic achievement than the experimental groups that were participants for only once. According to this result, it can be said that applying twice at the different times the GI method improves the students' academic achievement in the "States of Matter and Heat" unit. When the results of EG-SPST were investigated, it was determined that the GI method was partly effective in improving science process skills. The experimental design in the second implementation explained 10.7% of the difference in the EG-SPST when the effect-size of the GI method was investigated. This has a direct correlation with the research process of GI method (Bayrakçeken, Doymuş, & Doğan, 2013; Dikel, 2012; Doymuş, 2012). The GI method also enables students to perform activities with which they establish causal relations and determine their variables. In the skills of “Determining Variables”, the significant difference was to the advantage of the experimental groups that participated in the implementation for two years. However, there was no statistically significant difference between the control group and the group that participated the implementation for only one year. Applying the GI method for two years helped improve students' skill in “Determining Variables”. In the curriculum, the skill of “Determining Variables” in eighth grade sciences involves approximately thirty acquisitions and the largest number of acquisitions in the “Matter and Heat” unit as well (MEB, 2013).

It is possible to explain the results obtained from the study in two different situations. The first is to apply the learning method twice at the different intervals and the second is useful in GI method. It can be said that students' academic success and science process skills are improved by applying the learning method twice at different times because of ensuring students become accustomed to the method, being aware of what they need to do in the process. Knowing the applied learning method allows the students to learn the subjects better by being planned and active in the lessons (Kaufman, 2014; Schwarz, de Groot, Mavrikis, & Dragon, 2015). In this study, since the students learned GI method in the first application, they were able to apply the GI method fully in the second application. Students come together with group friends outside the classroom to work more planned lessons, focusing on the learning of students in the whole group while learning the subject, and being active properties can be said to develop by applying twice at the different intervals the GI method. In the GI

method, out-of-class group work and synthesis learning subjects are involved (Bayrakçeken, Doymuş, & Doğan, 2013). It can be said that students' academic achievement and scientific process skills improve because of the properties which out-of-class group work and synthesis learning subjects of GI method.

According to the findings obtained from EG-SPST no statistically significant difference existed between the experimental and control groups in the following skills; "Hypothesizing and Defining", "Making Operational Explanations", "Designing the Required Investigations for the Solution of the Problem", and "Drawing a Chart and Interpretation". Therefore, the implementation of GI method to teach the "States of Matter and Temperature" unit was not effective in teaching these four scientific process skills. Scientific process skills can be taught and improved by means of experiments and activities (Hofstein, Navon, Kipnis, & Naaman, 2005). Different teaching methods and techniques may be used along with GI including experiments and activities. In the study by Zorlu (2016) the GI method was implemented along with the modelling-based teaching method in science class and benefits were observed in the students' acquisition of "Hypothesizing (Guessing)", "Experimenting and Designing Experiments", "Establishing Number-Space Relationship", and "Modelling" skills. Administering the activities of the modelling-based teaching method to students may enable them to understand and conduct scientific experiments to form mental models (Halloun, 2007, 2011; Ünal-Çoban, 2009; Zorlu & Sezek, 2019).

Teachers' perspectives also supported the fact that, by applying it twice, the Group Investigation (GI) method contributed to students' skills regarding academic achievement and scientific processes. Teachers highlighted that the course was performed more comfortably since students were familiarized with the process due to the application being carried out twice. Teachers pointed out that students' familiarization with the GI method contributed to their active participation anytime in the lesson, the process within heterogeneous groups, and increased self-confidence as part of the learning-teaching processes and course preparation. These perspectives are in parallel with the results of the study conducted by Turaçoğlu (2011). One of the most important tasks a person has to accomplish is social development (Öztürk & Kutlu, 2017). Teachers also emphasized students' sharing skills, preparation for the future, and managing and directing skills. Teachers indicated that the efficiency of the courses increased; therefore, student achievement was increased. When students were knowledgeable about the process of the course and comprehend its content well, the efficiency was optimized. A student who comprehended the process of the GI method well should attend the course preparedly and participate in the learning–teaching process within their group. This study revealed that students were able to reach this level in the second application. A student can get efficiency from a course if he or she preparedly attend the course and actively participate in the learning-teaching process. This study determined per interviews with the teachers that students became more efficient when they taught the topics themselves.

Additionally, teachers indicated that, since the students were knowledgeable about the method, carrying out the application twice saved time and created an environment in which the course would be taught more comfortably. Şimşek (2007) and Yıldırım (2006) proposed in their studies that insufficient time was one of the negative perspectives regarding these methods. By conducting the method twice in the

classrooms, it was thought to contribute to the students in terms of saving time. Since time-saving efforts make it possible to allocate more time in which to teach the topic, learning efficiency can be increased. Teachers expressed that there were some difficulties in preparing the classroom physically before such application. These difficulties can stem from the wooden seats and tables in the classroom. Wooden rows were one-piece and big, therefore, it was difficult to move them, and students were unable to sit comfortably. Furthermore, the classroom was prepared for application during a five-minute period (the break time). In fact, if the wooden seats were to be changed with soft and beautiful portative chairs and the wooden rows-tables were changed to easily recyclable materials, this preparation time could be shortened. Açıkgenç, Köse, Günel, and Demirkol (2011), indicated that the physical conditions of schools and classrooms were among those factors greatly affecting educational quality. Specifically, due to the changes required by this age, designing learning environments according to the learners' characteristics—and making these environments easier for learners to construct their learning—plays a key role their education. Teachers stated that such applications should be performed by using different learning methods throughout all educational stages; in particular, they emphasized the importance of primary education regarding such applications because students acquire most of their educational habits during primary educational years, and because these habits subsequently shape their lives.

The researchers created a new experimental design to use in the second year of this study by revising the Solomon Four-group Experimental Design (Figure 1). A review of the relevant literature using Solomon Experimental Design found that it was used not only in educational sciences studies, but also in applied sciences such as psychology, medicine and food technology (Amirfakhraei, Ahadi, Keraskian, & Khalatbare, 2016; Bekker, Fischer, Tobi, & van Trijp, 2017; Holdnak, Clemons, & Bushardt, 1990; Retzbach, Retzbach, Maier, Otto, & Rahnke, 2013). These studies made only one implementation with the same sample. The new experimental group included in this study made it possible to make multiple implementations by adding groups to the same sample at different times, improve internal and external validity and comparing implementation results with each other. The researchers believe that this experimental model will be used in different research areas (e.g., psychology, genetics, biotechnology, biology, chemistry and engineering) in long-term studies in the future rather than being used only in the education studies for the implementation of different learning methods, and these studies will also make a great contribution to the literature.

Statement of Responsibility

Fulya Zorlu; conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing - original draft, writing - review & editing, visualization, supervision, project administration, funding acquisition. Fatih Sezek; conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing - original draft, writing - review & editing, visualization, supervision, project administration, funding acquisition.

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Towards a Defensible EAP Curriculum: A Needs Analysis*

Savunulabilir Bir Akademik Amaçlı İngilizce Öğretim Programına Yönelik İhtiyaç Analizi *

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ABSTRACT: This paper reports on the process and findings of curriculum development towards a defensible EAP curriculum in the Department of Foreign Languages at Eskisehir Osmangazi University. In addition, it illustrates the evaluation of newly introduced innovations by the students. The study was designed as a curriculun development project which was based on Brown's needs analysis (NA) framework. The NA studies were conducted in 2016-2017 academic year with the students and the teaching staff employed in the department. Focus group technique was used to take the opinions of the teaching staff about the components of the curriculum, and the opinions of the students were taken through workshops. In 2016-2017 academic year, repeat students' opinions about the innovated curriculum were taken through an open-ended questionnaire. The data were analyzed by using thematic content analysis technique. The emerging themes in the NA study are (a) need for clarification of the program objectives, (b) need for revision of teaching materials, (c) need for improvement in teaching and learning practices, and (d) need for improvement in assessment practices. The emerging themes in the evaluation of the NA study based on the open-ended questionnaire are 'materials', 'assessment procedures', and 'overall structure of the EAP curriculum'.

Keywords: curriculum design, curriculum development, EAP curriculum, needs analysis, English language preparatory curricula.

ÖZ: Bu çalışma Eskişehir Osmangazi Üniversitesi Yabancı Diller Bölümü İngilizce Hazırlık Programının geliştirilmesi kapsamında gerçekleştirilen ihtiyaç analizi çalışması sonuçlarını ve ihtiyaç analizi sonucunda yapılan yeniliklerin öğrenciler tarafından değerlendirilmesini kapsamaktadır. Çalışma Brown'un ihtiyaç analizi çerçevesine dayalı olarak gerçekleştirilen bir program geliştirme projesi olarak tasarlanmıştır. İhtiyaç analizi çalışmaları 2016-2017 akademik yılında bölümde öğrenim gören öğrenciler ve öğretim elemanları ile gerçekleştirilmiştir. Öğretim elemanlarının öğretim programına ilişkin görüşleri odak grup görüşmeleri yolu ile alınırken, öğrenci görüşlerinin alınabilmesi için çalıştay tekniği kullanılmıştır. Ayrıca ihtiyaç analizi sonucunda gerçekleştirilen yeniliklerin değerlendirilmesi için 2016-2017 akademik yılının sonunda tekrar öğrencilerine açık uçlu bir anket uygulanmıştır ve tekrar öğrencilerinin görüşleri alınmıştır. Çalışmanın verileri tematik içerik analizi yoluyla analiz edilmiştir. İhtiyaç analizi çalışmasının sonuçları 4 tema altında sunulmuştur. Bu temalar şu biçimdedir: (a) programın amaçlarının belirlenmesine ilişkin ihtiyaçlar, (b) öğretim materyallerinin yeniden düzenlenmesine ilişkin ihtiyaçlar, (c) öğrenme-öğretme süreçlerinin geliştirilmesine ilişkin ihtiyaçlar ve (d) ölçme değerlendirme süreçlerinin geliştirilmesine ilişkin ihtiyaçlar. İhtiyaç analizi çalışmasının değerlendirilmesine ilişkin açık uçlu anket sonuçlarına göre ortaya çıkan temalar şu biçimdedir: 'öğretim materyalleri', 'ölçme değerlendirme süreçleri' ve 'akademik amaçlı İngilizce öğretim programının genel yapısı'.

Anahtar kelimeler: öğretim programı tasarımı, öğretim programı geliştirne, akademik amaçlı İngilizce öğretim programı, ihtiyaç analizi, İngilizce hazırlık öğretim programı.

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Over the past two decades, there has been a vast increase in the numbers of English-medium programs in Turkish universities and it has been leading to an increase in English for academic purposes (EAP) context in universities. These contexts are organized and carried through either department of foreign languages or schools of foreign languages in universities. The students have to meet the criteria determined by these institutions to start their faculties in the universities. It seems to be a challenging context for many freshmen students as very limited number of these students can achieve the proficiency tests at the beginning of the academic year. Thus they have to pursue the EAP curriculum offered by the universities and succeed it by the end of their first year in the university.

In our study context, Eskişehir Osmangazi University (ESOGU), one of the three state universities in Eskisehir, Turkey, the Department of Foreign Languages (DFL) has undertaken the role of implementing the language preparatory curriculum for the students who do not have the required language competence to continue their departments. DFL organizes and implements an English language preparatory curriculum for the students of both Faculty of Engineering and Architecture (Departments of Computer Engineering, Electrical and Electronics, Mechanical Engineering), and Faculty of Economics and Administrative Sciences (Department of International Relations). Although DFL has considerable experience of English language preparation in practice, no written EAP curriculum had been designed in the department until the current study results. This context resulted in problems of adopting the practices in the department by the instructors. In other words, a growing need for a defensible EAP curriculum appeared in our context.

As newly-appointed curriculum unit members, we initiated a curriculum design study in the department with the support of the administration body. This paper reports on the EAP curriculum innovation based on a comprehensive needs analysis (NA) in our department. We used Brown's (2009) suggested framework and steps for NA to go through a methodical process towards a defensible EAP curriculum in the department.

In the section below an overview of EAP context in Turkish universities and our EAP context are given to provide a better understanding of the study context. Prior to the design and methodology of the study, the need for a defensible curriculum and the framework used in the study are explained. The design and methodology of the study is followed by the results and discussion part. Finally, the conclusion gives a brief summary and several implications for further research.

Overview of EAP Context in Turkish Universities and ESOGU EAP Context

Departments or schools of foreign languages which are established within the universities in Turkey serve to improve language proficiencies of freshmen so that they can achieve the essential foreign language skills to pursue the curriculum of their English-medium departments. There is not a national official exit level for these language preparatory programs, so the universities often design these curricula according to their overall and context-specific policies, and the academic needs of students.

Our context does not seem to differ from the overall EAP context in Turkey. ESOGU offers an intensive EAP curriculum to the students of both Faculty of Engineering and Architecture and Faculty of Economics and Administrative Sciences.

All students have to achieve the required level of English language skills in the language proficiency exam at the beginning of the academic year. Otherwise, they have to pursue the intensive EAP program offered by our department and attain the exit level B1+ of the Common European Framework of Reference for Languages (Council of Europe) to start their departments. It is a challenging period for these students because they are obliged to drop out or transfer to Turkish-medium departments unless they can succeed in the EAP curriculum offered.

Prior to the present study, the EAP program in our department was carried out by about 50 instructors and there were three levels of the program: Beginner, Elementary and Pre-Intermediate. Students in all levels had to obtain an overall grade of 60 or more from a range of different assessment components at the end of one academic year. These components involved periodical quizzes, classroom performance grades and online task performances, four midterm exams and a final exam. A series of course books from beginner to intermediate level was used in the program. In addition, a grammar reference and exercise pack, and a writing pack prepared by the instructors were used as supplementary materials in the curriculum.

The curriculum, assessment procedures and materials seemed to be comprehensive; however, there appear several major concerns in the EAP curriculum. First, it was observed that classroom performance grades were often assigned through subjective and biased evaluation of the instructors because they did not take the criteria provided by the administration into consideration while grading classroom performance of the students. Second, writing tasks were assigned from the outset of the second semester of the academic year, which means the students were not able to practice writing in the first semester. Third, tasks that could improve students' productive language skills (speaking and writing skills) seemed to be ignored in both teaching and assessment context, which led the students to focus on grammar rules and memorize new words to pass the exams. Fourth, there was neither a written curriculum, nor curricular principles, nor clear objectives, which featured our program as a course book and test-driven EAP curriculum. Taken together, it appeared that we had to try hard to design a defensible and embraced EAP curriculum in our context.

Need for a Defensible EAP Curriculum and Brown's (2009) NA Framework

To make our EAP curriculum more defensible and embraced by all bodies (i.e. administrative bodies, instructors and students), an immediate curriculum innovation was needed in the department. Our deliberate attempt to make changes and to renew the existing EAP curriculum was a curriculum innovation instead of a change as suggested by White (1988) and Nation and Macalister (2010). They distinguish innovation from change in that the latter does not involve conscious planning or intention. Thus our intention of alteration in the curriculum seemed to be a curriculum innovation.

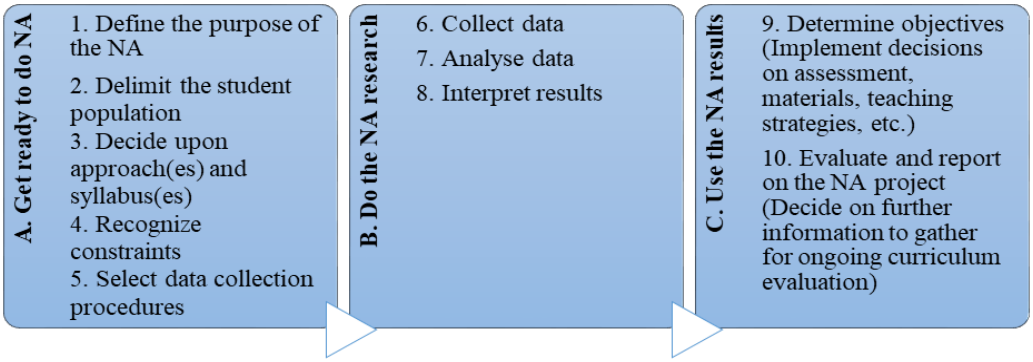
Analyzing the needs is widely accepted as fundamental and initial step in both overall (Demirel, 2011; Henson, 1995; Ornstein, & Hunkins, 2009) and EAP (Benesch, 1996; Braine, 2001; Brown, 2009; Dudley-Evans & St John, 1998; Hyland & Hamp-Lyons, 2002; Nation & Macalister, 2010; Richards, 2001) curriculum development practices. The goal of needs analysis (NA) studies is simply described by Richards (2001) as collecting information to form a profile of the language needs of the learners and accordingly, to introduce innovations on the goals and content of any language

course. Similarly, Benesch (1996) identifies NA studies to be utilized as bases for change in the targeted contexts. Taken together, we started our attempt to innovate the EAP curriculum in our context.

NA in foreign language contexts is precisely defined by Brown (2009) as "the systematic collection and analysis of all information necessary towards a defensible curriculum" (p. 269). He also describes a defensible curriculum as one that satisfies the learning needs of both students and teachers in specific contexts. As our goal was to make innovations and create a defensible EAP curriculum in our context, we decided to use Brown's (2009) suggested framework for NA process as our guide in our study. His systematic 10-step framework guided us throughout the process and facilitated the implementation of curriculum innovation in our context.

Brown (2009) draws our attention to three essential sets of steps in NA studies in foreign language learning contexts. The general and secondary steps are illustrated in Figure 1:

Figure 1. Brown's (2009) 10-step Framework for NA in EFL Contexts.



As depicted in Figure 1, the framework involves 10 steps to follow in NA studies for curriculum development. Brown (2009) extends the scope of NA through using the results, which refers to curriculum innovation. In the present multi-phase study, we started with getting ready to do NA and carried out the NA research in the first academic year. At the beginning of the second academic year, the EAP curriculum was designed according to the results of our NA study. The last phase of our study involved the evaluation of the innovations in the EAP curriculum, which refers to the 10th step in Brown's (2009) framework. This paper primarily reports on both the process and findings of the curriculum development towards a defensible EAP curriculum in our tertiary-level context. In addition, it illustrates the evaluation of the newly introduced innovations by the students.

Method

The study was designed as a curriculum development project and using Brown's (2009) framework for NA studies, our overall goal was to develop the curriculum and introduce innovations in our EAP context. As Richard (2001) suggests, a triangular approach that made us collect data from a variety of bodies and motivated us to a participatory process was adopted in the study. Therefore, the first main phase, in particular getting ready to do NA was initiated and carried out in a rigorous cooperation

with the administrative bodies of the department. Preceding the 'Do the NA research' phase, the data collection procedures and the participants were specified. A qualitative approach was adopted in this phase in order to reach in-depth understanding of the context and the needs. After the data analysis and interpretation of the results within 'Do the NA research' phase, various decisions on different aspects of our EAP program were made as the first step of the 'Use the NA results'. Finally, the innovated EAP curriculum was evaluated from the perspectives of the students pursuing the new curriculum, which closely corresponded to the 10th step in Brown's (2009) framework.

Data Collection and Instruments

The study involved three phases. The first phase included informal meetings with the administrative bodies and instructors in the department. It appeared that there were numerous concerns such as no-written curricular principles and texts, discomfort among the instructors and students in the department. It led the department to initiate an innovation movement. Thus, the second phase was doing the NA research and data were collected from both instructors and students. After introducing changes in the EAP curriculum, the evaluation was done through collecting data from students in the third phase of the study.

Regarding the process of the data collection in the second and third stages, the participants took part in this study after giving informed consent. They were informed about the aim of the study, protecting their anonymity and the right to withhold consent to the study. Fourty-one instructors and thirty-seven students for the workshops, and sixty-one students for open-ended questionnaires agreed to be volunteers to take part in the research.

The first phase comprised getting ready to do NA study in the department, and it was carried out through numerous informal meetings and talks with the administrative bodies. The procedure and the roles of each body were clarified in this period collaboratively.

The second phase 'Do the NA research' involved two sets of data, in particular focus group interviews with the instructors and two-hour student workshops.

Focus group interviews. First, we started collecting data through five focus group interviews with the eight to twelve instructors in each group. The interviews were done in March, 2016.

In preparation step of the focus group interviews, the instructors were grouped according to pre-determined criteria which were being an administrative member, level coordinator or unit staff, availability of the instructors according to their weekly schedules, and seniority of the instructors. After that, they were sent a guideline about the content and the timing of the interviews a week before. The interviews were pre-supposed to last 1-1.5 hour, yet some of them lasted more than two hours.

During the interviews, one of the researchers acted as a moderator while other researcher, as a reporter, noted down the views expressed during the interviews. The interviews were also audio-recorded with the consent of the participants.

After the interviews, the notes taken by the moderator and the reporter were blended together. The audio records were consulted in case of a disagreement between

the researchers or need for clarification of the views of the instructors. After, organized notes were e-mailed to the instructors in 2-3 days after the interviews for member-checking procedure. Finally, the views were re-organized in consistence with the feedbacks and reported under the titles of views of single groups and common views of the groups.

Workshop sessions. Following the focus group interviews, student workshops were organized in the department. Prior to the workshops, a protocol and form were formed by the researchers and permission was obtained from the administration. The form entailed questions as to "overall objectives and outcomes of the EAP curriculum', 'the EAP content', 'materials and assessment procedures' and "other concerns". Then, one representative student from each class was invited to the workshops.

The students were categorized according to their levels in the program, in particular beginner, elementary and pre-intermediate. Before the sessions began, they had been informed about the time, content and procedures of the workshop. Three workshop sessions were done on 25th May, 2016. The students were asked to identify a group leader, monitor and reporter in their groups. Each group was delivered the form and they were instructed to fill in the form to express their views about the curriculum implemented in the department. The researchers also monitored each session occasionally throughout the sessions. The workshops lasted about two hours and the forms were completed and delivered to the researchers in the end.

In the third phase, the results of the needs analysis study were benefited to draw the frame of the curriculum including the context, core values and the aims, assessment system, and the outcomes. Accordingly, some changes in teaching and learning processes, assessment processes and teaching principles were made and implemented through 2016-2017 academic year. Repeat students who had an education in prep-class program in the last two academic years (2015-2016 and 2016-2017) as they failed the class in their first academic year (2015-2016), were delivered an open-ended questionnaire to compare the effectiveness of teaching, learning and assessment processes applied in the academic years of 2015-2016 and 2016-2017. A total of 62 students completed the questionnaire.

Open-ended questionnaire. An open-ended questionnaire was developed by the researchers and permission was obtained from the administration. It was prepared in three sections, specifically the materials used during the lessons, assessment and evaluation, and the overall structure of the program.

The questions in the first section asked the students to express their views about the elimination or use of grammar pack and writing pack as a course material and justify their view. In addition, the students' views about the course book were asked in the first section. The second section constituted three questions exploring the ideas of the students about the evaluation of the speaking skills in the exams and quizzes, CPG replacing with project work grade, and administration of the writing quizzes at the lessons. In the third section of the questionnaire, firstly, the students' expectations about the program were explored. For this aim, they were provided a table indicating the current structure, and they were also given a blank table to fill in taking their expectations into consideration. Lastly, the second question inquired the problems the students had encountered so far.

Participants

The participants were different in three sets of data. A total of forty-one instructors participated in five focus groups, one of the qualitative research techniques. Twenty-eight female and thirteen male instructors took part in the focus group interviews. They were all teaching EAP in the Department of Foreign Languages at the time of the study.

Also, workshop technique was used to get the views of the students. There were a total of thirty seven classes in the department. The number of students in each class was between 20 and 25, and the students had been assigned to one of three levels in particular beginner, elementary or pre-intermediate according to their scores in the placement exam at the very beginning of the academic year. A representative student who was chosen by the students in each class functioned as communicative bridges between the students and the administrative bodies of the department. These representative students were invited to participate in the workshop and all of them participated in the workshops.

The students who could not achieve the exit level in the former EAP and had to repeat the innovated EAP were the participants in phase 3. All the repeat students in the innovated EAP program (N=236) were invited to complete the open-ended questionnaire and 61 students responded.

Data Analysis

Except for the first phase which was based on informal meetings and discussions on planning the curriculum, the study involved two sequential phases of data collection. Thematic content analysis was conducted for both sets of qualitative data. Thematic content analysis is defined as one of the qualitative methods for identifying, analyzing and reporting themes within a data (Braun & Clarke, 2006). The initial categories emerged as 'overall objectives and outcomes of the EAP curriculum', 'the EAP content', and 'materials and assessment procedures' in phase 2–Do the NA research. The views by the instructors in focus group interviews and students' views in workshop sessions were categorized under these emerged categories first by each researcher separately.

In phase 3–Evaluation of the NA study, the emerging categories in phase 2 led us to ask questions in three areas, i.e. 'overall structure of the EAP curriculum', 'materials' and 'assessment procedures'.

Analyses of data from both phases were conducted separately by each researcher first. Before organizing several meetings to consolidate the codes and the sub-themes, each researcher coded the data. After several consolidation meetings, a total consistency between the researchers was ensured between the codes and sub-themes by both researchers, which provides evidence for the reliability of the analysis. Other signs of evidence for the reliability of the data analysis were (a) the explicit description of both researchers' roles in the study, (b) the connectedness of the whole study to the framework i.e Brown's (2009) framework for NA studies, (c) intercoder agreement checks between both researchers' codes were regularly made throughout the study as Miles, Huberman, and Saldana (2014) suggests for ensuring reliability in qualitative studies.

The Role of the Researchers

We, as the two curriculum unit members, planned a comprehensive multi-phase NA study which involves all the steps in Brown's (2009) framework. We both received our master degrees in English Language Teaching and got PhD degrees in Curriculum and Instruction. Also, we had been teaching EFL for more than ten years at the time of the stufy, which means we had a considerable experience of teaching EFL. As the curriculun unit members, we were responsible for organizing, carrying out, monitoring and reporting the curricular practices in the department to the administrative body of the department.

In the current study, we took the role of agents of curriculum development in the department. After several meetings with the administrative bodies, the curriculum development project was initiated by the curriculum unit. In all phases of the project, the administative body was informed about the planning of the data collection and results. However, the confidentiality of both instructors and students was strictly ensured in the project.

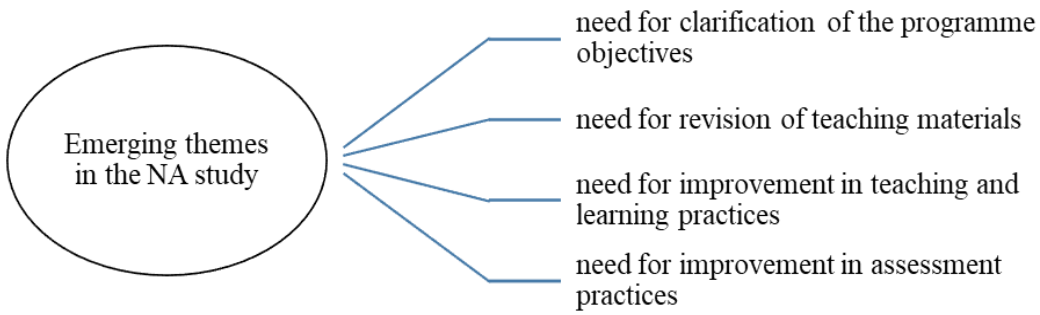
Results

The results involve three consistent phases with the data collection procedures of the research. First, results of the initial NA study are presented in terms of the data sources which cross-validate each other and any differences occurring among two data sources. Second, it is followed with the innovations introduced so as to connect NA to the rest of the curriculum. Last, the results obtained from the evaluation of the NA study are demonstrated.

Results of the NA study

The results of the NA study are presented in line with four themes: need for clarification of the program objectives, need for revision of teaching materials, need for improvement in teaching and learning practices, and need for improvement in assessment practices (Figure 2).

Figure 2. Emerging Themes in the NA Study.



Theme 1: Need for clarification of the program objectives. Initially, concerning the need for clarification of the program objectives, the results reveal that vague objectives pushed the instructors to follow the series of coursebook and supplementary materials throughout an entire academic year, which demotivated both the students and instructors. Similarly, absolute requirement to catch up with the syllabus robed the instructors out of their skills to vary lessons through creative

activities they would bring to the class. Another demotivating factor was the primary focus on grammar teaching for both groups. Obviously, a clear consensus existed over the necessity to adopt objectives that aim to improve productive skills. In addition, both groups agreed on overall objective of English prep-class program that is "to teach English for General Purposes". However, regarding English for Specific Purposes (ESP), there seemed to be a mismatch between the demands of the students and the instructors. The students demanded ESP teaching before they left the preparatory program to continue their departments; however, the instructors did not consider themselves as qualified enough to deliver lessons of ESP. Last, contrary to the current practice, the program was in need of enhancing free writing skills of the students prior to their academic writing skills, so the EAP curriculum is needed to adopt objectives as to improvement in free writing skills, which is highly confirmed by the participant instructors in focus groups.

Theme 2: Need for revision of teaching materials. Second, both groups reached at a consensus about the need for revision in teaching materials. Initially, there appeared a wide gap between the language proficiency level of the students and the packs. Especially, the proficiency level of the packs were pretty higher than language proficiency of beginner level students. Additionally, variety and number of the activities in the packs were proved to be inadequate. They were not consistent with in-class activities, either. Similarly, high price, repetitive content and scarcity of a wide range of grammar activities were the problems encountered about the course book.

Theme 3: Need for improvement in teaching and learning practices. Third, both stakeholders put forward their demand for improving teaching and learning activities. Especially the need for production-oriented and skill-based activities was obvious according to the students and the instructors. In view of the students, grammar focused lessons and traditional teaching techniques hindered their progress in productive skills. The students were in need of activities that required them to use the target language for communicative purposes. In the same vein, the instructors demanded the use of productive activities which let the students use the language to accomplish communicative aims inside and outside the classroom and, also, add variety to the lesson.

Theme 4: Need for improvement in assessment practices. Lastly, regarding the need for improving assessment practices, both controversial and noncontroversial findings were obtained. The main concern of both groups was the inconsistency between the teaching and learning practices and the assessment procedures. It was apparent that style and level of the in-class activities were at odds with the questions the students were required to answer in the exams. Additionally, production skills of the students were not evaluated throughout the entire year, which caused them and the instructors to ignore the tasks that could improve productive language skills. In conclusion, both the students and the instructors demanded skill-based assessment procedures evaluating both receptive and productive skills. Last but not least, two sources of data revealed contradictory results about class performance grade. According to the students, CPG was not a fair assessment system as it was assigned through subjective evaluation of the instructors. On the other hand, most of the instructors

resisted any change in the CPG as they perceived it as a tool to assert their authority on the students.

The Innovations Introduced in 2016-2017 Academic Year

After getting the findings, it is necessary to fit what was learned in the NA to the actual instruction that will be delivered (Brown, 2009). Brown (2009) suggests specifying the objectives led by the findings of the NA and determine the innovations to be reflected on the curriculum. In this process, as the curriculum unit members, we shared the results of the NA study with the instructors and answered their questions. Afterwards, we suggested a set of possible changes to the administration. Fortunately, most of the changes were supported by the administrative body except the adoption of skill-based approach and selection of a new series of course book. The lessons are still delivered with a holistic approach based on the integration of four skills in a single lesson. However, the existing series of course book was used in the following academic year and a new one has been selected to pursue from the outset of the 2017-2018 academic year. Table 1 illustrates the differences between teaching context prior to the current study and the innovations introduced according to the results of the NA study.

Table 1

EAP Context Before and After NA Study.

Context prior to the current study	Innovations introduced
-No written EAP curriculum	-Specified core values, objectives, assessment system and the outcomes of the curriculum
-Grammar-based activities	-Skill-based activities
-Grammar & vocabulary focused assessment	-Skill-based assessment
-Obligatory writing and grammar supplementary packs	-Optional supplementary materials
-Primary focus on academic writing	-Primary focus on free writing
-Writing pack used from the outset of the second term of the academic year	-Portfolio approach adopted from the outset of the academic year
-Class performance grade (CPG)	-Project grade (PG)

As illustrated in the Table 1, the initial step ensuing from the NA study was to draw a frame that indicates core values and objectives, assessment system, and the outcomes of the curriculum. Later, the use of skill-based activities in the lessons has been encouraged. For this aim, the progress of the students in four language skills has been evaluated in all assessment components. Similarly, CPG replaced with PG which helps the students improve speaking skills. Also, writing performance of the students is evaluated through the tasks assigned to them from the outset of the academic year, which gives them greater opportunity to practice and improve free writing skills. Last,

the obligatory supplementary materials were eliminated to provide the instructors with sufficient flexibility about the timing of the units and use of various materials.

Results of Evaluation of the NA Study (Open Ended Questionnaire)

The 10th step of Brown's (2009) model requires the evaluation of innovations in EAP curriculum. The results of the evaluation study illustrate the views of the students who had to repeat the innovated curriculum as they could not achieve the exit level in the former EAP. The results are presented in line with three themes that are 'materials' and 'assessment procedures', and 'overall structure of the EAP curriculum'.

Theme 1: Materials. First, the results indicate that most of the students tend to have a favourable attitude towards the changes in supplementary materials. Regarding the grammar pack, three different views revealed. The first view that is in favour of its elimination finds the production-based lessons more useful than the grammar-based ones. The second view that is against the elimination highlights the inadequacy of the course book in terms of having a full coverage of the grammar topics. The third view favors neither the use of the grammar pack nor its elimination and suggests the use of a grammar reference book as a supplementary material. Concerning the writing pack, the majority of students seems to favor the change as they are frequently allowed to practice writing skills in an enjoyable way.

Theme 2: Assessment procedures. Second, the changes in assessment procedures have satisfied the students to an extent. CPG replacing with PG seems to be positive for a great number of students in terms of the objectivity of the evaluation and improving productive skills. On the other hand, counter views reveals concerns about poor classroom management and low level of participation in lessons. Also, skill-based evaluation is favored by majority of the students as it pushes them to improve their productive skills throughout the academic year. However, the contradictory views highlight the concerns of the students about the objectivity of the assessment and high anxiety the speaking exams cause.

Theme 3: Overall structure of the EAP curriculum. Regarding the overall structure of the curriculum, the views are presented according to two sub-themes that are the expectations of the students and the problems the students encounter. Initially, the expectations of the students are categorized into three sub-categories that are changes in percentages of the assessment components, use of in-class activities that matches to English language in real life and ESP lessons preparing the students for their undergraduate programs. Second, the results indicate four categories as the sources of problems that are instructor-oriented problems, coursebook-oriented problems, administrative problems, and problems as to in-class practices. Regarding the first category, instructor-oriented problems are poor classroom management skills and instructors' improper behaviors such as insulting, humiliating, losing temper during lessons, and treating students unfairly while grading their project works or speaking performances during the examinations. Second, high price, repetitive content and inadequate grammar activities in number and range are among the coursebook-oriented problems. Third, administrative problems result from compulsory attendance, long

lesson hours and lesson hours high in number. Last source of problem is in-class practices that do not correspond with needs and interests of the students.

Discussion

Apart from the first phase of the study which includes both formal and informal meetings with the department directors and the colleagues, the study reveals two overall bodies of results, particularly the results of the NA study and the results of the evaluation by the students. Building on the curriculum development in our EAP context, a number of changes are introduced in a variety of curricular aspects which are highlighted in the results section above. In this essence, the very key strength of this study is its practical outcomes in our institutional EAP context. The present study makes several noteworthy contributions to our institutional curriculum and organizational policies. On the other hand, the evidence from the study also extends our theoretical and practical understanding of NA in EAP contexts.

First of all, it is worth discussing the practical outcomes in our institutional context as there appeared concrete changes in the EAP curriculum based on the results of the study. In brief, core values, principles and objectives are specified; skill-based activities and assessment are favored; the writing aspect of the EAP curriculum is strengthened with involving free writing prior to academic writing task from the beginning of the academic year and classroom-performance grades are replaced with performance-based project grades.

In addition, an awareness of curricular studies is developed in our institution. Currently, it is certain that the innovation motive will never end and all parties in our context will benefit it in further years. As Nation and Macalister (2010) suggests, it was a participatory and continuing attempt to innovate the curriculum, which also seemed to be a crucial part of instructors' professional development as most of them attended the focus groups, shared their opinions intimately and learnt a lot from each other. Nevertheless, innovation in curriculum is a 'complex, multidimensional phenomena' (Markee, 1997, p. 40) and we, the curriculum unit, only activated both the instructors and students to take part in the continuum and moderately negotiate the curriculum. In addition, our experience in this study confirms the principles proposed by Markee (1997) for any curricular innovation movement in these we clearly find out that good communication among participants is needed for success in curricular innovation, adopting a strategic approach from the outset of the process is a must, working through opinion leaders who can influence their peers is crucial, and change agents need practical skills and energy.

The overall results of the study also confirm that involving teachers–instructors in our context–in curricular decisions and innovation movements as they are those who deliver the curriculum and actualize the changes in classrooms. In our study, majority of the instructors seem to adopt the changes and show high effort to actualize them. This result ties well with the critical warning by Brown (2009) that teachers need to feel respected and ignoring them will result in failure in any movement of curriculum innovation. Although integrating more writing tasks and interactive tasks into the curriculum increased the workload of the instructors, majority of the instructors adopted the renewed practices and tried to be part of the innovation. The evidence comes from the high participation in the regular feedback meetings and high rates of responses

during the study period. This also increases our hopes for further innovation movements and the applicability of them in our context.

Results from our study on the needs of both instructors and students confirm what has been found in a number of previous studies in similar EAP contexts. Perceived need for skill-based activities and assessment by both participant groups almost completely corroborates the findings of Karatas and Fer's (2009) study. They evaluate English preparatory curriculum using well-known Context, Input, Process, and Product (CIPP) model developed by Stufflebeam (2003). Both students and instructors complain about the low rates of speaking and writing practices in their EAP curriculum. Thus both groups of participants are in favor of skill-based improvement of students. Similarly, vast majority of the tertiary level students feel the need and expectation to use English language through oral communication, producing written texts and giving presentations in Chostelidou's (2010) study. In addition, demanding for more focus on productive skills and learning in a higher education EAP context is emerged as one of the five major innovative changes in Kirkgoz's (2009) research. Another relevant finding in her study is inserting writing portfolios into the EAP curriculum. Moreover, EAP students' preferences of skill-building and emphasis on speaking and writing skills is found in Afshar and Movassagh's (2016) and Helmer's (2013) studies. The NA phase results of current study appear to be in satisfactory agreement with earlier findings in the literature. The result of EAP students being content with the inserting productive skill practices into the curriculum also provides further support for the need of skill-based activities in EAP contexts.

Another result in the current study is the demand of ESP materials that may familiarize the students with subject specific English. This result accords with findings of relevant research which found students' needs for ESP syllabi and materials (Chostelidou, 2010; Karatas & Fer, 2009; Kirkgoz, 2009). Chostelidou (2010) concludes her study by designing the tertiary level curriculum with a focus on ESP and target disciplines. Considerably, the results of our study are in line with her conclusion. The students in our study expressed their demands for an EAP curriculum which includes subject-specific vocabulary, reading and writing during the NA study. Unfortunately, the department was not ready to initiate such a curriculum in the study. Accordingly, the students still insisted on their expectations for ESP courses and materials in the curriculum. These expectations also appeared as one of the problems they highlighted in the overall structure of the EAP curriculum. It seems that the students would like to start learning some aspects of their subject areas. This result implies that we need to seek ways to integrate subject-specific materials into our EAP curriculum in further movements. These can transform our curriculum to a more focused on students' needs, consequently to an efficient and effective EAP curriculum as Fox (2009) suggests.

Considering the results related to assessment element of curriculum, students' views of perceiving the learning tasks as performance assessment to enable them to start their department appear to be fit well with Salter-Dvorak's (2016) study findings. Similarly, Helmer (2013) also finds that passing the writing exam is among the priorities of her EAP students and it negatively affects the forms of learning tasks in classrooms. Both the culture-specific explanation by Salter-Drovak (2016) and the effect of test-driven context in Helmer's (2013) study seem to explain the reason for our

EAP students misperceptions of the learning task as only a part of assessment procedures. To clarify, the students start to take and achieve a series of exams to be able to be accepted into universities and it unfortunately motivates the teachers to pursue test-driven syllabi in middle and high schools. Therefore our students are already used to study for the tests in our national context. Therefore they might perceive each learning task as a step or challenge to start their department.

Conclusion

The results of the NA study led the curriculum development unit to specify the principles of the curriculum and to revise the materials and assessment/evaluation procedures. In addition, the evaluation study done in 2016 and 2017 academic year reveals that most of the students had a positive attitude towards the current practices applied in teaching learning process. The results related to the course materials shows that majority of the students positively commented about the elimination of the writing pack as a course material. The use of writing portfolios (free writing) helps the students improve their free writing skills and prepare them for further academic writing tasks. However, the comments of some students reveal that grammar teaching still poses problems. The results indicate the necessity of a grammar supplementary book and a broader coverage of grammar topics in the classroom.

The results which were based on the responses by the students in the second section of the questionnaire prove that the students had positive attitude towards the current applications in assessment and evaluation. Inserting the writing and speaking quizzes into the assessment and evaluation process has brought considerable benefits both for the students and the teaching staff. While the students have found more opportunities to practice writing and speaking skills, the teaching staff has been able to adopt a skill-based approach which is compatible to the assessment and evaluation practices. Replacing the CPGs with the project work grade helped the students improve productive skills as well.

The results about the overall structure and the principles of the curriculum indicated that the problems still exist in various areas. The behaviors and the attitudes of the teaching staff towards the students are among the problems commonly expressed by the students. Therefore, the instructors need to be informed about the effects of their behaviors and attitudes on affective characteristics of the students in language learning process. The views of the students may be kept in mind while planning in-service training activities targeting the instructors. Also, it is obvious that there is a need for further studies exploring and explaining the other problems expressed about administration, teaching and learning processes, assessment and evaluation processes. In order to explore and explain the problems, the views of the teaching staff may be taken in addition to the views of the students.

To conclude, we initiated a curriculum innovation movement in our EAP context. However, further studies of NA, curriculum development and curriculum evaluation studies in accordance with an existing model in the literature in order to provide sustainability of the curriculum development studies are still needed. The views taken from the curriculum development experts may increase the effectiveness of follow-up studies. To illustrate, Richards (2001) highlights several variables such as political, economic, social and institutional factors as key determinants of the success of

a language curriculum. Thus he suggests analyzing these factors i.e. situation analysis to complement the needs analysis studies. The areas or factors he suggests might be used as frameworks for further NA or curriculum development studies. In addition, instructors' beliefs and understanding of the principles of any curriculum innovation movement need to be considered and they should be supported in taking part in these innovations (Kirkgoz, 2008).

Statement of Responsibility

Onur Ergünay; conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, reviewing & editing, visualization, supervision and project administration. Derya Uysal; methodology, validation, formal analysis, investigation, resources, data curation, visualization, supervision and project administration.

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Gender in Career Choices of Fourth Grade Students*

İlkokul Dördüncü Sınıf Öğrencilerinin Meslek Seçimlerinde Toplumsal Cinsiyet

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ABSTRACT: The aim of the study is to examine the career choices of 4th grade students from gender perspective. The research was designed as a mixed method in which qualitative and quantitative research approaches were used together. 417 primary school students participated in the study in which "Attitude Towards Gender-Based Career Choices Scale" was used. 77 students were drawn a picture on which career they wanted to do in the future, and then they were asked to explain why they preferred. In the data analysis process, descriptive statistics (arithmetic mean and standard deviation) and t-test were used. For qualitative data, document analysis was used. According to the results of the research, it was found that the attitudes of 4th grade students towards women's choices of career did not differ according to gender. It was determined that most girls preferred to be a doctor and teacher and the majority of the boys preferred to be a football player and they preferred to be a doctor in the second place. At the end of the study, make suggestions for teachers, administrators and families to ensure gender equality.

Keywords: gender, career choice, primary school.

ÖZ: Araştırmada ilkokul dördüncü sınıf öğrencilerinin meslek seçimlerindeki toplumsal cinsiyet algısını belirlemek amaçlanmıştır. Araştırma, nitel ve nicel verilerin birlikte toplandığı karma yöntem deseni ile tasarlanmıştır. Öncelikle çalışma grubunu oluşturan 417 öğrenciye "Toplumsal Cinsiyete Dayalı Meslek Seçimlerine Yönelik Tutum Ölçeği" uygulanmıştır. Sonrasında çalışma grubundan seçilen 77 öğrenciye ileride hangi mesleği yapmak istedikleri üzerine birer resim çizdirilmiş, ardından öğrencilerden çizdikleri meslekleri neden tercih ettiklerini açıklamaları istenmiştir. Analiz sürecinde aritmetik ortalama ve standart sapma gibi betimsel istatistiklerden ve toplumsal cinsiyete dayalı meslek seçimlerinin cinsiyete göre farklılaşıp farklılaşmadığının belirlenmesinde t-testinden yararlanılmıştır. Nitel veriler için ise doküman analizinden yararlanılmıştır. Araştırmada sonuçlarına göre, ilkokul dördüncü sınıf öğrencilerinin kadınların meslek seçimine yönelik tutumlarının cinsiyete göre farklılaşmadığı bulunmuştur. Bunun yanında kız öğrencilerin çoğunluğunun doktorluk ve öğretmenlik mesleğini; erkek öğrencilerin ise önemli çoğunluğunun futbol oyuncusu olmayı tercih ettiklerini, ikinci sırada ise doktorluğu seçtikleri belirlenmiştir. Son olarak araştırmada toplumsal cinsiyet eşitliğinin sağlanması için öğretmenlere, yöneticilere ve ailelere önerilerde bulunulmuştur.

Anahtar kelimeler: toplumsal cinsiyet, meslek seçimi, ilkokul.

* This study was partly presented at the 18th International Primary Teacher Education Symposium in 2019.

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Individuals are in an effort to adapt to the society in which they live from the moment they were born. The process of adaptation to the society starts in the family, the first institution where the individual is socialized, and in their future lives, the efforts to adapt to and find a place in a society continue in every social environment. The more the expectations of the society are met by the individual, the healthier the adaptation process and the state of being are. Whatever is needed by society is attached to the life of the individual as the social norms during this process; in other words, it shapes their life. As a natural outcome of this, the wishes, needs, preferences, attitudes and tendencies of the individual are formed within the framework of social expectations. Gender is a social and cultural title that we face in our endeavor to become a part of the society. Within this broad heading, variables such as gender roles, equality or inequality, stereotypes and attitudes have been discussed from different perspectives by both sociologists and psychologists and educational researchers. The focus of all these discussions is the equality or inequality situation created by the roles that society assigns to women and men and the placement of these roles in life.

Gender is a concept that emphasizes the social relations and interactions between gender-based division of labor and biological sex (Savcı, 1999). In this context, gender perception reveals the socially constructed aspects of the differences between men and women (Parlaktuna, 2010). These differences between genders show themselves in all areas of society and the preferences of individuals are shaped in the context of society's perception of men and women. The choice of career, which is at the top of these preferences, can be directly related to be a man or a woman. The choice of career is one of the most important choices an individual makes during their life. While choosing the career, the individual also chooses the environment, economic situation and people to interact with (Kulaksızoğlu, 1999). Therefore, the choice of career is very crucial for an individual in terms of choosing the most suitable area to reveal his/her talents and determining the happiness and quality of individual's future life.

One of the most striking examples of the duality of social life arising from the quality of gender relations is seen in business life (Savcı, 1999). In this context, attributing different responsibilities to women and men in business life has caused the emergence of gender differences in career choice. Social judgments about what girls and boys can and cannot do might affect the choice of career for both sexes (Kulaksızoğlu, 1999). It is seen that gender roles have a dominant effect in careers to be chosen by women (Özaydınlık, 2014). The career groups of women are less diverse than those of men; office and service sectors are the sectors where women are mostly represented (Erdoğan, 2010). Differences in the roles of men and women in careeral life have been examined and demonstrated in the related literature. Yağan-Güder and Güler-Yıldız (2016) stated that preschool children generally emphasize the superiority of one gender over another in their career preferences; on the other hand, it is observed that the children consider women as cooks, and men as firefighters. In their study Aratemur-Çimen and Bayhan (2018) stated that there are more examples in the textbooks that reinforce stereotyped gender norms for the choice of career than positive examples. Similarly, Sarıtaş and Şahin (2018) found that in social science textbooks, women are assigned roles in careers related to home and childcare, and men in career branches combined with power and authority. These studies, the role of gender in career choice reveals the perception of gender in society; and this perception is generally against

women. The fact that choice of career is the first case that comes to mind when talking about gender equality brings the necessity of examining the concept of gender in the context of career choice (Koyuncuoğlu-Şahin, Esen-Çoban, & Korkmaz, 2018). Children are introduced to the concept of gender at an early age with the influence of family and environment and this situation may affect children's academic achievement, social roles and preferences in areas such as career choice (Zelyurt, 2018). Gender perceptions that children develop according to the role models and how they behave, what they do, which roles they adopt and which careers they do are reflected in children's own lives (Yağan-Güder, Ay, Saray, & Kılıç, 2017). It is obvious that the family and school life of the child has a great impact on the choice of career. In this process, if a child encounters any teachings of gender inequality, this situation will affect his or her future life and hence the choice of careers they wish to pursue in the future. As it is known, children would like to choose their ideal careers. These ideals emerge as a result of good teachings for children. Good teachings are shaped by family and society. Children must adopt the good doctrines of society while making their own choices according to their dreams and thoughts. According to Wharton (2005), the expectations of families from their children differ depending on whether they are boys or girls. Schools are the institution that stand for the key elements of the society and play an important role in shaping a child's future and hence the choice of career. For this reason, the meanings attributed to the concept of gender and awareness of gender equality in schools form the basis for decision making such as choosing a career that affects the future of the child. As reported by Thorne (1992), differences in gender roles are common in primary schools that the children of this period mostly matched the same sex. In particular, children in the final years of primary school can be seen to have reached a certain maturity in cognitive, emotional and social development areas and to have developed more awareness in future-oriented areas such as career choice. Therefore, it is important for fourth grade students to preference of careers within the frame of gender, to find out the relationship between gender-based career choices and the meanings attributed to women and men, and to take precautions to prevent the inequality, if there is any, in gender roles and to create awareness. From this point of view, examining the careers that children want to do in the future in the context of gender has been an important subject that is worth studying, so the present research was carried out based on this requirement.

The main aim of the study is to examine the career choices of fourth grade students from a gender perspective. For this purpose, we sought to answer the following research questions:

- Do fourth grade students' gender attitudes differ according to their gender in their career choices?
- How do girls describe their preferred careers through drawings?
- How do boys describe their preferred careers through drawings?

Method

The research was designed as a mixed method in which qualitative and quantitative research approaches were used together. In this content, concurrent mixed method design was used in the research. In concurrent mixed method design, qualitative

and quantitative data are collected and combined at the same time (Creswell, 2005). In this context, qualitative and quantitative data were collected simultaneously, and the results were combined and presented.

Research Setting and Participants

This study has been conducted with 417 fourth grade students studying in a public primary school in 2018-2019 academic year. 195 (46.8%) participants were girls and 222 of them (53.2%) were boys. While 172 of students (41.2%) stated that their mothers worked, 245 of them (58.8%) stated that they did not. 384 (92.1%) of the students stated that their father worked while 33 (7.9%) stated that they did not work. 51 students (12.2%) stated that they did not have siblings and 366 (87.8%) students stated that they had one or more siblings. Student drawings used in the qualitative section and 77 students were determined by randomly from all participants. 30 of these students were boys and 47 of them were girls.

Data Collection Instruments

In the quantitative part of the study, "Attitude Towards Gender-Based Career Choices Scale" (Çetin-Gündüz, Tarhan, and Kılıç, 2015) was used to determine the attitudes for 4th grade students. The qualitative data of the research were collected through the drawings of the students. The attitude scale is consisted of 9 items with two factors. The first factor consisting of 5 items points to the negative attitude towards women's career choices, while the second factor consisting of 4 items gives information about the attitude towards women's careers. The validity and reliability studies required for the development of the scale have been conducted and it has been demonstrated that the scale is an appropriate scale in scientific research (Çetin-Gündüz, Tarhan, & Kılıç, 2015). In order to determine whether the scale was valid and reliable for this study, Confirmatory Factor Analysis (CFA) was performed for validity and Cronbach's Alpha coefficients were re-calculated for reliability. The CFA results of the two-factor scale confirm the structure ([X2=44.22; Sd=26; X2/Sd=1.70; AGFI=.96; GFI=.98; NFI=.93; CFI=.97; IFI=.97; RMR=.022; RMSEA (.041]), but Cronbach's Alpha (α) value for the second dimension was found to be very low. In this context, it was decided not to use the second dimension of the scale in the sample of the present study. The construct validity of the 5 items in the single dimension of the scale was examined by EFA and varimax rotation technique was used in the analyses. Kaiser-Meyer-Olkin value was found to be .76 (>.60), which determined the suitability of the data for factor analysis, while Barlett Sphericity test was obtained as $\chi 2$=2078.42 (p<.001). At the end of the analysis, it was found that the single factor structures whose eigenvalue (2.220) is greater than 1 account for 44.40% of the variances as a result of the principal component analysis. The factor loads of the one-dimensional structure were found to range between .60 and .71. The scale items are as follows: "I am surprised that women are mayors.", "Women cannot fly airplanes.", "Careers such as car mechanics and painting are only suitable for men", "Women cannot run a country", "I feel uncomfortable that postmen are women". The highest score that can be obtained from the scale is 15 and the lowest score is 3. A high score from the attitude scale is an indicator of negative attitudes towards gender-based career choices (Çetin-Gündüz, Tarhan, & Kılıç, 2015).

Data Collection

The data collection process of the research was carried out in May 2019. Quantitative and qualitative data were collected together, and 417 primary school students were reached within the scope of quantitative data. Qualitative data, on the other hand, were collected through pictures drawn by randomly selected students. In this context, the students were asked to paint a picture on what career they wanted to do in the future, and then participants were asked to explain their drawing verbally. All ethical rules were taken into consideration in the data collection process. In this content, approval was obtained from the Ethics Committee for the research.

Data Analysis

Firstly, quantitative data were analyzed. Before the main analysis, outliers and missing data analyzes were done. As a result of the analyses, 15 scale forms were excluded from the research and a total of 402 scale forms were analyzed. In addition, kurtosis and skewness coefficients were examined to determine whether the normality of data. The related coefficients were observed to be within ±1 range and the data were found to have normal distribution. In the data analysis process, descriptive statistics (arithmetic mean and standard deviation) and t-test were used. For qualitative data, document analysis was used. In this context, the pictures drawn by the students were examined separately as boys and girls. Firstly, the careers which students prefer in their drawings are determined and shown with the graphics. Afterwards, the statements they wrote about the reasons for choosing their preferred careers were examined and in the findings section of the research, direct quotations are presented.

Results

Students' Attitudes Towards Gender-Based Career Choices

The t-test was used to determine whether the attitudes of women towards career choices differed according to gender. Table 1 shows the t-test results of the students' attitude scores on "women's choice of career" according to gender.

Table 1

Results of T-Test of Women's Choice of Career According to Gender

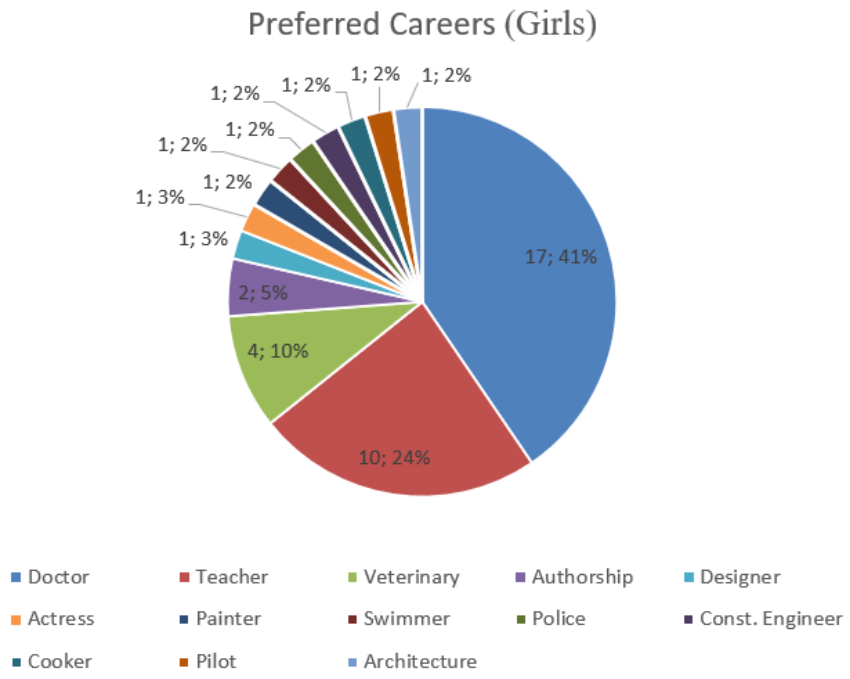
Gender	*n*	$\bar{X}$	*ss*	*df*	*t*	*p*
Female	190	7.47	2.32	400	-2.76	.522
Male	212	8.10	2.41			

As can be shown in Table 1, the attitudes of fourth grade students towards women's choice of career do not differ significantly by gender [t(402)=-2.76, p>.01]. In other words, the attitudes of the students towards the careers such as mayor, pilot, repairman, painting, postman and manager do not differ according to gender.

Preferred Careers in Girls' Drawings

The careers preferred by the girls who participated in the research are presented in Graph 1.

Graph 1. Preferred Careers in the Drawings of Girls

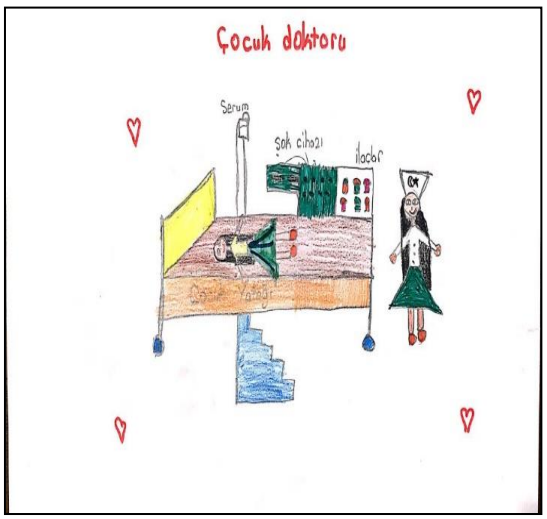


Graph 1 shows that most of the girls (*f*=17) stated that they wanted to be a doctor. It is seen that being teacher (*f*=10) is preferred more than other careers. This is followed by veterinary (*f*=4) and authorship (*f*=2). Designer, actress, painter, swimmer, police, cook, pilot and interior architecture were preferred by only one student. It is seen that girls mostly have a traditional point of view for career choices. In addition to this, there are also some girls who choose the careers that are preferred by men, such as pilot, civil engineer and police.

Merve (Illustration 1), one of the girls who wants to work as a doctor, stated that she wanted to *"save people"* as a neurosurgeon. Burcu (Illustration 2) explained her drawing with the expression *"I want to be a pediatrician because I think of the children's well-being"*.

Illustration 1. Drawing of Merve (Doctor)

Illustration 2. Drawing of Burcu (Doctor)



The second most preferred career by girls was being teacher (*f*=10). Ayça (Illustration 3), one of the students who preferred being teacher, said *"Because I love children very much and learning and teaching something"*. Melis, explained her drawing (Illustration 4), with the expression *"I want to be a teacher because I love children very much"*.

Illustration 3. Drawing of Ayça (Teacher)

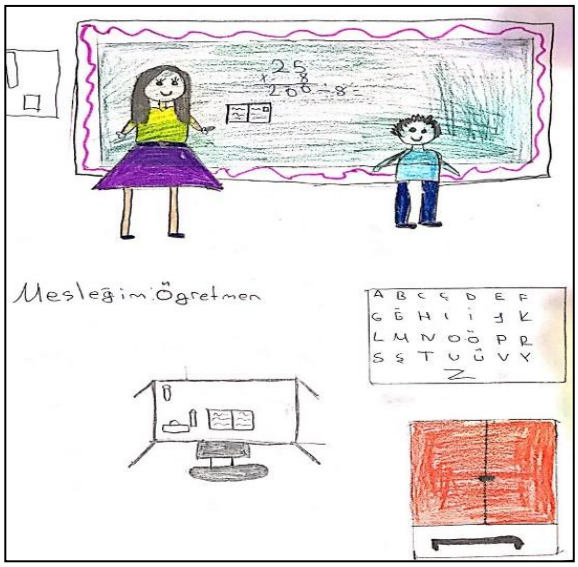
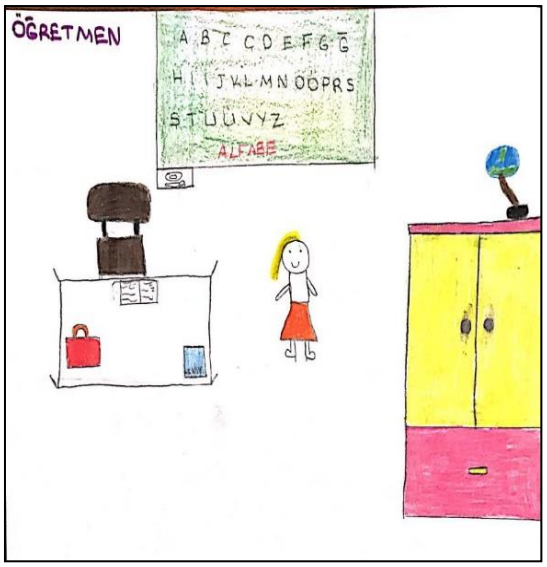


Illustration 4. Drawing of Melis (Teacher)



4 of the girls who participated in the research stated that they wanted to be veterinary and 2 of them wanted to be a writer. Pınar made the following state in relation her drawing (Illustration 5) *"I want to be a veterinary. Because I love animals and I can't stand them being sick. I think we should protect the animals"*. Şeyda made the following statement regarding her drawing (Illustration 6) *"I am talented, and I am interested in writing"*.

Illustration 5. Drawing of Pınar (Veteriner)

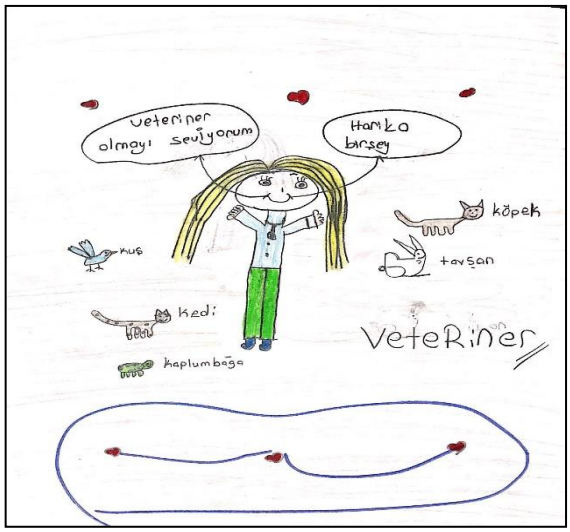
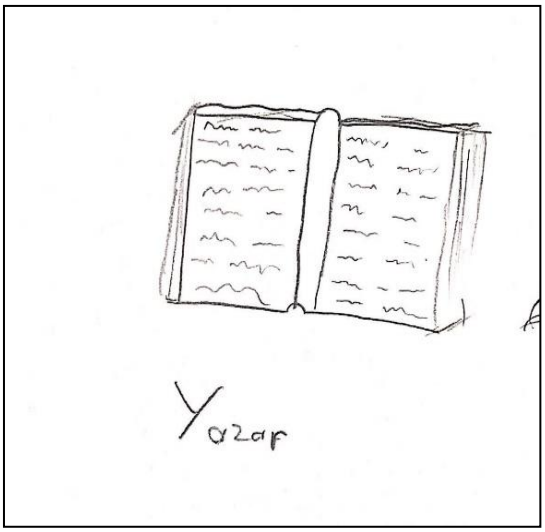


Illustration 6. Drawing of Şeyda (Author)



According to the choice of careers in the drawings of girls, it is seen that they prefered some careers unlike traditional. These are police (*f*=1), pilot (*f*=1) and civil engineer (*f*=1). Banu said *"I want to travel to other countries through my life and I want to see the foreign countries. That's why I will become a pilot"*. Seda explained her drawing (Illustration 8), with the expression *"Because I want to be a civil engineer. I want to make new and beautiful houses for people. So, they could live in peace and happiness at home."* Gözde (Illustration 9) drew female police figures by saying *"My most preferred job is being a police officer when I grow up."*

Illustration 7. Drawing of Banu (Pilot)

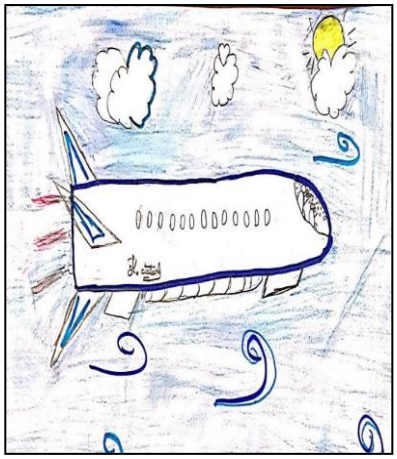


Illustration 8. Drawing of Seda (Civil Eng.)

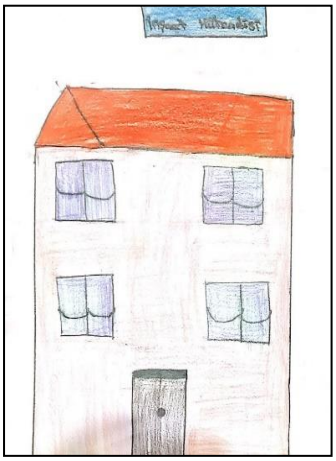


Illustration 9. Drawing of Gözde (Police)

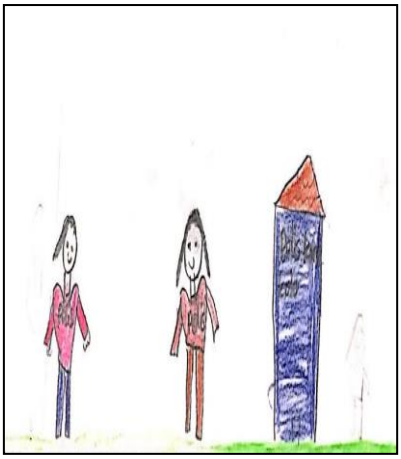
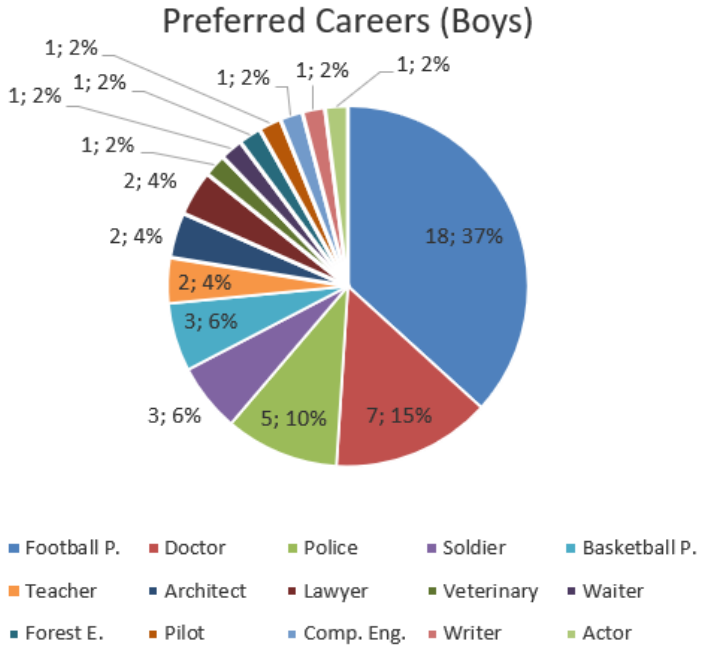


Illustration 7, 8 and 9 shows that girls stated that they wanted to be pilot, civil engineer and police officer. In real life, careers such as pilot, civil engineer and police are usually chosen by men so it can be said that girls are less interested in these careers. In this context, preference of girls for these careers may indicate that their gender perception in their career choices is more egalitarian.

Preferred Careers in Boys' Drawings

The careers preferred by the boys in the drawings are presented in Graph 2.

Graph 2. Preferred Careers by Boys in Their Drawings



As can be seen in Graph 2, the most preferred careers of boys are football player (*f*=18), doctor (*f*=7) and police officer (*f*=5). There are students who said that want to be basketball players (*f*=3), soldiers (*f*=3), teachers (*f*=2) and architects (*f*=2). The careers such as veterinary, waiter, architect, forest engineer, computer engineer, pilot, writer and actor were preferred by only one student. According to the career choices in drawings of boys, it is seen that they mostly have a traditional perspective and do not prefer the careers which are chosen by girls.

One of the boys who said that he wanted to be a football player in his drawings, Okan (Illustration 10) stated that *"I am very talented and successful in sports"*. Hakan (Illustration 11) expressed his *opinion "I love football very much and I want to win medals"*.

Illustration 10. Drawing of Okan (Football P)

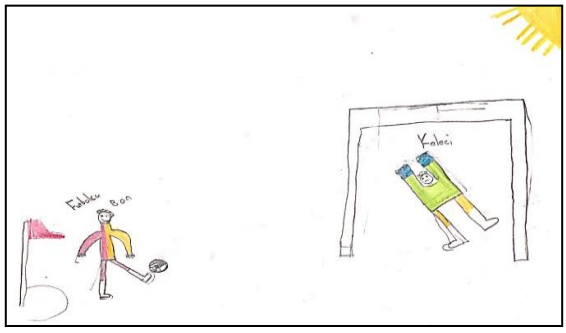
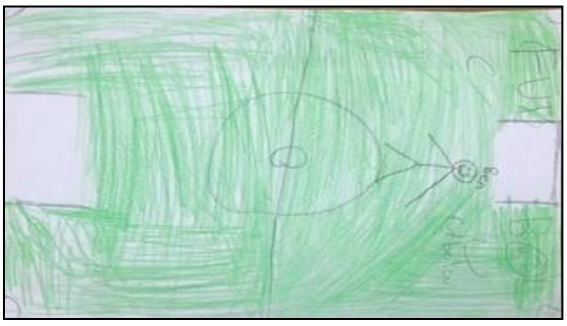


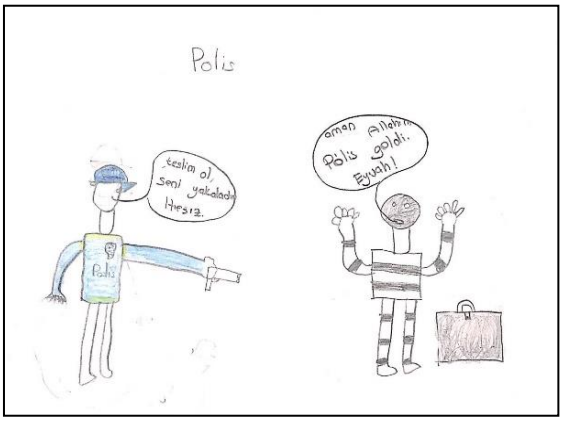
Illustration 11. Drawing of Hakan (Football P)



Özgür, one of the students who said that he wants to become a doctor, made the following statement regarding his drawing (Illustration 12) *"I will become a doctor to heal sick people"*. Ahmet (Illustration 13), who preferred to be a police officer, explained his opinion as *"because I want to catch the thieves and prevent him from committing more crimes"*.

Illustration 12. Drawing of Özgür (Doctor)

Illustration 13. Drawing of Ahmet (Police)



Barış (Illustration 14), one of the students who preferred basketball player, which was chosen by fewer students among other careers, explained the reason for requesting this career by saying *"I want to be a basketball player because I like team games and competition"*. Sinan made the following state in relation his drawing (Illustration 15) *"I always see in movies. I chose this career because I saw it from there. I also chose to protect our flag"*.

Illustration 14. Drawing of Barış (Basketball P)

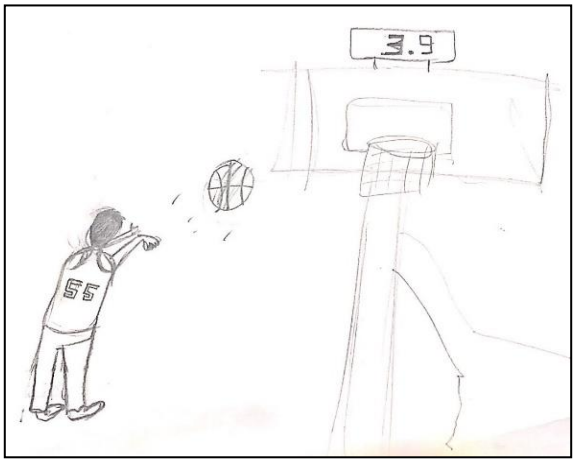


Illustration 15. Drawing of Sinan (Soldier)

Deniz made the following state in relation his drawing (Illustration 16), *"I will be a lawyer because I want justice to be provided"*. Onur (Illustration 17), is the one student that who prefers architecture said, *"I am very interested in visual arts. I always paint. That's why I want to be an architect."*

Illustration 16. Drawing of the Deniz (Lawyer)

Illustration 17. Drawing of Onur (Architect)

According to the drawings of boys about the choice of careers, It has been observed that they mostly prefer jobs work by men in real life. In this context, it can be said that boys have a traditional perspective on gender roles in career choice.

Discussion and Conclusion

The results of the current study show that the attitudes of fourth grade students towards women's choice of career did not differ according to gender. In other words, the attitudes of girls and boys towards the choose of the careers such as mayor, pilot, repairman, painting, postman and manager are similar. This finding may be attributed to the fact that gender stereotypes are not fully established in participants. However, in the study conducted by Çetin-Gündüz and Tarhan (2017), it was determined that boys had more negative attitudes towards women career choice than girls. According to that, the findings of the study and Çetin-Gündüz and Tarhan (2017) do not overlap with each other. According to the results of the research, it was determined that the majority of girls preferred the career of doctor and teacher. Similarly, the research conducted by Selanik-Ay and Emeksever (2016) found that girls mostly plan to choose the career of doctor and teacher. Indeed, most of the teachers in Turkey and OECD countries are women (TED, 2019). On the other hand, it was determined that the majority of the boys preferred to be a football player and they preferred to be a doctor in the second place. In parallel with this finding, Yüksel (2014) concluded that the majority of men tend to the football career. The preference of girls for being a doctor may indicate that they think independently of their gender stereotypes. Again, Selanik-Ay and Emeksever (2016) found that girls were more prone to the career of doctor than boys. In this sense, the fact that girls prefer physicians more is consistent with the results of this research. In addition, according to Taş, Altan and Sayek, (2006) considering that the perception of physician in children is positive for all age groups and both sexs. So, it can be seen as an expected situation that the being a doctor is mostly chosen by male and girls in the study. In addition, being teacher is the second most preferred career by girls; Only two of the boys stated that they chose being a teacher. Günindi-Ersöz (2016) stated that teachers, nurses and secretaries are among the careers deemed appropriate for women. Béreaud (1975) stated that women are mostly portrayed in the roles of teachers and nursing for work life. Saraç (2013) emphasized the traditionality of women in business life; while women were found to be suitable for hostess, teacher, secretary, nursing,

cleaning, men underlined that they were directed to business areas where autonomy and competition were higher. Erdoğan (2010) found that gender differences in the researches on children's programs became more evident and that women were presented in the family, in the careers that reminded the mother or motherhood, and men in the careers with high social status in working life. In this context, it is consistent with the views of Saraç (2013) and Erdoğan (2010) that girls choose being a teacher in the second place and that most of the boys want to be football players. In the study conducted by Tezer-Asan (2010), it was revealed that the visuals in the textbooks suggest that careers such as housewife, teacher, doctor, nursing are mostly offered to women. Therefore, the findings that the most preferred careers of girls in the research are doctors and teachers coincide with the research findings made by Tezer-Asan (2010).

Our findings show that girls prefer careers such as veterinary, writer, pilot, civil engineer and police. In particular, it is important that the careers preferred by men in general such as pilot, civil engineer and police officer are preferred by girls. This finding in the study may mean that girls think free of gender stereotypes. Dökmen (2018) stated that gender roles and stereotypes have changed compared to the past; In the study, the author questioned the views of university students about the changes in gender roles. Accordingly, both male and girls explained the rationale for the change in gender roles in the context of women's reading, education levels, and career. Today, it is important for women to be more involved in business life than before, to ensure gender equality and to show their potential. In particular, the roles of women in different careers will increase the awareness of the society in terms of minimizing the discrimination between men and women in working life as well as in all areas of life and becoming a role-model for the growing generations. In addition, it was determined that only one of the girls chose the policing career and five of the males preferred the policing career. In the study conducted by Selanik-Ay and Emeksever (2016), it was determined that boys gave more place to be a police officer in their career choices and diaries they wrote than girls. This result is in line with the finding that boys prefer policing more than girls. Another finding of the study was that the majority of boys prefer traditional careers that are imposed on men in business life. This finding is in line with the roles assigned to men in the social field. As a matter of fact, Sarıtaş and Şahin (2018) examined the careers given to women and men in the context of gender in life science textbooks; men are given more roles than women, in positions that combine with power and authority. Again, Arslan-Özer, Karataş, and Ergün (2019) stated that males are mostly portrayed as soldiers in Turkish textbooks. When the mentioned research findings are considered, roles are imposed on men in terms of career choice as well as women in all areas of life (daily, education, work, etc.). As it is known, primary school children adapt to society through observation and modeling. In this adaptation process, they internalize whatever the norms and rules of the society; they tend to stay away from situations that are not accepted or frowned upon by the society. The findings of the research conducted by Sarı (2011) are noteworthy. In this study, nursing students (male) had a role conflict about nursing; It is revealed that they are afraid to tell their career, think they will have difficulty in marrying and have fear of exclusion from society. In this context, education of preschool and primary school children, regardless

of gender, can be seen as a prerequisite for their future in a more democratic and equal society.

Another finding in this study show that being a physician, police officer, teacher, architecture, veterinary, pilot, writer and actor/actress are preferred by both boys and girls. In addition to these, the careers preferred by the girls were designer, painter, swimmer, civil engineering and cookery. Boys, unlike girls, stated that they wanted to be football player, basketball player, soldier, lawyer, waiter, forest engineer and computer engineer. As it is seen, boys preferred more careers than girls. Like this finding, Yağan-Güder and Güler-Yıldız (2016) found that preschool children were more likely to express more careers for boys. Arslan Özer, Karataş, and Ergün (2019) stated that men were shown in different careers in Turkish textbooks. Also, Esen and Bağlı (2002), in his study examining the visuals in primary school textbooks in the context of men and women, told women that being teacher was generally accepted, and men were more involved in public and business life.

Gender is a cultural concept that emphasizes the roles and responsibilities of men and women shaped by society. The way in which women and men are adopted in society gives us information about gender perception; reveal the place of women or men in society and their interactions with society. The choice of career is also influenced by profiles of men and women, based on the characteristics and needs of the society. When the literature is examined, it is seen that career roles are mostly shared in the traditional context, and those who go beyond the traditional are odd by the society. This prevents equality in the context of gender in society and prevents women from getting to prominent positions especially in the fields where they consider close to themselves. However, the elimination of the status of being a man and a woman in both the preference of career and other areas of life, and the ability of individuals to manifest themselves independently of gender will lead to the emergence of more free and democratic societies in the future.

In this research, that the majority of female students chose to be a physican is a positive finding in the context of achieving gender equality. On the other hand the choice of teachership indicates that they have a more traditional attitude and that the teachership in the society is generally done by women. In addition, it was seen that they preferred careers such as being a pilot, engineer and police officer, which are usually performed by men. There are some measures that should be taken by family, school and program developers for girls to do the jobs that society considers appropriate for men in the future. In this context, first, families should raise children in an attitude free from gender stereotypes; they should allow girls to be themselves in all areas. The roles given to students in school practices and in-class activities should be performed regardless of gender, addressing all boys and girls. Curriculum and textbooks should be designed to raise gender perception towards equality; especially male and female figures in textbooks should be revised from an egalitarian perspective. These suggestions can be employed so that boys can stand out from traditional perspective and prefer different careers. In addition, the design of researches carried out in different ways that reveal the gender perspective in the career choices of children at primary school level can raise awareness about gender equality.

Statement of Responsibility

Aslı Gündoğan; conceptualization, methodology, software, validation, editing, formal analysis, resources, investigation, data curation, writing – original draft, writing-reviewing & editing, visualization, supervision, project administration and funding acquisition. Halime Kübra Erbey; conceptualization, investigation, resources, data curation, writing – original draft, writing- reviewing & editing, visualization and funding acquisition.

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