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CONTENTS
İçindekiler

REVIEWERS of the 41th ISSUE
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Evaluation of Cognitive Entry Behaviours in Music Courses in the Secondary Stage of Elementary School

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Abstract

Problem Statement: Research shows that "cognitive entry behaviours" individually can explain half of the variability observed in whose? success doing what?. This study will focus on a comparative evaluation of the cognitive entry behaviours developed by students who started secondary stage (6th grade) and studied music courses with a music teacher and those who did not study music with a music teacher in primary stage of primary school, especially in 4th and 5th grades.

Purpose of the Study: This research aims to determine the cognitive dimensions of musical entry behaviours developed by students who studied music with a music teacher in the primary stage of elementary school when they began the secondary stage (6th grade), and to compare the musical entry behaviours developed by students who could not study music with a music teacher in the primary stage when they began the secondary stage.

Method of the Research: This research was carried out with the survey model. A cognitive domain level test, prepared within the scope of the research, was applied to a student group of 119 students in Erzurum province at the very beginning of the 2008-2009 school year.

Findings of the Research: The average of the grades that students who studied music with a music teacher in 4th and 5th grades got from the cognitive entry behaviours domain level test related to a music course was 66 out of 100 at the very beginning of the 6th grade. The average of the same test of students who did not study music with a music teacher in 4th

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and 5th grades was 46 points. In the t-test, there was a notable difference between the points of the two groups, benefitting the student group that studied music with a music teacher in 4th and 5th grades.

Conclusions and Recommendations: The number of music course cognitive entry behaviours and point level of the students who studied music with a music teacher in the primary stage of elementary school are higher than the students who did not study with a music teacher. These evaluations that will be carried out at the beginning of the school year will make it possible to know students better, to correct their deficiencies, their lack of education and their behaviour patterns, and economize time and labour.

Keywords: Music education, musical behaviour, cognitive domain, cognitive entry behaviours

Considering the positive effects of behavioural changes brought about with music education on cognitive, affective and behavioural skills of an individual, the educational aspects of music have been an integral discipline of formal education, and is accepted as compulsory in the eight-year education system. Music education "is the process of developing musical behaviour of an individual intentionally and changing, transforming, developing and completing individual's musical behaviour by her/his experience" (Uçan, 1999, p. 4). What is meant here by "musical behaviour" is the behaviour related to the achievements in achievement-based music programmes rearranged according to the structuralist approach at certain levels.

In Turkey, eight-year continuous education was adopted and the "secondary schools" were configured as three-year education before they were then combined with the five-year elementary school, and certain disciplines of the programme were restructured as an eight-year education system. In this structure, music education was distributed into eight years and it was determined that music courses should be taught by music subject teachers. However, previous regulations continue to some extent due to inadequate numbers of music teacher staff, and music courses are sometimes taught by classroom teachers in the primary stage of elementary school. In some schools the class load of music courses are taught by music subject teachers from the 4th and 5th grades. This study aims to contribute to the field by considering the cognitive aspects of the musical behaviours developed by students who studied music with a classroom teacher in the primary stage of elementary school and those who studied it with a music subject teacher when they began 6th grade.

Basic Features of Elementary School Music Programme in Parallel with Programme Development in Education

Teaching activities in education are planned. However, these plans must be renewed continuously according to circumstances that change very fast. This necessity is the basis of the concept of "curriculum development in education."

Curriculum development in education is the act of correcting, renewing, and generalizing a specific education or scientific programme in terms of its general or

special aims, course subject, teaching methods and evaluation processes after the suggested amendments are tested (Büyükkaragöz & Çivi, 1998, p. 230). Four basic elements are mentioned in this and other definitions. First of all, an education programme expresses a certain target. This is the answer of the question "why." The second element reflects the content and answers the question of "what to teach." The third question asks how to organize what to teach in a planned way. Finally, the convenience of these activities should be considered, answering the question of "how much."

The subject- and target-based elementary school music programmes used since 1995 (Ministry of National Education, 2000) were partly altered on May 27, 2007, to measure achievements via activities instead of target and target behaviours using a structuralist model. When activities related to the programme's achivements in the field of learning are examined, it is obvious that its aim is musical achievement formed by various music types. The detections and decisions related to the quality and quantity of the activities were determined by the prelearning, concern and needs of the students with the guidance of teachers, reinforcing the idea that teachers should plan these activities carefully. This programme was arranged taxonomically as preparation for future learning and incrementally based on previous experience to emphasize teaching rather than learning. Learning accepts individual differences, supports students interested in research, gives importance to previous experience in learning, emphasises performance and activities in learning, considers how students learn, adopts the understanding of a student's learning in a social environment, adopts realism and functionality in teaching, and allows students to build information and make a deduction from experience (Ministry of National Education, 2007).

Cognitive Domain and Cognitive Entry Behaviours

A terminal behaviour aimed at education has cognitive, affective, behavioural, and heuristic dimensions. By stating that human behaviours about education are called cognitive, affective, behavioural and heuristic, Sonmez claims that "Cognitive domain is the domain where mentally domained of learnt behaviours are coded" (Sönmez, 2001, p. 46). The competences expressed in cognitive domain are those that mean knowledge or dealing with these backgrounds, knowing the methods and instruments and giving them back in the same way, presenting another expression without changing their meanings, using knowledge such as a given concept, generalization, principle, classification, criteria, method, etc., to comprehend new situations and to solve new problems, understanding the components of the whole and the relationship between these components, being able to produce original knowledge, developing sequences of operation and being able to develop a complement of relationships, and lastly determining the service of a complement of knowledge for target services (Özçelik, 1988, p. 86-88).

In his study, "Curriculum-An Introduction to Field" quoting from Bloom (Bloom et al., 1956), Gress describes cognitive domain as:

Our original plans called for a complete taxonomy in three major parts-the cognitive, the affective and the psyco-motor domains…The cognitive domain…includes those objectives which deal with the recall or reorganization of knowledge and the development of intellectual abilities and skills. This is the domain… in which most of the the work in curriculum development has taken place and where the clearest definition of objectives are to be found (Gress, 1988, p. 209). In his article, "The Taxonomy of Educational Objectives - Its Uses in Curriculum Building," Krathwohl defined cognitive domain as, "The taxonomy is divided into three domains: cognitive, affective and psycomotor. The cognitive includes those objectives having to do with thinking, knowing and problem solving" (Krathwohl, 1998, p. 261).

When we consider the education according to a certain systems in the axis of inputs, process and outputs, entry behaviours of the individual is an important input element to the student's comfort and ease of learnings. Since educational programmes are classified incrementally, the students who will go through another stage are supposed to reflect certain entry behaviours for this new stage. Uçan defines entry behaviours as "Prelearnings which enable (or make it possible) or at least make easier to learn a certain learning item are called as entry behaviours of that learning item" (Uçan, 1996, p. 152). He defines cognitive entry behaviours as "Cognitive featured (or this feature of it is dominant) prelearnings which enable (or make it possible) or at least make easier to learn a certain learning item are called Cognitive Entry Behaviours" for that learning item (Uçan, 1996, p. 152). Bloom explains that pre-learnings required for learning a certain unit are cognitive entry behaviours; with this concept, all information, skills and competence required for learning a series of learning unit is explained (Bloom, 1964/1998, p. 36-38).

Entry behaviours also means the availability of the student and his or her readiness to learn. Being ready or availabile is one of the most important factors affecting learning. A student's being ready to learn means he is ready to adopt learning mentally and psychologically and means he/she has a certain background in cognitive, affective and behavioural domains. When Sönmez explains mastery learning in his study called "Systematic Education," he claims that cognitive entry behaviours can explain .50 variance observed in success (Sönmez, 2004). In his study in which he adapted Bloom's study of "Learning at School" to art education, Uçan discusses cognitive entry behaviours in input variables of model chapter and claims that these behaviours can explain half of the success variables in subsequent learning units. (Uçan, 1996). The questions testing knowledge and skills that are a precondition of the programme are supposed to be included in the tests measuring cognitive entry behaviours. While preparing these tests, the targets and scope of the programme evaluated are supposed to be analyzed carefully and precondition behaviours related to every target are supposed to be individually discovered (Erden, 1998, p. 63).

This research is aimed at determining the cognitive aspects of musical entry behaviours developed by students who completed their music education with a classroom teacher or another subject teacher in the primary stage of elementary

school when they began the secondary stage (6th grade), and to compare the musical entry behaviours developed by the students who studied their music courses with a music subject teacher in the primary stage when they began the secondary stage. The results obtained from this research are important in examining the present case related to dimensions of the basic problems met by music educators in elementary school and especially with the effects of the quantity of available music teachers on the education process.

Method

Research Design

This research was carried out with the survey model. "In this model, the event, person or object which are subject to the research are tried to be defined in their own conditions and as they are" (Karasar, 2005, p. 77). The Cognitive Domain Level Test prepared within the scope of the research was given to the sample without any external interference at the very beginning of the 2008-2009 school year.

Sample

The sample of the research is 6th grade students from elementary schools, 119 students who were chosen randomly out of five elementary schools in Erzurum (centre and county) in the beginning of the 2008-2009 school year. Seventy-seven of 119 students had a music teacher in 4th and 5th grades while 42 of them had no music teacher in the previous years. (See Table 1)

Table1

Sampling Table

Schools	The number of students with a music teacher in 4th and 5th grades.	The number of students who did not have a music teacher in 4th and 5th grades.	Final Total
Mehmetçik Elementary School	25	1	26
Kayakyolu Ç.M.İ.S. Elementary School	30	-	30
Ömer Duygun Elementary School	25	3	25
Yağan Cumhuriyet Elementary School	-	31	31
Yahya Kemal Elementary School	-	7	7
Total	77	42	119

Validity and Reliability

A 18 itemed "Cognitive Domain Level Test" about learning domains and achievements in primary stage music programme of elementary schools was prepared by making use of the music course schedules of 3th, 4th, 5th grades toward the evaluation of music course cognitive entry behaviours of the students who began the secondary stage of elementary school, teacher's guide books, student course books, and various test materials previously prepared about this field. "Equivalent Halves (to halve a test) method" was used for the reliability of the test and the reliability co-efficient was .73.

In determining reliability with the equivalent halves method it is possible to apply a test form in a single session and get two test scores that belong to each individual by halving the test in two equal parts. It is supposed that two parts of the halved test applied in a single session are parallel and the average variances of these two halves are equal. The correlation between the scores that individuals got from the two halves of the test is the equivalence factor (Kan, 2007, p. 42). Therefore, there is a positive relationship among the answers given to the test divided into two parts and that measuring instrument had the minimum reliability. An item analysis was made on the data obtained from pre-application and the difficulty degreess of the items in test (p) was determined. The difficulty of a test item (p) is the percentage of the students who gave the correct answer to that item; in other words, the ratio of the number of those who gave correct answers for that item (Nd) to the total number of

students in the group (Nt) (Tekin, 2000, p. 246). According to the item analysis, test items are generally of medium difficulty and some questions that were calculated with ease and difficulty were not omitted from the test since they are directly related to programme achievements and measure the students' music interactions in daily life.

To determine the distinctiveness strength of items (d) points were sequenced from high to low and this operation was made by getting points in accord with their ratios from sub and top groups. As a result of calculation, the items whose distinctiveness is between 0.12 and 1 were included in the test. Although three questions are not distinctive (music channel Kral TV, pop music singer "Tarkan", etc. See Appendix) they were not omitted from the test since they are directly related to the common music culture achievements of the programme and helped determine the students' music interactions in daily life.

Data Analyses

The 18 item level test was applied to the students in the sample at the beginning of 2008-2009 school year. The whole test had 100 points and the point of each questions was determined as 5.5. The average was calculated on application results and measurement was evaluated in terms of the mastery learning limit (generally points in the ratio of 70 percent are successful).

Findings and Results

The findings and interpretation are explained in the following tables and texts.

1. The average of the answers given to the level test of cognitive entry behaviours of students who began secondary stage in elementary school are as follows:

Table 2

Arithmetic averages of the points obtained from measuring instrument

Student characteristics	N	$\bar{x}$
Students who had a music teacher in 4th and 5th grades	77	66
Students who did not have a music teacher in 4th and 5th grades	42	46

According to the table, the average of grades obtained by 77 students in the sample on cognitive entry behaviours domain level tests was 66 points for students who studied music with a music teacher in the 4th and 5th grades, when they began

6th grade. The average of points on the same test by the 42 students in the sample who did not study music with a music teacher (studied with a classroom teacher or another subject teacher) was 46. The 66 points earned by students who studied music with a music teacher in 4th and 5th grades reflects a successful level since the planned musical lives or behaviours of students at that time were passive because students at the beginning of a new educational programme forget their previous cognitive music lives to some extent.

Musical achievements in the primary stage of elementary school are often achieved with deficit learnings. A summer holiday just after these achievements can cause a negative effect on the cognitive aspects of targets achieved. In this discontinuous process where students interacted with different education stages, the 66 point- level is important because it reflects a success level close to the 70 percent level that Bloom's "Mastery Learning Model" sets as a criterion. At this point, cognitive entry behaviours and affective entry characters of students, cues, reinforcers, feedbacks and corrections are present in every education position, students' active attendance is ensured, and units of course or subject are sequenced gradually although they are far from the planned teaching-learning approaches, methods and techniques, and even when getting more attention, motivation, review, transition, development, summary, remotivation, closing and evaluation (Sönmez, 2001). Another important case (Table 2) is that the students who could not study music with a music subject teacher in the primary stage, especially 4th and 5th grades, could not have the same success and got 46 points. This result demonstrates the obligation of teaching music courses with music subject teachers in the primary stage of elementary school in order to reach the achievements anticipated in the music course programme.

2. Fourty-two tests that were answered and graded and which belong to the students who studied music with a music teacher in 4th and 5th grades were chosen randomly in order to compare with the student group consisting 42 people in our sample who could not study music courses with a music teacher in the same education stage. A t-test was applied to determine whether there was a point differentation between the two groups. The results are shown in the following table.

Table 3

T-test to determine point differentation between two groups in terms of studying music courses with music teachers or not

Student characteristics	N	$\bar{X}$	s	t	Sig
Students who did not have music teacher in 4th and 5th grades	42	46,5238	13,6564	-8,065	,000
Students who had music teacher in 4th and 5th grades	42	67,7619	10,2334		

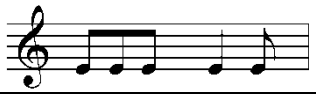
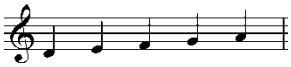
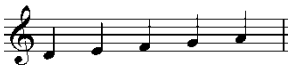
The reasonable difference between two point groups in the .05 meaningful level.

According to the table, a reasonable difference was determined between the student group who studied music with a music teacher in 4th and 5th grades and whose standard deviation was 10,23 and arithmetic average was 67,76 in terms of the points of the two groups. In other words, when the students who studied music with music teachers in 4th and 5th grades began the secondary stage, 6th grade, they developed cognitive entry behaviours that can be considered quite successful. These behaviours will cause a positive effect for achievements they develop in the secondary stage, and they will play a part in the level of .50 variance of their success.

3. Another important finding of the study is that the percentages of the correct answers given by the students who studied music with a music teacher and those who studied music courses with another subject teacher for 7, 9, 10, 11 and 12th questions of the measuring instrument are not in the intended level. The questions address mostly the achievement of know-write-tell-chose and marking the basic rhythm forms, rest signs and values, note names, places and values included in the music programme of 4th and 5th grades. The distrubution and percentages of correct answers are shown in the following table. Table 4 is developed with the data from the sampling group of 42 individuals in two separate groups illustrated in Table 3.

Table 4

The percentages of correct answers of cognitive entry behaviours about basic music symbols and signs

Questions	**Student Profile**	Students who did not have music teacher in 4th and 5th grades		Students who had music teacher in 4th and 5th grades	
	N	42		42	
	f	Number of people who gave correct answers	Percent of people who gave correct answers (%)	Number of people who gave correct answers	Percent of people who gave correct answers (%)
Question 7. Which rhythmic pattern does this rhythm form belong to? 		7	16	12	28
Question 9. What is the value of this note? 		8	19	20	47
Question 10. What is the value of this rest sign? 		16	38	19	45
Question 11. What are the low-pitched and high-pitched notes in the figure respectively? 		8	19	15	35
Question 12. What are the adjacent notes in this figure? 		8	19	24	57
Average Percentage			**22**		**42**

Although the quantity and percentage of the correct answers given by the sampling group to five questions related to basic music symbols and signs seems as if they favor the students who studied music with music teachers in the primary stage of elementary education, the percentiles here are lower with regard to the points obtained from the whole test.

Conclusions and Recommendations

When they began the secondary stage (6th grade), the number and point level of music course cognitive entry behaviours developed by students who studied music with a music subject teacher in 4th and 5th grades are higher than those who did not study with a music teacher. Along with many other possible factors, studying music courses with a music teacher is thought to be the most effective factor. Between the students who studied music with a music subject teacher and those who studied with a classroom teacher in 4th and 5th grades, there is an increase in realization levels of the achievements of music course cognitive entry behaviours related with knowing-writing-telling-choosing and marking the basic rhythm forms, note values, note names and places, rest signs and values in favor of students who studied with a music teacher, and the realization levels of related achievements seem low in both student groups. The reason for this result may be the handling of the subjects mostly related with theoretical and oral music culture in the primary stage programme of elementary school (although it includes music symbols and signs). According to the evaluation results, cognitive entry behaviours of the students who studied music with a music subject teacher occur in higher percentages than of those who did not study with a music teacher.

When the eight-year education system began in Turkey, it was proposed that music courses in primary stage of elementary school—especially in 4th and 5th grades—should be taught by music teachers. However, this action could not be carried out in some schools in central districts and especially in schools in counties and villages due to an inadequate number of music teachers. The formal reply the Ministry of National Education gave to an information request dated 28.11.2006, stated that there were 5.983 teachers, 5.883 of whom were permanent staff and 100 of whom were contracted staff (Ministry of National Education MN.E, 2006). There has not been a reasonable change so far, since, as Uçan indicated, there are nearly 40.000 educational institutions including preschools, elementary schools and secondary schools in Turkey and there is supposed to be at least one music teacher in each school (Uçan, 2005).

Basically, the level of cognitive, behavioural and affective domain-oriented prelearning of students who begin a new educational programme has a close relationship to the availability of that programme. Since music programmes in elementary schools depend on preleraning and they are designed as preparative for future learning, the individual's (students) prelearning s will play an important role in their success in the new programme.

Uçan claims that music education is proposed for preschool institutions in Turkey but the required case has not been achieved in this application yet, and the students begin the primary stage of elementary school with a great music education deficit. This deficit is getting bigger, and it affects the secondary stage negatively, so the troubles there are increasing, which affects the secondary school institutions. This is the "cumulative problem" transferred to music education in secondary schools in Turkey (Uçan, 1989, p. 26).

Therefore, it is thought that the applications toward the evaluation of entry behaviours can be useful to some extent in solving this cumulative problem. The studies on this subject can be discussed not only in the cognitive domain but also in the behavioural and affective domains. Such evaluations made in the beginning of the education process allow tracking of the students new in the process, and complete the prelearnings necessary for the students by repeating, reinforcing and giving feedback and correction. The elements that negatively affect the development of music programme achievements in elementary schools should be analyzed at the right time and position and all scientific efforts toward omitting these negative elements from the system should go on intensively and continously. The success of the students whose cognitive entry behaviours are at the top level must be evaluated at the end of the process and it must be determined if the same success is there or not. Also, cognitive entry behaviours must be determined with more elaborate and careful evaluations according to the possible positive relationships there. In addtion to these cognitive behaviours, such pre-process evaluations must be extended to behavioural and affective domains. These evaluations made in the beginning of the school year will allow teachers to know new students better, to correct and complete their deficit aspects if any, their learning deficit and behaviour patterns that are supposed to be completed. Such evaluations of recognition and placement enable students to reach the programme achievements easier and faster, to easily determine where the problems are and to economize time and labour.

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Appendix: Cognitive Domain Level Test carried out in the study

Music Course Level Test in 6th Grade of Elementary School (Entry Behaviours)

Name:

Surname:

School:

Grade:

P.S: Read the questions carefully and circle the possible correct choice with a pencil. You do not have to write your name. The results of the test will be concealed by the researcher. Thank you for your contributions.

1. What is the name of the group consisting of musical instruments?

   a) Chorus b) Opera c) Orchestra d) Solo

2. Which one is a "*Folk Dance*" danced with Turkish Folk Music?

   a) Ballet b) Ballad c) Halay d) Opera

3. Which one is mostly danced in Black Sea Region?

   a) Çayda Çıra b) Misget c) Bar d) Horon

4. What are the names of signs which indicate music sounds?

   a) Concert b) Note c) Song d) Orchestra

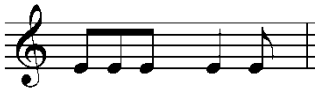
5. What is the name of the figure consisting of 5 horizontally parallel and equally divided lines?

   a) Note b) Treble Cleft c) Measure Number d) Stave

6. What is the name of the activity of singers playing or singing musical works in front of a group?

   a) March b) Concert c) Composition d) Melody

7. Which rhythmic pattern does this rhythm pattern belong to?



   a) 3/8 b) 2/4 c) 6/8 d) 5/8

8. What is it called to read musical works with their notes, lenghts sounds?

   a) Solfege b) Solo c) Ballad d) Tempo

9.  What is the value of this note?

   a) Half note (minim)

   b) Quarter note (crotchet)

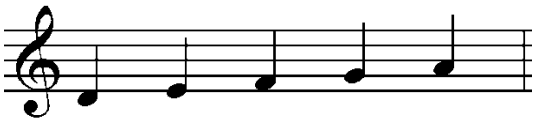
   c) Eighth note (quaver)

   d) Sixteenth note (semiquaver)

10.  What is the value of this rest sign?

a) Quarter rest b) Eighth rest c) Sixteenth rest d) Double whole rest

P.S: Answer the 11th and 12th questions according to the following figure.



11. What are the low-pitched and the high-pitched of these notes in the figure respectively?

a) re-fa b) mi-sol c) mi-la d) re-la

12. What are adjacent notes to mi note according to the figure above?

a) fa-sol b) re-fa c) re-la d) fa-la

13. Which one is a music channel?

a) ATV b) ShowTV c) KanalD d) KralTV

14. Which one is a pop music singer?

a) Gülşen Kutlu b) Ahmet Özhan c) Tarkan d) İdil Biret

15. Which one is a stringed instrument?

a) Guitar b) Piano c) Trumpet d) Violin

16. Which one can not be used as rhythm instrument?

a) Our body
b) Our desks in the classrooms
c) A violin
d) Wooden spoons

17. Which following work is a "March"?

a) Yemen Türküsü b) Bilaloğlan c) Yörük Ali d) Dağ Başını Duman Almış

18. Which one is not one of the music rennovations Ataturk led?

a) Opening a school for education of music teachers
b) Sending many numbers of students to Europe.
c) Opening new factories
d) Preparing collected works of folk music

End of the test. Thank You…

İlköğretim İkinci Kademe Müzik Dersi Bilişsel Giriş Davranışlarının Değerlendirilmesi

(Özet)

Problem Durumu: Yapılan araştırmalar tek başına "bilişsel giriş davranışları"nın başarıda gözlenen değişkenliğin yarısına kadar olan kısmını açıklayabildiğini göstermektedir. İlköğretim II. kademeye (6. Sınıfa) başlayan ve ilköğretim I. kademede ve özellikle 4. ve 5. Sınıflarda müzik derslerini müzik öğretmeni ile gerçekleştiren öğrencilerle, gerçekleştiremeyen öğrencilerin kendilerinde oluşturdukları bilişsel giriş davranışlarının karşılaştırmalı bir değerlendirmesi bu çalışmanın problemi olarak öngörülmüştür.

Araştırmanın Amacı: Bu araştırma ile ilköğretim birinci kademede sınıf öğretmeni veya bir başka branş öğretmeni ile yürüttüğü müzik eğitimi sürecinden çıkan öğrencilerin ikinci kademeye (6. sınıfa) geçerken kendilerinde oluşturdukları müzikal giriş davranışlarının bilişsel boyutlarının tespiti ile, birinci kademede müzik derslerini müzik branş öğretmeni ile yürüten öğrencilerin ikinci kademeye geçerken kendilerinde oluşturdukları müzikal giriş davranışlarının karşılaştırılması amaçlanmıştır.

Bu araştırmadan çıkan sonuçların, ilköğretim müzik eğitiminde yaşanan temel sorunların bazı boyutları ve özellikle "müzik branş öğretmeni niceliğinin eğitim sürecine etkileri" boyutuyla ilgili olarak mevcut durumun tespiti açısından önemli olduğu düşünülmüştür.

Araştırmanın Yöntemi: Bu araştırma, tarama (Survey) modeli ile yürütülmüştür. Araştırma kapsamında hazırlanan Bilişsel Alan Düzey Belirleme Testi, örnekleme alınan öğrenci grubuna hiçbir dış müdahale yapılmadan 2008-2009 Eğitim-Öğretim yılının hemen başında uygulanmıştır. İlköğretim ikinci kademeye başlayan öğrencilerin müzik dersi bilişsel giriş davranışlarını değerlendirmeye dönük olarak ilköğretim 3-4-5. sınıf müzik ders programları, öğretmen kılavuz kitapları, öğrenci ders kitapları ve daha önce bu alanda konu ile ilgili olarak hazırlanmış çeşitli test maddelerinden yararlanarak ilköğretim birinci kademe müzik programlarındaki hedef ve hedef davranışlarla ilgili olan, 18 maddelik bir "Bilişsel Alan Düzey Belirleme Testi" hazırlanmıştır. Hazırlanan testin güvenirliği için "Eşdeğer Yarılar (Testi Yarılama) Metodu kullanılmış, testin güvenirlik katsayısı .73 olarak tespit edilmiştir. Bu sonuca göre, iki yarıya bölünen teste verilen yanıtlar arasında olumlu yönde bir ilişki olduğu ve ölçme aracının asgari güvenirliği taşıdığı söylenebilir. Yapılan madde analizleri sonucu test maddeleri genellikle orta güçlükte olup, çok kolay ve çok zor olarak hesaplanan bazı sorular da direkt olarak program hedefleri ile ilgili oldukları için ve ayrıca öğrencilerin günlük hayattaki müzik etkileşimlerinin tespiti amacıyla testten çıkartılmamıştır.

Maddelerin ayırt edicilik gücünün (d) belirlenmesinde puanlar yüksekten düşüğe doğru sıralanmış ve bu işlem, alt ve üst gruplardan orantılarına uygun biçimde puanlar alınarak gerçekleştirilmiştir. Hesaplamalar sonucu, 0,12 ile 1 arasında ayırt ediciliği olan maddeler teste dahil edilmiştir. Üç adet soru ayırt edici olmamasına rağmen (müzik kanalı "Kral Tv", pop müzik sanatçısı "Tarkan" gibi, bkz. Ek 1.) direkt olarak program hedefleri ile ilgili oldukları için ve ayrıca öğrencilerin günlük hayattaki müzik etkileşimlerinin tespiti amacıyla testten çıkartılmamıştır. Kesinleşen 18 maddelik düzey belirleme testi, 2008-2009 eğitim-öğretim yılının hemen başında örneklemdeki öğrencilere uygulanmıştır. Bilişsel giriş davranışlarını ölçmeye dönük olarak hazırlanan 18 maddelik ölçme aracının değerlendirilmesinde testin bütünü 100 tam puan üzerinden puanlanmış ve her bir sorunun puanı, 5.5 olarak tespit edilmiştir. Uygulama sonuçları üzerinde aritmetik ortalama hesaplanmış ve ölçüm, "Tam Öğrenme" sınırına göre (genellikle en az %70 oranındaki puanlar başarılı) değerlendirilmiştir.

Araştırmanın evrenini; 2008-2009 Eğitim-Öğretim yılında Erzurum'daki (merkez ve ilçe) ilköğretim okullarının 6. sınıf müzik öğrencileri oluşturmaktadır. Örneklem ise bu okullardan random (rastgele) yöntemle seçilen 5 adet ilköğretim okulundan, 2008-2009 Eğitim-Öğretim yılında müzik 6.sınıfa (ikinci kademeye) başlayan 119 öğrencidir.

Araştırmanın Bulguları: İlköğretim ikinci kademeye başlayan öğrencilerin bilişsel giriş davranışlarını değerlendirmeye dönük olarak hazırlanan düzey belirleme testinde 4. ve 5. Sınıftaki müzik derslerini müzik öğretmeni ile yürüten, örneklemdeki yetmiş yedi öğrencinin 6. sınıfa başladıkları anda, müzik dersine ilişkin bilişsel giriş davranışlarını ölçmeye dönük düzey belirleme testinden 100 tam puan üzerinden aldıkları notların aritmetik ortalaması 66 puan, 4. ve 5. sınıftaki müzik derslerini müzik öğretmeni ile yürütmeyen (Sınıf öğretmeni veya bir başka branşın öğretmeni ile yürüten) örneklemdeki kırk iki öğrencinin aynı testten aldıkları puanların aritmetik ortalaması, 46 olarak tespit edilmiştir. Bu sonuç, müzik dersi programında kapsanan hedeflere ulaşılmasında ilköğretim birinci kademede kesinlikle bu derslerin müzik branş öğretmenleri ile yürütülmesi gerektiği konusunda bizlere önemli göstergeler sunmaktadır.

Örneklemdeki iki farklı öğrenci grubu arasında puan olarak bir farklılaşma olup olmadığının tespitine dönük t testi uygulanmıştır. İki öğrenci grubunun puanları açısından 4. ve 5. sınıfta müzik derslerini müzik öğretmeni ile yapan ve aritmetik ortalaması 67,76 ve standart sapması 10,23 olan öğrenci grubunun lehine, anlamlı bir fark tespit edilmiştir.

İlköğretim müzik 4. ve 5. sınıf müzik programında yer alan ve daha çok temel müzik sembolleri ve işaretleri ile ilgili olan 5 adet soruya örneklem grubunun vermiş olduğu doğru cevap miktarları ve yüzdeleri, çalışmaya konu olan eğitim kademesindeki müzik derslerini, müzik öğretmenleri ile

yürüten öğrencilerin lehine görünse de buradaki yüzdelik değerler, testin tümünden alınan puanlara göre daha düşük bir seviyededir.
Araştırmanın Sonuçları ve Önerileri: İlköğretim I. kademe 4. ve 5. sınıfta müzik derslerini müzik branş öğretmenleri ile gerçekleştiren öğrencilerin II. kademeye (6. Sınıfa) başlarken beraberlerinde getirdikleri müzik dersi bilişsel giriş davranışlarının **sayısı** ve puan olarak seviyesi, müzik öğretmeni ile çalışamayan öğrencilere oranla daha yüksektir. Bu sonuca varılmasında diğer pek çok faktör etkili olabileceği gibi, ağırlıklı olarak müzik derslerinin müzik öğretmeni ile yapılmış olmasının etkili olduğu düşünülmektedir.
İlköğretim I. kademe 4. ve 5. sınıfta müzik derslerini müzik branş öğretmenleri ile gerçekleştiren öğrencilerle, sınıf öğretmeni ile gerçekleştiren öğrenciler arasında, II. kademeye (6. Sınıfa) başlarken beraberlerinde getirdikleri müzik dersi bilişsel giriş davranışlarının "nota değerlerini, nota isimlerini ve yerlerini, sus işaretlerini ve değerlerini ve basit ritm kalıplarını tanıma- yazma-söyleme-seçip işaretleme" ile ilgili hedeflerinin gerçekleşme düzeylerinde, müzik öğretmenleri ile çalışan öğrencilerin lehine bir artış söz konusu olmakla beraber, ilgili hedeflerin gerçekleşme düzeyleri, her iki öğrenci grubunda da düşük görünmektedir. Bilişsel giriş davranışları üst düzeyde olan öğrencilerin başarı durumları, süreç sonunda da değerlendirilerek aynı başarının orada da olup olmadığının tespiti yapılmalı ve buradaki olası olumlu ilişkilere göre bilişsel giriş davranışlarının daha detaylı ve özenli değerlendirmelerle tespiti sağlanmalıdır. Ayrıca bilişsel davranışlara ek olarak bu tarz süreç başı değerlendirmeler hem devinişsel alanda hem de duyuşsal alanda yaygınlaştırılmalıdır.
Eğitim dönemi başında yapılacak bu tarz değerlendirmeler, sisteme girecek öğrencileri daha iyi tanıma, onların varsa eksik yönlerini, yarım yamalak öğrenmelerini ve tamamlanması gereken davranış örüntülerini bilinçli bir şekilde düzeltme ve tamamlama imkanı verecektir. Bu şekildeki tanıma ve yerleştirmeye dönük değerlendirmelerle, program hedeflerine daha kolay ve daha çabuk ulaşma imkanı yaratılacak, sorunların daha çok nereden kaynaklanmış olabileceği daha kolay tespit edilebilecek, emek ve zamandan tasarruf sağlanacaktır.
Anahtar Sözcükler: Müzik eğitimi, müziksel davranış, bilişsel alan, bilişsel giriş davranışları

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An Examination of Language Achievement Tests Administered in Primary Education

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Abstract

Problem Statement: Testing student performance during the teaching process is one of the responsibilities of a language teacher. Tests may have harmful or beneficial effects on teaching and learning. Language testing requires testing different skills and therefore, it is more complicated than testing for other subject areas presented in schools. On the other hand, an achievement test is very important for educational purposes, because, in addition to evaluating student performance, it has additional aims such as finding the areas of difficulty or providing students with the details of their performance.

Purpose of the Study: The purpose of this study was to examine the language tests prepared for the primary education system in Turkey. The study also aims to determine the language skills that are considered important by language teachers in language tests as well as the distribution of language skills and elements in tests.

Method: A descriptive research was performed in this study. Sixteen schools in Diyarbakır, Turkey, were chosen as samples. The instruments included a questionnaire prepared by the researcher and achievement test papers administered to the 8th grade students attending the sample schools. Thirty teachers answered the questionnaire and 55 test papers were examined.

Findings and Results: The results indicated that grammar is the most frequently tested element in language tests followed by vocabulary. Language skills, especially listening and speaking, are generally neglected.

Conclusions and Recommendations: The examples presented in this study show that teachers in primary schools tend to test grammar and

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vocabulary instead of language skills. To help the language teachers improve their testing skills, in-service testing courses could be prepared by institutions or by the Ministry of Education. In addition, teachers may be provided with booklets giving practical information about test preparation or a Web page can be prepared with explanations and sample test papers.

Keywords: Language testing, primary education and testing

A language teacher has many responsibilities, one of which is to test student performance during the teaching process. Testing is an inseparable part of language teaching because it pertains directly to the language learning process. As suggested by Hughes (2003), especially when a test is regarded as important, "preparation for it can come to dominate all teaching and learning activities" (p. 1).

Language testing is more complicated than testing for other subject areas presented in schools. Davies (1990) gives two reasons why testing the knowledge of a language is more complicated. First, a certain language does not have "obvious content" (p. 9). It covers a wide range of topics. Second, because of the natural acquisition of human language, there is a "native speaker" factor that does not exist in any of the other subject areas; for example, "we believe there is a native speaker of a language but not a native speaker of chemistry" (p. 10).

As noted by Bachman and Palmer, there is a difference between tests and the other components of an instructional program. Unlike the other components, the main purpose of a test is to measure (1996). The results of tests are crucial because they lead to important decisions for the programs as well as for the individuals (Shohamy, Donitsa-Schmidt & Ferman, 1996). Tests can be used for administrative, instructional, or research purposes (Cohen, 1991). Hughes (2003) subsumes language tests under four headings, including proficiency tests, placement tests, diagnostic tests, and achievement tests. Proficiency tests measure the general language proficiency levels of the students unrelated to any language course. Placement tests are administered to place the students according to their language proficiency levels. Teachers administer diagnostic tests before the language course begins to find strengths and weaknesses of the students. Achievement tests measure the students' progress in a language course. Teachers use achievement tests to measure the progress obtained by the students, recognize their weaknesses, and give them reasons to study. In other words, these tests are administered in order to learn "whether or where progress has been made in terms of the goals of learning" (McNamara, 2000; p. 6).

Weir (1991) lists three qualities of a test: validity, reliability and efficiency. A test is accepted as valid if it measures accurately what it is intended to measure. It is considered reliable if the same result is obtained repeatedly. Efficiency, on the other hand, is related to practicality and cost in test design and administration.

Tests may have harmful and beneficial effects on both teaching and learning processes (Hughes, 2003). The term used to describe these effects is *washback* (or

backwash as used by some authors). Messick (1996) described *washback* as "the extent to which the introduction and use of a test influences language learners to do things they would not otherwise do that promote or inhibit language learning" (p. 241). *Curricular alignment* is another term and describes the situations in which the curriculum is narrowed according to the contents of the test (Hamp-Lyons, 1997). A related concept is *measurement driven instruction*, which refers to the situations in which learning is modified according to tests (Shohamy et al., 1996). As suggested by Hughes (2003), language tests are not always of good quality. Consequently, they may often affect teaching and learning processes negatively. Although testing is an inseparable facet of teaching, it is generally recognized as a burden for teachers and students. According to Cohen, students often recognize tests as possible threats because they think they will not be successful (1991). Teachers, on the other hand, find it difficult to prepare test items and they are seldom satisfied with the results.

The main concern of the present study is the examination of language achievement tests administered by primary schools in Turkey. As mentioned before, achievement tests are related to language courses. That is to say, they "refer back to previous learning and are concerned solely with that" (Davies, 1990; p. 20). They consist of progress achievement tests, which are administered within an educational year or term, and final achievement tests administered at the end of a course (Hughes, 2003). The content of the test items are often pertinent to the course syllabus or course objectives. Much like external examination tests, an achievement test is prepared by most teachers with evaluation purposes, but it also has some additional aims such as obtaining information about the effectiveness of the instruction and finding the areas of difficulty (Heaton, 1975). A good classroom test also may help students improve their language skills because students can learn from their errors when provided with the details of their performances.

Test items are examined in detail within the scope of this study. As is known, a test consists of items defined as the specific tasks to perform (Cohen, 1991). Each item can test one or more points or objectives. For instance, an item can test a student's knowledge of a word's meaning or the use of grammatical structure as well as his/her comprehension of a reading passage. Similar items can be classified in different sub-groups as discrete-point (testing one element at a time) or integrative (testing elements in an integrative way). This study also examines the role of language skills and elements in the achievement tests in Turkey. Harmer (2001) analyzes the knowledge of a native speaker and lists the main areas of native speaker knowledge as grammar, vocabulary, pronunciation, appropriacy, discourse and language skills. Literate users of a language possess four language skills: reading, writing, listening and speaking. A competent user of a language knows the grammar of the language, but a *grammatical competence* is not enough. It is also important to have *communicative competence*, which means understanding what language is appropriate in different situations.

In Turkey, students start learning English in primary school. During higher education, they continue taking language courses. Since Turkey is aiming to join the European Union, foreign language instruction is extremely important. According to

the regulations related to language testing, it is essential to teach all language skills within the language courses, and the acquisition of these skills is evaluated by the use of various testing instruments including oral, written tests, assignments, and projects (Turkish Ministry of National Education, 2003). In theory, it can be said that all skills should be tested in language tests.

The present study aims to examine the language tests administered in the primary schools in Turkey. The following research questions are sought:

1- Are the language teachers educated in test preparation?

2- What language skills (reading, writing, listening, speaking) and elements (grammar, vocabulary, pronunciation) are considered important by language teachers in language tests?

3- What is the distribution of language skills and language elements in tests?

Method

Sample

The sample of this study consisted of the state primary schools in Diyarbakır, Turkey. There are 79 primary schools located in the city center. Sixteen schools were chosen randomly to comprise the sample (20% of the schools). The researcher collected test papers that have been administered to the 8th grade students attending these 16 schools. The students are 13-14 years old and have been studying English for five years. Forty-three language teachers prepared the test papers and 30 agreed to answer the questionnaire prepared by the researcher.

Research Instruments

The first instrument was a questionnaire prepared by the researcher to be administered to the language teachers working in the sample schools (Appendix). A total of 30 teachers agreed to complete this questionnaire. Another instrument used in the study included achievement test papers administered to the 8th grade students attending the same schools. With the consent of language teachers, 55 test papers prepared by different teachers have been collected by the researcher to be examined in detail.

Procedures

Achievement tests were collected from the schools during the 2007-2008 educational year. The questionnaire prepared by the researcher was administered to the English teachers working in these schools and accepted to answer the questions. The analyses of test papers were performed in the following way. First, the researcher examined the test papers thoroughly and rewrote the questions, classifying them according to the skill or element each one tested. Then, the questions in each group were analyzed further.

Findings and Results

The first source of data was a questionnaire prepared by the researcher. The analysis of the first set of questions asked in this instrument revealed background information about the teachers. As can be seen in Table 1, most of the teachers were experienced in teaching language.

Table 1

Teachers' Experience

Years	f	%
5-9	10	33.3
10-14	10	33.3
15-19	6	20.0
20 or more	4	13.3
Total	30	100.0

Research Question 1 asked about the previous training of teachers related to test preparation. The results showed that none of the teachers had either pre-service or in-service training in language testing, although they had taken courses in testing in general. This answer was expected, since students of the English Language Teaching (ELT) departments have been offered language-testing courses only recently in most of Turkey's universities. In addition, some teachers are graduates of literature or linguistics departments and therefore their university education did not focus on language teaching or testing (Demircan, 1988; Çelebi, 2006).

The 8th grade students are offered four hours of language courses a week. The overall term grade for these students was obtained by the administration of three written tests. In addition, teachers were required to add oral test grades, but only two teachers mentioned administering separate oral tests. Most reported that they evaluated students' overall performance or that oral test grades were determined according to in-class performances of the students.

Teachers were asked how often they included language skills (reading, writing, listening and speaking) and elements (vocabulary, pronunciation, grammar) in the prepared written tests. The results are presented in Table 2. As can be seen in the table above, the teachers stated that they always tested grammar. This result is consistent with the examination of the test papers (Table 4). It was apparent that a large number of questions tested grammar. In the tests they prepared, 53.3% of teachers always included reading questions. Vocabulary proved to be another popular test type, because 46.7% of teachers said they always tested this item and 36.7 % sometimes tested it. Speaking was never tested by 40% of the teachers. Only four teachers (13.3%) said they always tested listening and 26.7% claimed they

sometimes tested this skill. However, in the examination of test papers, no listening items were found. This contradicts the information given by the teachers.

Table 2

Frequency of Language Skills and Elements in Tests

	Always		Sometimes		Never	
	f	%	f	%	f	%
Vocabulary	14	46.7	11	36.7	5	16.7
Grammar	30	100	-	-	-	-
Reading	16	53.3	10	33.3	4	13.3
Writing	12	40	8	26.7	10	33.3
Listening	4	13.3	8	26.7	18	60
Speaking	10	33.3	8	26.7	12	40

In the questionnaire, the teachers were also asked to order a number of items according to their effects on the determination of a student's grades. The purpose of this question was to find out which skills and language elements were considered more important by language teachers in their final determination of a student's grades. The items were ranked according to the values they got from the teachers and the results are presented in Table 3. Teachers considered vocabulary the second most important item after grammar.

Table 3

Ranking of Items that Effect Grades According to their Importance

Items	Ranking
Knowledge of vocabulary	1
Knowledge of grammar	2
Writing correct sentences	3
Understanding written texts	4
Pronunciation	5
Speaking fluently	6
Understanding spoken texts	7

The last question in the questionnaire asked about the changes that were considered necessary by language teachers. Most teachers did not answer this question. Interestingly, some teachers stated that the tests should consist of only multiple choice items.

As mentioned before, the tests examined herein are achievement tests. The number of questions in the tests ranges between 15 and 30. The average number of test items was 24 and all of the items were discrete in nature. That is, each item tested only one element at a time. There were not any integrative items. Twenty-four papers were produced using a word processer and 29 of them were hand-written. Some hand-written papers were illegible and disordered. Forty-one test papers included spelling mistakes and four papers contained grammatically incorrect sentences.

As can be seen in Table 4, there was a disparate distribution of items. For example, there were no questions that tested listening. This result was supported when the questionnaire results were analyzed, as all of the teachers stated that they never tested listening.

Table 4

Distribution of Language Skills and Elements in Tests

Language skill or element	Number of test papers containing skill or element	Total number of questions asked in tests	Percentages of questions asked in tests (%)
	-	**-**	**-**
LISTENING			
SPEAKING (indirect testing)	**6**	**80**	**7.2**
READING	**8**	**70**	**6.3**
Open-ended questions	6	50	4.5
True false items	2	20	1.8
WRITING	**-**	**-**	**-**
GRAMMAR	**55**	**730**	**66**
Completion items	55	230	20.8
Multiple choice grammar items	21	150	13.5
Transformation items	18	124	11.2
Word order items	18	98	8.8
Combining sentences	23	96	8.6
Error recognition items	3	30	2.7
VOCABULARY	**24**	**225**	**20.4**
Matching items	16	143	12.9
Completion items	14	67	6.1
Multiple choice vocabulary items	2	15	1.4
PRONUNCIATION	**-**	**-**	**-**

Six test papers included a number of open-ended questions. These questions were classified as speaking ability questions, since they were questions that could be asked in daily communication. However, since they were not direct questions requiring speaking, it cannot be said that they tested speaking appropriately. Pronunciation, an

important sub-skill of speaking, was not tested. The questions below fall under the category of open-ended questions.

Example

Where do you live?

How old are you?

The researcher noticed that some of these questions were vague and difficult to interpret, as the examples below exemplify.

What is your job? (The students are 13-14 years old. Most do not have jobs.)

What can you do?

What did you do last night?

What do you want in the future?

It may be difficult for the students to interpret these questions. On the other hand, in yes/no questions, the teachers accepted only long answers, although short answers would be more natural.

Do you like flowers? (Expected answer: "Yes, I like flowers," not "Yes, I do.")

Were you at home yesterday? (Expected answer: "Yes, I was at home yesterday," not "Yes, I was.")

Some questions regarding speaking gave a description of the situation and then asked for the appropriate response, as the following examples illustrate:

You are in a café. You want a hamburger and a coke. What would you say to the waiter?

You have to post some letters. You don't have time, but your brother has. What would you say to him?

Eight of the test papers incorporated questions that tested reading skills. Most of the reading questions included short paragraphs and a number of open-ended questions about the paragraph, which tested students' comprehension. The remaining examples measured basic reading skills, as the following questions exemplify:

Example

Instruction: Write either "true" or "false."

Winter is hotter than summer.

February is longer than January.

In the test papers, none of the questions had the purpose of solely testing writing ability. However, since all the questions required writing sentences, all the questions tested mechanical skills of writing such as spelling and punctuation. The grammar questions in particular can be accepted as examples of controlled writing. However, none of the test questions required writing more than one sentence, which means

that cohesion and coherence were not tested. The students were not asked to write communicatively, namely, they were never required to write paragraphs, letters, or notes.

One of the most tangible ramifications of the study was that grammar questions constituted 66% of all test items. Interestingly, some papers (a total of 13) included only grammar items, proving that grammar is accepted as the focal element in language testing. Completion items were the most commonly used question types (20.8%); therefore, virtually all papers included these items.

Examples

(Tag questions) He speaks French, ----------?

They are not here, ----------?

(Use of adjectives)

He can't lift the suitcase. (heavy) Because-------

(Comparative form of adjectives) Mary is ---------- Jane. (beautiful)

(Superlative form of adjectives) My car is ---------- car in town. (good)

(Present passive)

Books ---------by authors. (write)

Letters ---------by postmen. (deliver)

When testing grammar, the teachers used various question types. Multiple-choice items comprised 13.5% of all items that test grammar. Questionnaire responses clarified that teachers find it necessary to include this type of item in order to prepare their students for the national tests (Level Identification Test) administered at the end of 6th, 7th, and 8th grades. These multiple choice tests measure all school subjects, including English and students who have high scores are placed in prominent high schools.

Transformation items existed in 18 papers. In these questions, the students were asked to transform words or sentences, as can be seen in the following examples:

Write the adverbs.

Careful ---------- Good ----------

Rewrite the following using should/shouldn't

Don't drink alcohol. (Expected answer: You shouldn't drink alcohol.)

Don't smoke. (Expected answer: You shouldn't smoke.)

Make negative.

Mary broke the glass.

Write the past forms.

Drink ---------- *Eat* ---------- *Hear* ----------

A total of 98 items in all tests included word order items. In these items, the word order of a sentence was scrambled and the students were required to make grammatically correct sentences.

Example

London/living/ she/ been/ has/ in/./

The students were asked to combine two sentences when grammatical structures such as relative clauses and conjunctions were tested.

Example

(Relative clause) A giraffe is an animal. It has a long neck.

(Conjunction) He was tired. He continued to work.

Some items were based on error recognition in which the sentences were written incorrectly and the students were asked to rewrite them correctly.

Example

I am from Turkish.

My father are 30 years old.

Vocabulary items formed 20.4% of the questions. There were 98 matching items in which the students had to match the words with their meanings. In 25 items, the students were asked to match the synonyms and in 20 items, they were asked to match the antonyms.

Example

Match the antonyms.

happy	*short*
long	*small*
big	*young*
old	*sad*

Completion items also were used to test vocabulary items. In these questions, the students were given a list of words. Then they were required to complete the following sentences by using these words.

Example

brush paint play

I ---------- my teeth everyday.

They ---------- the walls.

We ---------- basketball in the garden.

According to the examination performed by the researcher, no pronunciation questions were found. In addition to the language skills and elements presented in Table 4, the analysis of the papers revealed the use of translation items. Two papers included sentence translation items and one paper contained word translation items.

Discussion

According to Messick, language-testing assessment requires "authentic and direct samples of the communicative behaviors of listening, speaking, reading and writing" (1996, p. 241). However, the results of the present study indicated that, in the sample schools chosen for this study, some of these skills were neglected. In fact, language abilities such as grammar and vocabulary were overemphasized and they were tested more frequently than language skills. The importance of grammar and vocabulary is reminiscent of the principles in the Grammar Translation Method (GTM). Richards and Rodgers state that courses taught according to the GTM require "memorizing endless lists of unusable grammar rules and vocabulary" (1986, p. 4). Although the method used by teachers who contributed to this study is not an exact application of the GTM, they follow the main theory behind this method to a certain degree. As suggested by Işık (2008), in Turkey, traditional language teaching practice continues and it is accepted that knowing the rules of a language means knowing the language itself. In tests examined within the scope of this study, it was noticed that grammar and vocabulary items were tested in a high percentage of the questions. Teachers ask questions that require memorization of vocabulary and grammar items and the number of questions that tested these language abilities is more than the questions that tested other skills and abilities.

According to the regulations of the Ministry of Education related to language testing (Turkish Ministry of National Education, 2003), all language skills should be taught in language courses and various testing instruments should be used for the acquisition of these skills. The results of this study show that the regulations of the Ministry of Education are not being met, and tests prepared by language teachers in Turkey promote the study of grammar and vocabulary instead of language skills. The influence of this type of testing might result in the ignorance of language skills, especially listening and speaking. In a study conducted by Bekleyen (2007), students were asked to evaluate their previous language education. Not surprisingly, most students indicated that in their previous education, speaking and listening were neglected. Since proficiency in a language includes proficiency in all language skills and elements, they should be added to a language test.

As mentioned by Hingle and Linington (2002), many teachers feel more comfortable with paper and pencil tests. The present study confirms this comment. The teachers who contributed to this study always prepared paper-and-pencil tests. However, although it was possible to do so, they did not prepare separate oral tests. They preferred to evaluate students' oral performances or oral test grades according to their in-class performances. According to Hingle and Linington, teachers have a lot of experience with producing and scoring written tests and preparing these tests are easier for them. Therefore, they may avoid preparing oral tests.

Richards (2008) reports that, today, the level of professionalism in language teaching is higher than before. This means that teaching the English language necessitates "a specialized knowledge" in the field. The results of this study indicate that none of the contributing language teachers had training in language testing during or after their university education. With the implementation of the new curriculum in the Education Faculties of Turkey (The Council of Higher Education of the Republic of Turkey, 1997), language-testing courses have been added to the curricula of all pre-service courses in ELT. This means prospective language teachers will be more educated on language testing than teachers who presently teach. However, it is also necessary to educate experienced language teachers on language testing. Some of the participants of the study reported that they have 5-9 years of experience. Therefore, it may be assumed that they have taken such courses. However, in Turkey, graduates of other departments (e.g., literature, linguistics) may also become language teachers. In-service courses are necessary to increase their teaching and testing skills.

In Turkey, there are a number of national tests that are considered very important for the future education of students. Among these, the most important are the Level Identification Test (SBS: Seviye Belirleme Sınavı), prepared for grades 6, 7, and 8, and the University Entrance Exam (ÖSS: Öğrenci Seçme Sınavı), administered at the end of high school. Turkish learners are forced to accomplish these two tests, which become more competitive each year. Both tests include language components consisting of multiple choice test items. None has oral or aural components. Since the success of a teacher is evaluated according to the performances of their students in these two tests, teachers try to teach accordingly. The teachers stated that the questions in the achievement tests should include multiple choice items. It has been discussed by some writers that multiple choice items only test recognition knowledge and they do not require an authentic use of language (Hughes, 2003). The teacher's tendency to use multiple choice items is a result of the two national tests, since both of them include only multiple choice test items. One reason why listening is never tested directly by the teachers may be because these skills are not included in either of these tests. In other words, this may be explained as the impact of the national tests on education. Many scholars mentioned the influences of tests on language learning and teaching, namely, *washback* (e.g., Messick, 1996; Hughes, 2003). The following situation is an example of this impact.

Conclusion

Testing is an important part of language teaching. Unfortunately, the examples presented in this study show that many teachers do not prepare tests that are suitable for their purposes. Teachers may even use grammatically incorrect question items. A suggested approach for institutions would be to prepare in-service testing courses for teachers, since language teaching is more complex than other subjects taught in schools. In these courses, teachers may be introduced to the basic concepts of language testing, and sample test papers can be examined and evaluated. If it is not possible to prepare an in-service course, teachers may be provided with booklets giving practical information about test preparation. A Web page with explanations and sample test papers may also be useful.

Limitations of the Study

This study was conducted in Diyarbakır, a southeastern city of Turkey. Although the Turkish education system is centralized and teachers in different cities have similar educational backgrounds, different results may be obtained in different cities. In addition, only state schools were included. The results might have been different if private schools were included.

APPENDIX

Questionnaire

1. How long have you been teaching English?

   A- Less than 5 years
   B- 5-9 years
   C- 10-14 years
   D- 15-19 years
   E- 20 years and more

2. Have you had a pre-service or in-service education in language testing?
3. Write the number of English lessons offered to 8th graders every week. ----------
4. Write the number of written tests administered in a term. ----------
5. Are there any oral tests? If "yes," how do you organize them?

6. How often do you include the following language skills and elements in your tests?

	Always	**Sometimes**	**Never**
Vocabulary			

Grammar			
Pronunciation			
Reading			
Writing			
Listening			
Speaking			

7. Which of the following items are important in the determination of the final grade of the students? Rank them according to their importance. (1- most important, 7-least important)

8.

Understanding written texts	
Understanding spoken texts	
Pronunciation	
Speaking fluently	
Writing correct sentences	
Knowledge of vocabulary	
Knowledge of grammar	

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İlköğretim Okullarında Uygulanan İngilizce Sınavlarının İncelenmesi

(Özet)

Problem Durumu: Öğrenme süreci sırasında öğrenci başarısının ölçülmesi bir öğretmenin önemli görevlerinden biridir. Yapılan sınavların sınıf geçmeye etkilerinin yanı sıra öğrencilerin gelişim düzeyleri ile ilgili ayrıntılı bilgi verme ve zorlandıkları konuların belirlenmesine yardımcı olma gibi çeşitli katkıları vardır. Yabancı dil derslerinde başarının ölçülmesi müfredatta yer alan diğer derslere göre daha zor olmaktadır. Bunun nedeni birbirinden oldukça farklı olan dinleme, konuşma, okuma

ve yazma gibi değişik dil becerilerinin yanı sıra telaffuz, kelime bilgisi ve dilbilgisinin ölçülmesinin gerekmesidir. Yabancı dil öğretmenlerinin dil becerilerinin tümünü sınava dâhil etmeye çalışması öğrencilerin bu becerileri geliştirmeleri için güdüleyici olmakta, bazı becerilerin ölçülmemesi ise bunların öğrenciler tarafından göz ardı edilmesine neden olmaktadır.

Araştırmanın Amacı: Bu çalışmanın amacı Türkiye'de ilköğretim okullarında yabancı dil öğretmenleri tarafından hazırlanan İngilizce sınav kâğıtlarının incelenmesidir. Çalışmada hangi dil becerilerinin öğretmenler tarafından daha önemli kabul edildiği ve sınavlara daha çok dâhil edildiğinin belirlenmesine çalışılmıştır. Ayrıca öğretmenlerin sınav hazırlama konusunda eğitimlerinin yeterli olup olmadığı araştırılmıştır. Sınav kâğıtları şekil ve doğruluk açısından da incelenmiş, sayfa düzeni, yazım kurallarına uygunluk, dilbilgisi ve anlamsal doğruluk bakımından hazırlanma amacına uygunlukları araştırılmıştır.

Araştırmanın Yöntemi

Diyarbakır il merkezinde bulunan 79 ilköğretim okulu araştırmanın evrenini oluşturmaktadır. Bu okullardan 16'sı araştırmanın örneklemini oluşturmak üzere seçilmiştir. Araştırmaya bu ilde bulunan özel öğretim kurumları dâhil edilmemiştir. Kullanılan veri toplama araçları araştırmacı tarafından hazırlanan bir anket formu ve ilköğretim 8. sınıf öğrencilerine farklı yabancı dil öğretmenleri tarafından İngilizce derslerinde uygulanan toplam 55 adet sınav kâğıdından oluşmaktadır. Seçilen 16 ilköğretim okulunda öğretmenlerle görüşülmüş, uygulanan 55 sınava ait yazılı soruları öğretmenlerin onayı ile toplanmıştır. Hazırlanan anketi doldurmayı kabul eden 30 öğretmenden sorulara yazılı olarak cevap vermeleri istenmiştir. Verilerin incelenmesi aşamasında ilk önce yazılı sınav kâğıtları genel görünüş ve sayfa düzeni açısından incelenmiştir. Sorulan soruların dilbilgisi kurallarına uygunluğu ve anlamsal açıdan doğruluğu araştırılmıştır. Daha sonra toplanan sınav kâğıtlarındaki sorular türlerine ve test ettikleri dil becerilerine göre sınıflandırılmıştır.

Araştırmanın Bulguları: İlköğretim okullarının 8. sınıfında okuyan öğrenciler haftada dört saatlik İngilizce dersi almaktadırlar. Öğrencilerin dönem sonu notları uygulanan üç yazılı sınavın sonuçlarına göre belirlenmektedir. Buna ek olarak öğretmenlerden sözlü sınav notları vermeleri de istenmektedir. Ancak yazılı sınavların değerlendirmede daha fazla önemi olduğu dikkat çekmektedir. Öğretmenlerin büyük çoğunluğu sözlü sınav yapmadıklarını veya sözlü sınav notlarını öğrencilerin sınıf içerisindeki durumlarına göre belirlediklerini belirtmişlerdir.

Çalışmadan elde edilen sonuçlara göre bütün öğretmenler dilbilgisinin mutlaka test edilmesi gerektiğini düşünmektedir. Kelime bilgisi de öğretmenlerin önemli bir kısmı tarafından ölçülmesi gereken bir öğe olarak kabul edilmektedir. Öğretmenlerin dil becerilerine dilbilgisi ve kelime bilgisinden daha az önem verdikleri belirlenmiştir. Okuma becerisi öğretmenler tarafından daha önemli kabul edilirken, konuşma ve dinleme

sınavlarda ölçülmesi gerekli olan beceriler olarak görülmemektedir. Sınav kâğıtlarının incelenmesi sonucunda da yukarıda verilen bulguları destekleyen veriler elde edilmiştir. Sınav sorularının dağılımında bazı öğelere ağırlık verildiği bazılarının ise tamamen göz ardı edildiği dikkat çekmiştir. Örneğin tüm sınav sorularının % 66'sını dilbilgisi, % 20,4'ünü ise kelime bilgisi soruları oluşturmaktadır. % 6,3 oranında okuma, % 7,2 oranında ise dolaylı olarak hazırlanan konuşma soruları bulunmaktadır. Hiçbir sınavda dinleme veya telaffuz ile ilgili soruya rastlanmamıştır. Öğretmenlerin sınavların hazırlanmasında el yazısı veya bilgisayar kullanımını tercih ettikleri gözlenmiştir. Sınavlarda bazı dilbilgisi hataları veya anlam belirsizlikleri saptanmıştır.

Araştırmanın Sonuçları ve Önerileri: Bu çalışmadan elde edilen bulgular öğretmenlerin dilbilgisi ve kelime bilgisi gibi öğeleri dil becerilerinden daha ön planda ele aldıklarını göstermektedir. Başka bir deyişle dilbilgisi açısından düzgün cümle kurmak ve kelime ezberlemek öğrencilerin ders notlarını arttıran en önemli etkenler olarak kabul edilmektedir. Dilbilgisi-Çeviri yöntemini temel alan bu uygulamanın öğretme-öğrenme sürecini olumsuz etkilemesi kaçınılmazdır. Bu tür sınavlar öğrencilerin dinleme ve konuşma gibi dil becerilerini önemsememeleri sonucunu doğurabilmektedir.

Okullarda yapılan yazılı sınavlarda bazı becerilere yer verilmemesinin bir nedeni de uygulanan YDS, KPDS, ÜDS gibi sınavların çoktan seçmeli olarak hazırlanması ve bu sınavlarda bazı becerilerin göz ardı edilmesi olabilir. Türkiye'de İngilizce bilgisinin bu tür sınavlarla ölçülmesi bu sınavlarda ölçülmeyen dil becerilerinin önemsiz olduğu izlenimini yaratmaktadır. Yapılan merkezi dil sınavlarında konuşma, dinleme, okuma ve yazma becerilerine eşit olarak yer verilmesi öğretmen ve öğrencilerin yabancı dili bütün yönleri ile öğrenmeleri için güdüleyici olacaktır. Ayrıca çoktan seçmeli sınav soruları ile bazı yabancı dil becerilerinin tam olarak ölçülmesi mümkün görülmemesine rağmen araştırmaya katılan öğretmenlerin çoğunluğu yukarıda belirtilen sınavların etkisiyle bu tür sınav sorularına ağırlık vermeleri gerektiğini düşünmektedir.

Araştırmadan elde edilen sonuçlar öğretmenlerin yazılı sınavları sözlü sınavlara tercih ettiklerini göstermiştir. Bu yaklaşım öğrencilerin sözlü iletişim becerilerini geliştirmelerini engelleyici bir rol oynayabilir. Elde edilen başka bir sonuç da öğretmenlerin yabancı dil sınavlarını hazırlama konusunda yeterli eğitim almamış oldukları gerçeğidir. Öğretmenlerin bu konuda kendilerini geliştirebilmeleri için eğitim kurumları ya da Milli Eğitim Bakanlığı tarafından hizmet içi kurslar açılması yararlı olabilir. Bu konuda öğretmenlere kaynak kitaplar dağıtılması ve bakanlığa ait internet sayfalarında örnek sınav soruları ve konuyla ilgili açıklamalara yer verilmesi de büyük yararlar sağlayacaktır.

Anahtar Sözcükler: dil sınavları, ilköğretimde yabancı dil öğretimi, sınav hazırlama

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A Study on Multidimensional Relationships

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Abstract

Problem Statement: Close relationships formed during the young adulthood stage are important to the fulfillment of developmental tasks and may be supportive for young adults psychologically. Due to their important status within the society, it has been significant to identify the factors that affect university students' relationships with the opposite sex. Studies have revealed a relation between intimate and romantic relationships and the self-concept and perfectionism. Also, the literature includes studies on multidimensional relationships, attachment styles, family characteristics, and reactions against stressful events.

Purpose of Study: This study aims to identify the variables that affect university students' multidimensional relationships.

Methods: Participants consisted of 367 university students. Multidimensional Relationships Scale, Multidimensional Perfectionism Scale, Subjective Well-being Scale, and Rotter Locus of Control Scale were used in the study. Stepwise regression technique was used in analyzing the data.

Findings and Results: It was found that multidimensional relationships were predicted best by subjective well-being, whether relationships exist or not and the number of days without relationships, while they were predicted

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at a moderate level by multidimensional perfectionism. Gender and age partially predicted multidimensional relationships of university students. Locus of control did not predict multidimensional relationships.

Conclusions and Recommendations: Based on these findings, the variables of subjective well-being, relationship, and number of days appear to be the best predictors of the multidimensional relationships. Multidimensional perfectionism seems to be moderately significant to predict the multidimensional relationships. For the subjective well-being of the university youth, psycho-educational programs may be provided on healthy close relationships and preparation for marriage. According to the findings of the present study, it may be concluded that gender and age are significant factors to be considered to design the program and form the groups for relational assertiveness and external relationship control. Multidimensional relationships and anger/fury, irrational beliefs, hostility, and optimism relationships may be studied in future researches.

Keywords: Multidimensional relationships, multidimensional perfectionism, subjective well-being, locus of control.

Most Turkish students attend university between the ages of 18-25. Human development theorists use different concepts to address this stage as "late adolescence" or "young adulthood" (Kılıççı, 1992). A common issue that development theorists pointed out is a search for a life partner in relation to the young adulthood stage. In this stage, the young adult is expected to form and maintain close relationships with the opposite sex.

Close relationships formed during this stage are important to the fulfillment of developmental tasks and may be supportive psychologically for young adults. In a study on adolescents, Greca and Harrison (2005) found that in addition to having a large peer group and good friends, young people also need relationships to protect themselves from social anxiety. However, only few studies concluded that a positive romantic relationship during adolescence provides support and affects psychological health positively. Still, it is believed that negative relationship experiences may cause stress for the adolescents.

Türküm, Kızıltaş and Sarıyer (2004) stated that emotional relationships with the opposite sex is an important problem experienced by university students. In another study, it was revealed that the most prevalent reason for applying to psychological counseling centers was relationship problems with opposite sex (Creasey, Kershaw and Boston, 1999). Prager and Buhrmester (1998) have shown that intimacy is related to physical and psychological wellness (such as lower level of stress, lower depression, less loneliness, better physical health). In addition to wellness, well-being is also affected by close relationships (Myers, Sweeney & Witmer, 2000; Sweeney & Witmer, 1991; Witmer & Sweeney, 1992). A study on university students' wellness levels yielded significantly higher love subscale mean scores for students who have

opposite sex friends in comparison to others (Doğan, 2004). This finding is consistent with the findings of Sarı's (2003) study also.

Several other studies have revealed a relationship between romantic relationships and attachment styles (Lehnart & Neyer, 2006; Simpson, Collins, Tran & Haydon, 2007), irrational relationship beliefs and relationship satisfaction (Metts & Cupach, 1990; Stackert & Bursik, 2003), optimism (Assad, Donnellan & Conger, 2007), and the self-concept (Kim, 2006).

Snell, Schicke, and Arbeiter (2002) have underlined individual tendencies in intimate relationships by referring to relevant concepts from the literature. These concepts include relational-esteem, which is the tendency to evaluate positively one's own skills and capacity in relationships with others. Relational-preoccupation, on the other hand, is being continuously preoccupied with close relationships. The other concepts are defined as such: internal relational control is the belief that one's close relationships stem largely from one's own behaviors and personal control. Relational-consciousness is the ability to perceive the positive and negative aspects of one's close relationships. Relational-motivation is the will to have a close relationship. Relational anxiety is the fear of establishing emotional intimacy/interaction with the opposite sex. Relational-assertiveness is taking initiative in close relationships. Relational-depression is the feeling of discouragement and disappointment in one's close relationships. External relational control is the belief that one's close relationships generally develop by coincidence or as a result of destiny, without the person's control. Relational-monitoring is attaching importance to how one's close relationships are evaluated by others. Fear of close relationships is the apprehension one has when establishing close relationships with others. Relational-satisfaction is the contentment or happiness derived from one's close relationships. Also the relationship between multidimensional relationships and attachment styles (Mikulincer et al., 2002) and family characteristics (Kikuchi & Snell, 2002; Qtd. in. Büyükşahin, 2006) and reactions against stressful events (Snell et al., 2002) were studied. Similar studies also examined the intimate relationships and relationship satisfaction, love attitudes, or perfectionism (Büyükşahin, 2006; Shea, Slaney & Rice, 2006).

There are positive and negative attitudes toward perfectionism, which is an important variable in multidimensional relationships. Among these, Hewitt and Flett (1991) discuss perfectionism as a pathological concept and suggested three dimensions: self-oriented, other oriented, and socially prescribed perfectionism. Self-oriented perfectionism (SOP) is the tendency to set unrealistic and unattainable standards for oneself. Other-oriented perfectionism (OOP) is setting unrealistic standards for others and expecting them to be met. Socially prescribed perfectionism (SPP), on the other hand, is the tendency to believe that others expect one to be perfect. Links have been found between perfectionism and depression, anxiety, stress (Schweitzer & Hamilton, 2002), normal and abnormal levels of perfectionism and depression, anxiety, stress, test anxiety (Bieling, Israeli & Antony, 2004), neurotic perfectionism and depression, and psychosomatic symptoms (Sumi & Kanda, 2002).

On the other hand, Saya (2006) has shown that no meaningful relationship exists between attachment styles of the two sexes and perfectionism. According to some studies cited in the literature, self-oriented and other-oriented perfectionism is related to both positive and negative aspects of psychological health, while SPP is consistently related to stress (Enns, Cox & Clara, 2002). Other-oriented perfectionism is claimed to lead to stress and conflict in interpersonal relationships (Hewitt, Flett & Mikail, 1995). Flett, Hewitt, Shapiro and Rayman (2001) identified higher communication, trust and support expectations in the relationships of people with SOP and OOP. The relationship between SPP and belief in couple relationships is weak. On the other hand, there is a stronger relationship between SPP and relationship damaging tendencies (exclusion, neglect, insensitivity, etc.), lack of harmony between a couple, lovesickness, emotional dependence on one's partner and obsessions. This may indicate that perfectionism affects one's relationships with others mostly negatively.

In addition to perfectionism, locus of control is another most examined variable searched in close relationships and well-being studies. In a study focusing on the subjective well-being levels of university students, Dost (2004) found that those with internal control have higher subjective well-being.

Similar with current results, research studies report conflicting findings regarding intimate/romantic relationships and multidimensional relationships. Yet, there have been studies reporting significant relationships between a host of variables (i.e., sex and age, attachment styles, irrational beliefs, optimism, self concept, love attitudes, and perfectionism) and both intimate/romantic relationships and multidimensional relationships. Therefore, further research is needed in order to make a firm conclusion about these variables.

Purpose of Study

The study aims to identify the variables that predict university students' multidimensional relationships. The independent variables are gender, age, current relations, number of days without relations, multidimensional perfectionism, subjective well-being, and locus of control.

Method

Participants

The participants of the study consisted of 367 students attending Hacettepe University (n=231), Ankara University (n=75), and Başkent University (n=61) during the spring and summer semesters of the 2005-2006 academic year. One participant did not specify his or her gender. Of those who did, 66% were female and 34% male. The mean age was 21.77. All students were given the scales but, similar to Büyükşahin's (2005) study, the only responses that were analyzed belonged to the 304 students (age $\overline{X}$: 20.71, SD: 2.03) who were either in a close relationship at the time of the study or who recently had a close relationship.

Research Instruments

Multidimensional Relationship Scale (MDRS). It was developed by Snell, Schicke, and Arbeiter (2002) with the aim of measuring various psychological tendencies related with close relationships. The Cronbach alpha internal consistency coefficient for subscales was 0.70-0.93 for females and 0.68-0.92 for males. The test-retest reliability coefficient was 0.72. Büyükşahin (2005) examined the construct validity of the MDRS on university students and found that the scale had an eight-factor structure: "high relationship focus, relational-satisfaction, relational anxiety, relational-monitoring, relational esteem, external relational control, relational-assertiveness, internal relational control." MDRS was scored on a 5 point Likert-type scale. Originally having 60 items, the scale included 53 items eventually. Five items were inversely scored. The correlation coefficients between the MDRS and Relationship Satisfaction Scale ranged between -0.41 and 0.69. The Cronbach alpha internal consistency coefficient for the MDRS was 0.81, split-half reliability coeffiicient was 0.83, and test-retest reliability coefficient was 0.80.

The Multidimensional Perfectionism Scale (MDPS). It was developed by Hewitt and Flett (1991) and adapted to Turkish culture by Oral (1999). The scale has three subscales: self-oriented, other-oriented, and socially prescribed perfectionism. The MDPS has 45 items and is a 5 point Likert-type scale. In Oral's (1999) study, one item was removed from the scale and the scale therefore had 44 items. Eighteen items are scored inversely. In the study conducted by Sun Selışık (2003) on 331 university students, four factors were identified: self-oriented perfectionism (15 items), socially prescribed perfectionism (9 items), other-oriented perfectionism (9 items) and perfectionist expectations (4 items). In the current study, Sun Selışık's results were considered.

The Subjective Well-being Scale (SWBS). It was developed to identify the subjective well-being of university students (Dost, 2004). It is a 5-point Likert-type scale containing 42 items. The internal consistency coefficient of the scale was 0.93; and test-retest coefficient was 0.86. The criterion validity study conducted by using Beck Depression Inventory showed that there was a negative relationship (-0.70, $p<0.01$) between subjective well-being and depression.

The Rotter Locus of Control Scale (RLCS). It was developed by Rotter (1966) and adapted to Turkish by Dağ (1991). Cronbach alpha internal consistency coefficient of the scale obtained from 532 university students was 0.71. The KR-20 reliability coefficient of the scale obtained from 99 individuals was 0.68. The test-retest reliability coefficient obtained from the same sample was 0.83. As a result of principal component analysis, observed 7 factors explained 47.7% of the total variance (N= 532). It may be claimed that the number and patterns of these factors are similar to the factors in the original scale (Dağ, 1991).

Data Analyses

This study focused on the variables predicting Multidimensional Relationships Scale scores. The stepwise regression technique was administered to the data. The Variance Inflation Factors was used to see whether a multiple relationship existed

between variables (Alpar, 2003; Tabachnick and Fidell, 2001). In this study, it was found that none of the equations had a greater Variance Inflation Factor (VIF) value than 5. Also, to eliminate the singularity problem (Alpar, 2003), the correlations between variables were examined and observed that there was no correlation coefficient between dependent and independent variables greater than 0.80. Secondly, Durbin–Watson d (D-W) statistics was used to control the autocorrelation between variables (Alpar, 2003; Büyüköztürk 2002; Tabachnick and Fidell, 2001). The D-W statistics for all regression models was smaller at the 0.01 level.

Multidimensional Relationship subscales scores were added in the regression equation as dependent variables, and the following as independent variables: gender, age, the presence of a relationship, time without a relationship (days), locus of control score, subjective well-being score and Multidimensional Perfectionism Scale subtest scores (SOP, OOP, SPP, PE). Before the analyses, categorical variables were coded as dummy variables.

Table 1

*Correlations between dependent and independent variables**

	HRF	RS	RA/F	RM	RE	ERC	RA	IRC	Days	Age	Gender	R(Y/N)	RLCS	SOP	SPP	OOP	PE	SWBS
HRF	1,00																	
RS	**.17**	1,00																
RA/F	.02	**-.54**	1,00															
RM	**.32**	**-.21**	**.36**	1,00														
RE	**.35**	**.64**	**-.41**	.00	1,00													
ERC	.10	**-.29**	**.32**	**.30**	**-.14**	1,00												
RA	**.25**	**.24**	**-.20**	.00	**.41**	**.20**	1,00											
IRC	**.15**	**.21**	-.04	.13	**.39**	.02	**.29**	1,00										
Days	**-.23**	-.10	.08	-.12	**-.27**	-.08	**-.20**	**-.19**	1,00									
Age	.04	**.12**	**-.12**	-.05	.06	**-.14**	-.05	-.05	.09	1,00								
Gender	.06	-.06	.05	-.01	**-.13**	-.08	**-.23**	.00	.05	**.16**	1,00							
R(Y/N)	**.20**	**.63**	**-.37**	**-.12**	**.43**	**-.15**	**.24**	**.11**	**-.21**	.09	**-.17**	1,00						
RLCS	.01	**-.20**	.10	.04	-.09	.09	-.06	-.07	.04	.03	**.13**	**-.20**	1,00					
SOP	.07	**.13**	-.06	.09	**.17**	-.01	**.15**	**.20**	-.08	.00	-.02	.08	.09	1,00				
SPP	.06	**-.17**	**.24**	**.27**	-.08	**.16**	.00	.03	.02	.00	**.12**	-.06	.10	**.48**	1,00			
OOP	.03	-.08	.02	.05	.02	-.02	.09	.10	.00	-.05	.06	.07	.02	**.34**	**.30**	1,00		
PE	.10	-.10	**.11**	**.17**	.02	**.19**	**.14**	**.11**	**-.11**	-.07	-.08	-.05	.05	**.48**	**.41**	**.28**	1,00	
SWBS	.00	**.48**	**-.48**	**-.21**	**.50**	**-.24**	**.13**	**.22**	-.05	.06	-.03	**.18**	-.10	**.15**	**-.18**	-.01	-.10	1,00
$\bar{X}$	37.37	31.71	23.95	12.52	18.45	10.78	15.94	13.05	1009	21.72	0.35	0.54	16.12	67.25	33.60	29.83	17.68	176.36
SD	9.19	8.58	6.76	4.37	4.05	3.73	3.09	2.77	1894	2.03	0.48	0.50	4.72	16.93	9.47	6.80	4.13	28.30

* The correlations whose absolute values are higher than 0.10 are significant at the 0.05 level.

HRF: high relationship focus, RS: relational-satisfaction, RA/F: relational anxiety/fear, RM: relational monitoring, RE: relational esteem, ERC: external relational control, RA: relational-assertiveness, IRC: internal relational control, R(Y/N): Relationship (yes/no), RLCS: Rotter Locus of Control Scale, SOP: self-oriented perfectionism, SPP: socially prescribed perfectionism, OOP: other-oriented perfectionism, PE: perfectionist expectations, SWBS: Subjective Well-being Scale.

Findings and Results

Table 2 presents the results of the stepwise regression performed to identify the variables predicting the subscales of the multidimensional relationship scale.

Table 2

Multiple Regression Analysis Results and Regression Equation

Dependent variables	Independent variables	B	Sh_b	β	t	VŞF	D-W	F	R	R^2
HRF	(Constant)	36.74	.85		43.35**		1.24	12.94**	.28	.08
	Days	.00	.00	-.20	-3.53**	1.05				
	R(Y/N)	2.96	1.04	.16	2.84**	1.05				
RS	(Constant)	10.48	2.59		4.05**		1.83	120.27**	.74	.55
	R(Y/N)	9.71	.68	.56	14.25**	1.04				
	SWBS	.12	.01	.38	9.59**	1.03				
	OOP	-.15	.05	-.12	-2.95**	1.01				
RA/F	(Constant)	39.11	2.52		15.55**		1.73	50.28**	.58	.34
	SWBS	-.09	.01	-.40	-8.14**	1.07				
	R(Y/N)	-3.97	.65	-.29	-6.12**	1.03				
	BBM	.11	.03	.15	3.18**	1.03				
RM	(Constant)	14.02	1.88		7.48**		1.54	10.97**	.36	.13
	SPP	.11	.03	.23	4.27**	1.03				
	SWBS	-.02	.01	-.16	-2.80**	1.07				
	Days	.00	.00	-.16	-2.88**	1.05				
	R(Y/N)	-.97	.49	-.11	-1.97*	1.08				
RE	(Constant)	6.63	1.16		5.73**		1.86	66.05**	.63	.40
	SWBS	.06	.01	.43	9.40**	1.03				
	R(Y/N)	2.56	.38	.32	6.79**	1.08				
	Days	.00	.00	-.18	-3.99**	1.05				
ERC	(Constant)	17.79	2.74		6.50**		1.91	10.91**	.31	.10
	SWBS	-.03	.01	-.21	-3.89**	1.01				
	PE	.15	.05	.16	2.94**	1.01				

* p < .05** p < .01

Sample regression equation; IRC= 8,33+(.02)SWBS + (-.00)Days + (.03)SOP

Findings and results present for subtest scores of multidimensional relationship scale as shown in Table 2. Accordingly, finding and results present for HRF, RS, RA/F, RM, RE, ERC, RA and IRC, respectively.

1. Regression analysis for HRF: Relationship (Y/N) and time without a relationship (days) were included in the equation for predicting the HRF subtest scores (Table 2). When the standardized beta coefficients are examined, it can be seen that the variable time without a relationship has the most significant prediction power on the HRF subtest scores. A negative relationship between time without a relationship and the dependent variable is observed (β = -.20). The relationship (Y/N) variable appears to be the second significant variable (β = .16). The other variables were not a significant predictor for the HRF subtest scores.

2. Regression analysis for RS: The relationship (Y/N), SWBS and OOP subtests scores were included in the regression equation for predicting the RS subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that the relationship (Y/N) has the most significant prediction power on the RS subtest scores (β = .56). It has been followed by SWBS (β = .38) and **OOP** (β = -.38) respectively. While the relationship and subjective well-being variables were positively correlated to the RS variable, OOP was negatively correlated. The other variables were not a significant predictictor for the RS subtest scores.

3. Regression analysis for RA/F: Subjective well-being score, relationship (Y/N) and SPP subtests scores were included in the regression equation for predict RA/F subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that subjective well-being has the most significant prediction power on the RA/F (β = -.40). It has been followed by relationship (Y/N) (β = -.29) and SPP (β = .15) respectively. While relationship (Y/N) and subjective well-being have a negative relationship with RA/F, SPP has a positive relationship. The other variables did not sicnificant predictictor for the RA/F subtest scores.

4. Regression analysis for RM: SPP subtest scores, subjective well-being scores, days and relationship (Y/N) were included in the equation for predicting the RM subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that SPP has the most significant prediction power on RM (β = .23). It has been followed by subjective well-being (β =-.16), days (β = -.16) and relationship (β = -.11) respectively. While the relationship (Y/N), days and subjective well-being variables had a negative relationship with RM, SPP had a positive relationship. The other variables were not a significant predictictor for the RM subtest scores.

5. Regression analysis for RE: Subjective well-being scores, relationship (Y/N), and days were included in the equation for predicting the RE subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that subjective well-being has the most significant prediction power on RE (β =-.43). It has been followed by days (β = -.32) and relationship (β = -.18) respectively. While subjective well-being and relationship were positively related to RE, the number of days was negatively related. The other variables were not a significant predictictor for the RE subtest scores.

6. Regression analysis for ERC: Subjective well-being score, PE subtests scores and age were included in the regression equation for predicting ERC subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that subjective well-being has the most significant prediction power on ERC (β = -.21). It has followed by PE subtest scores (β = .16) and SPP (β = -.12) respectively. While subjective well-being and age have a negative relationship with ERC, PE has a positive relationship. The other variables were not a significant predictictor for the RA/F subtest scores.

7. Regression analysis for RA: Relationship (Y/N), gender, days, and SOP subtest scores were included in the regression equation for predicting RA subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that relationship (Y/N) has the most significant prediction power on RA (β = -.19). It has been followed by gender (β = .17), days (β = -.15) and SOP (β = .12) respectively. While relationship (Y/N) and days have a negative relationship with RA, gender and SOP have a positive relationship. The other variables were not a significant predictictor for the RA subtest scores.

8. Regression analysis for IRC: subjective well-being score, the number of days, and SOP subtest scores were included in the regression equation for predicting IRC subtest scores (Table 2). When the standardized beta coefficients were examined, it can be seen that subjective well-being score has the most significant prediction power on IRC (β = .18). It has been followed by days (β = -.17) and SOP (β = .16) respectively. While days have a negative relationship with IRC, subjective well-being score and SOP has a positive relationship. The other variables were not a significant predictictor for the RA subtest scores.

Conclusions and Recommendations

When the regression equations that were formed to identify the variables predicting the multidimensional relationship scale subtests were evaluated alltogether, it was seen that the variable of subjective well-being entered all the 6 equations apart from those formed for HRF and RA as a significant variable. Similarly, the variable of being in a relationship entered all the 6 equations apart from those formed for ERC and IRC as a significant variable. The variable of number of days entered the 5 equations other than RS, RA/F, and ERC. Based on these findings, the variables of subjective well-being, relationship and number of days appear to be the best predictive variables for the multidimensional relationship scale subtest scores. Similar to the studies mentioned in the introduction, this study concluded that close relationships are significant for university students. In a different study (Cenkseven, 2004), it was concluded that positive emotions resulting from flirt and relationships predict the subjective well-being of university students.

When the Multidimensional Perfectionism Scale subtests OOP, SPP, PE, and SOP are considered, the SOP subtest scores were significant variables for the regression equations formed for RA/F and IRC; PE subtest scores were significant variables for the regression equations formed for ERC; SPP subtest scores were significant

variables for the regression equations formed for RA/F and RM; and OOP subtest scores were significant variables for the regression equations formed for RS. Based on these findings, Multidimensional Perfectionism Scale subtest scores seem to be moderately significant in predicting the Multidimensional Relationship Scale subtest scores. Having close and romantic relationships is a critical part of university students' psychosocial development. In other words, this is necessary for young adults. Therefore, the results obtained in this study were expected. In a study conducted on university students by Öner-Özkan (2004), it was found that those with high future time orientation are less tolerant to thought and behavior differences between themselves and their partners. It has been argued that this may have been caused by these individuals approaching their relationships in a perfectionist way.

The variable of gender is significant in regression equations formed for the variable RA/F; and the variable of age is significant in regression equations formed for the variable ERC. Therefore, gender and age are relatively significant in multidimensional relationship subtests. Female university students were found to be more assertive in the study. In a different study, (Büyükşahin, 2005) no statistically significant difference was found between the two genders with respect to relationship assertiveness. This is worthy of further exploration. It is expected that as age increases, external relationship control decreases. Studies have shown that those in mid and late adolescence have more internal control than younger individuals and therefore internal control rises with age (Çoban and Hamurcu, 2006).

Locus of control scores was not a significant variable in any of the regression equations. This suggests that locus of control scores is not a significant variable in predicting multidimensional relationship scale subtest scores.

Based on the findings of the study, the following may be recommended: For the subjective well-being of the university youth, psycho-educational programs may be offered regarding healthy, close relationships and preparation for marriage. Individual and group counseling would be beneficial to enable individuals to know themselves about close relationships, raise their awareness of the qualities they should look for in a potential partner, get rid of the negative aspects of perfectionism and make healthy choices. These programs may help young adults to experience healthier relationships and improve their levels of subjective well-being. Taking into account the findings of this study on relational assertiveness and external relationship control, gender and age emerge as significant factors to be considered when designing the program and forming the groups. The programs may further be supported by seminars, conferences, and panels.

For researchers, the following may be recommended: The relations between multidimensional relationships and anger/fury, irrational thoughts, hostility (negative partner behaviors) and optimism may be studied. Group programs may be organized for university couples, and the positive effects of these programs on mental health may be tested. Similar studies may be conducted on married couples and the relationship between these variables and marriage satisfaction may be studied.

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Çok Boyutlu İlişkiler Üzerine Bir Araştırma

(Özet)

Problem Durumu: Gelişim kuramcılarının genç yetişkinlik dönemine ilişkin olarak yaptıkları ortak açıklamalardan biri, gencin yaşamını birlikte sürdüreceği kişiyi bulma uğraşısı içine girmesi konusundadır. Bu dönemde gençten karşı cinsle yakın ilişkiler kurması ve bunları sürdürmesi beklenmektedir. Gencin kurduğu yakın ilişkiler hem onun gelişimsel görevlerini başarması adına önem taşımakta hem de psikolojik açıdan genci destekleyici olabilmektedir. Dolayısıyla yakın ve romantik ilişkiler konusunda yapılan çalışmalar daha çok ergenlik ve genç yetişkinlik dönemlerini temel almaktadır. Toplumda üstlendikleri önemli rol nedeniyle de genç yetişkinlik döneminde bulunan üniversite öğrencilerinin karşı cinsle ilişkileri ve bunu etkileyen faktörlerin ortaya konması daha fazla önem kazanmaktadır. Yakın ilişkiler konusundaki psikolojik eğilimler ilişkide kendine güven, ilişkiye saplantı, içsel ve dışsal ilişki kontrolü, ilişki farkındalığı, ilişki güdüsü, ilişki kaygısı, ilişki korkusu, ilişki depresyonu, ilişki izlenimi ayarlama, ilişki doyumu olarak belirtilmekte ve bunlar çok boyutlu ilişkiler olarak ele alınmaktadır. Gerek yakın ve romantik ilişkiler gerekse çok boyutlu ilişkiler konusunda yapılan araştırmalarda birbiri ile paralel olmayan sonuçlarla karşılaşılabilmektedir. Bununla birlikte cinsiyet, yaş, ilişki deneyimi gibi faktörlerin yanı sıra bağlanma stilleri, akılcı olmayan inançlar, iyimserlik, benlik kavramı, aşk tutumları, mükemmeliyetçilik gibi kavramların önemli olduğu sonucuna varılan araştırmalar bulunmaktadır.

Araştırmanın Amacı: Bu araştırmanın amacı üniversite öğrencilerinin çok boyutlu ilişkilerini etkileyen faktörlerin belirlenmesidir. Araştırmada cinsiyet, yaş, şu an ilişkisi olup olmama, ilişkisiz geçen gün sayısı, çok boyutlu mükemmeliyetçilik, öznel iyi oluş, kontrol odağı bağımsız değişkenler olarak alınmıştır.

Araştırmanın Yöntemi

Araştırmada betimsel yöntem kullanılmıştır. Katılımcılar Hacettepe, Ankara ve Başkent Üniversitesi'ne devam eden 367 öğrenciden oluşmuştur. Öğrencilerin hepsine ölçeklerin uygulanmasına rağmen uygulama sırasında ya da öncesinde ilişki deneyimi olan 304 öğrencinin yanıtları analize alınmıştır. Regresyon denklemini kurarken, değişken

sayısı ve değişkenler arasındaki ilişki dikkate alınarak çoklu regresyon tekniklerinden adımsal (stepwise) regresyon tekniğinden yararlanılmıştır. Analizler yapılmadan önce kategorik değişkenler kukla (dummy) değişken olarak kodlanmıştır. Buna göre cinsiyet değişkeninde kadın 0, erkek 1; ilişki değişkeninde ilişkisi olmayan 0, ilişkisi olan 1 değerleri ile kodlanmıştır. Diğerleri ise test toplam puanları dikkate alınarak sürekli değişkenler olarak değerlendirilmiştir.

Araştırmanın Bulguları: Çok boyutlu ilişki ölçeği alt testlerini yordayan değişkenleri belirleme amacıyla kurulan regresyon denklemleri bir arada değerlendirildiğinde öznel iyi oluş değişkeninin ilişkiye yüksek düzeyde odaklanma ve ilişki girişkenliği için kurulan denklemler dışındaki altı regresyon denklemine önemli değişkenlerden biri olarak girdiği görülmektedir. Benzer olarak şu an bir ilişkide olup olmama değişkeni de dışsal ve içsel ilişki kontrolü için kurulan regresyon denklemleri dışındaki altı regresyon denklemine önemli değişkenlerden biri olarak girmiştir. Gün değişkeninin ise ilişki doyumu, ilişki kaygısı/korkusu ve dışsal ilişki kontrolü için kurulan denklemler dışındaki beş regresyon denklemine girdiği görülmektedir. Bu bulgulara dayanarak öznel iyi oluş, ilişki ve gün değişkenlerinin çok boyutlu ilişki ölçeği alt test puanlarını en iyi yordayan değişkenler olduğu yorumu yapılabilir.

Çok Boyutlu Mükemmeliyetçilik Ölçeği alt testleri dikkate alındığında kendine yönelik mükemmeliyetçilik puanlarının ilişki girişkenliği ve içsel ilişki kontrolü; mükemmeliyetçilik beklentisi puanlarının dışsal ilişki kontrolü; başkalarınca belirlenen mükemmeliyetçilik puanlarının ilişki kaygısı ve ilişki izlenimi ayarlama; başkalarına yönelik mükemmeliyetçilik puanlarının ilişki doyumu için kurulan regresyon denklemlerinde önemli değişkenler arasında olduğu görülmektedir. Bu bulgulara dayanarak çok boyutlu mükemmeliyetçilik ölçeği alt test puanlarının çok boyutlu ilişki ölçeği alt test puanlarını yordamada orta düzeyde önemli olduğu yorumuna gidilebilir.

Cinsiyet değişkeni ilişki girişkenliği; yaş değişkeni ise dışsal ilişki kontrolü değişkeni için kurulan regresyon denklemlerinde önemlidir. Dolayısıyla cinsiyet ve yaş değişkenlerinin çok boyutlu ilişki alt testlerinde göreli bir öneme sahip oldukları söylenebilir. Araştırmada üniversiteli kızların ilişki girişkenliği daha yüksek bulunmuştur. Yaş arttıkça dışsal ilişki kontrolü azalmaktadır. Kontrol odağı puanları ise kurulan regresyon denklemlerinin hiçbirinde önemli değişkenler arasına girememiştir. Bu sonuç, denetim odağı puanlarının çok boyutlu ilişki ölçeği alt test puanlarını yordamada önemli bir değişken olmadığı şeklinde yorumlanabilir.

Araştırmanın Sonuçları ve Önerileri: Alan yazında yer alan çalışmalarda olduğu gibi bu araştırmada da yakın ilişkilerin üniversite gençliği için önemli olduğu sonucuna varılmıştır. Üniversite öğrencilerinin yakın ve romantik ilişkilerinin olması psiko-sosyal gelişimlerinin kritik bir parçasıdır. Diğer bir deyişle bu, genç yetişkin için olması gerekeni ifade

etmektedir. Bu bağlamda mükemmeliyetçilik önemli bir değişken olarak karşımıza çıkabilmektedir. Üniversiteli kızlar ilişkide daha girişken olabilmektedir. Yaş ise göreli öneme sahip bir değişkendir. Kontrol odağı ise bu araştırmanın sonucuna göre üniversite öğrencilerinin çok boyutlu ilişkilerinin yordanmasında önemli bulunmamıştır.

Araştırmada elde edilen bulgulara dayalı olarak şu önerilerde bulunulabilir. Üniversite gençliğinin öznel iyi oluşu göz önünde bulundurularak sağlıklı yakın ilişkiler ve evliliğe hazırlık konusunda psiko-eğitsel programlar yapılabilir. Bireyin yakın ilişkiler konusunda kendisini tanıması, seçmek istediği kişinin özelliklerine ilişkin farkındalık kazanması, mükemmeliyetçiliğin olumsuz yönlerini üzerinden atarak sağlıklı seçim yapabilmesi konusunda bireysel ve özellikle grupla psikolojik danışma uygulamalarının yararlı olacağı ileri sürülebilir. Bu programlar aracılığı ile hem gençlerin ilişkilerini daha sağlıklı bir şekilde yaşamalarına hem de öznel iyi oluş düzeylerinin geliştirilmesine yardımcı olunabilir. Araştırmanın ilişki girişkenliği ve dışsal ilişki kontrolü konusundaki sonuçları göz önünde bulundurularak, grupların ve programın yapısının oluşturulmasında cinsiyet ve yaş faktörüne dikkat edilebilir. Bu uygulamalar seminerler, konferanslar ve panellerle desteklenebilir.

Araştırmacılara yönelik öneriler ise şunlar olabilir. Çok boyutlu ilişkiler ile kızgınlık/öfke, akılcı olmayan inançlar, düşmanlık (olumsuz partner davranışları), iyimserlik ilişkisine bakılabilir. Üniversiteli çiftlere yönelik grup programları düzenlenerek, bu programların olumlu ruh sağlığı kapsamında etkililikleri test edilebilir. Evlilik yaşamı devam eden bireyler üzerinde benzer bir araştırma yapılabilir ve evlilik doyumu ile bu değişkenlerin ilişkileri gözden geçirilebilir.

Anahtar Sözcükler: Çok boyutlu ilişkiler, çok boyutlu mükemmeliyetçilik, öznel iyi oluş, kontrol odağı.

Anahtar Sözcükler: değerlendirme Çok boyutlu ilişkiler, çok boyutlu mükemmeliyetçilik, öznel iyi oluş, kontrol odağı.

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Assessment Preferences of Higher Education Students

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Abstract

Problem Statement: Teaching the content and assessing the level of success are two processes that complement and influence each other in a two dimensional way. Furthermore, selected evaluation methods facilitate students' approaches to content and affect their level of understanding, thus supporting students in gaining higher order thinking skills. For this reason, considering students' assessment preferences may be a key factor for academic achievement.

Purpose of the Study: From this perspective, the purpose of this study was to expose the assessment preferences of higher education students.

Method: This research study is a "causal-comparative study." The main research question that directed this research was: "What are the assessment preferences of higher education students?" The general overview of the student profile and the differences between departments and grade levels was questioned. The study involved a total of 476 higher education students from six different departments of the Faculty of Education of a private university who voluntarily participated in this study. Purposive stratified sampling was used to collect data. The data was then analyzed using MANOVA.

Findings and Results: The findings indicated that higher education students prefer alternative assessment methods, namely "formative assessment," which leads to deeper learning. Placing importance on the "self-concept"

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by higher education students also emerged as an important dimension of the findings.

Conclusions and Recommendations: These two key points lead us to the conclusion that "higher education students want from their instructors an approach taking into consideration individual differences, not only in the teaching-learning process, but also in the assessment process." The study revealed that the students are more likely to employ surface learning approaches when preparing for their examinations and deep learning approaches when writing their assignment essays, and have a clear preference for assessment by assignment essays, rather than examinations. The findings of this study also indicated that the assignment essay gave the students a chance (a) to look critically at the reading and information in depth, (b) to provide enough time to develop and improve writing skills, and (c) to enable them to narrow their research and extend reading into the topics they were interested in.

Keywords: assessment preferences, inventory adaptation, higher education

Evaluation is a broad term that covers all ages, in all learning environments, in different disciplines within various educational settings. Parallel with such variables such as content, target group, learning environment and the teaching-learning process, where the standardization and control is difficult, the evaluation methods and processes were also reshaped by evident diversity. The situation is also the same for higher education. All faculty members and instructors in all higher education institutions make decisions based on various assessment methods and techniques about the level of academic achievement of students. The results of these decisions not only affect the students' lives and career plans, but also play an important role in many other variables. Many variables such as students' study habits, learning preferences, levels of understanding, levels of knowledge, and skills in transforming theory into practice show variety according to the selected assessment method. Owing to this fact, parallel with the personal characteristics of students, the levels of success may also fluctuate according to the preferred assessment method.

Evaluation of student achievement is administered during and after the teaching-learning process, and it is perceived as an event that is independent from teaching. However, the methods selected for evaluating students have various effects on different variables such as how students study, how they prepare themselves for the evaluation process, what they experience during the assessment process and to what extent they learn the content. Moreover, the selected assessment methods should give the chance for description and feedback in relation to these variables (Birenbaum, 1997; Struyven, Dochy & Janssens, 2005; Birenbaum, 2007).

This continuous and never ending process brings to mind the following questions: What factors separate students who are "successful learners" from ones who are "less successful learners?" In other words, which assessment methods cause differentiation between high achievers and low achievers? Not long ago, the primary

source of information for students was libraries, books, teachers, experts and printed materials. Although there were successful learners both in those times and today, the primary source of information has changed. Today, most students have access to up-to-date information through Internet and Web technologies. Such a transformation has required shifts in teaching, learning and evaluation approaches. Parallel with constructivism and new teaching methods in different subject fields, new approaches have emerged in assessment preferences since classical measurement and evaluation methods would remain incapable of measuring and evaluating multi dimensional and patterned cognitive, affective and psychomotor skills of the learners (Baştürk, 2005).

Evaluations may be formative or summative, focusing on either the process or the product. Serious problems in higher education have shown that there is a gap between the theoretical knowledge and application. Among the possible alternatives for overcoming these obstacles may be an evaluation of the process and product from various dimensions and in terms of several variables that affect the decision. Other than the evaluation methods and approaches, the scope of which is outside of this manuscript, an alternative approach of this study focuses on assessment preferences. Assessment preferences of students change according to different variables such as study habits, content, motivation, instructors' approach to evaluation and concerns about achievement scores. Therefore, providing students with the freedom to choose preferred assessment methods might increase motivation, improve their responsibility and lead to deeper understanding of content.

Any assessment process which is good and high in quality should be a part of the students' learning process and assist students in knowing what to learn and how to learn. The fact that teaching-learning methods and assessment methods are defined similarly means that assessment should contribute to the learning process (Biggs, 2003). In accordance with the selected assessment methods, students' approaches to learning differ, being either "deep" or "surface." In their study, Gijbels and Dochy (2006) questioned the relationships between hands-on experiences with formative assessment, students' assessment preferences and their approaches to learning. Their results revealed that students' assessment preferences differ according to their approach to learning. Parallel with the literature, students who learn by memorizing and reproducing factual contents prefer simple and surface assessment methods, whereas students who intend to understand and construct the meaning of the learned content prefer complex and deep approaches to learning.

Assessment preferences not only help to explain how students learn, but also affect how they study the content (Struyven, Dochy & Janssens, 2005). On the other hand, students' study habits play an important role in their preferred assessment methods. In most of the research studies it is reported that students prefer surface evaluation methods, which contain multiple-choice and short-answer question types, since they tend to obtain higher scores and become less anxious. Another research outcome is that students who want a deep understanding of content prefer alternative assessment methods, since they think that alternative assessment methods

measure their learning outcomes more accurately (Sambell, McDowell & Brown, 1997).

In their research study, Birenbaum and Rosenau (2006) made a comparison between pre-service teachers and in-service teachers in terms of teaching strategies and assessment preferences. The researchers concluded that in-service teachers approach assessment in a more detailed and deep manner. They also stated that this result is the effect of in-service teachers' continuous engagement in meaningful learning experiences. This outcome reveals that instructors should enable students to experience active learning strategies, authentic activities based on the constructivist approach and on work-based learning in their classrooms (Walsh, 2007).

Trotter (2006) investigated the effect of continuous formative evaluation on students. The researcher concluded that although instructors have a high workload, continous formative evaluation increases student motivation, contributes to their perceptions about learning and improves the teaching-learning process. Another approach that contributes to learning is the planning of work time with drills. Wilhelm and Pieters (2007) provided students with drills to plan their work, and they reported an increase in students' academic achievement, especially the achievements based on collaborative group work.

Gelbal and Kelecioğlu (2007) conducted research with 242 in-service teachers from both public and private primary schools. They found that teachers generally prefer traditional evaluation methods rather than student-centered evaluation methods, since they feel more confident in using traditional ones. The most important obstacles faced in not using new alternative approaches are: crowded classrooms, insufficient time, difficulty of assessment, and difficulty of application. Time spent getting prepared and insufficient support from families was also reported by teachers as reasons for not preferring alternative methods.

It is clear from the literature that teaching the content and assessing the level of success are twofold processes, which complement and influence each other in a two dimensional way. Furthermore, the selected evaluation method facilitates students' approaches to content and affects their level of understanding, thus supporting students in the gaining of higher order thinking skills. For this reason, considering students' assessment preferences may be a key factor for academic achievement.

Hence, the purpose of this research study was to determine the higher education students' assessment preferences.

Method

Research Design

This research study was a "causal-comparative study." Causal-comparative design aims to determine the cause of the consequence of difference between groups of people. In educational research, causal-comparative studies are valuable in identifying possible causes of observed variations in the behavior patterns of students (Fraenkel & Wallen, 2006).

The main research question which directed this research was: "What are the assessment preferences of higher education students?" The sub-issues were as follows:

What is the general overview of the student profile in terms of the assessment-form related dimension, the examinee related dimension, and the grading and reporting dimension?

What are the differences between departments and grade levels in terms of the assessment-form related dimension, the examinee related dimension, and the grading and reporting dimension?

Sample

The population of this study is a total of 1230 undergraduate students of the Faculty of Education of a private university. Purposive stratified sampling was used to collect data. Departments and grade levels were taken as the criteria for sample selection. Of the 1230 students, 476 volunteered to participate in this study.

Among the participants, 77 (16.2%) were male, while 399 (83.8%) were female. The distribution of participants according to grade level is as follows: 137 freshmen (28.8%), 101 sophomores (21.2%), 176 juniors (37.0%) and 62 seniors (13.0%). The distribution of participants according to departments is as follows: 60 students (12.6%) were from Computer Education and Instructional Technology (CEIT), 65 students (13.7%) were from Early Childhood Education (ECE), 74 students (15.5%) were from Primary Teacher Education (PTE), 113 students (23.7%) were from Mathematics Education (MTE), 77 students (16.2%) were from Turkish Language Teaching (TLT), and finally, 80 students (16.8%) were from English Language Teaching (ELT).

Research Instruments

The Assessment Preferences Inventory (API), originally developed by Birenbaum (1994, 1997, 2007), was used to collect data for this study. For the adaptation of the original inventory to Turkish, permission was received from Menucha Birenbaum through e-mail communication with the researcher. The inventory, which is composed of 67 questions and three independent scales, enabled the questioning of assessment preferences in seven dimensions. The adaptation of the Assessment Preferences Inventory into Turkish was realized by Gülbahar & Büyüköztürk (2008). The authors explained that the adaptation process was carried out in parallel with the ideas of Hambleton and Patsula (1999), based on their suggestions for adaptation of inventories between cultures. The process and results of the adaptation are briefly explained below.

First, the inventory was translated into Turkish by two experts. After the language was aligned by these two experts, the inventory was again translated into English and inconsistencies were checked. Upon investigation, the items in the original inventory and the items retranslated to English from Turkish were found to be well-matched in terms of language. Moreover, the items were considered for their "match" in terms of semantics (definition of words), phrasal (phrases used in daily

life), experiential (existence and meaning of experiences) and conceptual (use of concepts for the same context). For this reason, the opinions of the two field experts were taken. Following this process, 13 items, which address the emerging alternative approaches, were added to the inventory leading to a total final number of 80 items.

The final version of the inventory was administered to 476 students via stratified sampling in all departments of the Faculty of Education in a private university. The factor structure of the inventory was analyzed through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The internal consistency values of scales range between .58 and .92, having a mean of .79. Of the 80 items, 8 were eliminated after the related analysis. As a result, the inventory was composed of 72 items, with the subscales and dimensions described in detail below.

I. Assessment-form Related Dimensions (32 items)

1. Assessment Types (16 items)

Alternative Assessment Types (projects, portfolios, discussion, etc.)

Classical Assessment Types (written and oral exams, etc.)

2. Item Format/Task Type (12 items)

Simple/Multiple Choice (multiple choice, true-false, etc.)

Complex/Constructivist (concept maps, performance based skills, etc.)

3. Pre-assessment preparation (4 items): Guidelines for preparation, examples, etc.

II. Examinee's Related Dimensions (26 items)

4. Cognitive Processes (14 items): Declarative, procedural, conceptual, synthesis, critical thinking, evaluation and creativity.

5. Student's Role/Responsibilities (12 items): Participation in determining evaluation standards and criteria; item development, evaluation (self-evaluation, peer-evaluation etc.), *collaboration.*

III. Grading and Reporting (14 items): Criterion referenced, relative to student's own progress, single score, objectivity in grading and feedback.

Data Analysis

The data was analyzed using one-way multivariate analysis of variance (MANOVA). MANOVA evaluates differences among centroids for a set of dependent variables when there are two or more levels of an independent variable. When the F-value calculated in the analysis was significant, the results of the following MANOVA were used to assess differences among subgroups for each dependent variable.

Findings and Results

General Overview of the Student Profile

Students' Preferences about Classical and Alternative Assessment. The results showed that higher education students mostly prefer self-evaluation (in which they take self-responsibility and become a part of their own assessment process) ($\overline{X}$ =3,95), observation ($\overline{X}$ =3,70), individual presentations ($\overline{X}$ =3,64), papers/projects ($\overline{X}$ =3,64) and peer-evaluation ($\overline{X}$ =3,64) as the methods of assessment. On the other hand, individual oral tests with supporting materials ($\overline{X}$ =2,90), without supporting materials ($\overline{X}$ =2,56) and when the questions are given half an hour prior to the test are those which the students least prefer.

Students' Preferences about Item Format and Task Type. In terms of item format and task type, the higher education students' first preference was found to be multiple-choice questions ($\overline{X}$ =4,09), the second preference was tasks and skills such as real life events and situations ($\overline{X}$ =3,97), and the third preference was found to be true-false types of questions ($\overline{X}$ =3,82). The least preferred task types were complex tasks and skills which have more than one possible answer ($\overline{X}$ =2,85), open-ended questions requiring long answers (essays) ($\overline{X}$ =2,88) and detailed tasks or skills facilitated by the teacher at every stage ($\overline{X}$ =2,94). An obvious outcome is that students mostly prefer items appearing under the heading "simple/multiple choice" due to, or caused by, the classical education system. Other researchers also reached a similar finding.

Students' Preferences about Pre-assessment Preparation. When the students' preferences about pre-assessment preparation were analyzed, items that were preferred in every instance (or frequently) were: handouts at the beginning of the course, a detailed description of the way the student's achievements will be assessed ($\overline{X}$ =4,28), clarification of what will be on the test and how to prepare for it ($\overline{X}$ =4,32), examples of the kinds of questions to be asked on the test, given out prior to the test ($\overline{X}$ =4,15), and handouts containing a list of questions from which students can choose the test questions ($\overline{X}$ =3,87).

Students' Preferences about Cognitive Processes. In terms of cognitive processes, higher education students stated their preferences from the top down, such as: questions which require personal explanation and opinions ($\overline{X}$ =3,99), questions

which require creativity and imagination ($\overline{X}$ =3,86), and questions which require the drawing of conclusions ($\overline{X}$ =3,70). Questions which require scientific investigation were found to be the least preferred type of questions by the students ($\overline{X}$ =3,15).

Students' Preferences about Taking Roles and Responsibilities in the Assessment Process. When the findings were interpreted in terms of the taking of roles and responsibilities in the assessment process, the most favored items from the perspective of expectations from the teachers as included in the grades were: assessment as part of the grade, the amount of effort invested by the student in coping with the material ($\overline{X}$ =4,37), the taking into consideration the self-assessment of students' progress and achievements in the course ($\overline{X}$ =4,23) and assessment, as part of the grade, of the amount of interest exhibited by the student ($\overline{X}$ =4,12). On the other hand, allowing the students to prepare the test questions ($\overline{X}$ =3,22) and allowing each student to set her/his own test questions ($\overline{X}$ =3,22) were the items that were least preferred by the students.

Students' Preferences about Grading and Reporting. With regard to grading and reporting, the students mostly preferred getting detailed feedback about the results of their exam or work ($\overline{X}$ =4,29), assessment of the process together with the product ($\overline{X}$ =4,21) and grading the homework and applications as a part of the total grade ($\overline{X}$ =4,15). The least preferred task by the students was being graded by considering other students' performances ($\overline{X}$ =2,98).

Differences between Departments and Grade Levels

Assessment Types. The results of MANOVA, on the factor scores of ATS on assessment types, revealed a significant difference between the grade levels of students $F(6, 942)=2.36$, $p<.05$. Based on the results of MANOVA, ANOVA was conducted for each factor score according to grade levels. The mean of factor scores for ATS for "Alternative Assessment Types" was found for freshmen as 42.21 (SD=9.78), for sophomores as 41.85 (SD=7.90), for juniors as 42.45 (SD=8.85) and for seniors as 42.38 (SD=9.01). No significant difference was found between grade levels in terms of ATS scores for "Alternative Assessment Types," $F(3, 472)=0.41$, $p>.05$, η^2 =.003.

The mean score for "Classical Assessment Types" of freshmen was 12.75 (SD=4.25), for sophomores was 11.99 (SD=3.76), for juniors was 13.16 (SD=3.65) and for seniors was 11.28 (SD=4.18). The difference between students' mean scores is considerd to be significant, $F(3, 472)=4.35$, $p<.01$, η^2 =.027. The results of the Tukey

test revealed that the mean scores of freshmen and juniors were higher than for seniors, and that no significant difference existed in other pairs.

The results of MANOVA, on the factor scores of ATS, revealed no significant difference between the departments, F (10, 924)=1.13, p>.05. The mean score for "Alternative Assessment Types" of CEIT students was 41.88 (SD=9.30), for ECE students was 41.37 (SD=8.85), for PTE students was 43.19 (SD=9.60), for MTE students was 41.75 (SD=9.05), for TLT students was 42.84 (SD=8.42), and for ELT students was 43.54 (SD=8.70). The mean score for "Classical Assessment Types" of CEIT students was 13.28 (SD=3.84), for ECE students was 12.11 (SD=3.91), for PTE students was 12.19 (SD=3.84), for MTE students was 13.06 (SD=3.77), for TLT students was 11.88 (SD=4.06), and for ELT students was 12.55 (SD=4.14).

Item Format/Task Type. The results of MANOVA, on the factor scores of IFTTS on item format/task type, revealed a significant difference between the grade levels of students F(6, 942)=3.70, p<.01. Based on the results of MANOVA, ANOVA was conducted for each factor score according to grade levels. The mean of the factor scores for IFTTS for "Simple/Multiple Choice" was found for freshmen as 26.65 (SD=5.12), for sophomores as 25.85 (SD=4.43), for juniors as 25.98 (SD=4.83) and for seniors as 24.91 (SD=4.87). No significant difference was found between grade levels in terms of IFTTS scores for "Simple/Multiple Choice" F(3, 472)=1.88, p>.05, η^2 =.012. The mean of factor scores for IFTTS for "Complex/Constructivist" was found for freshmen as 14.82 (SD=3.79), for sophomores as 15.73 (SD=3.55), for juniors as 16.14 (SD=3.62), and for seniors as 15.84 (SD=3.91). A significant difference was found between grade levels in terms of IFTTS scores for "Complex/Constructivist," F(3, 472)=3.37, p<.05, η^2 =.021. The results of the Tukey test revealed that the mean scores of juniors were higher than those of freshmen, while no significant differences existed in other pairs.

The results of MANOVA, on the factor scores of IFTTS on item format/task type, revealed a significant difference between the departments, F(10, 924)=3.29, p<.05. The results of ANOVA conducted for each factor of the subscale are as follows: The mean score for the "Simple/Multiple Choice" factor of CEIT students was 26.42 (SD=4.50), of ECE students was 23.61 (SD=4.97), of PTE students was 26.92 (SD=5.03), of MTE students was 26.03 (SD=5.07), of TLT students was 25.73 (SD=4.49), and of ELT students was 27.10 (SD=4.41). The difference between students' mean scores was found as significant for the "Simple/Multiple Choice" factor, F(5, 463)=4.77, p<.01, η^2 =.049. The results of the Tukey test revealed that the mean scores of ECE students were lower than for students of other departments, while no significant differences existed in other pairs.

The mean score for the "Complex/Constructivist" factor of CEIT students was 16.40 (SD=3.43), for ECE students was 14.53 (SD=3.91), for PTE students was 15.39 (SD=3.82), for MTE students was 16.19 (SD=3.50), for TLT students was 15.55 (SD=3.34), and for ELT students was 15.45 (SD=4.04). The difference between

students' mean scores was found as significant for the "Complex/Constructivist" factor, F(5, 463)=2.31, p<.05, η^2 =.024. The results of the Tukey test revealed that the mean scores of CEIT students are higher than those of ECE students, while no significant differences exist in other pairs.

Pre-assessment preparation. The results of ANOVA, on the factor scores of PPS, revealed a significant difference between the grade levels of students, F (3, 472)=3.09, p<.05, η^2 =.019. The mean scores for PPS were found for freshmen as 17.13 (SD=3.27), for sophomores as 16.01 (SD=2.77), for juniors as 16.75 (SD=2.96) and for seniors as 16.18 (SD=3.47). The results of the Tukey test revealed that the mean scores of freshmen were higher than for sophomores, while no significant differences existed in other pairs.

The results of ANOVA, on the factor scores of PPS, revealed a significant difference between the departments, F(5, 463)=3.29, p<.01, η^2 =.034. The mean score for PPS of CEIT students was 17.32 (SD=3.00), for ECE students was 15.93 (SD=3.07), for PTE students was 16.96 (SD=3.08), for MTE students was 16.12 (SD=3.16), for TLT students was 16.29 (SD=3.34), and for ELT students was 17.41 (SD=2.71). The results of the Tukey test revealed that mean scores of ELT students were higher than for ECE students, while no significant differences existed in other pairs.

Examinee's Related Dimensions. The results of MANOVA, on the factor scores of ERDS, revealed no significant difference between the grade levels of students, F(6, 942)=1.07, p>.05. The mean of factor scores for ERDS for "Cognitive Processes" was found for freshmen as 49.06 (SD=10.93), for sophomores as 49.63 (SD=9.24), for juniors as 50.84 (SD=10.30) and for seniors as 51.37 (SD=11.53). The mean of factor scores for ERDS for "Student's Role/Responsibilities" was found for freshmen as 46.40 (SD=8.31), for sophomores as 45.69 (SD=7.02), for juniors as 47.38 (SD=7.21) and for seniors as 46.20 (SD=8.11).

The results of MANOVA, on the factor scores of ERDS, revealed a significant difference between the departments, F(10, 924)=2.13, p<.05. The results of ANOVA were conducted for each of the two factors. The mean score for the "Cognitive Processes" factor of ERDS for CEIT students was 50.37 (SD=9.39), for ECE students was 46.66 (SD=9.51), for PTE students was 51.35 (SD=10.64), for MTE students was 50.79 (SD=9.80), for TLT students was 50.71 (SD=10.78), and for ELT students was 50.67 (SD=11.31). No significant difference was found between departments in terms of mean scores for "Cognitive Processes", F(5, 463)=1.87, p>.05, η^2 =.020.

The mean score for the "Student's Role/Responsibilities" factor of ERDS for CEIT students was 46.85 (SD=6.47), for ECE students was 45.29 (SD=8.35), for PTE students was 48.74 (SD=7.28), for MTE students was 46.03 (SD=8.19), for TLT students was 45.00 (SD=7.58), and for ELT students was 47.49 (SD=6.94). The difference between students' mean scores was found to be significant for "Student's

Role/Responsibilities" between departments, F(5, 463)=2.62, p<.05, η^2 =.027. The results of the Tukey test revealed that mean scores of PTE students are higher than of TLT students, while no significant differences exist in other pairs.

Grading and Reporting. The results of ANOVA, on the factor scores of GRS, revealed no significant difference between the grade levels of students, F(3, 472)=0.59, p>.05, η^2 =.004. The mean score for GRS was found for freshmen as 53.11 (SD=8.94), for sophomores as 53.01 (SD=7.66), for juniors as 53.95 (SD=8.03) and for seniors as 54.36 (SD=9.12).

The results of ANOVA, on the factor scores of GRS, revealed a significant difference between the departments, F (5, 463)=2.66, p<.05, η^2 =.028. The mean score for GRS of CEIT students was 54.28 (SD=8.64), for ECE students was 50.56 (SD=8.95), for PTE students was 53.56 (SD=8.32), for MTE students was 53.55 (SD=8.39), for TLT students was 53.19 (SD=7.87), and for ELT students was 55.45 (SD=7.59). The results of the Tukey test revealed that mean scores of ELT students were higher than of ECE students, while no significant differences existed in other pairs.

Conclusions and Recommendations

Assessment is such a wide-ranging term that we come up against this phenomenon at every age, in every learning environment, in every institution, in every training; in short, everywhere that learning occurs. Since the variables such as content, target group, instructor, learning environment and teaching process cannot be fixed, assessment methods and processes are being continuously reshaped and changed. Assessment can be either formative or summative, that is, both the process and the product may be evaluated.

Research studies in the area of content and application show that students have difficulties in transforming theoretical knowedge to practice after graduation, since the content mostly covers the theoretical dimension which is far from context (Knight, 2006). Many new approaches are suggested to overcome such obstacles. Making students become a part of their own assessment process (Dancer & Kamvounias, 2005) and the assessment of the quality of education given by the instructor (Shoa, Anderson & Newsome, 2007) are some examples of these new approaches.

Among many assessment types and approaches, which are outside the scope of this research study, a different approach considered for this study is the "assessment preferences." The assessment preferences of students may show variety according to variables such as students' study habits, instructors' attitudes, assessment methods, content, motivation and anxiety. Due to this fact, assessing students according to their own preferences may lead to more effective learning, since their motivation may increase and they gain responsibility for their own learning. The results showed that, in terms of assessment-form related dimensions, higher education students

preferred alternative assessment methods, especially individual ones such as observation and individual presentation. Dobson (2006) specified that preparing a presentation may both be used as a support for learning and as an alternative assessment approach.

When the item format and task type results are investigated, it is seen that students prefer multiple choice items and real-life tasks. Struyven, Dochy and Janssens (2005) also concluded that students prefer tests composed of multiple choice items, since they caus less anxiety, and the students like simplicity and can get higher scores. These findings indicate that when assessment choices are given to students, they prefer alternative types, but when the item format is questioned, it is obvious that students answer by considering traditional structures. When traditional structure is considered, students directly choose surface understanding, since they believe they will get higher scores with multiple choice items. However, their own preference is deeper learning since they prefer alternative assessment. Students' preferences in terms of cognitive processes are being creative and imaginative, and explaining personal opinions, which indicates that students want to express themselves independently and freely.

In terms of pre-assessment preparation, the findings indicated that students want to know all the details about the assessment process and the product. Also, students want to have active roles in the assessment process. This endeavor, wanting to take more responsibility, is also the baseline for the alternative assessment approach. In terms of grading and reporting, students want to get critical feeback about their work and they value assessment of both the process and the product. The value of feedback is an obvious fact cited over many years in the literature. In a recent study, the importance of feedback is also discussed by Russell, Elton, Swinglehurst and Greenhalgh (2006). The researchers discussed the evaluation of e-learning, where they focus on the improvement of quality and detail of feedback provided during collaboration processes. All of these findings bring us to the conclusion that students mostly prefer formative assessment methods in which they are actively engaged.

When the results of cognitive processes were investigated, questions which required personal explanation and opinions, along with creativity and imagination, appeared to be the ones most prefered by the students. In terms of taking roles and responsibilities in the assessment process, the most favored items from the point of expectations from the teachers as included in the grades were: assessment as part of the grade, the amount of effort invested by the student in coping with the material, taking into consideration the self-assessment of students' progress and achievements in the course. With regard to grading and reporting, the students mostly preferred getting detailed feedback about the results of their exam or work, and the assessment of process together with the product.

Students' preferences regarding assessment didn't demonstrate considerable changes according to grade levels and departments, since the effect size values are low. On the other hand, students' preferences about task type have changed over the years. In other words, they prefer complex and constructivist items more when they get older. The findings showed that ECE students' mean scores on both item format

and task type are relatively lower than other departments. This means that ECE students show diversity within their own group. In terms of pre-assessment preparation, the groups of freshman and ELT students were found to be more willing to be informed about the process. This finding may be explained as a lack of such kinds of experiences for students, or upon previous experiences with positive outcomes.

When students' roles and responsibilities are investigated, it is seen that PTE students' factor scores are higher than other departments, and moreover statistically higher than TLT students. This result is a good indicator that, as the graduates of the department of PTE will be class teachers, their perceptions towards their future roles are positive. Finally, grading and reporting preferences of ELT students are higher than those of ECE students, which can be explained as being due to the lack of experiences or satisfaction about previous experiences rergarding this topic.

To sum up, this research study has indicated that higher education students prefer alternative assessment methods, or in other words, "formative assessment," which leads to deeper learning. The placing of importance on the "self-concept" by higher education students also emerged from the findings as an important dimension. These two key points lead us to the conclusion that "higher education students want from their instructors an approach taking into consideration the individual differences, not only in the teaching-learning process, but also in the assessment process."

Similar to this current study, Sander, Stevenson, King & Coates (2000) conducted research into an exploration of freshman undergraduate students' expectations of and preference in teaching, learning and assessment (N=395). The study revealed that: (a) they preferred to be taught by interactive lectures and group-based activities, (b) their least favorite learning methods were formal lectures, role-plays and student presentations, (c) coursework assessment preference was for essays, research projects and problem exercises, and (d) there was an overall preference slightly in favor of coursework assessment rather than examinations.

Scouller (2000) also researched assessment preferences and student learning (tertiary undergraduate students). The study revealed that the students are more likely to employ surface learning approaches when preparing for their examinations and deep learning approaches when writing their assignment essays, and have a clear preference for assessment by assignment essay, rather than an examination. The findings of this study also indicated that the essay assignment gave the students a chance: (a) to look critically at the reading and information in depth, (b) to provide enough time to develop and improve writing skills, and (c) to enable them to narrow their research and extend reading into the topic that they were interested in. Scouller (2000) also concluded that assessment method plays an important role in the sudents' learning.

Based on the current and previous research studies conducted in revealing the preferences of higher education students, further research studies should focus on the effect of individual assessment preferences, both on the process and on the

product. Thus, future studies should focus on achievement when the evaluation is completed according to individual preferences. It is expected that a framework for "evaluation based learning" will emerge as a result of these future studies. Future research studies may consider self-concept, learning styles, study habits and performance levels of students when assessment preferences are under question.

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Yüksek Öğretim Öğrencilerinin Değerlendirme Tercihleri

(Özet)

Problem Durumu: Değerlendirme, her yaşta, her öğretim ortamında, her kurumda, her eğitimde, kısaca öğrenme oluşması beklenen her ortamda vazgeçilmez bir olay olarak karşımıza çıkmaktadır. Aktarılması planlanan içerik, öğrenci kitlesi, öğretim elemanı, öğretim ortamı, öğretim süreci gibi farklı değişkenler sabitlenemediği için, değerlendirme yöntemleri ve süreçleri sürekli yapılandırılmakta ve değişiklik göstermektedir. İçeriğin öğretilmesi ve ne kadar öğrenildiğinin ölçülmesi, birbirlerini bütünleyen ve çift yönlü etkileyen süreçlerdir. Ayrıca, seçilen değerlendirme yöntemi öğrencilerin içeriğe yaklaşımlarını ve öğrenme düzeylerini etkilemekte, dolayısı ile üst düzey düşünme becerileri kazanmalarına yardımcı olabilmektedir. Öğrenciler, öğretim elemanının belirlediği değerlendirme türüne göre çalışma biçimlerini düzenlemektedirler. Klasik yöntemler uygulandığında daha çok ezbere dayalı ve yüzeysel öğrenme, klasik yöntemler dışında kalan seçenekleri tanımlayan alternatif değerlendirme yöntemlerinde ise daha çok uygulamaya dayalı ve derinlemesine öğrenme gerçekleşmektedir. Bu nedenle seçilen değerlendirme yöntemi, eğitimin en önemli amacı olan öğrenme sürecini ve sonucunu doğrudan etkileyen önemli bir etkendir. Bu gerçeklerden hareketle bu çalışma, yüksek öğretim öğrencilerinin değerlendirme tercihlerini ortaya çıkarmayı amaçlamaktadır.

Araştırmanın Amacı: Bu araştırma yüksek öğretim öğrencilerinin hangi değerlendirme türlerini tercih ettiklerini ortaya çıkarmak amacıyla gerçekleştirilmiştir. Bu kapsamda değerlendirme yöntemlerine ilişkin boyutlar, öğrencilere ilişkin boyutlar ile notlandırma ve raporlaştırma olmak üzere üç boyutta öğrencilerin tercihleri ortaya çıkarılmıştır. Değerlendirme Yöntemlerine İlişkin Boyutlar; Değerlendirme Türleri, Madde biçimi/İşlem türü ve Değerlendirmeye hazırlık olarak ele alınmıştır. Öğrencilere İlişkin Boyutlar Bilişsel Süreçler, Öğrenci rolü/sorumlulukları ve Gayret göstergeleri olarak incelenmiştir. Son olarak ise, Notlandırma ve Raporlaştırma, notlandırma ve dönüt kapsamında ele alınmıştır. Bu bağlamda belirtilen boyutlar açısından bölümler ve sınıflar arasında farklılıklar olup olmadığı da incelenmiştir.

Araştırmanın Yöntemi

Bu araştırma, nedensel karşılaştırmalı bir çalışmadır. Bu çalışmaya özel bir üniversitenin Eğitim Fakültesi'nde bulunan 6 farklı bölümde okuyan ve araştırma için gönüllü olan 476 öğrenci katılmıştır. Öğrencilerin değerlendirme tercihlerini belirlemek amacı ile Birenbaum (1994, 1997,

2007) tarafından geliştirilen ve araştırmacılar tarafından Türkçeye uyarlama çalışması yapılan "Değerlendirme Tercihleri Ölçeği - DTÖ" kullanılmıştır. Öğrencilerin genel olarak tercihleri, bölümler ve sınıflar bazındaki olası farklılıklar incelenmiştir. Veriler amaçsal tabakalı örneklem kullanılarak elde edilmiş ve MANOVA yöntemi ile analiz edilmiştir.

Araştırmanın Bulguları: Klasik ve alterantif değerlendirme yaklaşımları ile ilgili olarak öğrencilerin daha çok kendi değerlendirme süreçlerinin bir parçası oldukları ve sorumluluk aldıkları "öz değerlendirme" yaklaşımını tercih ettikleri görülmektedir. Madde ve işlem türleri açısından öğrenciler öncelikli olarak çoktan-seçmeli testleri, daha sonra ise gerçek yaşamda karşılabilecekleri olay ve durumlara ilişkin becerileri tercih etiklerini belirtmişlerdir.

Değerlendirme öncesi hazırlık konusunda ise, dersin başında ders notlarının elde edilmesi, kendilerinin nasıl değerlendirileceğine ilişkin bilgi verilmesi ve değerlendirmede nelerin yer alacağı ve nasıl hazırlanmaları gerektiği konusunda bilgi verilmesi öğrencilerin en öncelikli terihleri olarak belirlenmiştir. Bilişsel süreçler açısından ele alındığında yüksek öğretim öğrencileri, kişisel yorum gerektiren, yaratıcılık ve hayal gücüne dayalı ve sonuç çıkarabildikleri soruların kendilerine yöneltilmesini istediklerini ifade etmişlerdir.

Öğrenciler değerlendirme sürecinde puan verilmesini bekledikleri konulardaki tercihlerini ise, harcadıkları çaba, öz değerlendirme sonuçları ve gösterdikleri ilgi ve motivasyon olarak belirtmişlerdir.

Notlandırma sürecine ilişkin olarak öğrenciler, gösterdikleri performansa ilişkin detaylı dönüt alınması, süreç ve ürünün birlikte değerlendirilmesi ile ödev ve uygulamaların da genel notun bir parçası olması konularındaki beklentilerini dile getirmişlerdir.

Bulgular, yüksek öğretim öğrencilerinin daha derin öğrenmeleri sağlayabilen "alternatif değerlendirme", diğer bir ifade ile düzeltici değerlendirme yaklaşımlarını daha fazla tercih ettiklerini göstermiştir. Yüksek öğretim öğrencilerinin "benlik kavramı"na verdikleri önem ise araştırmanın bir diğer önemli bulgusudur.

Araştırmanın Sonuçları ve Önerileri: Değerlendirme hem süreci hem de ürünü kapsayabilir, düzey belirlemeye veya biçimlendirmeye yönelik olabilir. Bu konuda yapılan çalışmalar, öğrencilerin kuramsal bilgilerini uygulamaya dönüştürürken zorluklar yaşadıklarını göstermiştir. Bu zorluğu aşmak için pek çok çözüm önerisi ileri sürülmüştür. Örneğin, öğrencileri değerlendirme sürecinin bir parçası haline getirmek bu çözümlerden bir tanesidir.

Önerilerden bir tanesi olarak öğrencilerin değerlendirme tercihlerinin belirlenmesi bu çalışma kapsamında ele alınmış olan farklı bir yaklaşımdır. Değerlendirme tercihleri öğrenciye göre çeşitlilik gösterebilir ve öğrencinin çalışma alışkanlıklarını, içeriğe yaklaşımını, motivasyonunu ve ilgisini etkileyebilir. Bu gerçekler ışığında her öğrenciyi kendi tercihleri doğrultusunda değerlendirmek, hem motivasyonun artmasını, hem de

kendi öğrenme sorumluluğunu almasını sağlayacağı için, çok daha etkili bir öğrenme ile sonuçlanabilir.
Madde ve işlem biçimine ilişkin elde edilen sonuçlarda öğrencilerin çoktan-seçmeli ve gerçek hayatla ilişkili becerileri tercih ettiklerini göstermiştir. Bu ve diğer bileşenler ele alındığında, öğrencilerin aslında alternatif yaklaşımları tercih ettiği, ancak geleneksel sistemle kazandıkları alışkanlıklardan çok fazla kopamadıkları yorumu yapılabilir.
Değerlendirme öncesi için ise öğrencilerin hem süre hem de ürün değerlendirmeye ilişkin tüm detayları önceden bilmek istedikleri görülmektedir. Ayrıca bu süreçte aktif rol alma istekleri de önemli bulgulardan bir diğeridir.
Bilişsel süreçler ve notlandırma açısından öğrencilerin dönüte çok fazla önem verdikleri ve daha çok kendi fikir ve yorumlarını paylaşabildikleri türleri tercih ettikleri sonucu ortaya çıkmıştır.
Öğrencilerin değerlendirme tercihleri bazı bölümler arasında farklı açılardan değişim göstermektedir. Ayrıca yıllar bazında da özellikle işlem türünde farklılık ortaya çıktığı görülmektedir. Geleneksel yapıdan uzaklaşıp, karmaşık ve oluşturmacı süreçlerde kazandıkları deneyim arttıkça, alternatif değerlendirme yaklaşımları tercihi de artmaktadır.
Özetlemek gerekirse; "yüksek öğretim öğrencileri öğretim üyelerinden, bireysel farklılıklarının yalnızca eğitim-öğretim sürecinde değil, değerlendirme sürecinde de dikkate alındığı yaklaşımları kullanmalarını beklemektedir". Öğrenciler, daha derin öğrenmeleri sağlayacak yaklaşımların uygulanmasını beklemektedirler.
Bu ve önceki çalışmalara dayanarak, hem sürece hem de ürüne odaklanan değerlendirme süreçlerinde bireysel farklılıkların önemine ilişkin daha fazla araştırma yapılması gereği ortaya çıkmıştır. Gelecekte yapılacak araştırmalar, bireysel tercihlere dayalı değerlendirme sonuçlarına göre başarı açısından oluşan farka odaklanabilir. Böylece, "değerlendirmeye dayalı öğretim" için kavramsal bir çerçeve oluşması beklenmektedir.
Anahtar Sözcükler: değerlendirme tercihleri, ölçek uyarlama, yüksek öğretim

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An Analysis of Analogies Used in Secondary School Biology Textbooks: Case of Turkey

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Abstract

Problem Statement: Analogies can help make science concepts meaningful to learners but only when used appropriately. They can visualise abstract concepts and motivate. For this reason, analogies are common in biology textbooks. However, previous studies have suggested that analogies are used randomly and carelessly in science textbooks. This situation can cause students to misunderstand scientific concepts. From this point of view, it is considered that analysing the analogies used in biology textbooks will benefit students and teachers.

Purpose of the Study: The aim of this study is to analyse the types of analogies used in secondary school biology textbooks in Turkey and investigate how these analogies are presented.

Method: A document examination technique was used in this research. Seven secondary school biology textbooks were investigated. Determined analogies in the textbooks were classified as follows: analogical relationship, presentational format, level of abstraction, position of the analogue relevant to the target, level of enrichment, pre-topic orientation and the limitations of the analogy.

Findings and Results: A total of 119 analogies were determined in the biology textbooks. A considerable proportion of those were related to cell structure and function, including cells and organelles such as the factory analogy for cell structure and function and the power generator analogy for mitochondria. It was determined that analogies were configured mostly as structural, verbal, concrete–abstract, embedded activator and simple

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analogies. Most were not configured in accordance with analogy-based teaching models. Therefore, students can develop misconceptions. Analogies that only indicate superficial similarities can confuse students, and these must be elaborated and made interesting for students. To prevent misconceptions, it is necessary to indicate the irrelevant features of the target and analogue concepts.

Conclusions and Recommendations: When preparing biology textbooks, the principles highlighted by teaching models such as the teaching with analogies model should be taken into consideration.

Keywords: biology education, analogy, biology textbooks

An analogy is a comparison of the similarities of two concepts. The familiar concept is called the analogue and the unfamiliar idea the target. If the analogue and target share similar features, an analogy can be drawn between them. A verbal or visual systematic comparison between the features of the analogue and target is called mapping (Duit, 1991; Dunbar, 2001; Glynn, 2007). Analogies are effective teaching tools. They help students transfer new knowledge to a prior knowledge structure, provide motivation to learn and make students gain new points of view about a subject (Atav, Erdem, Yılmaz, & Gücüm, 2004; Geban, Ertepınar, Topal, & Önal, 1999; Glynn & Takahashi, 1998; Heywood, 2002). Analogies help deal with misconceptions and play important roles in conceptual change (Duit, Roth, Komorek, & Wilbers, 2001; Stavy, 1991; Venville & Treagust, 1996). Analogies concretise difficult and abstract concepts that cannot be observed directly (Thiele & Treagust, 1994).

Most research about analogies in science education focuses on those used by teachers (Mastrilli, 1997; Treagust, Duit, Joslin, & Lindauer, 1992; Treagust, Harrison, & Venville, 1998), students (Coll & Treagust, 2001; Glynn & Takahashi, 1998; Jarman, 1996; Pittman, 1999; Yanowitz, 2001) and textbooks (Curtis & Reigeluth, 1984; Newton, 2003; Orgill & Bodner, 2006; Parida & Goswami, 2000; Thiele & Treagust; 1994; Thiele, Venville, & Treagust, 1995). The use of analogies in biological texts is common and indispensable. Glynn and Takahashi (1998) have suggested that biological texts supported with analogies have improved conceptual change. In one study, researchers prepared two texts about cells, one without analogies and one with an analogy, and investigated the conceptual changes of the readers. The researchers determined that those students learning with the text that included an analogy gained a more permanent knowledge. Paris and Glynn (2004) determined that analogy texts, which were detailed by clearly specifying the relationship between analogue and target concepts and supported by pictures, provide benefits for pre-service teachers to transfer new knowledge from the known to unknown.

The use of analogies in a textbook can have a negative effect if used inappropriately (Duit, 1991; Duit et al., 2001). Just as all analogies are not good analogies, all good analogies are not beneficial to all students (Orgill & Bodner, 2004). In addition, an analogue concept never shares all the common features with a target

concept in an analogy. In some situations, an analogue concept might replace a target concept and could mislead students. This situation might cause students to misunderstand the target concept (Clement, 1993; Duit et al., 2001; Orgill & Bodner, 2004). Gilbert (1989) states that using analogies in biology lectures reduces student success. Therefore, analogies need to be chosen carefully.

Textbooks constitute a major source of analogies, and they are used freely by teachers and pupils (Parida & Goswami, 2000). This situation can cause misunderstandings for students (Thiele & Treagust, 1994). For these reasons, teaching models have been developed for analogies to be used effectively in science teaching, including the general model of analogy teaching (Zeitoun, 1984), the teaching with analogies (TWA) model (Glynn, 1991) and the focus-action-reflection (FAR) model (Treagust et al., 1998). The TWA model is the most widely used; this model explains the rules that teachers need to follow during analogy-based teaching. These rules are formed of the six following steps:

1. Introduce target concept;
2. Cue retrieval of analogue concept;
3. Identify relevant features of target and analogue;
4. Map similarities;
5. Indicate where the analogy breaks down; and
6. Draw conclusions.

Analogies act as starting models for introducing science concepts and are used commonly in science textbooks (Iding, 1997). Curtis and Reigeluth (1984) developed an analogy classification framework for analysing the analogies used in science textbooks and investigated analogies used in books in the United States. On average, researchers determined 8.3 analogies per book. Thiele and Treagust (1994) extended this analogy classification framework by classifying the analogies in Australian secondary school chemistry textbooks. They found a total of 93 analogies in chemistry textbooks. Thiele et al. (1995) investigated the analogies in secondary school biology textbooks in Australia and compared them with chemistry textbooks. They determined that analogies were used more often in biology than in chemistry textbooks. Parida and Goswami (2000) investigated the analogies used in a 9th grade science textbook. They determined that although there were many analogies, most were inappropriate for teaching models with analogies. Newton (2003) compared the analogies used in primary school science textbooks with those used in secondary school science textbooks and found 92 analogies. Orgill and Bodner (2006) investigated the analogies in eight college level biochemistry textbooks and determined that there were 158 analogies in these books.

Recent research on high school biology textbooks in Turkey has focused on misconceptions, content knowledge and illustrations (Dikmenli & Çardak, 2004; Mülayim & Soran, 2002; Özay & Hasenekoğlu, 2007). The results have indicated the presence of many problems in such textbooks. It is not known if there are any

problems with the analogies used in high school biology textbooks. In science literature, no research has been undertaken about the analogies used in biology textbooks in Turkey. High school textbooks have a significant and central role in the instructional process of science. For example, Chiappetta, Ganesh, Lee and Phillips (2006) noted that more than 90 percent of secondary school science teachers rely on textbooks to organise and deliver instruction and assign homework. Therefore, it is considered that analysing the analogies used in secondary school biology textbooks in Turkey will benefit students, teachers, textbook authors and programmers.

Purpose of the Study

The main purpose of this study is to investigate the types of analogies used in secondary school biology textbooks in Turkey and understand how these analogies are configured and presented. Answers for the following two questions will also be sought:

- How often are analogies being used in secondary school biology textbooks?
- What are the types and structures of analogies used in these textbooks?

Method

This study used a descriptive research method. This method is used generally for enlightening a given situation, making evaluations according to standards and revealing possible relationships between incidents. The main aim of these kinds of works is to define and explain the reviewed situation in a comprehensive manner (Çepni, 2005).

Textbooks

Seven biology textbooks for high school students were recommended by the Ministry of National Education in 2008/2009 (MEB Tebliğler Dergisi, 2008). Thus, these seven biology textbooks (see appendix) were investigated. The textbooks were prepared in accordance with the new national curriculum in Turkey and are used in the 9th, 10th, 11th and 12th grades as biology textbooks.

Data Collection and Analysis

The document examination technique was used in this research. This technique consists of analysing written materials including information about the incidents targeted to be researched (Yıldırım & Şimşek, 2005). The textbooks under examination were read in full at least twice to understand analogy usage. All types of comparisons or similes considered analogies were marked on the textbooks, and the books were photocopied. These similes were reread on the photocopies and the analogies were again determined and categorised according to the system used by Curtis and Reigeluth (1984) and Thiele and Treagust (1994) as follows.

1. *The analogical relationship between analogue and target*

Structural: Analogue and target concepts in an analogy share similar attributes such as shape, size, colour, etc.

Functional: Analogue and target concepts in an analogy share similar attributes such as function, behaviour, etc.

Structural–functional: Analogue and target concepts in an analogy share both structural and functional attributes.

2. *The presentational format*

Verbal: The analogy is presented in the text in a verbal format only.

Pictorial–verbal: The analogy is presented in a verbal format along with a picture of analogue.

3. *The level of abstraction of the analogue and target concepts*

Concrete–concrete: Both the analogue and target concepts are of a concrete nature.

Abstract–abstract: Both the analogue and target concepts are of an abstract nature.

Concrete–abstract: The analogue concept is of a concrete nature but the target concept is abstract.

4. *The position of the analogue relevant to the target*

Advance organiser: The analogue concept is presented in the text before the target concept.

Embedded activator: The analogue concept is presented in the text with the target concept.

Post synthesiser: The analogue concept is presented in the text after the target concept.

5. *The level of enrichment*

Simple: Only one similarity is underlined between the analogue and target concepts. An analogy is formed of a simple sentence with no details.

Enriched: Two similarity dimensions between the analogue and target concepts are underlined. An analogical statement is formed of sentences that are basic for analogy.

Extended: Three or more similarity dimensions between the analogue and target concepts are underlined. An analogical statement is formed from basic sentences including details. The analogies in which many sources have been used to explain a target concept are also considered extended analogies.

6. *Pre-topic orientation*

Analogue explanation: Introducing the analogue concept related to the target concept in the analogy through at least one point.

Strategy identification: Underlining that the text presented as an analogy is an assimilation.

Both analogue explanation and strategy identification: Underlining both the explanation of the analogue and the strategy identification.

None: No emphasis on the analogue explanation or the strategy identification.

7. *The limitations of the analogy:* Underlining the situation that there are breaking points in analogies at which misunderstandings are possible.

In this study, teaching theories based on analogies were not discussed and the analogies presented in biology textbooks were categorized according to an analogy classification system (Curtis & Reigeluth, 1984; Thiele & Treagust, 1994).

Findings and Discussion

Many simile types that can be interpreted as analogies were encountered in the biology textbooks. Among these similes, comparisons made between a biological target domain and an analogue domain chosen from everyday life were considered analogies. For instance, the ladder analogy for a DNA molecule (Book-A, p. 61; Book-E, p. 42; Book-G, p. 99) was considered an analogy. This type of analogy is based on the comparison between two different domains. The analogue domain (ladder) is about everyday life and the target domain (DNA molecule) is about a biological concept. A lot of research considered different domain analogies a teaching tool (Duit, 1991; Orgill & Bodner, 2006; Thiele et al., 1995). Other comparisons made within the same domain were not considered analogies. For example, "There are four different types of nucleotides in the structure of RNA as DNA" (Book-E, p. 45). In this type, comparisons between the analogue and target domains are about biological concepts. In addition, metaphoric expressions in the texts were not evaluated as analogies. For example, "nutrients taken into the cell are digested and separated into building blocks" (Book-A, p. 20). Furthermore, the anthropomorphic expressions in the textbooks were also not evaluated as analogies; for example, "oxygen-loving bacteria" (Book-E, p. 12).

A total of 119 analogies were determined in the secondary school biology textbooks. Each analogy was examined independently by the researcher and two biology lecturers with an original agreement of 90.8 percent for the 833 classifications (nine criteria × 119 analogies). The remaining 77 classifications (9.2 percent of 1071) were agreed upon following consensus discussions. Accordingly, an average of 17 analogies was determined in each book. The fewest analogies were in Book-B (three) and the most in Book-C (31). According to previous studies, an average of 8.3 analogies were used in primary and secondary science textbooks in the United States (Curtis & Reigeluth, 1984), whereas an average of 9.3 analogies were used in

secondary school chemistry textbooks in Australia (Thiele & Treagust, 1994), 43.5 in secondary school biology textbooks in Australia (Thiele et al., 1995), 2.6 in primary school science textbooks in England (Newton, 2003) and 19.75 in college biochemistry textbooks (Orgill & Bodner, 2006).

A considerable proportion of analogies were related to cell structure and function including cells and organelles such as the factory analogy for cell structure and function (Book-A, p. 73) and the power generator analogy for mitochondria. Other areas in which analogies were used frequently were nucleic acids, including DNA and RNA such as the ladder analogy for DNA molecule (Book-A, p. 61; Book-E, p. 42; Book-G, p. 99) and the clover leaf analogy for the t-RNA molecule. The microscopic and submicroscopic nature of these concepts underlines the role of analogies for biological concepts requiring further visualisation. From this point of view, most of the analogies in biology textbooks in Turkey were appropriate in terms of the content area of the target concept. Thiele and Treagust (1994) stated that analogies in secondary school chemistry textbooks are used mostly for difficult target concepts such as atomic structure, chemical bonds and energy. Similarly, Orgill and Bodner (2006) stated that analogies in college biochemistry textbooks are used mostly for difficult target concepts such as energy, DNA and ATP.

In terms of the analogical relationship between analogue and target concepts in biology textbooks, structural (61.3 percent), functional (30.3 percent) and structural–functional (8.4 percent) analogies were used (Table 1). Most structural analogies were used for interesting abstract concepts that are difficult to understand. One explained the structure of a DNA molecule by making a similarity between it and a ladder (Book-A, p. 61; Book-E, p. 42; Book-G, p. 99). Structural analogies also were used for simple biological concepts but were not interesting. One made a similarity between the shape of the kidney and a dry bean (Book-C, p. 161). Here is an example of the functional analogies used in textbooks: "The starts and stops of a refrigerator are regulated by a device called a thermostat that is placed in the refrigerator. This device closes the electric circuit and starts the motor when the temperature inside the refrigerator exceeds a certain level. When the temperature drops to a defined level, it stops the motor. There are thousands of such mechanisms in biological systems. Even in a cell that we can't see with our naked eye, there are hundreds of such control systems...In a healthy body, hormones are not produced in excess and are not accumulated. The body stops the production of a hormone when the hormone produced exceeds the normal levels. If the hormone drops below the normal level, the body starts producing it again. This is called a feed-

back mechanism" (Book-D, p. 59). A structural–functional analogy used in the textbooks was formed of these statements. "A cell is similar to a factory in terms of structure and function. Cellular membrane is similar to outer wall of the factory, enzymes are similar to workers, organelles are similar to machinery and the cell nucleus is similar to management centre of the factory" (Book-A, p. 73). In this analogy, by making both structural and functional comparisons between the analogue and target domains, a cell's structure and functions are explained. According to previous studies, functional analogies were used most in science (Curtis & Reigeluth, 1984), chemistry (Thiele & Treagust, 1994), biology (Thiele et al., 1995) and biochemistry (Orgill & Bodner, 2006) textbooks. Considering that functional and structural–functional analogies are more effective in teaching (Duit, 1991; Thiele & Treagust, 1994), using mostly structural analogies in biology textbooks in Turkey is an unexpected situation. In a structural analogy, students need to know that the analogue and target concepts share only structural features. Otherwise, they might also transfer functional features from the analogue to the target. In such a situation, students can develop misconceptions (Orgill & Bodner, 2006).

Table 1

Categorisation and number of analogies in secondary school biology textbooks

	Books	A	B	C	D	E	F	G	Total number of analogies	
Category	**Number of analogies**	**28**	**3**	**31**	**29**	**10**	**8**	**10**	**119**	**%**
Analogical relationship	Structural	16	0	24	24	3	3	3	73	61.3
	Functional	10	3	3	4	6	4	6	36	30.3
	Structural–functional	2	0	4	1	1	1	1	10	8.4
Presentational format	Verbal	26	3	31	29	7	8	10	114	95.8
	Pictorial–verbal	2	0	0	0	3	0	0	5	4.2
Condition of subject matter	Concrete–concrete	7	0	5	5	0	0	0	17	14.3
	Abstract–abstract	1	0	0	0	0	1	1	3	2.5
	Concrete–abstract	20	3	26	24	10	7	9	99	83.2
Position in text	Advance organiser	5	1	3	2	3	3	3	20	16.8
	Embedded activator	23	2	27	27	7	5	7	98	82.4
	Post synthesiser	0	0	1	0	0	0	0	1	0.8
Level of enrichment	Simple	21	0	23	26	4	4	5	83	69.8
	Enriched	4	3	6	2	3	1	2	21	17.6
	Extended	3	0	2	1	3	3	3	15	12.6
Pre-topic orientation	Analogue explanation	1	0	1	0	1	2	1	6	5.0
	Strategy identification	3	0	4	2	0	1	1	11	9.2
	Both	1	0	2	1	2	3	5	14	11.8
	None	23	3	24	26	7	2	3	88	74.0
Limitations	Existing	1	0	0	0	2	0	0	3	2.5
	None	27	3	31	29	8	8	10	116	97.5

It has been determined from the presentational format of the analogies in the textbooks that 95.8 percent of analogies were presented in a verbal format (Table 1). One of the pictorial–verbal analogies made a simile between biological classifications and a library (Book-A, p. 123). In this analogy, the text was supported with a picture of the analogue; therefore, the subject of biological classifications was rendered interesting and permanent for the students. In most verbal analogies, analogical statements were supported with microscopic and submicroscopic pictures and diagrams of target concepts. Thiele et al. (1995) stated that only six out of 174 analogies in four secondary school biology textbooks used in Australia were presented in a pictorial–verbal format. Pictorial–verbal analogies make remembering easier and increase the permanency of the knowledge. It is known that pictures are remembered more than sentences. Bean, Searles, Singer and Cowen (1990) concluded that an analogy presented in a pictorial–verbal format was more effective for understanding the structure and function of a cell compared to an analogy presented in a verbal format.

In terms of the condition of the subject matter, 14.3 percent of the analogies were concrete–concrete, 2.5 percent were abstract–abstract and 83.2 percent were concrete–abstract (Table 1). Using mostly the concrete–abstract analogy type in biology textbooks in Turkey is a natural and intended situation because analogies concretise difficult and abstract concepts that cannot be observed directly (Curtis & Reigeluth, 1984; Orgill & Bodner, 2006; Thiele & Treagust, 1994; Thiele et al., 1995). However, Newton (2003) stated that in science textbooks for students between 7 and 11 years old, the concrete–concrete analogies were used more (59.8 percent), showing that this situation was related to the cognitive levels of younger children.

In terms of the position of the analogue related to the target, embedded activator analogies (82.4 percent) were used mostly in the biology textbooks, followed by advance organiser (16.8 percent) and post synthesiser analogies (0.8 percent; Table 1). Similar results have been stated in previous studies (Curtis & Reigeluth, 1984; Orgill & Bodner, 2006; Thiele & Treagust, 1994). Newton (2003) determined that all the analogies in the science textbooks prepared for 7–11-year-old students in England were used as embedded activators. The embedded activator type of analogies is understood more easily by students. The advance organiser or post synthesiser type of analogies require experience and advanced information from students.

In terms of the enrichment level of the analogy, simple analogies (69.8 percent) were used mostly in the biology textbooks, followed by enriched (17.6 percent) and extended analogies (12.6 percent; Table 1). An extended

analogy sample with details is presented below. "In terms of sections and functions, a simile can be made between a cell and a factory. In these terms, we can assimilate cellular membrane to outer wall of the factory, enzymes to workers, organelles to machine and cell nucleus to the place where managers are. This analogy is the only way to be able to perceive the cell more easily because the cell is more complicated than a factory" (Book-A, p. 73). In this study, simple analogies were used more in the biology textbooks in Turkey. However, research indicates the dangers of simple analogies. In simple analogies, students need to set the relationship between the analogue and target concepts themselves. For this reason, frequent usage of simple analogies can cause students to develop misconceptions (Thiele et al., 1995). Glynn and Takahashi (1998) stated that analogies should be explained or enriched in accordance with their aim. Elaborated analogies have been found to increase student learning of target concepts and their interest in such concepts (Paris & Glynn, 2004).

In terms of pre-topic orientation, the analogue explanation was made in only 5 percent of the analogies used in the biology textbooks, strategy was identified in only 9.2 percent and both the analogue explanation and the strategy identification was given in 11.8 percent. In 74 percent of analogies neither the analogue explanation nor the strategy identification was encountered (Table 1). For the analogical transfer between the analogue and target domains to be set up accurately it is important to explain the basic features of the analogue used in the analogy. Analogue explanation and strategy identification aim to make students focus on the appropriate features in analogical transfer (Thiele & Treagust, 1994).

Only 2.5 percent of analogies showed limitations (Table 1), and this rate was similar to that in chemistry textbooks (Thiele & Treagust, 1994). To prevent misconceptions it is necessary to specify the breaking points that can cause misunderstandings in the analogies used. Using analogy teaching models requires the articulation of the limitations as part of the instructional process. Otherwise, it can lead to additional misconceptions (Eryılmaz, 2010; Kao, 2007; Kılıç & Sağlam, 2009).

Conclusions and Recommendations

This study determined that analogies are used frequently in secondary school biology textbooks in Turkey. However, most analogies are not configured in accordance with the teaching models of analogy and the relationships between the analogue and target concepts are not clearly defined. For this reason, possible misconceptions can occur. The analogies in these textbooks are mostly structural, verbal, concrete–abstract, embedded activator and simple type analogies. Among these, some structural and simple analogies are superficial and inappropriate for analogy-based teaching. Therefore, rather than highlighting structural and simple analogies in textbooks, it is important to focus on structural–functional and extended analogies. Analogies should be explained and detailed in accordance with their aims; those that only indicate superficial similarities can confuse students. This type of analogy must not be used or must be elaborated and made interesting for students. Analogies must be generated with care in accordance with the content of the target concept and they must be appropriate to the cognitive levels of the students. In most analogies, it is not indicated where the analogy breaks down. To prevent misconceptions, it is necessary to specify the inappropriate features of the analogue and target concepts in an analogy.

The communication strategy between the author and reader is of utmost importance (Sönmez, 2003). The types of analogies in textbooks and their context and presentational format are all determined by the author, who should aim to teach new and unknown concepts to students while generating these analogies. However, this aim can be obstructed by the format of the analogy or the individual differences during the learning process. Therefore, teachers using textbooks have to make great efforts in this regard. They should strain the analogies in the books and, if necessary, change or extend them in a way that is understandable. The relationships between the analogue and target concepts in an analogy and the limitations of the analogy have to be specified by the teacher. Students must know or notice the connections between source and target concepts in an analogy mentioned in a textbook. Otherwise, there can be problems in the transfer of knowledge from the source concept to the target concept. To facilitate analogical transfer, students should be given information about the important role of analogies in learning and how analogies should be used, because problems related to analogical transfer indicate that students are not used to analogies as a teaching tool (Harrison & Treagust, 2000). When preparing biology textbooks, the principles highlighted by teaching models such as the TWA (Glynn, 1991) and FAR (Treagust et al., 1998) should be taken into consideration. Authors should design well-configured analogies in their textbooks and teachers should use these analogies in the teaching process.

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Appendix: List of textbooks examined

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Ortaöğretim Biyoloji Ders Kitaplarında Kullanılan Analojilerin Analizi: Türkiye Örneği

(Özet)

Analoji (benzeşim), bilinmeyen ve yabancılık çekilen bir olgunun, bilinen ve tanıdık gelen bir olguya benzetilerek açıklanmasıdır. Bilinmeyen olgu 'hedef', bilinen olgu ise 'kaynak'tır. Analoji ile, kaynak ve hedefin benzer özellikleri kıyaslanır ve bilinen bilgi sahasından bilinmeyen bilgi sahasına geçiş yapılır. Kaynağın özellikleri hedefin özelliklerine ne kadar çok uyuyorsa, analoji o kadar etkili ve güçlüdür. Analojiler etkili öğretim araçları olup, yeni bilgiyi mevcut bilgi yapısına nakletmede öğrencilere yardımcı olur, anlamlı öğrenmede motivasyonu sağlar ve konu ile ilgili yeni bakış açıları kazandırır. Bu nedenlerden dolayı analojiler, fen ders kitaplarında yaygın olarak kullanılır. Fakat bu konu üzerine yapılan bazı çalışmalara göre ders kitaplarındaki analojiler, genelde rastgele kullanılmakta ve öğrencilerde yanılmalara neden olabilmektedir. Bu bakımdan Türkiye'deki ortaöğretim biyoloji ders kitaplarında kullanılan analojilerin çeşitli boyutlarda analiz edilmesinin öğretmenlere, kitap yazarlarına ve program geliştiricilere faydalı olacağı düşünülmüştür.

Araştırmanın Amacı : Bu çalışmanın amacı, Türkiye'deki ortaöğretim biyoloji ders kitaplarında kullanılan analojilerin çeşitlerini analiz etmek ve bu analojilerin nasıl yapılandırıldığını ve sunulduğunu incelemektir. Bu amaca paralel olarak, şu sorulara

cevap aranmıştır: Biyoloji ders kitaplarında analojiler ne sıklıkta kullanılmaktadır? Bu kitaplarda hangi tip analojiler, hangi hedef kavramlar için kullanılmaktadır? Kullanılan analojilerde kaynak açıklamasına, strateji tanımına ve analojinin sınırlılıklarına yer verilmekte midir?

Araştırmanın Yöntemi : Betimsel araştırma yöntemine dayalı olarak gerçekleştirilen bu çalışmada, döküman inceleme tekniği kullanılmıştır. Çalışmada, Milli Eğitim Bakanlığının tavsiyesi doğrultusunda 9., 10., 11. ve 12. sınıflarda halen okutulmakta olan yedi adet ortaöğretim biyoloji ders kitabı incelenmiştir. Çalışmanın amacı doğrultusunda her kitap, baştan sona en az iki defa okunmuştur. Analoji olabileceği düşünülen benzetme veya kıyaslama tiplerinin tümü işaretlenmiş ve fotokopileri alınmıştır. Bu kıyaslamalar, fotokopiler üzerinde tekrar incelenmiş ve analoji olanlar belirlenmiştir. Belirlenen analojiler, aşağıdaki kategorilere gore sınıflandırılmıştır:

1-Kaynak ve hedef kavramlar arasındaki analojik ilişki:

Yapısal analoji: Kaynak ve hedef saha; şekil, görünüş ve büyüklük gibi benzer özellikleri paylaşır.

Fonksiyonel analoji: Kaynak ve hedef saha; görev, hareket ve davranış gibi benzer özellikleri paylaşır.

Yapısal-fonksiyonel analoji: Kaynak ve hedef, hem yapısal hem de fonksiyonel benzerlikleri paylaşır.

2-Analojinin sunuluş biçimi:

Sözel analoji: Analoji ders kitabında sadece cümle veya cümlelerle sunulur.

Resimsel-sözel analoji: Analoji metni, kaynağın bir resmi ile desteklenir.

3-Kaynak ve hedef kavramların soyutlanma düzeyi:

Somut-somut analoji: Somut hedef için somut kaynak kullanılır.

Soyut-soyut analoji: Soyut hedef için soyut kaynak kullanılır.

Somut-soyut analoji: Soyut hedef için somut kaynak kullanılır.

4-Hedefe ilişkin kaynağın pozisyonu:

Ön organize edici: Analoji hedef konudan önce, başlangıçta sunulur.

Gömülü aktive edici: Analoji hedef konunun içinde, konu ile birlikte sunulur.

Son sentez edici: Analoji hedef konunun sonunda sunulur.

5-Analojinin zenginlik düzeyi:

Basit analoji: Kaynak ve hedef saha arasında tek bir benzerlik boyutuna vurgu yapan, basit bir cümle veya cümlelerden oluşan, ayrıntı içermeyen analoji.

Zenginleştirilmiş analoji: Kaynak ve hedef saha arasındaki benzerliğin en az iki boyutuna vurgu yapan ve temel cümlelerden oluşan analoji.

Genişletilmiş analoji: Kaynak ve hedef saha arasındaki benzerliğin en az üç ya da daha fazla boyutuna vurgu yapan ve ayrıntı içeren analoji.

6-Konu öncesi yönlendirme:

Kaynak açıklaması: Hedefe ilişkin kaynak sahanın en az bir yönüyle tanıtılması.

Strateji tanımı: Analoji olarak sunulan metnin, bir benzetme olduğuna dair vurgu yapılması.

Kaynak açıklaması ve strateji tanımı: Kaynak açıklaması ve strateji tanımına birlikte yer verilmesi.

Hiçbiri: Analojide, ne kaynak açıklamasına ne de strateji tanımına yer verilmesi.

7-Analojinin sınırlılıkları: Analojide yanlış anlamaların olabileceği kırılma noktalarının öğrencilerin dikkatine sunulup sunulmamasıdır.

Bulgular ve Tartışma : Yapılan analiz sonucunda, analoji olarak değerlendirilebilecek çok sayıda kıyaslama tipine rastlandı. Bunlar içerisinden, DNA molekülünün yapısını açıklayan merdiven analojisinde olduğu gibi, sadece biyolojik bir hedef kavram ile günlük hayattan seçilen bir kaynak kavram arasında yapılan kıyaslamalar analoji olarak değerlendirildi. Mitokondri ve kloroplast arasında yapılan kıyaslamalarda olduğu gibi aynı sahadan seçilen kaynak ve hedef kavramları içeren kıyaslamalar, analoji olarak değerlendirilmedi. Yedi adet biyoloji ders kitabında toplam 119 analoji tespit edilmiştir. Buna göre her bir ders kitabında ortalama 17 analoji bulunmaktadır. Hedef kavramın içerik alanı bakımından analojilerin daha çok hücrenin yapı, fonksiyonu ve nükleik asitler ile ilgili kavramların açıklanmasında kullanıldığı görülmüştür. Bu kavramların çoğunun mikroskobik, submikroskobik düzeyde veya soyut nitelikte olması sebebiyle biyoloji ders kitaplarında kullanılan analojilerin çoğunun hedef kavramın içeriğine uygun olduğu görülmüştür. Bir öğretim aracı olarak analojilerin en önemli işlevlerinden birisi, soyut kavramları somutlaştırmaktır. Biyoloji ders kitaplarında kullanılan analojilerin çoğunun yapısal, sözel, somut-soyut, gömülü active edici ve basit analojiler şeklinde yapılandırıldığı ve sunulduğu tespit edilmiştir. Sadece yüzeysel benzerliklere dayalı olarak kurulan basit analojilerde olduğu gibi, bir çok analojinin analoji temelli öğretim modellerine göre yapılandırılmadığı belirlenmiştir. Özellikle kaynak ve hedef kavramlar arasındaki haritalamanın yetersiz oluşu, analojilerin kırılma noktalarının gerekli şekilde belirtilmemesi ve analojilerden kaynaklanabilecek olası yanlış anlamalara dikkat çekilmemesi gibi sebeplerden dolayı öğrencilerde kavram yanılgılarına neden olabilecek bazı durumların mevcut olduğu görülmüştür. Örneğin, kitaplarda kullanılan analojilerin % 74'ünde kaynak açıklamasına ve strateji tanımına yer verilmemiş, % 97.5'inde ise analojide yanlış anlamaların olabileceği kırılma noktaları (sınırlılıklar) öğrencilerin dikkatine sunulmamıştır. Bu şekildeki analojiler detaylandırılarak genişletilmeli ve öğrenciler için ilgi çekici hale getirilmelidir. Detaylandırılmış analojilerin öğrencilerin ilgisini çektiği ve hedef kavramları öğrenmelerini kolaylaştırdığı, bir çok araştırma tarafından ortaya konmuştur.

Sonuç ve Öneriler : Bu çalışmada, Türkiye'deki ortaöğretim biyoloji ders kitaplarında analojilerin çok sık kullanılmasına rağmen bu analojilerin çoğunun, analojiler ile öğretim modeli veya odaklama-eylem-yansıma modeli gibi analoji temelli öğretim rehberlerine göre yapılandırılmadığı ortaya konmuştur. Bu bakımdan ders kitaplarını kullanan biyoloji öğretmenleri özellikle basit, kaynak açıklamasının ve strateji tanımının yapılmadığı ve sınırlılıklarının belirtilmediği analojileri süzgeçten geçirmeli, detaylandırarak genişletmeli ve analojilerin kırılma noktalarını öğrencilerinin dikkatine sunmalıdır. Biyoloji ders kitapları hazırlanırken kullanılacak olan analojiler için, analoji temelli öğretim modellerindeki ilkeler dikkate alınmalı ve bu ilkeler ders kitaplarına yansıtılmalıdır.

Anahtar Sözcükler: Biyoloji eğitimi, analoji, biyoloji ders kitapları

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Effects of Brain-Based Learning on Academic Achievement: A Sample Case of In-Class Application

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Abstract

Problem Statement: In recent years, one important theory of learning that has increasingly gained interests has been Brain-Based Learning (BBL). To construct an effective framework for learning-teaching, teaching needs to be designed and reconceptualized based on the learning-teaching conditions and principles of BBL across various dimensions. The information obtained from research regarding how the brain works and learns indicates that we need to revise our teaching methods and restructure them. There is a need to reorganize classroom teaching processes in compliance with the functioning of the brain and in consideration of the metacognitive dimensions.

Purpose of the Study: The aim of this study is to investigate the effects of a teaching process that has been designed according to a BBL-based metacognitive flow chart of learning-teaching conditions on the academic achievement of student-teachers.

Method: The study was designed according to an experimental model with a pre-test-post-test control group. The participants are student teachers from the department of social studies teaching at the Faculty of Education in west part of Turkey. There were 34 students (18 female and 16 male) in the experimental group; in the control group, there were 34 students (15 female and 19 male). The average age of the participants is 21, and they come from middle-class families. For this study, the Measurement and Evaluation Course was selected as the academic course. A test consisting of 40 multiple-choice type questions was used to measure the students' acquisition of academic knowledge and skills. The KR-20 reliability

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coefficient of the test was found to be .86. Moreover, the test asked the opinions of the experimental group participants regarding the BBL process.

Findings and Results: In this study, it was found that there are significant differences among the achievement levels of the experimental groups taught by a process designed according to the metacognitive flow chart of BBL conditions, and that of the control group, which was taught by traditional teaching methods based on lecturing and question-answer activities. The student-teachers have stressed that BBL is effective and enjoyable for them.

Conclusions and Recommendations: The design and application of BBL in the form of a metacognitive flow chart is expected to bring some applicable practices and differences to BBL conditions and processes at a conceptual level, and support attempts to develop brain-based learning-teaching programs.

Keywords: Brain–based learning, metacognition strategies, flowchart, learning to learn

In recent years, one important theory that has increasingly gained the interest of researchers and teachers has been Brain-Based Learning (BBL) (Jensen, 2005). BBL means knowing the functioning of the brain and the rules of learning for meaningful learning to occur and organizing the teaching together with these rules in the brain (Caine, Caine, McClintic & Klimek, 2005). BBL is a way of thinking about the learning process (Jensen, 2008). Of course, brain-based instruction is part of a new generation in the evolution of instructional practice in classroom. In recent years, educational reforms based on brain-based studies have investigated how students' academic achievement can be improved (Wortock, 2002; Getz, 2003; Özden & Gültekin, 2008). At the same time, they have explained the best learning methods as aligned with the functioning of the brain (Fogarty, 2002; Prigge, 2002; Goswami, 2004; Hall, 2005; Caine, Caine, McClintic, & Klimek, 2005; Sousa, 2006; Jensen, 2008).

The present study is designed according to the three learning-teaching conditions of BBL. Some principles and concepts need to be applied to these conditions. These concepts and principles are indicative of how brain-based learning is different from traditional learning methods. Caine et al. (2005) summarized the theoretical foundations of BBL as follows:

The Principles of Brain-based Learning:

- The brain is a complex adaptive system.

- The brain is a social brain.

-The search for meaning is innate.

-The search for meaning occurs through patterning.

-Emotions are critical to patterning.

-Every brain simultaneously perceives and creates parts and wholes.

- Learning involves both focused attention and peripheral attention.

- Learning always involves conscious and unconscious processes.

- We have at least two ways of organizing memory.

- Learning is developmental.

- Complex learning is enhanced by challenge and inhibited by threat.

- Every brain is uniquely organized.

The principles of BBL provide a theoretical framework for an effective learning and teaching process in the classroom. These principles are simple and neurologically sound. Applied to education, however, they help us reconceptualize teaching by taking us out of traditional frames of reference and guiding us in defining and selecting appropriate programs and methodologies (Caine & Caine 1990). BBL aims to enhance learning potential and, in contrast to the traditional approaches and models, provides a teaching and learning framework for educators (Materna, 2000 as cited in Özden & Gültekin, 2008).

In this respect, to construct an effective framework for learning-teaching, teaching needs to be designed and reconceptualized based on the learning-teaching conditions and principles of BBL across various dimensions. The present study first elaborates on designing the learning-teaching process according to BBL, then on how this learning-teaching process should be implemented, and finally the features of the metacognitive flow chart used in the present study and on which BBL conditions are designed.

Designing Brain Based Learning-Teaching Processes: In BBL research, one of the points emphasized is the necessity of multiple, complex and concrete experiences for meaningful learning-instruction to occur. Based on their research and experience, Caine et al. (2005) determined that learning–teaching involves three inter-related and fundamental conditions of BBL: *relaxed alertness, orchestrated immersion, and active processing*, that seem to be necessary for optimal learning-teaching to occur.

An optimal state of mind is that which we call *relaxed alertness,* consisting of low threat and high challenge (Caine & Caine, 1994). Teachers play classical music when appropriate to set a relaxed tone in the classroom. Students should feel safe to ask questions and express their opinions freely. Students should be able to think critically during the learning process and take risks without feeling threatened, which requires a safe environment (Pool, 1997). Emotional and thinking processes are closely connected to each other (Weiss, 2000). In this process, an affective climate conducive to learning should be created. Emotions are the most important factor in the learning-teaching process. A positive emotional climate in the class helps students to learn and retain what they have learned (Caulfield, Kidd & Kocher, 2000).

The orchestrated immersion of the learner should be carried out with multiple, complex, authentic experiences (Caine & Caine, 1994). Learning environments that

immerse students in a learning experience should be created, and teachers must immerse learners in complex, interactive experiences that are both rich and real. A social environment with enriched stimuli provides connections between previous and new knowledge, and enhances the retention of memory (Diamond & Hopson, 1999; Sylwester, 2000; Jensen, 2008). During the immersion phase, students need to be offered a complex learning framework and learning experiences that challenge them without creating anxiety (Caulfield et al., 2000).

The regular, active processing of experience is the basis for making meaning. Active processing consists of four elements, which are higher thinking, deep thinking, creative processing, and combining (Caine & Caine, 1994). At this stage, students need to use thinking and creating processes at higher levels to ensure meaningful and conceptual integration and internalization of information. In a learning process designed according to the principles of BBL, the topics should be integrated in the form of themes, and taught through real experiences and multiple-presentations. By patterning topics under themes, small pieces of information within the whole picture can be assigned meaning (Roberts, 2002; Sousa, 2006), and the whole picture can then be internalized.

BBL strategies include many real-life examples of how the three elements occur in successful teaching situations with a variety of methods. As shown below, in the present study, BBL conditions are designed according to the metacognitive flow chart and applied in the classroom. The teacher leads the students through thinking processes shown in the flowchart by means of asking them questions, giving examples, and think-aloud modeling.

The Flowchart: in this study, three fundamental conditions of BBL were designed within the context of the flow chart based on metacognitive strategies. The strategies are planning, self-monitoring, and evaluation. This flow chart includes a sample application using the teaching of the "measurement and evaluation" unit in class. The teacher leads the students through the thinking processes shown in the flowchart by means of asking them questions, giving examples, and think-aloud modeling. The purpose of this flow chart is both to prepare a lesson according to BBL, based on optimal learning conditions, environment and process for students, to employ the various stages of metacognitive strategies for teaching and to provide guidance in restructuring the following learning situations. The meta-cognitive flow chart synthesized by the researcher based on BBL conditions is presented below.

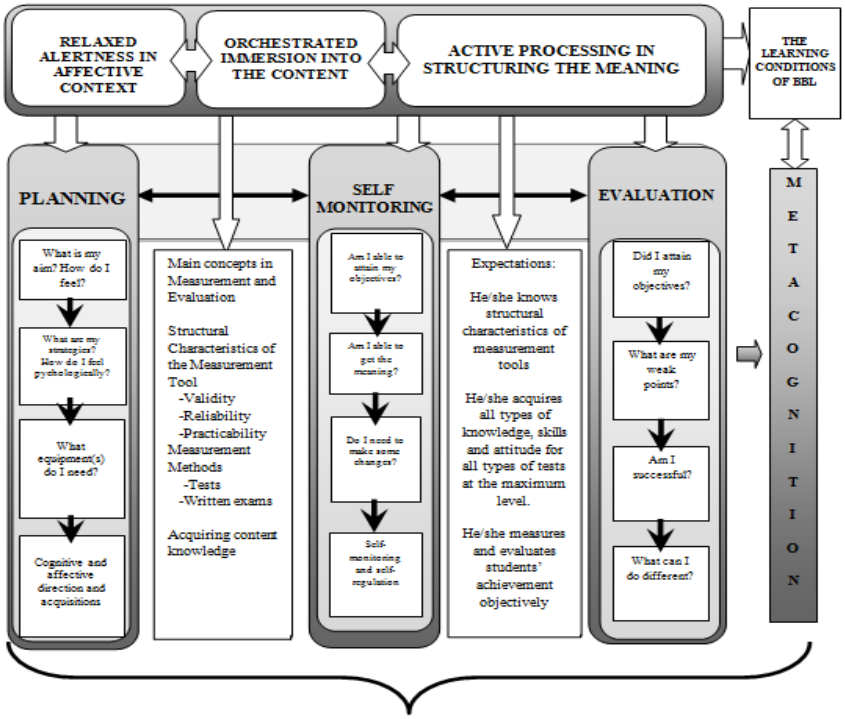

Figure 1. Metacognition flow chart of brain-based learning conditions

The vertical and horizontal processes of this flow chart are related to each other in the form of a crosstab. Horizontal processes include the conditions of BBL, and vertical processes include the stages of metacognitive strategies. Every process has both a hierarchical and an interactive functioning within itself. In every sub-dimension of a horizontal process, there is more than one vertical dimension. Under the first learning condition (relaxed alertness) of the horizontal process are the stages of metacognitive strategy in planning the first vertical column. Design of learning and teaching at the planning stage is essential for ensuring that all student-teachers can participate and benefit from instruction. In the vertical process of the second horizontal process (orchestrated immersion), the content and sub-themes of the content are included. In the vertical processes of the third horizontal learning condition (active processing), readers find higher level questioning, self-monitoring, creation of expectations about the content and internalization of the meaning and evaluation stages. One of the components of the active processing phase is evaluation (Caine & Caine, 1994).

In summary, brain-based learning is the platform for many of the efforts in learning reform. The information obtained from the research on the functioning of how the brain works and learns indicates that we need to "revise our teaching methods" (Dwyer, 2002) and restructure them. In particular, the learning and teaching processes of the student-teachers should be organized at different dimensions based on metacognitive flow charts and conceptual designs. According to Caine and Caine (1994), the first objective of education should be to get to know the brain. Thus, there is a need to reorganize the classroom teaching processes in line with the methods complying with the functioning of the brain and by considering metacognitive dimensions.

The Purpose of the Study: in this context, the present study is designed according to the metacognitive flow chart of the inter-related and integrated conditions (relaxed alertness, orchestrated immersion and active processing) of brain-based learning and teaching. The aim of this study is to investigate the effects of the teaching process designed according to the metacognitive flow chart of the learning-teaching conditions of BBL on the academic achievement of student-teachers. This study seeks answers to the following research questions:

1. Is there a difference in academic achievements between the experimental group that received brain based learning and the control group that did not?
2. How do the student teachers evaluate the teaching process designed according to BBL in relation to their academic achievement?

Method

Research Design

Designed on the pre- and post-test control group model, this experimental study was conducted in order to determine the effects of brain-based learning on academic achievement in the course of measurement and assessment. In this design, the participants were randomly assigned to control and experimental groups and pre- and post tests were conducted in both groups. In this research, which aims to identify the effects of brain-based learning outcomes, quantitative and qualitative methods were used together.

Sample

The study was carried out with the participation of second year day and evening student teachers from the Department of Social Studies in the Teacher Training program at the Faculty of Education, Muğla University in Turkey. The study was

designed according to an experimental model with a pre-test post-test-control group. In the experimental process, classes were randomly assigned as "experimental group" and "control group." In order to match the participants in terms of different variables, they were given a form including a pre-test and questions to obtain personal information. A personal information form was prepared in order to equalize the participants in the groups,. Opinions of two experts were sought to finalize the personal information questionnaire. Based on the students' personal information as indicated in the form, 34 students were assigned for each of the groups so that the groups could be equal. Not all the student teachers constituting the sample of the study were included, as just those that could be matched were included in the study. Due to some reasons, the students in the same class were not included (those stating that they may be absent, or taking some other courses of the former terms)

In the experimental group, there were 34 students (18 female and 16 male); in the control group, there were 34 students (15 female and 19 male). In total, there were 68 students, of whom 33 (48%) were female, and 35 (51.5%) were male. According to the information gathered from the personal information forms completed by the participants, the average age was 21, and the students come from middle-class families.

In the equalization process, pre-test scores of the students were also taken into consideration. In order to determine the pre-test scores of the participants on the subject, the pre-test was used as an academic achievement test. In order to determine whether there are significant differences between the pre-test scores of the participants, a t-test was used and did not reveal a significant differentiation (t (66)=-1.171 p= .246). In terms of the pre-test scores, the groups were found to be equal. At the beginning of the study, the participants were given a pre-test and, at the end of the study, they were given a post-test to evaluate the efficiency of the process. Moreover, the opinions of the experimental group participants about the BBL process were recorded.

Research Instruments

The data for this study were gathered from an academic achievement test, open-ended questions and observations. For the academic achievement test, basic subjects that cover measurement and evaluation course were chosen, such as 1. Basic Concepts of Measurement and Evaluation, 2. Structural Characteristics of Measurement Tools, 3. Measurement Tools and Methods in Testing, 4. Reliability and Validity of Measurement Tools in Testing. The academic course "Measurement and Evaluation" is a compulsory course for student-teachers, which is why it was chosen for this study. The reason why this particular course was selected is not only its status as a requirement for the student teachers but also because the researcher of this stduy was the instructor for this class.

First, the related literature about how to prepare an academic achievement test on "Measurement and Evaluation" was reviewed. Great care was taken to ensure the test items covered all content and optimally tested the target behaviors of each of the

test items, in order to ensure the content validity of the test (Tekin, 2007). The primary attainments expected to be measured in the academic achievement test were determined, and the academic achievement test consisting of 45 questions was prepared. Experts in the field of measurement and evaluation were consulted to determine the content validity of the tests. After the required changes were made, the test was administered to 148 students in a higher level class at the Faculty of Education. The difficulty level and item discrimination between test items were also analyzed. As for item discrimination, .40 and above .40 were taken as acceptable levels. The five test items that did not meet these criteria were eliminated from the test, and the resultant multiple-choice test consisted of 40 items. The KR-20 reliability coefficient of the test was found to be .86. This multiple-choice test was administered to both the experimental and control groups of students-teachers before starting the study in order to evaluate their prior knowledge levels and, after the application was completed, to test their acquisition levels. Each correct item on the test received 1 point, and each incorrect answer in the test received 0 points. The questions had four choices, with 40 as the highest score obtainable.

Second, opinions were taken from the experimental group students about the teaching process as designed in accordance with the metacognitive flow chart of the learning-teaching conditions of BBL. For this purpose, a questionnaire form was designed. After seeking the opinions of two academic experts in the field of measurement and evaluation and BBL, the format of the questions was finalized. In this questionnaire, three open-ended semi-structured questions were asked of the experimental group students. The students were asked to evaluate how the content was designed according to the BBL teaching process, how the process was carried out and how they felt during this process. The questions are as follows: 1. How do you feel in the BBL and teaching process? 2. How was the content dealt with in the BBL teaching process? 3. How was the content construction done with BBL activities? The opinions of the students indicating similar patterns were interpreted. In addition to the data collection tools used in the study, the effects of the BBL learning-teaching process on the experimental group students were observed naturally, through in-class observations and experiences of the researcher. The findings gathered from this part of the study were used to support the quantitative data.

Experimental Procedure

At the beginning of the experimental study, once the experimental and control groups were defined, the participants were informed about the research process and its scope. An academic achievement test on the subject of Measurement and Evaluation was applied to the experimental and control groups as a pre-test by the researcher. Teaching activities for both the experimental group and the control group were carried out by the researcher. The researcher has sufficient knowledge and experience to conduct this research. The researcher works at the university where the study was conducted as an instructor in the field of educational sciences with the title of Assistant Professor. The researcher gives measurement and assessment courses and has a great deal of experience in this field. He successfully completed a research project on brain-based learning supported by the university, and has made

presentations to national and international conferences on BBL. At the same time, he has published a book on BBL and written sections in textbooks written about BBL.

Throughout the experimental process, the experimental group's students were exposed to the teaching process designed according to the metacognitive flow chart of optimal BBL conditions (relaxed alertness, orchestrated immersion and active processing), while the control group was taught in a traditional way based on lecturing and a question-answer procedure. The application took 6 weeks, with 5 hours of class in a week. After the experimental application finished, both groups were administered an achievement post-test on the subject of Measurement and Evaluation. In both control and experiment groups, the focus of teaching was the Measurement and Evaluation unit and, by carefully following the related literature, the researcher determined the expected gains in proficiency for both groups. The researcher handed out a syllabus to the experimental group students explaining the aims and themes of the course. With a multimedia presentation, the student-teachers were allowed to form a holistic opinion about, and approach to, the themes of the unit. Then, activities designed in accordance with the metacognitive flow chart of the BBL's learning-teaching conditions (orchestrated immersion, relaxed alertness, and active processing), and related strategies were carried out as follows:

In the phase of 'relaxed alertness', the planning strategy indicated in the flow chart was used. Great care was taken to establish a safe and emotionally comforting classroom climate. The introduction to each lesson was given with classical music in the background. To increase participation in the lesson and create synergy, heterogeneous groups were formed according to the themes to be studied. By asking such dialectic questions as "What is measurement? What is evaluation? What is reliability?" (to be discussed within the groups), students were given opportunities to discuss and share their opinions. The students were encouraged to take active roles in group work and other activities. The researcher took great care to perform the role of organizer, ensuring that the preparation and the presentation of the topics would be performed in the form of multiple presentations, and also in the role of guiding students to use their thinking and creativity skills. The students were given visual and auditory presentations about how the brain works and learns. Based on the strategies given in the flow chart, the students were encouraged to use their brain-based learning and thinking skills.

During the 'orchestrated immersion' phase, the self-monitoring strategy shown in the flow chart was used. Great care was taken to immerse the students into the topic by using visual and auditory PowerPoint presentations, posters, cartoons, photographs and pictures related to the topic. While these presentations and displays were being made, the content was elaborated upon using authentic experiences. In collaboration with the students, themes and sub-themes of the topic were determined. With respect to these themes, prior and new knowledge were connected with examples and questions. The presentation of the content was carried out under the main themes such as measurement and evaluation at the conceptual level indicated in the flow chart. For the students to comprehend the content, immediate and enriched feedback was provided.

During the 'active processing' phase, the self-evaluation strategy indicated in the flow chart was used. By means of activities such as "asking questions, analyzing the themes, recognizing the contrast and similarities, classification, sequencing, and comparison," the students were encouraged to question the content, think, internalize the content and consolidate their knowledge. For this purpose, self-monitoring and controlling strategies were used in a metacognitive process indicated in the flow chart. By making use of the students' powerful imagination, great care was taken to help the students to form their personal patterning of the topics. To internalize the pattern of the topic, "thinking stations" were established as free activity areas within class. In these places, the students were given opportunities to question and evaluate whether they had reached their goals.

The seating of the classroom was designed in a U formation to facilitate the study of the topics. Dynamic movements were allowed for the performance of the activities, arrangement of the boards, preparation of the posters, and project presentations. The need to capitalize on movements while performing brain-based activities has been suggested (Jensen, 2008). The physical conditions of class were arranged in such a way as to make students comfortable, and every type of tool, equipment and materials were related to the main topic of measurement and evaluation and its themes.

Formative evaluations were carried out to improve the academic performance of the experimental group students by getting the students to prepare scoring keys in order to evaluate performance, together with student journals, individual development files, and portfolios. With these instruments, the students were provided with opportunities to monitor themselves and evaluate their shortcomings. With open-ended questions, immediate and enriched feedback was given. The students were encouraged to freely express their feelings and opinions. Process-oriented evaluations were performed.

The teaching in the control group was performed based on traditional teaching methods (lecturing and question-answer). The role of the teacher in the traditional teaching method is to transfer the information to the students in the process called direct teaching. In other words, teachers teach and students learn. In fact, the students' real task is to reinforce and internalize the target material by listening to the teacher, taking notes and doing the assigned tasks (Caine et al., 2005).

The teaching of the topics was carried out in different classes, with no posters and visuals displayed and using mainly textbooks. The topics were presented in the order stated in the program. The students were encouraged to take notes when required. By using a question-answer technique, the topics which had not been understood were repeated. A traditional seating format was used in the classroom. Evaluations were made after the topics of the unit were studied by using multiple-choice tests (summative).

Data Analysis

The data obtained in the present study through qualitative and quantitative data collection tools were analyzed as presented below:

First in this study's analysis of the quantitative data came the calculation of the students' pre-test and post-test scores, and means and standard deviations of these scores were then taken. In order to test the significance level of the difference between the means of the groups, a t-test was conducted. The significance level was accepted to be .05. The statistical analyses employed SPSS (Statistical Package for the Social Sciences).

Second, the analysis of the qualitative data also included descriptive analysis.. According to Strauss and Corbin (1990), descriptive analysis is used in studies where the conceptual structure of the study is clearly defined before the study. The data obtained in the descriptive analyses are summarized and interpreted according to pre-determined themes (Yıldırım & Şimşek, 2005). The students' responses were placed into categories and sub-categories established by the researcher based on the common features of the students' statements, and the main theme and their frequencies and percentages were then calculated. The sorting of data according to emerging themes was supported withdirect quotations from the students' statements. These quotations are written in italics. These quotations are useful in directly reflecting the students' opinions and experiences (Yıldırım & Şimşek, 2005).

Finally, the findings were explained, associated and interpreted by the researcher based on his in-class observations and experiences. Inclusion of the opinions and experiences concerning the observed events by the researcher is an important example of the effective participation of the researcher in the research process (Yıldırım & Şimşek, 2005). As one student simultaneously described more than one feature, the number of the features presented in the tables is higher than the number of students. Hence, the tables are organized in such a way as to match each response with one item.

Results

In the present study, the effects of the teaching process designed according to the metacognitive flow chart of BBL conditions have been compared with a traditional teaching process based on lecturing and question-answer activities in order to ascertain learners' academic achievement scores for a unit on Measuring and Evaluation.

Pre-test

For the present study, a pre-test was carried out to evaluate the prior knowledge of the students about the class unit "Measurement and Evaluation" and to match the groups to one another. The results of the t-test — carried out to determine whether there is a significant difference between the pre-test scores of the groups — are presented in Table 1.

Table 1

Statistics For The Independent Samples T-test Results Of The Students' Academic Pre-test Achievement Scores Of The Experimental And Control Groups.

Groups	N	Mean	Std. Deviation	sd	t	p
Experimental Group	34	15.3235	2.67106	.66	-1.171	.246
Control Group	34	16.0882	2.71212			

An independent samples t-test was used to determine whether there is a significant difference between the means of the groups. According to these results, it can be stated that there was no significant difference (t (66) =-1.171, p= .246) between the pre-test scores of the experimental and control groups on the subject of Measurement and Evaluation before the experiment. According to these results, the groups are equal in terms of their prior knowledge about Measurement and Evaluation.

Post-test

After the experimental process, an independent samples t-test was conducted to evaluate the results of the experimental process and determine whether a significant difference emerged between the post-test scores of the groups. The groups' t-test results for the post-test are presented in Table 2.

Table 2

Results Of The Independent Samples T-Test Analysis Of The Post-Test Total Scores Of The Experimental And Control Groups

Groups	N	Mean	Std. Deviation	sd	t	p
Experimental Group	34	31.0588	3.72495	.66	6.757	.00
Control Group	34	24.9412	3.74118			

In Table 2, it is seen that the post-test arithmetic mean of the experimental group (X=31.058) is higher than that of the control group (X= 24. 94). That is, t (.66) =6.757, p=.00 values show that the teaching process designed according to the metacognitive flow chart of BBL conditions (relaxed alertness, orchestrated immersion and active processing) led to more significant differentiation of the achievement scores of the experimental group students than did the traditional teaching method based on lecturing and question-answer activities.

For the second question of the study (what are the opinions of the experimental students exposed to the brain-based teaching process about their experience with brain-based learning?), answers were sought. For this purpose, the experimental group students were asked open-ended questions. The students' opinions, elicited through a questionnaire, are presented in Tables 3, 4 and 5.

Table 3 presents the analyses of the students' responses to the question, "how do you feel during the BBL teaching process?" According to the results in Table 3, 29.8% of the student teachers reported that they feel relaxed, 24.5% felt safe, 21.4% stated that they experienced a metacognitive process, 8.7% stated that they experienced a planned lesson and 15.7% declared it an enjoyable lesson. Based on these opinions of the students, it seems to be possible to claim that the students were in the state of "relaxed alertness" as desired by BBL.

Table 3

How do you feel during the BBL teaching process? (n=32)

Responses	f	%
Safe	14	24,5
Relaxed	17	29,8
In a metacognitive process	12	21,0
Fun	9	15,7
Planned	5	8,7
Total	57	100

It has been already expected that students should be in a state of relaxation and awareness within the BBL conditions. Tendencies expressed in the responses of the students seem to support this expectation.

Student (K), in the experimental group undergoing experimental process stated: *"I felt relaxed, creative and at the same time safe in the lesson."*

Student (R), "Studying my courses within the metacognitive process helped me improve my academic achievement."

Students (Y), "I felt so relaxed that the lesson was presented as if we were having a conversation with the teacher."

Student (C), "There has always been a sense of freedom in this setting."

Student (A), "The activities performed in the lesson did not make us anxious."

Student (D), "Performing the activities in this way is enjoyable and a source of pleasure."

Student (K), "We make better use of our brains now and we learn more meaningfully."

Most of the students stated positive opinions such as *"We can express ourselves better in the lessons, the lessons are studied in positive atmosphere and not boring,"* and none of the students expressed negative opinions. The reason why the students did not express negative opinions may be because the BBL process is carried out in relaxed alertness conditions. Moreover, during the researcher's in-class observations and experiences, it was observed that the students appeared to feel safe and relaxed and actively participated in the learning process.

Table 4 presents the analyses of the students' responses to the question "How was the content taught in the BBL process?" The most common response to this question is that the course was taught with multiple presentations (29.1%), and then, by means of visualization (25.5%), in an integrated way (20.0%), based on real experiences (18.1%), and with games (7.2%). In light of these opinions, it can be argued that the lessons were studied through multiple contexts. The more senses involved while studying the lesson, the longer lasting learning can be claimed to occur. This makes a great contribution to the creation of a permanent memory.

Table 4

How was the content taught in the BBL teaching process? (n=32)

Responses	N	%
With Multiple presentation	16	29,1
With Visualization	14	25,5
In an integrated way	11	20,0
With real experiences	10	18,1
With Games	4	7,2
Total	55	100

Studying lessons under BBL conditions and performing the activities in an integrated way, through multiple presentations and based on real experiences, is expected to deeply immerse the students into the lessons. Tendencies observed in the students' statements seem to support this expectation.

Students (M), "The way the lesson was studied was successful primarily in drawing students' attention and in being enjoyable."

Student (İ), "The lessons were constructed through multiple presentations. These multiple presentations addressed both the ear and eye and therefore made positive contributions to the improvement of our achievement."

Student (K), stated that "Now we use our brain better and we can learn in a more meaningful way."

Almost all of the students stated opinions along the line of, "*Previously, we used to memorize the topics, but now by involving all of our senses in the learning process, and applying our knowledge, we assign meaning to the information through our own processing.*"

From the statements of the students, it can be concluded that presentation of the content through multiple presentations and real experiences drew the students' attention to the content. On the other hand, the students were observed to remain passive in game-like activities. In the orchestrated immersion condition of BBL, it is expected that the students learn the content with multi-dimensional experiences. This expectation complies with tendencies in the students' opinions in the present study. Based on the researcher's in-class observations and experiences, it can be argued that the students tried to concretize the content by drawing on various materials.

Table 5 presents analyses of responses given to the question "How was the content constructed in BBL-based activities?" 30.3% of the students responded to the question by stating that content was constructed based on sample events, 19.6% stated that it was constructed by using their imagination, 16.6% said coding, 22.7% said questioning and evaluation, and 12.1% said control in the classroom, where a teaching process designed according to the metacognitive flow chart of the BBL conditions was used.

In light of these student opinions, it can be argued that the students made evaluations by associating the content with the sample events and the sample events helped the students to capitalize on their imagination and internalize the meaning. It was also observed that in the process of constructing the content, the students performed coding and assigned meaning by associating the construct in the sample events with the content, and provided related examples.

Table 5

How was content constructed with BBL-based activities? (n=32)

Responses	f	%
Using sample events	20	30,3
Making evaluations	15	22,7
Using imagination	13	19,6
Coding	11	16,6
Controlling	8	12,1
Total	66	100

Under BBL conditions, students are expected to meaningfully internalize the content by performing a high level of thinking, questioning and evaluation within the process of active participation. It can be argued that opinions expressed by the students seem to confirm this expectation.

Student (E), "Among the activities, telling stories to help us to make use of our imagination made an especially great contribution to our more meaningful construction of the content."

Student (L), "One element [of BBL] *that can improve academic achievement is the way in which the lesson is presented; codings performed during the lesson and cartoons and figures drawn on the board made learning more permanent."*

Student (F), "The activities helped us better understand the content. By means of penetrating into the story, we were able to make connections with the content."

Student (S), "I cannot forget this sentence: "If there is questioning, then there is meaning." The feedback given in the lesson allowed us to make evaluations of the content."

The majority of the students' opinions indicate that the students associated sample events with the content and they carried out questioning and evaluations through the feedback they provided. On the other hand, the researcher observed that while the students performed evaluations through questioning, frequent checking seemed to remain relatively more passive.

In addition to these notes, the researcher observed that throughout the BBL activities in class, the students actively participated in group work, gave examples from their personal lives and evaluated the content through questioning. The strategies used by the students to construct the content could be argued to be brain-compatible strategies.

Discussion

Regarding the findings of this study, the teaching process designed in the form of a metacognitive flow chart of BBL conditions (relaxed alertness, orchestrated immersion and active processing) increased the academic achievement scores of the experimental group students significantly more than the traditional teaching approach based on lecturing and question-answer activities. The experimental group students taught with the BBL method could be claimed to have positive opinions about the teaching process. These findings of the present study concur with those reported by these studies: Wagmeister and Shifrin (2000) have applied brain based instruction programs in school (Westmark School) California. As a result of the applied BBL, anenriched learning environment was created and this helped the students both to improve their academic achievement and develop a positive attitude towards learning. Caulfield et al. (2000) have concluded that BBL has a positive impact on students' academic achievement, attitude and motivation.

Özden and Gültekin (2008) investigated the effects of brain-based learning on students' academic achievement in an elementary school science course. The

academic achievement of the experimental group for which brain-based learning was conducted was compared with that of the control group where traditional teaching was performed. The brain-based research revealed that brain-based learning developed the academic achievement of students more when compared to traditional teaching process.

Worthock (2002) indicated that the web-based teaching procedures designed in accordance with the principles of brain-based learning were very effective in improving the students' achievement. In Hoge's (2002) research, where he analyzed the integration of brain based learning and literacy acquisition, it has been seen that brain-based learning strategies positively affect the attitudes of the students towards literacy, and also that giving students opportunities to see themselves as literate is positive.

Getz (2003) investigated the effects of BBL on the academic achievements of students learning English. The findings of the present study match those of Getz. In his study, Getz implemented BBL in three classes and a traditional teaching process in four classes. At the end of the study, students were asked to write essays, and their attitudes towards writing were evaluated. The study revealed that BBL significantly increased achievement and improved student attitudes.

In the present study, the learning-teaching conditions of BBL (relaxed alertness, orchestrated immersion, and active processing) were designed in the form of a metacognitive flow chart and implemented in the classroom. The flow chart is believed to bring a new dimension and greater ease to the classroom use of BBL conditions. For instance, "planning" prevented the students from experiencing chaotic situations, "self-monitoring" and "self-control" made it possible to provide immediate and enriched feedback during the learning-teaching process, and "evaluation" enabled the students to see the extent to which goals were achieved. In all the activities, the researcher observed that the students actively participated, they explained the content with samples from different perspectives, and they personalized the content.

Moreover, the brain based teaching process carried out in the present study can be discussed from three different perspectives, integrated with one each other as follows. The following conclusions were reached in light of my in-class observations and experiences and data obtained from the data collection tool.

The data obtained for each question from the qualitative part of the study were grouped under three themes: 1. feeling safe and relaxed, 2. orchestrated processing of the content, 3. construction of the content through active processing.

As it is seen in the first question of the qualitative data and in table 3, it might be said that the high majority of the students think that the lessons were studied in a relaxed, safe, free, and enjoyable environment within a metacognitive process. These student opinions comply with the generally expected elements of BBL such as elimination of stress and anxiety, psychological relaxation, cognitive serenity and creation of the correct emotional climate for learning under the relaxed alertness conditions of BBL (Caine et al., 2005; Jensen, 2008).

Moreover, it was observed that when the students realized their own brain potential, they felt more relaxed in learning-teaching process and more actively participated in activities. This is similar to the findings of Pinkerton (1994), Holloway (2000), Caulfield et al. (2000), and Davis (2004), that "when students realize their brains' potential, they exhibit more positive attitudes towards learning."

In the warm-up section of the lessons in particular and during all the learning processes, the researcher attempted to create a welcoming and safe learning environment. If there is anxiety and fear in the learning process, downshifting occurs on the part of students. According to Goleman (1995), anxiety can sabotage all students' academic performance. In this respect, for meaningful learning to occur during the brain-based learning-teaching process, students should feel free from stress, anxiety, fear and threat and should feel relaxed, free and safe. In a study aimed at exploring the perceptions of students for the classroom atmosphere and teacher behaviors, it was found out that the students felt better and liked the learning environment most when the teachers could provide support for meeting their social-affective needs (Turanlı 2009).

According to the qualitative data obtained in this study, the reason why the students felt relaxed, free and safe seems to be that the process was planned beforehand and implemented according to plan, as shown in figure 1. It was observed that in a planned process, the students felt highly relaxed while participating in activities and group works.

As can be seen in the second question answered by the qualitative data and table 4, it can be seen that most of the students liked the presentations of the lessons through multiple-presentations and real experiences in an integrated way. On the other hand, the students' participation in game-like activities is not as active as in the other activities.

In the orchestrated immersion condition of BBL, it is expected that the content will be presented not in the form of isolated pieces of information, but as integrated themes in an appropriately arranged classroom environment, with materials addressing many sensory organs in order to expose students to multi-dimensional enhanced learning experiences (Caine & Caine, 1994; Fogarty, 2002; Hall, 2005; Sousa, 2006; Jensen, 2008)

The students' opinions expressed in the present study comply with the above-mentioned elements expected to emerge in the orchestrated immersion condition of BBL. In the processes indicated in the metacognitive flow chart, synthesized according to BBL conditions, it can be claimed that the students underwent the desired learning experiences and these processes helped the students to improve their academic achievement. The objective of the brain is to provide the internal description of reality (Restak, 1995). It was observed that while presenting their individual or group work, they made use of various materials in the explanation of the content. Through these complex activities, it can be argued that the students attained more meaningful learning, because it was observed that the students were provided with challenging activities and put forth more effort by using their spatial memories.

As can be seen in the third question of the qualitative data and table 5, in the students' opinions, strong emphasis was put on coding and assigning meaning based on sample events and stories. It was observed that by means of enhanced and immediate feedback, the students were able to understand the content. In addition, it can be said that providing sample events and stories drew the attention of the students, enhanced their motivation and helped them to create connections. The elements emphasized in active processing assign meaning to content through higher levels of thinking and questioning (Caine & Caine, 1994; Dwyer, 2002; Sousa, 2006; Jensen, 2008) and the students' opinions expressed in the present study complied with these elements.

In addition, in light of the in-class observations and experiences of the researcher, it can be argued that the experimental group students used the assessment strategies expressed in the flow chart to determine whether they had achieved their objectives, and in group discussions, explained the content by means of individual examples.

Bayındır (2003) investigated students' attitudes towards brain-based teaching applications in an English course. While 93% of the students showed positive attitudes towards brain-based applications, only 1% of the students indicated negative attitudes. The findings of the present study concur with these findings of Bayındır (2003). In this respect, in the both studies, using brain-based learning led students to feel relaxed, safe and self-confident.

Miller (2003) investigated technology-assisted brain-based learning in a vocational school located in a rural area and he sought the answer to the question, "How is brain-based learning carried out?" In his study, the descriptive data were collected through observations conducted in 56 classrooms and a methodological check list specially designed for the observations. The resulting findings revealed that the teachers included similes and activities requiring students to use their imagination in brain-based learning processes and in this way, met the students' dominant brain learning needs.

Brodnax (2004) carried out a study on educators' experiments with brain-compatible teaching activities in class. At the end of the study, it was concluded that the brain-based learning principles were used as a filter in decision-making and an evaluation of the effectiveness of learning and brain-compatible strategies was employed in reducing its risks.

Çengelci (2005), in a social studies course, and Getz (2003), in an English language course, researched the effects of BBL. The findings of these studies support the findings of the present study. Both researchers quantitatively and qualitatively investigated the effects, and both reported that BBL activities have positive effects on the students. Çengelci (2005) reports that BBL facilitates learning and makes it fun, and Getz states that BBL leads to positive changes on the part of the students.

According to data obtained from the present study (the questionnaire, classroom observations and open-ended questions), the brain based learning and teaching process helps students increase their self-confidence, improve their questioning skills, and construct the content in a meaningful way. It seems to be clear that the

process' application of BBL conditions in the form of a flow chart facilitated both teaching and learning.

Conclusion

This is an experimental study concerned with the application of the learning-teaching conditions of BBL (relaxed alertness, orchestrated immersion and active processing) in the classroom setting. The learning-teaching process designed according to a metacognitive flow chart of BBL conditions increased the academic achievement scores of the experimental group students significantly more than the traditional teaching approach based on lecturing and question-answer activities.

We can argue that this teaching process using the BBL flow chart brought a metacognitive perspective to the classroom activities of the students. The students were observed to be focusing on learning activities and participating in the lesson with interest.

As a consequence, design and application conditions of BBL according to the metacognitive flow chart is expected to bring some applicable practices and differences to BBL conditions and processes at a conceptual level, and to support attempts made in the manner of developing brain-based learning-teaching programs.

In the BBL and teaching process, integrated classroom activities, teaching-learning principles, and methods supported with the functions of the brain have to be used in an integrated way. Therefore, which of these elements made greater contributions to the students' academic achievements is not known. This is a limitation of the present study, one that can be dealt with by further research. The findings of the present study can be used in different courses and in the field of teacher education. Further studies may look at the different components of BBL and its effect on emotion management.

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Beyin Temelli Öğrenmenin Akademik Başarıya Etkisi: Sınıf İçi Bir Uygulama Örneği

(Özet)

Problem Durumu: Son yıllarda eğitim ve öğretimin yeni paradigması Beyin Temelli Öğrenme (BTÖ) yaklaşımı olarak savunulmaktadır. BTÖ, anlamlı öğrenme için beynin işleyiş kurallarının kabul edilmesini ve öğretimin zihindeki bu kurallara göre örgütlenmesini içerir. Beynin nasıl öğrendiği konusundaki araştırmalar sonucunda elde edilen bilgiler, bize öğrenme kapsamında öğretim yöntemlerimizi tekrar gözden geçirmemizi ve yeniden yapılandırmamız gerektiğini işaret etmektedir. Teorisyenler beynin çalışma sistemi bilinmeksizin öğrenmenin doğasının pek anlaşılamayacağı vurgularlar. Ancak BBL'nin, sınıf için öğretim uygulamalarında nasıl uygulanabileceği, öğretmenler tarafından tereddütle karşılanabildiği gibi çoğunlukla da merak ve problematik bir durum oluşturabilmektedir. Bu bağlamda, bu çalışma hem etkili öğrenme-öğretme çerçevesi için BTÖ'nün bilşselfarkındalıkçı akış kartlarına gore farklı şekillerde tasarlanmasına hem de sınıf içi öğretim süreçlerinin planlanmasına ve ortamların beyin uyumlu hazırlanmasına katkı sağlayacağı umulmaktadır.

Araştırmanın Amacı: Bu çalışmanın genel amacı, BTÖ rahatlatılmış uyanıklık, derinlemesine daldırma ve aktif süreçleme koşullarının bilişselfarkındalık bir akış kartına göre tasarlanan öğretim sürecinin, öğretmen-adayı üniversite öğrencilerinin akademik başarıları üzerindeki etkisini belirlemektir.

Araştırmanın Yöntemi: Araştırmada öntest-sontest kontrol gruplu deneysel desen kullanılmıştır. Araştırma aralarında akademik hazır bulunuşluk düzeyleri bakımından anlamlı bir fark olmayan Sosyal Bilgiler Öğretmenliği 2. sınıf birinci ve ikinci öğretim öğretmen-adaylarının katılımıyla Türkiye'nin batısındaki bir Üniversitenin Eğitim Fakültesinde yürütülmüştür. Araştırmaya deney grubundan 34, kontrol grubundan 34 olmak üzere toplam 68 (48 kız ve 52 erkek) öğrenci katılmıştır. Öğrenciler ortalama 21 yaşlarında, sosyo-ekonomik ve kültürel olarak orta düzeydedirler. Araştırmada öğrencilerin akademik başarılarında anlamlı bir değişiklik olup olmadığını değerlendirmek için ölçme ve değerlendirme ünitesi işlenmiştir.

Araştırmada deney gruplarında BTÖ, kontrol gruplarında ise geleneksel öğretmen merkezli metotlar kullanılmıştır. Deney gruplarında BTÖ'nün uygulanmasında öncelikle şu işlemler yapılmıştır: Bu çalışmada, BBL'nin koşulları, bilişselfarkındalık bir akış kartına gore tasarlanıp uygulanmıştır. Bu bağlamda planlama stratejisiyle, kaotiklik bir durumun yaşanmamasına, kendini izleme ve kontrol etmeyle öğrenme-öğretme sürecindeki eksikliklerin anında zengin dönütlerle düzeltilmesine, değerlendirmeyle de amaçlara ne kadar ulaşılıp ulaşılmadığına özen gösterilmiştir.

BTÖ'nün rahatlatılmış uyanıklılık koşullarında, stres ve kaygının elimine edilmesi, bilişsel dinginlik ve öğrenmenin duygusal bir ikliminin oluşturulması gibi genel öğelere yer verilmiştir. Tehdidin olmadığı güvenli ve özgürlükçü öğrenme öğrenme atmosferi oluşturulmaya özen gösterilmiştir.

BTÖ'nün derinlemesine daldırma koşulunda, öğrencilerin içeriğe yoğunlaşması sağlanmıştır. Öğrencilerin içerikle ilgili çok boyutlu zenginleştirilmiş öğrenme yaşantılarını edinebilmesi için konuların işlenişi, derslerin izole edilmiş bilgi parçalarıyla değil, daha çok temalandırılması ve çok duyuya hitap eden araç gereçlerle içerik sunumlarının yapılmasına özen gösterilmiştir.

BTÖ'nün aktif süreçleme koşulunda, derinlemesine düşünme, yaratıcı işleme, birleştirme, değerlendirme gibi üst düzey düşünme ve sorgulamalarla anlamın kişisel olarak yapılandırılması gibi durumların yaratılmasına dair temel öğelere yer verilmiştir.

Kontrol grubunda öğretim, geleneksel öğretime dayalı anlatım ve soru-cevap yöntemlerine göre yapılmıştır. Konuların öğretimi programda belirlenen sıralamaya göre anlatımı yapılmıştır. Gerekli yerlerin not aldırılması sağlanmıştır. Soru-cevap tekniği kullanılarak anlaşılmayan konular tekrar edilmiştir.

Öğrencilerin akademik başarılarını ölçmek için araştırmacı tarafından geliştirilen 40 soruluk çoktan seçmeli test kullanılmıştır. Testin KR-20 güvenirlik katsayısı. 86 olarak saptanmıştır. Öğrencilerin akademik başarılarını değerlendirmek için şu işlemler yapılmıştır. Her iki grupta çoktan seçmeli test deneysel çalışmalar başlamadan önce öğrencilerin ünite konularına ilişkin önbilgilerini test etmek için öntest, deneysel işlemler tamamlandıktan sonrada kazanımlarını test etmek için son test olarak tekrar uygulandı. Testlerin uygulanma süresi 40 dakika olarak belirlenmiştir. Akademik başarı testindeki her soruya doğru cevap için 1 puan, her yanlış cevap için ise 0 puan verilmiştir. Her soru dört seçeneklidir. Bu testten alınabilecek en yüksek puan 40 tır. Araştırmada test sonuçlarının analizi t-testi ile yapılmıştır.

İkinci olarak, BBL koşullarının bilişselfarkındalık bir akış kartına göre tasarlanan öğretim sürecine ilişkin deney grubu öğrencilerin görüşleri alınmıştır. Bunun için, açık uçlu yarı yapılandırılmış 3 soruluk bir anket formu için BBL alanında uzman olan akademisyen görüşü alınarak, hazırlanmıştır. Ayrıca BBL'nin deney grubundaki öğrenciler üzerindeki etkisi araştırmacı tarafından doğal olarak gözlenmiştir.

Araştırmanın Bulguları: Araştırmanın sonuçları, BTÖ koşullarının bilişselfarkındalık bir akış kartına gore tasarlandığı öğretim sürecine katılan deney grubu öğrencileri ile geleneksel öğretime (anlatım ve soru cevap yöntemlerine) katılan kontrol grubu öğrencilerinin akademik başarıları arasında deney grubu lehine anlamlı bir farklılaşma olduğunu göstermektedir. Başka bir deyişle deney grubunda uygulanan BTÖ yaklaşımları öğrencilerin akademik başarılarını artırmıştır. Öğrenci görüşlerine göre BTÖ, öğrencilerin anlamlı öğrenmelerine olumlu katkı sağlamıştır.

Araştırmanın Sonuçları ve Önerileri: BTÖ koşullarının bilişselfarkındalıçı bir akış kartına göre tasarlanan öğretim sürecinin öğrencilerin akademik başarılarını geleneksel öğretim anlayşındaki anlatm-soru cevap yöntemine gore daha anlamlı olarak arttırmıştır. Bu uygulanan BBL akış kartı öğretim sürecinin, öğrencilerin, sınıf içi öğrenme etkinliklerine bilişselfarkındalıklı bir anlayış kattığını söyleyebiliriz. Öğrencilerin öğrenme etkiniklerine odaklanarak ilgiyle ve pozitif olarak derslere katıldıkları gözlenmiştir. BBL'nin bilişselfarkındalıkçı bir akış kartı şeklinde taasarlanıp uygulanması, BBL'nin kavramsal düzeydaki öğrenme-öğretme koşul ve süreçlerine uygulanbilir pratikler ve farklılıklar getirebileceği ve beyin temelli öğrenme-öğretme programlarının geliştirilmesi çabalarına daha güçlü bir boyut katabileceği umulmaktadır. Farklı derslerde ve öğretmen eğitimi alanlarında bu araştırmanın bulgularından ve uygulamalarından yararlanılabilir. Yapılacak araştırmalarda BTÖ'nün kalıcılık ve problem çözme becerilerinin geliştirilmesi üzerindeki etkisi çalışılabilir.

Anahtar Sözcükler: Beyin-Temelli öğrenme, bilişselfarkındalık stratejileri, akış kartı, öğrenmeyi öğrenme

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The Separation-Individuation and Perceived Parenting Styles in Adolescents

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Abstract

Problem Statement: An infantile that needs his/her caregiver's or mother's care starts moving independently by controlling his/her body movements during development stages. Therefore, an infantile becomes aware of the fact that he/she is a different individual from his/her mother. In other words, he/she begins to individualize. However, this process is a complex one which consists of father and the interaction between mother and infant. Adolescence is the second period in which a quick development takes place in an individual's life. Adolescence is a period of identity formation. In this study, the relationship between separation-individuation and perceived parenting dimensions in adolescents was analyzed since the characteristics of relationship between parents and adolescents during the separation-individuation process are significant.

Purpose of the Study: The purpose of the study is to explain the relationship between adolescents' separation-individuation and their perceived acceptance/involvement and strict control parental dimensions.

Method: The study group consisted of a total of 251 high school students (126 female, 99 male) studying at 9th, 10th, and 11th grade levels. However, the data gathered from 26 students were disregarded due to incomplete and/or mistaken data. The analyses were carried out on a 225-person data set. The points which were obtained from the three scales were analyzed

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through SPSS 11.5 and the total points of scales were found in data analyses.

Findings and Results: There was no difference between engulfment anxiety, rejection expectancy, and dependency denial subscales of SITA (the Separation-Individuation Test of Adolescence) according to gender. There was no difference between Parenting Styles Scale's acceptance/involvement and strict control dimensions according to gender. It was observed that there was a significant relationship between separation anxiety, rejection expectancy, and mother and father's strict control dimension. There was a positive relationship between practicing-mirroring and mother's strict control dimension. There was a positive relationship between rejection expectancy and mother's acceptance/involvement dimension. There was a negative relationship between rejection expectancy and father's acceptance/involvement dimension. There was a positive relationship between acceptance/involvement of mother-father and nurturance seeking. There was a positive relationship between nurturance seeking and father's strict control.

Conclusions and Recommendations: At the end of the study, it was observed that separation anxiety, healthy separation, nurturance seeking, and peer enmeshment subscales scores were significantly different in terms of gender. The study showed that the scores gained from Parenting Styles Scale's acceptance/involvement and strict control dimensions were not significantly different in terms of gender. Some separation-individuation problems of students can be prevented through doing studies to materialize their parenting styles and separation-individuation in the frame of the counseling.

Keywords: Separation-individuation, parenting style, adolescence, high school student.

Sullivan stated that late adolescence period, the end of the adolescence, is the period when a person starts taking responsibilities, which is considered to be a requirement to be a social individual (Geçtan, 1993; Altıntaş & Gültekin, 2003). The individual tends to have disengagement from both home where s/he takes shelter and his/her parents whom s/he is enveloped with. On the other hand, the individual has to cut off the attachment with the first objects and infantile ties during the adolescence period. The continuity of the true parental relationship remains after infantile characteristics of the relationship recede. Structural change period and achievement, instinct and ego deterioration are conceptualized as individuation of an adolescent. The reflection of these structural changes during the individuation of the adolescent is the discontinuation of the internalized infantile objects (Blos, 1989).

According to Blos, psychological separation of adolescents from their parents increasingly develops during separation-individuation period. This movement,

mostly towards independency, is supported by developing physical, mental, and interpersonal senses of adolescents (Quintana & Lapsley, 1990). Ryan and Lynch (1989) found that there was a negative correlation between emotional autonomy of adolescents and parental attachment; however, there was a positive correlation between emotional autonomy and peer attachment. There was a negative relationship between emotional autonomy and family cohesion, parental acceptance, independency support, self-perceived lovability. Furthermore, there was a negative relationship between parental rearing and emotional autonomy; however, there was a positive relationship between parental rearing and lovability perceived from parents. Children who are reared with utmost parental care feel more efficient than children who are reared with insufficient parental care and are more motivated to become autonomous (Grolnick, Ryan, & Deci, 1991). It was found that, in late adolescents, participating in relationships supports separation need; nevertheless, parental attitudes do not have an effect on separation-individuation (Hoffman, 1984).

According to Baumrind (1980), mothers and fathers can form their attitudes as they wish by determining targets with the help of their unique and organized self system. Children, on the other hand, are more vulnerable to outer effects since they are immature and inexperienced. Mothers and fathers play a decisive role, consciously or unconsciously, in the development of their children who are inexperienced about forming their environment while mothers and fathers serve the function of introducing standards of the social world to their children ever since the infantile period, they are also expected to introduce their children to the world as they perceive it and determine the targets they set for their children. A child is capable of learning some skills that are the necessities of a culture by insight, education, and imitation and while a child does these, mothers and fathers play a key role as primary models.

Mothers and fathers could communicate differently, according to their gender, with their children during the adolescence period, and they show different parenting styles, and interaction patterns (Shek, 1995). A parent's attitude about how their children behave and what kind of an individual they should become is different from another parent (Yılmaz, 1999). Some research reveals that approaches of mothers and fathers are different (Darling & Steinberg, 1993; Noller & Callan, 1990; Paulsan & Sputa, 1996) while some other research reveals that there are similarities in the approaches of mothers and fathers (Smetana, 1995; Stice & Barrera, 1995).

When the relevant literature regarding separation-individuation is consulted, we come across studies concerning the relationship between separation distress and attachment anxiety and malnutrition in women (Armstrong & Roth, 1989) as well as family relationship variables (Schulthesis & Blustein, 1994), separation anxiety of mother and father (Bartle-Haring, Brucker, & Hock, 2002), family structure (Lopez, Campbell, & Watkins, 1988; McCurdy & Scherman, 1996), function of the family (Holmbeck & Wandrei, 1993), and family coherence (Rice, Cole, & Lapsley, 1990).

When the relevant literature regarding parenting styles is consulted, we come across studies on the relationship between parenting styles and success at school,

self-respect, social skill, socializing (Salazar, Schludermann, Schludermann, & Huynh, 2001; Steinberg, Elmen, & Mounts, 1989; Steinberg, Lamborn, Dornbusch, & Darling, 1992) and studies revealing that parenting styles do not change much in time (McNally, Eisenberg, & Harris, 1991; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994), studies regarding parenting styles which are either sustained or not sustained throughout generations (Campbell & Gilmore, 2007); and studies regarding the parenting styles of both black and white parents.

In Turkey, on the other hand, there are studies concerning the relationship between separation-individuation in adolescents and family relations (Yaman, 2005), attachment and parenting styles (Sümer & Güngör, 1999), and young adults and fathers in which mother is the focus (Karadayı, 1994).

As it is mentioned above, during separation-individuation process, an adolescent's ongoing relationship between his/her parents gains importance on his/her way to independence and autonomy. Therefore, this study aims to analyze the relationship between adolescents' separation-individuation and their perceived acceptance/involvement and strict control parental dimensions.

Method

Participants

The study group consisted of a total of 251 students, 144 female and 107 male, who were studying at 9th, 10th and 11th grade levels in Keçiören Aktepe Lisesi and Çankaya Dikmen Lisesi in Ankara during the spring semester of 2007-2008 academic year. However, the data gathered from 26 students was disregarded due to incomplete and/or mistaken data. The analyses were carried out on a 225-person data set. Of the students participating in the study, 126 students (56%) were female and 99 (44%) male.

Research Instruments

High school form of the Separation-Individuation Test of Adolescence (SITA): SITA, which was developed by Levine, Green and Millon (1986) and Levine and Saintonge (1993), was adapted to Turkish by Kösem-Şen (2002, cited in: Yaman, 2005). The SITA consists of a total of 103 items and nine subscales. These subscales are:

1. Separation Anxiety: Significant others experienced as abandoning.
2. Engulfment Anxiety: Intimacy experienced as envelopment.
3. Nurturance Seeking: Strong caretaker attachment.
4. Peer Enmeshment: Strivings for intense peer intimacy.
5. Teacher Enmeshment: Strivings for intense, intimate attachments to teachers.
6. Practising-Mirroring: Narcissistic strivings.
7. Need Denial: Attachment needs denied.

8. Rejection Expectancy: Significant others experienced as callous and hostile.
9. Healthy Separation: Flexible balance of dependence and independence strivings.

The total internal consistency (Cronbach alpha) measured was .87. Internal consistency (Cronbach alpha) measured for each subscale are .64 for separation anxiety, .74 for engulfment anxiety, .69 for peer enmeshment, .67 for teacher enmeshment, .86 for practicing-mirroring, .59 for need denial, .80 for rejection expectancy, .41 for healthy separation and .57 for nurturance seeking. Test re-test reliability coefficient of the scale was measured between .70 and .82 except for the healthy separation measured .58. The result of the factor analyses applied in the structure validity study, the rate of variance was found to be 32.7 %, which is in parallel to the theoretical structure of the scale (Kösem-Şen, 2002, cited in: Yaman, 2005). The SITA subscales Cronbach alphas were .67 for Engulfment Anxiety; .85 for Practicing Mirroring; .63 for Dependency Denial; .61 for Separation Anxiety; .62 for Teacher Enmeshment; .90 for Peer Enmeshment; .58 for Nurturance Seeking; .87 for Healthy Separation; and .81 for Rejection Expectancy which were also found later on by Tamar et al. (2006).

Parenting Style Scale (PSS)

PSS was developed by Sumer and Güngör (1999) by taking the studies of Maccoby and Martin (1983) who suggested acceptance/involvement and strict control dimensions and Lamborn, Mounts, Steinberg and Dornbusch (1991) as an example. Parenting Style Scale consists of 22 items including acceptance/involvement, strict control. In the PSS, which was applied to adolescents, internal consistencies (Cronbach alfa) were .91 for acceptance/involvement and .81 for strict control perceived from mother, and .90 for acceptance/involvement and .79 for strict control perceived from father (Güngör, 2000). Although four parenting styles (authoritarian, authoritative, permissive/indulgent, and permissive/neglecting) gained from on dimensions and categorical grounds were obtained-since styles and types are specific "areas" on the two dimensions-acceptance/involvement and strict control in parenting styles were measured in order to prevent loss of knowledge.

Procedure

Materials were administered during class periods for three of the high schools. Participants first completed the Separation-Individuation Test of Adolescence (SITA). Next, they completed Parent's Style Scale's both mother's and father's form. The t test and correlation techniques were made use of in the evaluation of data.

Findings and Results

Below, first of all are given findings of adolescents' separation-individuation and parent's styles. Then, those findings of relationships between separation-individuation and parent's style are given.

The Separation-Individuation Test of Adolescence Subscales and Parent's Style Scale Results

Separation Anxiety, Engulfment Anxiety, Nurturance Seeking, Teacher Enmeshment, Peer Enmeshment, Practicing-Mirroring, Need Denial, Rejection Expectancy, and Healthy Separation subscales of The Separation-Individuation Test of Adolescence students' gender distributions and t test results are given in Table 1.

Table 1

The Separation-Individuation Test of Adolescents Subscale's Means, Standard Deviations and t Values of Students according to Their Gender

The Separation-Individuation Test of Adolescence	Females n: 126		Males n:99		t	p
	x	s	x	s		
Separation anxiety	43.64	8.57	38.32	8.12	4.72	.000***
Engulfment anxiety	19.89	6.55	19.52	5.86	.442	.659
Nurturance seeking	27.95	5.27	25.86	5.14	2.97	.003**
Peer enmeshment	32.03	4.68	29.56	5.65	3.58	.000***
Teacher enmeshment	22.04	5.49	20.35	4.69	2.44	.015*
Practicing-mirroring	46.82	10.44	46.75	11.06	.047	.962
Dependency denial	25.65	5.95	26.77	6.23	1.37	.172
Engulfment anxiety	31.20	8.42	29.41	7.37	1.67	.096
Healthy separation	27.98	4.12	25.93	4.97	3.37	.001**

*p<.05, **p<.01, ***p<.001

It was observed that, The Separation-Individuation Test of Adolescence's subscales of separation anxiety, healthy separation, nurturance seeking, and peer enmeshment subscales scores were significantly different in terms of gender while engulfment anxiety, practicing mirroring, rejection expectancy, teacher enmeshment and dependency denial subscales scores were not.

The t test results of whether there is a difference regarding gender between acceptance/involvement and strict control dimensions perceived from students' parents are given in Table 2.

Table 2

Parenting Style Scale's Subscale's Means, Standard Deviations and t Values of Students according to Their Gender

Parenting Dimensions	Females n: 126		Males n: 99		t	p
	x	s	x	s		
Mother's acceptance/involvement dimension	30.82	3.28	30.45	4.25	.73	.461
Mother's strict control dimension	29.41	5.93	30.48	6.36	1.30	.194
Father's acceptance/involvement dimension	29.52	3.45	29.40	4.17	.23	.814
Father's strict control dimension	28.71	6.17	30.29	5.73	1.96	.051

It was observed that Parenting Styles Scale's acceptance/involvement and strict control dimensions were not significantly different in terms of gender.

Correlation between the Separation-Individuation Test of Adolescence Subscales and Parent's Style Scale

The results of Pearson Correlation Coefficient between the subscales of the Separation-Individuation Test of Adolescence and Parenting Styles Scale are as follows. It was observed that there is a positive correlation between the separation anxiety subscale of SITA and mother's strict control dimension (r =.24, p<.01); and father's strict control dimension (r =.23, p<.01). It was observed that there is a positive correlation between the peer enmeshment subscale of SITA and mother's acceptance/involvement dimension (r =.16, p<.05). It was observed that there is a positive correlation between the practicing-mirroring subscale of SITA and mother's strict control dimension (r =.13, p<.05). It was observed that there is a positive correlation between the nurturance seeking subscale of SITA and mother's acceptance/involvement dimension (r =.41, p<.01); and father's acceptance/involvement dimension (r =.33, p<.01) and strict control dimension (r =.13, p<.05). While there is a negative correlation between the engulfment anxiety subscale of SITA and mother's acceptance/involvement dimension (r =.-16, p<.05), there is a positive correlation between the engulfment anxiety subscale of SITA and mother's strict control dimension (r =.20, p<.01). While there is a negative correlation between the same subscale of SITA and father's acceptance/involvement dimension (r =.-13, p<.05), there is a positive correlation between the same subscale of SITA and mother's strict control dimension (r =.28, p<.01). It was observed that there is a positive correlation between the teacher enmeshment subscale of SITA and mother's acceptance/involvement dimension (r =.19, p<.01) and mother's strict control dimension (r =.16, p<.01). It was observed that there is a positive correlation between the same subscale and father's acceptance/involvement dimension (r =.20, p<.01) and strict control dimension (r =.20, p<.01). It was observed that there is a positive correlation between the rejection expectancy subscale of SITA and mother's acceptance/involvement dimension (r=.25, p<.01) and strict control dimension (r =.24, p<.01). While there is a negative correlation, the same subscale of SITA and

father's acceptance/involvement dimension (r =.-18, p<.01), there is a positive correlation between the same subscale of SITA and father's strict control dimension (r =.15, p<.05). It was observed that there is a positive correlation between the healthy separation subscale of SITA and mother's acceptance/involvement dimension (r =.13, p<.05).

On the other hand, there was no significant correlation between the separation anxiety subscale of SITA and mother's acceptance/involvement dimension; and father's acceptance/involvement dimension. There was no significant correlation between the peer enmeshment, healthy separation subscales of SITA and mother's strict control dimension; and father's acceptance/involvement dimension and strict control dimension. Also there was no significant correlation between the dependency denial subscale of SITA and mother's acceptance/involvement dimension and strict control dimension; and father's acceptance/involvement dimension and strict control dimension. There was no significant correlation between the practicing-mirroring subscale of SITA and mother's acceptance/involvement dimension; and father's acceptance/involvement dimension and strict control dimension.

Discussion and Recommendations

Below, results are discussed according to literature. Then, implications of the results and recommendations for future research are presented.

Since there was no difference between engulfment anxiety, rejection expectancy, and dependency denial subscales of SITA according to gender, the results are consistent with those of the study by Tamar et al., (2006). These concepts should be reconsidered in terms of gender roles of females and males in Turkish culture because there were no significant results in practicing-mirroring and teacher enmeshment subscales in this study. In some studies there are differences in the relationship of adolescent and mother-father according to gender (Noller & Callan, 1990; Ongen, 2004; Youniss & Ketterlinus, 1987). These results are inconsistent with the results of this study, because there is no difference between acceptance/involvement and strict control dimensions which adolescents perceive from mother and father in terms of gender.

In this study, it was observed that there was a significant relationship between separation anxiety and mother and father's strict control dimension. There was a negative relationship between separation-individuation and secure attachment in adolescents in Aslan's (2008) study. Because of this, it can be said that there is a negative correlation between secure attachment to mother-father and separation anxiety, rejection expectancy, and engulfment anxiety. Consistent with Aslan's (2008) study, Sümer and Güngör (1999), in their study, showed that there is a significant relationship between high level acceptance/involvement and secure attachment. And also it was observed in Sümer and Güngör's (1999) study on young adolescents that there is a positive correlation between strict control dimension and insecure attachment styles (authoritarian, permissive/indulgent, and permissive/neglecting); similarly there is a positive relationship between separation anxiety and strict control

dimension. The fact that there is a positive relationship between separation anxiety and strict control dimension of mother-father in this study also supports the findings of Aslan's (2008) and Sümer and Güngör's (1999) study.

Karadayı (1994) found a relationship between perception of mother as an indulging person, in other words, the high level of acceptance/involvement dimension, and the high level of peer dependency. It is consistent that there is a positive relationship between peer dependency and mother's acceptance/involvement dimension found in Karadayı's (1994) research findings and the findings of this study. In addition to this, practicing-mirroring is defined by Mahler, Pine and Bergman (1975) as mirroring of mother care patterns towards her child. According to Quintana and Kerr (1993), practicing-mirroring needs refer to adolescents' needs to have their sense of self appreciated, respected, validated, or admired. Levine and Saintonge (1993), on the other hand, defined practicing-mirroring as adolescents' narcissistic striving and stated that practicing-mirroring, engulfment anxiety, dependency denial, rejection expectancy are the scales that reflect the negative expectancy in interpersonal attachment as dismissing attachment. Therefore, it can be stated that there is a positive relationship between practicing-mirroring and mother's strict control dimension as an expected result in this study. Moreover, it can be stated that there is a positive relationship between rejection expectancy and mother's and father's strict control dimension as an expected result. However, the fact that, there is positive relationship between rejection expectancy and mother's acceptance/involvement dimension and there is a negative relationship between rejection expectancy and father's acceptance/involvement dimension should be reconsidered in terms of separate roles of mothers and fathers in Turkish culture.

In this study, it was found that there is a positive relationship between acceptance/involvement of mother-father and nurturance seeking which is consistent with Sümer and Güngör's (1999) research findings. What is more, the fact that there is a positive relationship between nurturance seeking and father's strict control can be in relation with the traditional role of father in Turkish culture as Ongen (2004) stated in his study. It can be stated as an expected result that there is a positive relationship between adolescent's dependency and independency striving, in other words, healthy separation defined by Levine and Saintonge (1993) and mother's-father's acceptance/involvement. It can be stated as an expected result that there isn't a positive relationship between father's acceptance/involvement and strict control dimensions and adolescent's dependency and independency strivings, defined as healthy separation, are heavily experienced with mother (Blos, 1989; Mahler et al., 1975).

Aslan's (2008) research finding that there is a negative relationship between engulfment anxiety and secure attachment to mother-father and Sümer and Güngör's (1999) study findings that there is a positive relationship between acceptance/involvement dimension and insecure attachment support the findings regarding engulfment anxiety in this study. It was found that there is a positive

relationship between teacher enmeshment and acceptance/involvement dimension and strict control of mother and father.

On the other hand, Gilligan (1982) emphasized the role of separation-individuation and the end of the attachment period while an individual gains his personality during the adolescence period. Since our study group consists of people experiencing the first years of their adolescence and also since their attachment period is ongoing, a significant correlation was not found between dependency denial mother and father's both acceptance/involvement dimension and strict control dimension.

Given the above results, the following recommendations could be made:

1. While a counselling program is being developed for adolescents who are in the way of individuation and suffering from separation anxiety, programs can be developed by taking adolescents' perceived maternal-paternal dimension into consideration.

2. In order to contribute to students' separation-individuation process, a guidance program can be conducted for parents aiming to promote democratic and accepting mother-father attitude.

3. Counselling and guidance programs can be developed by considering adolescents' parental dimension perceived from their mothers, who are experiencing problems in the relationships with their peers.

4. Some more research can be carried out into separation-individuation levels of adolescents and perceived parental styles by considering and analyzing different variables (the education level of parents, socio-ecenomic level, divorced-undivorced parents, self concept, assertiveness, and problem solving skills, etc).

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Yüksek Öğretim Öğrencilerinin Değerlendirme Tercihleri

(Özet)

Problem Durumu: Annesinin/bakıcısının bakımına ihtiyaç duyan bebek, gelişim evreleri içinde kendi davranışlarını kontrol ederek ve çevresindekilerden farklı bir birey olduğunu da fark ederek bağımsız hareket etmeye başlar. Bir başka deyişle bireyleşmeye başlar. Bu süreçte anne babalar, kendi çevresini yapılandırmak konusunda deneyimsiz olan çocuklarının gelişiminde, bilerek ya da bilmeyerek belirleyici bir role sahiptir. Anne babaların, sosyal dünyanın standartlarını bebeklikten itibaren çocuklarına tanıtmak işlevini yerine getirirken, kendi benlik yapıları ve bakış açılarından algıladıkları şekliyle dünyayı çocuklarına tanıtmaları ve onlar için koydukları hedefleri bu temelde şekillendirmeleri beklenir. Anne-babanın birincil model olarak rol oynağı sosyalleşme

sürecinde çocuk içgörü, eğitim, gözlem ve taklit yoluyla kültürünün gerektirdiği becerileri kazanmaktadır. Bu süreç, temelinde özellikle anne ve çocuk arasındaki etkileşimleri içeren ve aynı zamanda babanın da yer aldığı karmaşık bir süreçtir. Bireyin devam eden gelişiminde ikinci hızlı bir değişimin olduğu dönem ergenliktir. Ergenlik dönemi, kimliğin oluştuğu ve kişisel bağımsızlığın kazanıldığı bir dönemdir. Ayrışma-bireyleşme sürecinde, ergenin ebeveynlerinden bağımsızlaşması ve özerklik kazanmasında anne-babayla sürdürdüğü etkileşimin özellikleri önem taşımaktadır. Bu nedenle bu çalışmada, ergenlerde ayrışma-bireyleşme ile algılanan anababalık boyutları arasındaki ilişki incelenmiştir.

Araştırmanın Amacı: Bu araştırmanın amacı, ergenlerin ayrışma-bireyleşmeleri ile ebeveynlerinden algıladıkları kabul/ilgi ve sıkı denetim/kontrol anababalık boyutları arasındaki ilişkiyi incelemektir.

Araştırmanın Yöntemi : Araştırmanın çalışma grubunu 9., 10. ve 11. sınıflara devam eden 251 lise öğrencisi (144 kız, 107 erkek) oluşturmaktadır. Ancak araştırmaya katılan öğrencilerin 26'sından elde edilen veriler eksik veya hatalı işaretlemeler nedeniyle analiz dışı tutulmuştur. Analizler, 126'sı (%56) kız, 99'u (%44) erkek olmak üzere toplam 225 kişilik veri seti üzerinden yapılmıştır.

Araştırmada veri toplama aracı olarak "Ayrışma-Bireyleşme Ergen Testi Lise Formu", "Anababalık Stilleri Ölçeği" ve bu araştırma için hazırlanmış "Kişisel Bilgi Formu" kullanılmıştır. Ayrışma-Bireyleşme Ergen Testi Lise Formu dokuz alt ölçek ve toplam 103 maddeden oluşmaktadır. Bu alt ölçekler; ayrışma kaygısı, kısıtlanma kaygısı, bakım veren kişiye bağlanma, akrana bağlanma, öğretmene bağlanma, aynalamayı yaşama, bağlılığı inkâr, reddedilme beklentisi ve sağlıklı ayrışmadır. Ayrışma-Bireyleşme Ergen Testi Lise Formu'nun toplam iç tutarlılık (Cronbach alfa) güvenirlik katsayısı .87 olarak bulunmuştur. Ayrışma Bireyleşme Ergen Testi Lise Formu'nun her bir alt ölçeği için bulunan iç tutarlılık güvenirlik katsayıları; ayrışma kaygısı .64, kısıtlanma kaygısı .74, akrana bağlanma .69, öğretmene bağlanma .67, aynalamayı yaşama .86, bağlılığı inkâr .59, reddedilme beklentisi .80, sağlıklı ayrışma .41 ve bakım veren kişiye bağlanma .57'dir. Ölçeğin test tekrar test güvenirlik katsayılarının da sağlıklı ayrışma (.58) dışında .70 ile .82 arasında değiştiği bulunmuştur. Yapı geçerliği çalışmasında uygulanan factor analizi sonucunda ölçeğin kuramsal yapısına uyan dokuz faktörün açıkladığı varyans oranı %32.7 olarak bulunmuştur. Anababalık Stilleri Ölçeği (ABSÖ), kabul/ilgi ve sıkı denetim/kontrol ebeveynlik boyutunu içeren toplam 22 maddeden oluşmaktadır. ABSÖ'de iç tutarlılıklar (Cronbach alfa) anneden algılanan kabul/ilgi ve sıkı denetim/kontrol boyutu için sırasıyla .91 ve .81; babadan algılanan kabul/ilgi ve sıkı denetim/kontrol boyutu için ise .90 ve .79 olarak bulunmuştur. Bu iki ölçekten elde edilen puanlar SPSS 11.5 kullanılarak analiz edilmiştir. Verilerin değerlendirilmesinde t testi ve Pearson Mometler Çarpımı Korelasyon Katsayısı kullanılmıştır.

Araştırmanın Bulguları: Ayrışma-Bireyleşme Ergen Testi'nin ayrılık kaygısı, sağlıklı ayrışma, bakım veren kişiye bağlanma ve akrana bağlanma alt ölçek puanlarında cinsiyete göre anlamlı farklılıklar bulunmuştur. Diğer yandan Ayrışma-Bireyleşme Ergen Testi'nin kısıtlanma kaygısı, reddedilme beklentisi, bağlılığı inkâr, aynalamayı yaşama ve öğretmene bağlanma alt ölçek puanlarında ise cinsiyete göre farklılık bulunmamıştır. Ergenlerin algıladıkları annenin ve babanın kabul /ilgi ve sıkı denetim/kontrol ebeveynlik boyutları arasında cinsiyete göre farklılık bulunmamıştır.

Ayrışma-Bireyleşme Ergen Testi alt ölçekleri ile Anababalık Stilleri Ölçeğinden alınan puanlar arasındaki korelasyonlar incelendiğinde; ayrılık kaygısının annenin ve babanın sıkı denetim/kontrol boyutu ile pozitif yönde anlamlı ilişkiler gösterdiği gözlenmiştir. Akrana bağlanma ile annenin kabul/ilgi boyutu arasında pozitif yönde anlamlı ilişki bulunmuştur. Aynalamayı yaşama ile annenin sıkı denetim/kontrol boyutuyla olumlu yönde ilişkili bulunmuştur. Annenin ve babanın kabul/ilgisi bakım veren kişiye bağlanmayla olumlu yönde ilişkili bulunmuştur. Sağlıklı ayrışma, annenin kabul/ilgi boyutuyla olumlu yönde ilişkili bulunurken, annenin sıkı denetim/kontrol boyutu ile ilişkili bulunmamıştır. Diğer yandan sağlıklı ayrışma ile babanın kabul/ilgi ve sıkı denetim/kontrol boyutları arasında anlamlı bir ilişki bulunmamıştır. Kısıtlanma kaygısı ile annenin ve babanın kabul/ilgi boyutu arasında negatif yönde anlamlı bir ilişki bulunurken, annenin ve babanın sıkı denetim/kontrol boyutu arasında pozitif yönde anlamlı bir ilişki bulunmuştur. Öğretmene bağlanma ile annenin ve babanın kabul/ilgi ve sıkı denetim/kontrol boyutu arasında olumlu ilişkili bulunmuştur. Reddedilme beklentisi ile annenin kabul/ilgi ve sıkı denetim/kontrol boyutu arasında pozitif yönde anlamlı ilişki gözlenirken, aynı alt ölçeğin babanın kabul/ilgi boyutu ile negatif yönde, sıkı denetim/kontrol boyutu ile pozitif yönde anlamlı ilişkiler gösterdiği gözlenmiştir. Bağlılığı inkâr ile annenin ve babanın kabul/ilgi ve sıkı denetim/kontrol boyutu arasında anlamlı ilişkiye rastlanmamıştır. Diğer taraftan ayrılık kaygısı ile annenin ve babanın kabul/ilgi boyutu arasında anlamlı ilişkilere rastlanmamıştır. Akrana bağlanma ile annenin sıkı denetim/kontrol ve babanın kabul/ilgi ve sıkı denetim/kontrol boyutu arasında anlamlı ilişkilere rastlanmamıştır. Aynalamayı yaşama ile annenin kabul/ilgi, babanın kabul/ilgi ve sıkı denetim/kontrol boyutu arasında anlamlı ilişkilere rastlanmamıştır.

Araştırmanın Sonuçları ve Önerileri: Araştırma sonucunda kız öğrencilerin ayrışma kaygısı, sağlıklı ayrışma, bakım veren kişiye bağlanma ve akrana bağlanma alt ölçek puanlarının erkek öğrencilere göre anlamlı olarak daha yüksek olduğu ortaya çıkmıştır. Kısıtlanma kaygısı, reddedilme beklentisi, bağlılığı inkâr, aynalamayı yaşama ve öğretmene bağlanma alt ölçek puanlarının ise cinsiyete göre farklılıklaşmadığı görülmüştür. Anababalık Stilleri Ölçeği'nin kabul/ilgi ve sıkı denetim/kontrol boyutlarından alınan puanların da cinsiyete göre anlamlı bir farklılık göstermediği ortaya

çıkmıştır. Diğer yandan ergenlerin ayrışma-bireyleşme düzeyleri ile ebeveynlerinden algıladıkları kabul/ilgi ve sıkı denetim/kontrol anababalık boyutları arasında bazı anlamlı ilişkiler ortaya çıkmıştır.
Okullarda yürütülen psikolojik danışma ve rehberlik hizmetleri kapsamında öğrencilerin sağlıklı bir şekilde ayrışma-bireyleşmesini sağlayıcı çalışmalar yapılarak onların bazı uyum sorunlarıyla karşılaşmaları önlenebilir. Böylelikle psikolojik danışma ve rehberlik hizmetlerinin önemli işlevlerinden olan önleyicilik işlevi de yerine getirilmiş olacaktır. Diğer yandan öğrencilerin ayrışma-bireyleşme sürecine olumlu katkı sağlamak amacıyla anne-babaların çocuklarına karşı kabul edici ve demokratik tutum geliştirmelerine yönelik eğitim ve rehberlik çalışmaları yapılabilir. Ayrıca ergenlerin ayrışma-bireyleşme düzeyleri ve algılanan anne-babalık stillerini başka değişkenlerle de (anne-babanın eğitim ve sosyo-ekonomik düzeyi, boşanmış anne-babalar, benlik kavramı, güvengenlik, sorun çözme becerileri vb.) ele alıp inceleyen araştırmalar yapılabilir.
Anahtar Sözcükler: Ayrışma-bireyleşme, anababalık stili, ergenlik, lise öğrencisi.

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Comparative Analysis of Students' Perceptions on Integration and Discrimination Policy in Sweden

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Abstract

Problem Statement: Discrimination and integration policy is an important issue all over the world. Sweden is a democratic and multicultural country trying to provide equal rights to every single person residing in Sweden. This study investigates how anti-discrimination policies are perceived by students in Sweden.

Purpose of the Study: The primary purpose of this study is to analyze the perception of students regarding the discrimination and integration policy implemented in Sweden. Focusing on educational policies in a multicultural setting in Sweden, the study explores how these policies are perceived by the students who are supposed to benefit from them, regardless whether the students are native Swedes or immigrants. First, the study presents the immigration flow into Sweden and consequent changes in relevant policies. Secondly, the study sets forth the perceptions of students on integration, internalization and discrimination. Finally, the study analyzes the interplay between these policies and students' perceptions of the issues concerned.

Method: The study was conducted at three high schools in Uppsala, Sweden. Data from the student sample (n=348) between the ages of 15-19, attending grades 10, 11, 12 at high schools, were collected using a face-to-face self-completion of a questionnaire, provided both in English and Swedish. Analysis of the quantitative survey focused on the perceptions of the students regarding integration policy, discrimination and

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internalization. Data from the questionnaire were analyzed using SPSS version 16.

Findings and Results: The findings show that though Swedish legislation provides strict rules to prevent discrimination and to ease integration, the percentage of students who complain about discrimination cannot be underestimated.

Conclusions and Recommendations: The conclusion is that the level of discrimination and segregation does not overlap with the official policy of Sweden. This fact shows that Sweden should re-examine its discrimation policy. The findings are expected not only to expose problems faced by students regarding integration and discrimination in Sweden but also to provide insightful implications that can be used to improve multicultural settings.

Keywords: Sweden, multicultural education, integration, discrimination.

Multiculturalism is defined as both a political theory and an ideology dealing with the question of equal recognition of cultures and "the fact of societies with more than one culture in the public realm" (Kelly, 2002, p. 4). Theorists of multiculturalism in general value difference and see the equal recognition of cultures as a group right in a democratic society (Kymlicka, 1995; Taylor, 1994). They suppose that cultures would lose value if they were all the same and Barry (2001, p. 270) argues that cultures cannot be equal in relation to each other because they have different values. The concluding remarks come from Kymlicka (1995, p. 272 in Joppke, 2004, p. 242) who agreed that the overall goal should be integration of the minority culture into the majority culture.

Multicultural education is one of the significant issues in countries like Sweden, which holds a national value that all children living in Sweden are entitled to equal educational opportunities. The purpose of the Swedish Code of Statutes (Education Act, 2006: 67) is to combat discrimination on grounds of sex, ethnic origin, religion or other beliefs, sexual orientation or disability. Sweden has very assertive laws regarding immigrants in the Education Act (1985:1100), but questions about how these national goals work and how realistic they are constitute the main motives for this research.

Every country has its own perspective on migration. Many countries are composed of highly diversified, pluralistic peoples who cry out for independence and dignity (Mitchel & Salsbury, 1996). Immigrants generally tend to continue their own cultural life style and thus many problems arise due to different kinds of attitudes in a certain society. The number of people migrating from one country to another has increased recently and it is reported that 2.9 % of the world's population are living in countries other than those in which they were born (Degazon-Johnson 2005 in Ochs 2006, p. 381). Therefore, many countries hosting immigrants constantly endeavour to provide the immigrants living in their society with an equal,

democratic and humanistic life, and to offer students multicultural education, one of the issues of paramount significance in such countries.

The term "multicultural education" has been frequently used in recent years but like many other frequent expressions, it is utilized in a variety of ways. Eldering (1994), for example, defines it as "education that takes into account in some way the ethnic/cultural differences between pupils" (p. 315). In this study, it is used in the meaning of all sorts of teaching and influences situations where two or more cultures are involved directly or indirectly.

Immigrant Flow in Sweden and Consequent Changes in Relevant Policies

After World War II, with refugees pouring in from neighbouring countries (1938 to 1948), labour immigration from Finland and southern Europe (1949 to 1971), family reunification and refugees from developing countries (1972 to 1989) and asylum seekers from south-eastern and eastern Europe, together with the newly free movement of EU citizens within the European Union (1990 to present), Sweden became a country of immigration (Westin, 2006).

Subsequent to the immigrant flow, the educational system has undergone relentless reforms since the late 1940s, and since the mid 70s, multicultural education has become an important issue for Sweden. The driving force behind the fundamental changes in Swedish education has been the pursuit of equality: "to enable all persons to attend education regardless of social, cultural or economic background or geographical location" (Education Act, 2006: 67). The growing population of the immigrants in the 1970s forced Sweden to focus on multicultural education more strictly (Runblom, 1994).

Table 1

The Number of Immigrant Flow between 1960 and 2004 in Sweden.

Country of origin	1960	1970	1980	1990	2000	2004
Scandinavia						
Denmark	35,112	39,152	43,501	43,931	38,190	41,663
Finland	101,307	235,453	251,342	217,636	195,447	186,589
Norway	37,253	44,681	42,863	52,744	42,464	45,000
Other Europe						
Estonia	21,000	18,513	15,331	11,971	10,253	9,920
Germany	37,580	41,793	38,696	36,558	38,155	40,826
Greece	266	11,835	15,153	13,171	10,851	10,794
Poland	6,347	10,851	19,967	35,631	40,123	43,472
Former Yugoslavia	1,532	33,779	37,982	43,346	131,772	134,940
Refugee-sending						
Chile	69	181	8,256	27,635	26,842	27,699
Ethiopia	59	346	1,797	10,027	11,907	11,213
Iran	115	411	3,348	40,084	51,101	53,982
Iraq	16	108	631	9,818	49,372	70,117
Lebanon	15	240	2,170	15,986	20,038	21,106
Somalia	0	68	146	725	13,082	15,294
Turkey	202	3,768	14,357	25,528	31,894	34,965
Other countries	58,914	96,406	131,413	205,654	292,307	352,682
GRAND TOTAL	**299,879**	**537,585**	**626,953**	**790,445**	**1,003,798**	**1,100,262**
Total population	**7,497,967**	**8,081,229**	**8,317,937**	**8,590,630**	**8,882,792**	**9,011,392**
Percentage foreign born	**4.0**	**6.6**	**7.5**	**9.2**	**11.3**	**12.2**

Source: Statistics Sweden, 2005.

As seen in Table 1, an increasing proportion of Sweden's population has been foreign (from about 7% in 1970s to 12% in 2000s), consisting of one in nine persons living in Sweden was foreign-born, and one fourth of the children below 17 had one or both of parents born outside of Sweden, which shaped the impact of immigration on Swedish society (Bernhard et al, 2007, p. 5). Today, this country with a population

of 9 million people (9,276,509) has a strong social-democratic tradition which stresses the redistributive role of the state, social inclusion and equality, underpinned by high levels of taxation and public spending.

The primary objective of education policy in Sweden is to ensure equality of opportunity by way of ensuring that all citizens have access to the necessary resources. Swedish policy applies two main instruments in trying to achieve equivalent outcomes. One stresses "demand-side" policies aimed at eliminating barriers to, and inequalities of, educational attainment, in particular with regard to credit constraints and resource weakness in families. Not only is family support unusually generous, but access to education is free throughout the system, from the first grade to higher education. The second instrument applies to educational system design. Swedish policy seeks to eliminate dead-ends and tracking of students through a large menu of second-chance options and bridges to higher levels. The stated aim is that all children will complete the equivalent of upper secondary school and that all will be given the opportunity to pursue tertiary studies if they so desire. The ultimate goal is not that everybody complete higher education, nor that curricula and qualifications be identical for all, but that the distribution of outcomes be uncorrelated with individuals' social origin; diplomas of the same level have equal value; and that every citizen, at any level of qualification, have the possibility to further upgrade their skills (Nicaise at al, 2005).

In a bill entitled "Security (Gov. Bill 2005/06, p. 8) respect and responsibility - the prohibition of discrimination and other degrading treatment of children and pupils" - the Government proposed a new Act that would apply to pre-school facilities, school-age childcare, primary and secondary school and municipal adult education. The Act, as is shown above, was intended to promote equal rights for children and pupils and to combat discrimination on grounds of sex, ethnic origin, religion or other belief, sexual orientation or disability. It was also intended to combat other degrading treatment, such as bullying. The Act would apply to both public and privately run facilities subject to the Education Act. The Act Prohibiting Discrimination and Other Degrading Treatment of Children and School Students (Education Act 2006: 67) was accepted and declared on the website of the government. This Act also has the purpose of combating other degrading treatment.

All the efforts and decisions on one hand, and the real life and feelings of the people on the other, this study aims to find out how the actual implementation of all these efforts have been regarded by the students in Swedish upper secondary school

As cultural diversity permeates every aspect of social life, studies tend to cut across many sectors: education, culture, housing, employment, immigration, integration. That makes the topic interesting, but also difficult to study. So, the scope of study is limited to the integration and discrimination policy in Sweden and students' perceptions on this issue.

Method

Sample

Participants in the survey. This survey was conducted in 2008, spring term, at three high schools in Uppsala, Sweden. The first school is a school which offers International Bachelorette, IB, and has many immigrant students. The second school has integration classes for immigrant children, which prepare the newcomers to be qualified enough to engage in mainstream education. The third school is a vocational school and also has many immigrants, yet the classes are mostly mixed. Both Swedish and immigrant students were in the same classes. Students were between the ages of 15-19 and attended grades 10, 11, 12 at high school. When the questionnaires were administered, the students' gender, nationality, father's nationality, mother's nationality, residence period and language spoken at home were taken into account. The sampling comprises 150 males (43 %) and 183 females (52%). 15 students did not answer the question regarding their sex, which totals 348 students from three high schools.

Procedure

Data from the student sample (n=348) were collected, using a face-to-face, self-completion questionnaire. Participants were asked to respond by indicating their opinions on a 25-item questionnaire, provided both in English and Swedish. Students were free to choose the language of the questionnaire. The first section of the questionnaire was designed to elicit identities ad personal profiles. The questionnaire also contained a section with a series of questions about internalization and integration. The rest of the questions were about discrimination. So as to effectively determine students' experiences and perspectives, an open-ended comment section was also provided. Students were asked to write their opinions, suggestions or anything they wanted to express about living in a multicultural society. The answers were coded and analysed in terms of frequencies. Before completing the questionnaire, the respondents read a short paragraph informing them of voluntary consent to answer the questions, insuring them anonymity, and informing them of their right to withdraw from the study, according to ethics laws (Swedish Code of Status: 2003:460).

Data Analyses

Data from the questionnaires were analyzed using SPSS version 16. Analysis of the quantitative survey focused on the perceptions of the students regarding integration policy, internalization and discrimination.

This section presents tables and comments on issues for which the students in the 3 schools had widely diverging opinions on integration of immigrants, internalization and discrimination. Table 2 and Table 3 give information about students' background profiles. Table 2 indicates that 70,1% of the subjects in the study were born in Sweden

Table 2

Students' Birth of Place

Country	F	%
Sweden	244	70,1
Other	104	29,9
Total	348	100,0

As seen in Table 3, at least one of every three children has a mother or father born outside of Sweden. While 244 students stated that they were Swedish, 146 out of 348 pointed that their mother was non-Swedish and 151 that their father was non-Swedish. This shows that these students, though born in Sweden, have at least one of their parents born out of Sweden.

Table 3

Parents' Birthplace

	Mother's birthplace		**Father's birthplace**	
Country	F	%	F	%
Sweden	202	58,0	197	56,6
Other	146	42,0	151	43,4
Total	348	100,0	348	100,0

Table 4 shows not only how often these students use their home language at home but also their circle of friends. The term home language is defined as any other language than Swedish. This is the official Swedish definition of "home language" for educational settings. In Table 4, some 22% of students stated that they always speak their home language in their houses. The total percentage of those who speak a language other than Swedish at home is about half of the total participants.

Table 4

Students' Percentage of Using Home Language and Having friends from their own nationality

Home Language	F	%	Backgro und Friends	F	%
Always	77	22,1	All	21	6,0
Usually	38	10,9	Most	204	58,6
Rarely	61	17,5	Some	94	27,0
Never	172	49,4	None	29	8,3
Total	348	100,0	Total	348	100,0

As seen in Table 4, the total percentage of students who responded that they mostly spend their time with friends from their own ethnic background was 58.6%. The percentage of those who stated that some of their friends were from their own ethnic background was 27%. In total, some 91.6% of students prefer to be with friends from their own ethnic background. This high percentage indicates the high degree of segregation in Sweden. The segregation aspect is discussed in the last section of the study.

As for subjects' views on integration policy for migrants and their life in Sweden, Table 5 reveals that students have quite positive opinions about both issues.

Table 5

Students opinion about integration policy and living in Sweden

Integration Policy	F	%	Living in Sweden	F	%
very well	30	8,8	very good	204	59,3
well	241	70,5	good	128	37,2
badly	65	19,0	bad	8	2,3
very badly	6	1,8	very bad	4	1,2
Total	342	100,0	**Total**	344	100,0

Among 342 students, the percentage of those who think the integration policy works well in Sweden was (79.3%). The percentage of those who think the integration policy works poorly was only 20.8. When it comes to their feelings about living in Sweden, almost all of the students responded positively (59.3% very good,

37.2% good and only 2.3% bad and 1.2% very bad). This shows that 96.5% percent of students have internalized the values of life in Sweden.

The European Commission conducted another survey on local perceptions of quality life, carried out in 31 European cities, in 2004, with 300 randomly selected individuals in each country. Although this survey showed that at least part of the population in most towns believed that foreigners were integrating, in Stockholm (and in Stockholm only) did there seem to be consensus that this was not the case. Most of the people disagreed with the statement "Foreigners who live in the city are well-integrated" (p:7). The same result appears in another survey, carried out by the same Commission in 2007 in 75 cities (p:8). However, this survey, as seen in Table 5, reflects general optimism about integration policy in Sweden. On the other hand, students' perceptions of discrimination are not so optimistic as those of integration. Table 6 shows the frequency of how often the students witnessed discrimination, how many times they were discriminated against and how often they discriminated against others.

Table 6

Percentage of Students' Perceptions on Discrimination

	Witnessed Discrimination		**Being Discriminated Against**		**Discrimination Against Others**	
	F	%	**F**	%	**F**	%
Often	31	9.0	5	1.4	1	,3
A few times	129	37.5	62	17.9	22	6.4
Rarely	97	28.2	97	28.0	87	24.1
Never	87	25.3	182	52.6	236	68.2
Total	**344**	**100**	**346**	**100**	**346**	**100**

As is clear in Table 6, the survey reflects general pessimism regarding discrimination. Some 37.5% of those polled said they had witnessed discriminatory attitudes several times and 9% claimed that they witnessed discriminatory attitudes very often. The total percentage of those who claimed that they had observed discrimination is 74.7%. The percentage of those who rarely witnessed discrimination is 28.2%. Some 24% of students considered they rarely discriminated against others and 6.4% confessed that they had discriminated against others a few times. In total, some 47% of the participants in the survey thought they were discriminated against, although the rates were mainly "a few times" or "rarely." Some 17.9% polled that they had been discriminated against a few times and 28% that they were rarely discriminated against.

Table 7

Students' Opinions on Discrimination Types

Type of Discrimination	F	%
Sex	44	12.6
Ethnic origin	49	14.1
Disability	7	2.0
Sexual orientation	10	2.9
Religion	16	4.6
More than one kind of discrimination	69	19.8
I don't know	77	22.1
No answer	76	21.9
TOTAL	**348**	**100**

Table 7 reveals that students divide almost evenly with respect to discrimination on the basis of sex (12.6%) and ethnic origin (14.1). It is remarkable that some 19.8 of students feel that more than one kind of discrimination takes place in Sweden. Interestingly, a gauge of the strength of feeling on this issue is that this question recorded an exceptionally high number of "don't knows" – more than 22% in fact. 21.9% of students did not want to make any comment on this section. In total, 40% of the students did not express their feelings on this issue. This might be because of the fact that these students did not observe any discrimination or they might not be eager to express their feelings on this issue.

Table 8

Students' Desire for Their Future

Desire for Future	F	%
Having a good education	46	13.3
Not be discriminated against	66	19.1
Have necessary social security	34	9.8
Have good employment	113	32.4
I don't know	87	25.1
TOTAL	**346**	**100**

As for the students' desire for their future, as seen in Table 8, 19.1% of students see discrimination as a threat and hope not to be discriminated against in their future life in Sweden. The highest percentage of student hopes for the future rested in finding good employment with 32.4%. Only 9.8% consider having the necessary social security as a problem for their future. The exceptionally high number of "don't knows" – more than 25% on this issue – is also interesting. This might stem from the fact that these students feel secure on account of the social security benefits offered by the Swedish government, and hence entertain no fear about the future; or that they don't see discrimination as a threat in future.

Conclusions and Recommendations

In this part, the data obtained from the investigation of student perceptions of integration and discrimination is discussed in context of the related policies in Sweden. Here, the aim is not to analyse the policies in Sweden, but rather to interpret the general situation surrounding discrimination in Sweden.

The Interplay between Policies and Students Perceptions on Integration and Discrimination

Sweden started to form a multicultural society after WWII, comprising people who fled their countries during the World Wars, and tried to implement a welfare state. In the 1970s policymakers saw immigrants as a disadvantaged group like children, handicapped or pensioners, to which solidarity or the concept of *Folkhemmet* (People's house) should be extended (Mahama, 2006).

As shown in Table 1, the number of immigrants started to increase in the '70s and reached its peak in 2006. Starting in the 1972s, in order to facilitate immigrants' integration into the Swedish society, the country developed a framework declaring that the state should help the immigrants to practice their own culture. The moral map of Swedish policymakers viewed the equal recognition of immigrants' cultures as another application of the same People's house principle. They viewed it as more important than the achievement of a common culture (Mahama, 2006).

The survey in this study shows that the participants think that Swedish legislation on the integration of immigrants works well. However, two surveys carried out by the European Commission (in 31 countries in 2004 and 75 countries in 2007) reflected general pessimism about the state of foreigners' integration in Sweden. According to these two surveys, most of the people in Sweden disagreed that foreigners in their cities (Stockholm, Malmo) were well-integrated. The results in this survey contradict the results of previous surveys done by the European Commission. This contradiction might result from the fact that the present survey was specifically conducted on high school students in Uppsala, disregarding the perceptions of the general population.

On the other hand, the questions about discrimination policy in Sweden have resulted in surprising outcomes. Interestingly, most of the participants who think that integration policy works well in Sweden also state that discrimination exists in

Sweden. Despite the high percentage of positive perceptions on integration and living in Sweden, an unexpected number of those polled said that they had witnessed discrimination (Table 6).

In fact, current discrimination legislation is a patchwork of laws and statutes developed over the years. The Swedish Parliament passed the government bill "Stronger safeguards against discrimination" (2007/08:95) in June 2008. A new, comprehensive and condensed Anti-Discrimination Act has recently superseded the current Equal Opportunities Act and six other civil law enactments. The purpose of the Anti-Discrimination Act is to counteract discrimination and also to promote equality of rights and opportunities, regardless of sex, transgender identity or expression, ethnicity, religion or other beliefs, disability, sexual orientation or age.

The Act applies to most areas of society, such as working life, education, goods, services and housing, social services, the social insurance system, health care, national military and civilian service and public appointments (Regeringskansliet, 2008). According to this act, alongside the current grounds of discrimination, two new grounds are to be added: age and transgender identity or expression. 'Age' means length of life to date. Everyone is included in these grounds of discrimination. It applies to children, young people and older people. 'Transgender identity or expression' refers to a person who does not identify herself/himself as a woman or a man, or who expresses belonging to another sex through his or her clothing or in some other way. People who identify or express themselves as transvestites will, for example, be able to invoke the prohibition of discrimination. (Regeringskansliet, 2009). As seen in Table 7 in this survey overall, only 15.5% of the respondents think that there is discrimination on the basis of sex and sexual orientation. This result shows that the majority of students do not feel that there is discrimination regarding this aspect of in Sweden. This survey also shows that most of the participants have not witnessed discrimination on the basis of disability and religion.

Changes and improvements to promote equal rights and opportunities are ongoing. The Swedish government is trying to combat actions that directly or indirectly violate the principle of the equal worth of all people, and developing effective and comprehensive anti-discrimination legislation to enable them to do so. Therefore, the new Discrimination Act (Swedish Code of Statutes 2008:567) entered into full force on 1 January 2009.

The Swedish government makes a constant effort to overcome discrimination and to provide equal opportunities to people entering Sweden from diverse societies. However, as seen in Table 6, some 74% of students have witnessed some kind of discrimination in Sweden. As seen in Table 8, on the other hand, the majority of responses to the question "what do you want in the future" named having good employment (32.4%). According to the survey, discrimination is a source of worry for 19.0% of the students. The percentage of those who want to have a good education is 13.2%, while having necessary social security is only 9.8%. These percentages do not present a large problem. However, for a country like Sweden, these numbers were expected to be close to zero.

Regarding this issue, research, launched on the subject of *segregation* shows that segregation exists in Sweden (Statistics Sweden, Demographic Reports 2007:2). As a result of different ethnic minorities coming together in certain regions of different cities in Sweden, these peoples are segregated. This discrimination results in the fact that some 40% of immigrant children live in the same regions, while in the regions where more than 50% Swedish children live, there are almost no immigrant children.

The level of discrimination and segregation in Sweden does not match the country's official policy. The fact that Sweden has strong anti-discrimination policies does not automatically mean that discrimination has been eliminated. Therefore, the measures for implementing the policy should be reconsidered. The integration policy, on the other hand, seems to work quite well, and internalization seems to be high. Still, the percentage of those who claim that the integration policy does not work well or works badly is not small, and cannot be ignored. Aspects of discrimination should also be taken more seriously. It is clear that while the anti-discrimination policy is well-defined, clearly identified and providing equality undert the law, the perceptions of students could be taken as small warnings of how these national goals work and how realistic the goals are.

Sweden seems to have made ambitious efforts to tackle the integration and discrimination problems of immigrants so far. However, it appears that there are still more effort to be expended and more precautions to be taken. Follow-up research into the educators' perceptions of integration and discrimination is currently being carried out. The goal is to compare the perceptions of students with those of teachers. Furthermore, studying the relationship between the success of immigrant students and Swedish students could be recommended for future research.

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İsveç'te Entegrasyon ve Ayrımcılık Politikası Hakkındaki Öğrenci Görüşlerinin Karşılaştırmalı Çözümlemesi

(Özet)

Problem Durumu: Ayrımcılık ve entegrasyon politikası tüm dünyada önemli bir konudur. Her ülkenin göçmenlik konusunda kendi bakış açısı vardır ve pek çok ülke farklı kültürlerden gelen ve kendi ülkesinde sahip olduğundan daha iyi yaşam şartı arayan topluluklara sahiptir. Gittikleri ülkelerde göçmenler, genellikle kendi kültürel yaşam şekillerini devam ettirme eğiliminde oldukları için bulundukları toplumun farklı tutumlarına maruz kalmaktadırlar. Bu da göçmenlerin entegrasyon ve ayrımcılık konusunda olumsuz etkileşimine yol açmaktadır. Göç, son zamanlarda tüm dünyada artış göstermiştir. İsveç'te de 1970 yılından itibaren yabancı nüfus oranı hızla artmıştır. Bugün İsveç'te yaşayan 17 yaş altı her dört çocuktan biri yabancı kökenlidir. İsveç kendi ülkesinde yaşayan her bir bireye eşit haklar sunmaya çalışan demokratik ve çok kültürlü bir ülkedir. İsveç yasaları bu ülkede yaşayan insanlara etnik köken, din ve diğer inançlar, cinsiyet tercihi ve fiziksel engel konusunda herhangi bir ayrım yapılamayacağını belirtmektedir. Yasalarında eşitlik ilkesine bu kadar önem veren bir ülkede eğitim alan öğrencilerin ayrımcılık ve entegrasyon konusundaki görüşlerini öğrenmek ve gerçek hayatta eşitlik ilkesinin uygulanabilirliğini görebilmek açısından böyle bir araştırma yapılması gerekli görülmüştür.

Araştırmanın Amacı: Bu araştırma, İsveç'te uygulanmakta olan ayrımcılık ve entegrasyon politikası konusunda öğrenci görüşlerini çözümlemektedir. Çalışma, İsveç'te çok kültürlü bir ortamda eğitim politikaları, yabancıların entegrasyonu konusundaki yasalar ve bu yasaların öğrenciler tarafından nasıl algılandığı konularını işlemektedir. Çalışmanın giriş bölümünde, İsveç'e göçmen akışı ve bunun sonucu olarak da ilgili yasal düzenlemeler ortaya konmaktadır. Çalışmanın ikinci bölümünde, öğrencilerin ayrımcılık, entegrasyon ve içselleştirme ile ilgili görüşleri verilmektedir. Son bölümde ise bu yasalar ile öğrenci görüşleri karşılaştırılmaktadır. Bu çalışmanın İsveçte öğrencilerin entegrasyon ve ayrımcılık konusundaki düşüncelerini ortaya koymasının yanısıra çok kültürlü ortamlarda ayrımcılığın önlenmesine yönelik dolaylı katkı sağlaması beklenmektedir.

Araştırmanın Yöntemi : Bu çalışma İsveç, Uppsala şehrinde üç lisede uygulanmıştır. Farklı ülkelerden gelen göçmenlerin gittiği okullardan rasgele seçilen 10., 11., ve 12. Sınıflara devam eden, yaşları 15 ile 19 arasında değişen öğrencilere 25 soruluk bir anket verilmiştir . 348 öğrenciye uygulanan anket İsveççe ve İngilizce olmak üzere iki dilde hazırlanmıştır. Öğrencilerin anketin dili konusundaki tercihleri kendilerine bırakılmıştır. Araştırmanın analizi sırasında öğrencilerin entegrasyon, içselleştirme ve ayrımcılık konusundaki politikalara ilişkin görüşlerine odaklanılmıştır. Anket sonucunda elde edilen veriler SPSS 16 ile analiz edilmiştir.

Araştırmanın Bulguları: Araştırma sonuçlarına göre İsveç'te entegrasyon politikası konusunda, öğrenci görüşlerine göre toplam %70.5 oranında genel bir iyimserlik olduğu görülmüştür. Bu bulgulara göre İsveç'te öğrenim gören öğrenciler, ülkeye uyum sağlamak ve burada yaşamak konusunda olumlu görüşlere sahiptir. Öte yandan, yine öğrenci görüşlerine göre ayrımcılık konusunda, toplam % 74.7 oranında genel bir kötümserlik olduğu tespit edilmiştir. Araştırmaya katılan 348 öğrencinin 244'ü İsveç'te doğmuş olmasına rağmen % 42 oranında öğrenci annesinin, % 43.4 oranında öğrenci ise babasının İsveçli olmadığını belirtmiştir. Öğrencilerin % 22'si evlerinde kendi ana dillerini kullandıklarını belirtirken %58.6'sı arkadaşlarının çoğunun kendi etnik çevresine ait olduğunu belirtmiştir. Toplamda yüzde 91.6 oranında öğrenci kendi etnik çevresinden kişilerle arkadaşlık etmektedir. İsveç'te yaşamak ve entegrasyon konusunda oldukça olumlu görüşlere sahip olan bu öğrenciler ayrımcılık konusunda aynı görüşleri yansıtmamaktadırlar. Bu öğrencilerin %9'u çok sık, %37.5'i birkaç kez, %28.2'si ise ender olarak ayrımcılık olduğunu gözlemiş, %19.9 birkaç kez, %28 ender olarak ayrımcılığa maruz kaldığını belirtmiş, %6.4'ü birkaç kez, %24.1'i ise ender olarak kendisinin başkalarına ayrımcılık yaptığını belirtmiştir. Ayrımcılık konusundaki bu kötümser tablo ise İsveç'te beklenenin üstünde bir ayrımcılık tutumu sergilendiğini ortaya koymaktadır. Dahası, ayrımcılığın bir diğer boyutu olan segregasyonun (toplumsal ayrım) da yüksek oranda olduğu görülmüştür. Yapılan bu araştırma, İsveç'te yasaların ayrımcılığı engelleme ve entegrasyonu kolaylaştırmaya yönelik katı kurallar içermesine rağmen, ayrımcılık konusunda yeterli sonuç alınamadığını göstermektedir.

Araştırmanın Sonuçları ve Önerileri: Sonuç olarak İsveç'te ayrımcılık konusundaki öğrenci görüşlerinin İsveç'in demokratik tutumu ile örtüşmediği görülmektedir. Araştırmanın sonucunda, anketi cevaplayan öğrencilerin İsveç'te yaşamak konusunda olumlu düşündükleri, bu ülkedeki ortamı benimsedikleri ve bu ülkede yaşama uyum gösterdikleri ortaya çıkmaktadır. Buna rağmen, aynı öğrenciler, çok yüksek oranda olmasa da İsveç'te ayrımcılık olduğunu iddia etmektedirler. Bu gerçek İsveç'in ayrımcılık politikasını yeniden değerlendirmesi gerektiğini ortaya koymaktadır. İsveç gibi gelişmiş bir ülkede ayrımcılığın engellenmesi, entegrasyon sürecinin daha da hızlandırılması ve segregasyonu

(toplumsal ayrımı) engellemeye yönelik daha fazla çalışmalar yapılması zorunludur. Yasalar yeterli ve demokratik imkanlar sunsa da, bu çalışmanın sonucunda, İsveç'te olduğu kadar diğer çok kültürlü ortamlarda da gerçek yaşam ile yasalar arasındaki örtüşmeyi ölçmek amacıyla ciddi araştırmalar yapılması gerektiği görülmektedir. Bu çalışmanın devamı niteliğinde İsveç'te görev yapmakta olan eğitimcilerin ve öğretmenlerin de entegrasyon ve ayrımcılık konusundaki görüşlerinin alınmasına yönelik bir araştırma yapılmaktadır. Devam etmekte olan bu araştırmanın amacı, ayrımcılık ve entegrasyon konusundaki öğrenci görüşleri ile öğretmen görüşlerini karşılaştırmaktır. Bunun dışında göçmen öğrencilerin başarı düzeyi ile İsveç'li öğrencilerin başarı düzeyini karşılaştırmalı olarak incelemek yeni bir araştırma konusu olarak önerilebilir.

Anahtar Sözcükler: İsveç, çok kültürlülük, entegrasyon, ayrımcılık

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Development of an Attitude Scale towards the Course of Music Education Teaching Methods

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Abstract

Problem Statement: Music teacher training programs comprise courses on the field, courses on teaching as a profession, and courses aimed at increasing the general information of the student. The course of "Music Education Teaching Methods" included in the program differs from the other courses as it includes both field instruction and teaching instruction. The fact that music is an abstract field that requires different arrangements and that the criterion of evaluation differs from other fields increases the importance of the course "Music Education Teaching Methods". In order for this course to fulfil its purpose, the students who take the course need to grasp its significance and develop a positive attitude towards the course.

Purpose of the Study: The purpose of the study is to develop a scale to measure the attitude of the prospective music teachers towards the course of "Music Education Teaching Methods" included in the music teacher training programs.

Methods: The study group consists of 194 people who pursue or have obtained a bachelors degree in music education in Turkey in the universities of Dokuz Eylül, Selçuk, Marmara, Uludağ, Adnan Menderes and Balıkesir, and who have taken the course of Music Education Teaching Methods I and Music Education Teaching Methods II. The factor structure and the reliability of the scale have been studied respectively through factor analysis and item analysis and the Cronbach alpha (α) internal consistency coefficient of the scale has been computed.

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Findings and Results: The Cronbach alpha (α) internal consistency coefficient of the final scale, which consists of 25 items selected following item and factor analyses, is computed as 0.90. The scale consists of a single factor.

Recommendations: It is recommended that this attitude scale, which has been determined to be valid and reliable, be used by the academic staff teaching the course of Music Education Teaching Methods and by researchers who conduct studies in this field.

Conclusions and Results: The Cronbach alpha (α) internal consistency coefficient of the final scale, which consists of 25 items selected following item and factor analyses, is computed as 0.90. The scale consists of a single factor.

Keywords: The course of Music Education Teaching Methods, attitude, scale development, music teacher training programs.

Education is the process of purposefully creating a desired action in the behaviour of the individual through his/her own experience (Ertürk, 1972). The realization of the "desired change of action" depends on the quality of the planning of the learning process, which, in turn, involves the organisation of learning experiences in line with the behavioural objectives related to the predetermined objectives, the collection of feedback about the realisation of the learning experiences, and the development of the steps of evaluation of the feedback. The realisation of these steps in an orderly manner and, especially, the effective organisation of the learning experiences require an equipment of knowledge and skills, which is the very art of teaching. The cornerstone of the training of teachers is therefore the imparting of the art of teaching, upheld by the knowledge and skills pertaining to the field.

Music teacher training programs comprise courses in the field, courses on teaching as a profession, and courses aimed at increasing the general information of the student. Prospective teachers studying in teacher training institutions acquire teaching proficiency through courses on teaching as a profession, while acquiring the knowledge and skills necessary for their discipline through courses in the field. These two groups of courses support one another from the point of view of teaching, and the deficiency or lack of one will spoil the balance. It would not be realistic to expect a teacher who is insufficient in his/her field or who cannot perform the art of teaching proficiently to bring about the desired changes of behaviour in his/her students. Therefore it is of utmost importance that a perfect balance be established between the courses in the field and the courses on teaching as a profession in teacher training institutions. As is known, Education Faculties Teacher Training Programs have been revised during the reformation movement of 1997 following the statement that "there was a confusion of mission in education faculties, that, in other words, teacher training was not considered a priority" (Yüksek Öğretim Kurulu

[Turkish Higher Education Council], 1998), in fact, the programs are still being updated.

When we look at the history of the institutions training music teachers, we can see that, at times, the institutions have diverged away from their mission of training music teachers and have been regarded as equivalent to conservatories of which the mission is to educate performers. It can be seen that, with the reformation movement, an effort has been made to establish a balance between the courses in the field and the courses on teaching as a profession. Whereas a total of 27 credits were assigned to courses on teaching as a profession within the grand total of 250 credits* in the program during the academic year 1983–1984 (10.8%); this number was revised to 32 in 147 (21.76%) in 1998–1999 and as 35 in 163 (21.47%) in 2006–2007 (Yüksek Öğretim Kurulu [Turkish Higher Education Council], 2007).

One of the courses included within the undergraduate programs of Education Faculties, namely the course of Teaching Methods, differs from the other courses in that it includes both field instruction and teaching instruction. Each field of education has acquired its own special teaching methods. This imparts a special importance to the course of Teaching Methods which is included in all teacher training programs. The subtleties of teaching a given field can only be known by the experts of that field. This has been considered by Turkish Higher Education Council (YÖK) and it can be seen that the course of Teaching Methods has been given a special place among the courses on teaching as a profession*, which make up a total of 35 credits in the latest program:

Following the structuring of 1982, in the Faculties of Education, the great majority of the courses on the field were taught by the academic staff originating from the Faculties of Science and Literature. This has caused the course of Teaching Methods taught in the Faculties of Education to shift towards field instruction in content, due to the fact that the academic staff had not received an adequate level of orientation, whereas particular teaching methods constitute a field of serious study and encompass a rather strong and extensive research and literature infrastructure in developed countries. This naturally necessitates that the staff working in that field acquire a serious level of expertise on special teaching methods (Yüksek Öğretim Kurulu, 1998, p.12). With this view, a particular Article has been inserted in the program of the academic year 1998–1999, asserting that "the subject of special teaching methods related to the field should be paid special attention and the time allocated to this subject should be increased" (Yüksek Öğretim Kurulu, 1998- Article 4.1.1.). Additionally, the course of Teaching Methods I has been designated as a course on teaching as a profession and Teaching Methods II as a course in the field, which shows the relationship of the course to both field theory and teaching theory.

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*Namely; Introduction to Educational Science, Psychology of Education, Teaching Principles and Methods, Measurement and Evaluation, Educational Technologies and Material Design, Classroom Management, Teaching Methods I, Counseling, School Experience I, Turkish Education System and School Management, Special Education.

Music, being an abstract discipline of art, requires different particular teaching methods than those pertaining to other fields. The diversity and the properties of the subjects in the field of music show the importance of "WHAT" is to be taught, whereas the diversity in the utilisation of the techniques of active learning especially shows the importance of "HOW" to teach music. Furthermore, the fact that individual evaluations are made frequently causes variations from other disciplines as to "HOW TO EVALUATE" performance. A high level of skills is required alongside of knowledge, to expose the students of various levels of talent to musical experiences appropriate to their own level and to make the right evaluations, which is directly related to the quality of the the course of Music Education Teaching Methods included in the music teacher training programs.

Due to the peculiar properties of the field of music and of music education that are mentioned above, the course of Music Education Teaching Methods that encompasses the subjects of what is to be taught, how to teach music, and how to evaluate the performance possesses a great importance. Teachers are agents who can shape students into creative, free thinking, self-confident, democratic, modern individuals. Music teachers, while realising this through art, also introduce their students to art, allowing them to discover their own talents and to forge an aesthetical lifestyle. Realising such a mission in Turkey, where the number of music lessons is limited, requires an improved level of music teaching proficiency, which will be achieved through the courses on teaching as a profession and especially through the course of Music Education Teaching Methods pertaining to the field.

Achieving the objectives of the course of Teaching Methods, which is considered especially important by teacher training programmers, depends on the students' grasping the importance of the course and their developing a positive attitude toward the course. Attitude is an acquired predisposition to react positively or negatively toward certain objects, situations, institutions, concepts or people (Tezbaşaran, 1997). Attitude is a multi-dimensional psychological construct based on the individual's feelings, beliefs, and values (Phillips, 2003). Kağıtçıbaşı (1988) states that attitude is not an observable action but a predisposition that prepares action. The definition of attitude includes four parts, the first of which is that attitude is the mental and neural state of predisposition. Attitudes exist in the mind and constitute the basis for many thoughts and behaviours. Secondly, attitudes are formed by experiences. Thirdly, attitudes have the power of affecting the reaction of the individual. Attitude is a strong driving factor. Lastly, attitudes are displayed toward objects or situations. The object or situation will become the drive on which the attitude is based (Phillips, 2003). Attitudes are learned through experience (Tavşancıl, 2002) and can change (Bernstein, Clarke-Steward, Roy, Srull & Wickens, 1994). The attitude of a student towards a course may be formed and changed depending on the course content, the teacher, the teaching-learning situations and the environmental factors. Starting from this statement, we can say that the attitudes of the students towards a certain course can give us clues about the course content, the teacher, the teaching-learning situations, and the educational environment. This study attempts to develop an attitude scale to measure student attitudes towards the course of Music

Education Teaching Methods included in the Music Teacher Training Programs in Turkey in the light of the information mentioned above.

Various scales of attitude have been developed by researchers towards the course of music theory included in the music teacher training programs (Canakay, 2006), towards learning to play an instrument (Özmenteş & Özmenteş, 2009), and towards teaching music as a profession (Tufan & Güdek, 2008). Alongside these, there exist scales developed to measure the attitudes of students at different stages toward the course of music (Bilen, 1995; Kocabaş, 1997; Özmenteş, 2005; Milli Eğitim Bakanlığı [Turkish Ministry of Education], 2006; Nacakcı, 2006; Türkmen & Adar, 2009). Attitude scales pertaining to music and music education are also encountered abroad (Phillips, 2003; Özeke & Humphreys, 2007). In addition, among the research studies, there is one attempting to evaluate the behaviours acquired through and the student activities conducted as part of the course of Music Education Teaching Methods included in the Science Education Graduate Program without graduate thesis requirement (Akdeniz & Karamustafaoğlu, 2005). However an attitude scale pertaining to the course of Music Education Teaching Methods included in the music teacher training programs has not been found in the literature regarding music education. This study is expected to make a contribution by filling the gap in this field.

Method

Study Group

The study group consists of 194 people who pursue or have obtained a bachelor's degree in music education in Turkey in the universities of Dokuz Eylül, Selçuk, Marmara, Uludağ, Adnan Menderes and Balıkesir, and who have taken the course of "Music Education Teaching Methods I" and "Music Education Teaching Methods II".

Procedure

To insure content validity, 4th year students of Dokuz Eylül University, Buca Faculty of Education, Department of Music Education, who had taken the course of "Music Education Teaching Methods I and II" for two semesters were asked to write a paper regarding their attitudes towards the course. The relevant expressions were selected from the papers and were rephrased into scale statements. Also, attitude scales pertaining to other fields (Bilen, 1995; Baykul, 1990; Phillips, 2003; Özmenteş & Bilen 2005; Canakay, 2006) found through literature search were drawn upon. A statistics specialist, three music teachers, and a faculty member teaching the course of Music Education Teaching Methods were consulted to form a five-point Likert scale of 50 items with 21 negative and 29 positive statements, where five response options were offered for each item, namely, "Strongly Agree", "Agree", "Somewhat Agree", "Disagree", and "Strongly Disagree".

The trial form that was prepared was sent to 255 students or graduates of music teacher training programs of various universities who had taken the courses of

"Music Education Teaching Methods I" and "Music Education Teaching Methods II". Of the 255 trial forms that were sent out, 194 were included in the study, leaving out those forms that were not returned or that were cancelled because of erroneous coding. The data obtained were subjected to item analysis and factor analysis using the program SPSS 12.00.

Findings and Results

The main objective in developing a scale is to create a valid and reliable measurement tool. As a scale which is not reliable cannot be valid either, validity need not be determined for a scale found to be unreliable, hence the scale has to be tested for reliability first (Tavşancıl, 2002). Starting from this statement, the scale was first subjected to a reliability study.

Reliability Study

As part of the reliability study of the scale, the Cronbach alpha (α) coefficient of internal consistency was computed. The Cronbach alpha (α) coefficient of the trial form consisting of 50 items was computed to be 0.70. To determine the discriminating capability of the items, item-test correlation coefficients were computed. A coefficient of an absolute value from 0.70 to 1.00 is considered to indicate a high correlation, whereas coefficients ranging in absolute value from 0.70 to 0.30 and from 0.30 to 0.00 are considered to indicate medium and low correlations, respectively (Büyüköztürk, 2005). In this study, the items lower than 0.44 were left out of the scale. The item-test correlation coefficients of the items left out vary between 0.37 and 0.28.

The analysis was repeated for the 25 items that were included in the final scale and the Cronbach alpha (α) reliability coefficient was found to be 0.95, whereas the item-test correlation coefficients were determined to vary between 0.44 and 0.77. The item-test correlation coefficients of the 25 items that were included in the final scale are presented in Table 1.

Table 1

Item-Test Correlation Coefficients of the Items Included in the Final Scale

Item number	Item-test correlation coefficient	Item number	Item-test correlation coefficient	Item number	Item-test correlation coefficient
2	*0.69*	*16*	*0.76*	*28*	*0.66*
3	*0.72*	*17*	*0.77*	*30*	*0.72*
4	*0.56*	*19*	*0.70*	*31*	*0.56*
6	*0.67*	*20*	*0.68*	*33*	*0.66*
9	*0.73*	*21*	*0.65*	*36*	*0.68*
12	*0.77*	*23*	*0.65*	*37*	*0.77*
13	*0.58*	*24*	*0.71*	*39*	*0.67*
15	*0.49*	*27*	*0.72*	*46*	*0.44*
				47	*0.52*

Validity Study

The structural validity of the scale has been examined through factor analysis. To determine whether the data and the sample were suited to factor analysis, Kaiser-Meyer Olkin (KMO) coefficient and Bartlett test were applied, which were found to be 0.93 and meaningful (0.000), respectively. As a result of the factor analysis, it was seen that all 25 items kept in the final scale were clustered in a single factor, which agrees with the unidimensionality principle which is among the basic principles of attitude scales (Tavşancıl, 2002). The factor loading values of the items included in the final scale were found to vary from 0.46 to 0.80. According to Büyüköztürk (2005), a factor loading value of 0.45 is a good criterion for selection. The factor loading values of the 25 items included in the final scale are presented in Table 2.

Table 2

Factor Loading Values of the Items in the Final Scale

Item Number	Factor Loading Value	Item Number	Factor Loading Value	Item Number	Factor Loading Value
2	0.73	16	0.79	28	0.70
3	0.75	17	0.80	30	0.75
4	0.59	19	0.73	31	0.58
6	0.69	20	0.72	33	0.70
9	0.76	21	0.68	36	0.71
12	0.80	23	0.68	37	0.80
13	0.61	24	0.75	39	0.71
15	0.52	27	0.76	46	0.46
				47	0.55

A single factor explains 48% of the total variance pertaining to the scale. A declared variance of 30% or above is deemed adequate for single factor scales (Büyüköztürk, 2005).

Discussion and Recommendations

Music teachers, who, through art, shape their students into creative, free thinking, self-confident, democratic, modern individuals, also introduce them to art, allow them to discover their own talents and to forge an aesthetical life style. The course of Music Education Teaching Methods which includes basic instructions on both the field of music and teaching as a profession plays an important role in creating this formation. It has been mentioned that attitudes become the basis for many thoughts and acts and that they are a strong driving factor. From these statements, we can conclude that prospective teachers who develop a positive attitude towards the course of Music Education Teaching Methods will join in the course activities more readily.

As far as could be seen from music education literature, there is a lack of tools to measure the attitudes towards the course of "Music Education Teaching Methods" which is included in the music teacher training programs in Turkey, hence an attempt was made to develop a scale to measure the attitudes of prospective music teachers toward the course of Music Education Teaching Methods in this study. The trial form composed of 50 items was completed by 194 subjects, factor analysis was conducted and item-test correlation coefficients were computed for the data obtained

and the items performing poorly were left out to form a final scale of 25 items. The Cronbach alpha (α) reliability coefficient of the final scale is 0.95, whereas the item-test correlation coefficients of the items in the scale vary between 0.44 and 0.77. The items in the scale constitute a single factor and their factor loading values vary between 0.46 and 0.80. These results show that the scale of attitude towards the course of Music Education Teaching Methods is valid and reliable.

This scale of attitude of which the validity and the reliability have been determined is expected to be helpful for the faculty members teaching the course of Music Education Teaching Methods, the researchers who run scientific studies in this field, and prospective teachers. Applying this improved scale will offer the teachers to raise class participation, fieldwork, motivation, and attendance of prospective music teachers. Consequently future music teachers will improve music pedagogy in Turkish schools.

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Özel Öğretim Yöntemleri Dersine İlişkin Tutumları Ölçmeye Yönelik Ölçek Geliştirme Çalışması

(Özet)

Eğitim, bireyin davranışında kendi yaşantısı yoluyla ve kasıtlı olarak istendik davranış meydana getirme süreci olarak tanımlanmaktadır. İstendik davranış değişikliğinin gerçekleştirilmesi öğrenme sürecinin iyi planlanmasından geçer. Öğrenme sürecinin planlanması, saptanan hedeflerle ilgili davranışsal hedefler doğrultusunda öğrenme yaşantılarının düzenlenmesi, öğrenme yaşantılarının gerçekleşmesi ile ilgili geri dönüt alınması ve geri dönütün değerlendirme basamaklarının oluşturulmasıyla ilgilidir. Bu basamakların nitelikli gerçekleştirilmesi, özellikle öğrenme yaşantılarının etkili düzenlenmesi, bilgi ve beceri donanımı gerektirir. Bu donanım öğretmenlik sanatının ta kendisidir. O halde alan bilgi ve becerileriyle desteklenecek olan öğretmenlik sanatının öğretilmesi öğretmen yetiştirmenin temel direğini oluşturmaktadır.

Öğretmen yetiştirme programları, alan dersleri, öğretmenlik meslek bilgisi ve genel kültür derslerini içermektedir. Öğretmen yetiştiren kurumlarda öğrenim gören öğretmen adayları alan dersleri ile kendi alanları için gerekli olan bilgi ve beceriyi edinirken öğretmenlik meslek bilgisine ait derslerde de öğretmenlik mesleği konusunda yetkinlik kazanmaktadırlar. Öğretmenlik mesleği açısından bu iki ders grubu birbirini desteklemektedir ve bu ders gruplarından birinin eksik olması dengenin bozulmasına neden olacaktır. Kendi alanında yetkin olmayan bir öğretmen veya öğretmenlik sanatını doğru icra edemeyen bir öğretmenden öğrencilerinde istenilen davranış değişikliklerini gerçekleştirmesini beklemek gerçekçi bir yaklaşım olmayacaktır. Bu sebeple öğretmen yetiştiren kurumların programlarında bulunan alan dersleri ve öğretmenlik meslek bilgisi dersleri arasındaki dengenin kurulması son derece önem taşımaktadır. Bilindiği gibi Eğitim Fakülteleri Öğretmen Yetiştirme Programları 1997 reformuyla yeniden düzenlenmiştir ve güncellemeler hala devam etmektedir.

Eğitim Fakülteleri lisans programları içinde bulunan Özel Öğretim Yöntemleri dersi alan bilgisi dersleri ve öğretmenlik meslek bilgisi dersleri arasında yer alması nedeniyle farklı bir nitelik taşımaktadır. Her alanın kendine özgü öğretim yöntemleri vardır. Bu durum tüm öğretmenlik lisans programları içinde yer alan Özel Öğretim Yöntemleri dersine özel bir önem yüklemektedir. O alanın nasıl öğretileceğinin inceliklerini ancak alanın uzmanları bilir. Bu durum Yüksek Öğretim Kurulu (YÖK) tarafından değerlendirilmiştir ve son düzenlemede Özel Öğretim Yöntemleri dersine özel bir yer verilmiştir.

Müzik, soyut bir sanat alanıdır, dolayısıyla diğer alanların özel öğretim yöntemlerinden farklı düzenlemeler gerektirir. Müzik alanında konuların çeşitliliği ve özelliği neyin; özellikle aktif öğrenme tekniklerinin kullanımı konusundaki çeşitlilik nasıl öğretileceğinin önemini göstermektedir. Ayrıca sık sık bireysel değerlendirme yapma durumu nasıl değerlendirileceği konusunda diğer alanlara göre farklılıklar görülmesine neden olmaktadır. Değişik yetenek düzeylerinde karşımıza çıkan öğrencilerin düzeylerine uygun müzik yaşantıları yaratmak ve doğru değerlendirmeleri yapmak bilginin yanı sıra daha üst düzeyde beceri gerektirir. Bu da müzik öğretmenliği lisans programlarındaki özel öğretim yöntemleri derslerinin niteliği ile doğrudan bağlantılıdır.

Yukarıda söz edildiği gibi müzik alanının ve müzik eğitiminin kendine has özellikleri sebebiyle neyin, nasıl öğretileceği ve değerlendirmenin nasıl yapılacağı konularını içeren özel öğretim yöntemleri dersi son derece önem kazanmaktadır. Öğretmenler yaratıcı, özgür düşünceli, özgüvenli, demokratik, çağdaş bireyler yetiştirmede etken kişilerdir. Müzik öğretmenleri bunu sanat yoluyla gerçekleştirirken aynı zamanda onların sanatla tanışmalarına, yeteneklerini keşfetmelerine ve estetik bir yaşam biçimi oluşturmalarına aracılık ederler. Böyle bir misyonu gerçekleştirmek müzik ders saatlerinin sınırlı olduğu ülkemizde daha fazla müzik öğretmenliği donanımı gerektirmektedir. Bu donanımı oluşturacak olan öğretmenlik meslek bilgisine ait dersler ve en önemlisi alanla ilgili olan özel öğretim yöntemleri dersidir.

Öğretmen yetiştirme programcılarının özel bir önem verdiği özel öğretim yöntemleri dersinin hedeflerinin gerçekleşmesi, bu dersi alan öğrencilerin dersin önemini kavramaları ve derse karşı olumlu tutum geliştirmeleri ile mümkündür. Bir öğrencinin derse ilişkin tutumları dersin içeriği, öğretmen, öğretme-öğrenme durumları ve çevre faktörlerine bağlı olarak oluşabilir ve değişebilir. Bu ifadeden yola çıkarak öğrencilerin bir derse karşı olan tutumlarının, bize dersin içeriği, öğretmen, öğretme-öğrenme durumları ve eğitim ortamı ile ilgili olarak ipuçları verebileceğini söyleyebiliriz.

Araştırmanın Amacı: Bu araştırmanın amacı müzik öğretmenliği lisans programında yer alan Özel Öğretim Yöntemleri dersine ilişkin geçerli ve güvenilir bir tutum ölçeği geliştirmektir.

Araştırmanın Yöntemi: Ölçeğin kapsam geçerliği için, özel öğretim yöntemleri dersini iki dönem almış olan Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Müzik Eğitim Anabilim Dalı 4. sınıf öğrencilerine dersle ilgili birer kompozisyon yazdırılmıştır. Kompozisyondan uygun ifadeler seçilmiş ve ölçeğe uygun cümlelere dönüştürülerek ölçeğe alınmıştır. Yapılan kaynak taramasında rastlanan başka alanlara ait tutum ölçeklerinden yararlanılmıştır. Bir istatistik uzmanı, üç müzik eğitimcisi ve özel öğretim yöntemleri dersini veren bir öğretim elemanının görüşleri alınarak 21 tanesi olumsuz, 29 tanesi olumlu ifadeden oluşan 50 maddelik bir ölçek oluşturulmuştur. Ölçek, Özel Öğretim Yöntemleri I ve Özel Öğretim Yöntemleri II derslerini almış 194 kişiye uygulanmıştır. Elde edilen verilere SPSS 12.00 paket programı kullanılarak faktör analizi ve madde analizi uygulanmıştır.

Araştırmanın Bulguları: Ölçeğin güvenirlik çalışması kapsamında içtutarlık için Cronbach alfa katsayısı (α) hesaplanmıştır. 50 maddeden oluşan öndeneme formunun Cronbach alfa katsayısı (α) 0.70 olarak bulunmuştur. Maddelerin ayırt edicilik gücünün belirlenmesi için madde-test korelasyon katsayıları hesaplanmıştır ve katsayısı 0.44'den küçük olan maddeler ölçekten atılmıştır. Nihai ölçeğe alınan 25 madde için tekrar analiz yapılmış ve Cronbach alfa güvenirlik katsayısı (α) ise 0.95 bulunmuştur. Madde-test korelasyonu katsayılarının ise 0.44 ile 0.77 arasında değiştiği saptanmıştır. Ölçeğin yapı geçerliği faktör analizi ile incelenmiştir. Verilerin ve örneklemin faktör analizi için uygun olup olmadığını belirlemek için uygulanan Kaiser-Meyer Olkin (KMO) katsayısı .93 ve Barlett testi anlamlı (.000) bulunmuştur. Yapılan faktör analizi sonucunda nihai ölçekte kalan 25 maddenin tek faktörde toplandığı gözlenmiştir.

Araştırmanın Sonuçları ve Önerileri: Yaratıcı, özgür düşünceli, özgüvenli, demokratik, çağdaş bireyler yetiştirmeyi sanat yoluyla gerçekleştiren müzik öğretmenleri öğrencilerinin sanatla tanışmalarına, yeteneklerini keşfetmelerine ve estetik bir yaşam biçimi oluşturmalarına aracılık ederler. Bu donanımı oluşturmada hem alan bilgisine hem de öğretmenlik mesleğine ilişkin temelleri içeren özel öğretim yöntemleri dersi büyük öneme sahiptir. Tutumlar birçok düşüncenin ve hareketin temeli haline geldiğinden ve tutumların güçlü bir güdüleyici faktördür. Bu tanımlamadan özel öğretim yöntemleri dersine yönelik olumlu tutum geliştirecek olan öğretmen adaylarının ders etkinliklerine daha fazla katılacakları yargısına varabiliriz.

Ulaşılabildiği kadarıyla müzik öğretmenliği lisans programında yer alan özel öğretim yöntemleri dersine ilişkin tutumları ölçecek araç konusunda bir boşluk bulunmaktadır. Bu sebeple bu araştırmada müzik öğretmeni adaylarının özel öğretim yöntemleri dersine ilişkin tutumlarını ölçmeye yönelik bir ölçek geliştirme çalışması yapılmıştır. Özel Öğretim Yöntemleri Dersi Tutum Ölçeği 5'li Likert tipinde ve 25 maddeden oluşmaktadır. Ölçeğin Cronbach alfa güvenirlik katsayısı (α) 0.95'dir. Madde-test korelasyonu katsayıları 0.44 ile 0.77 arasında değişmektedir ve ölçekte yer

alan 25 madde tek faktörde toplanmıştır. Geçerlik ve güvenirliği saptanmış olan bu tutum ölçeğinin özel öğretim yöntemleri dersini yürüten öğretim elemanlarına, bu alanda bilimsel çalışmalar yapan araştırmacılara ve öğretmen adaylarına faydalı olacağı umulmaktadır.
Anahtar Sözcükler: Özel Öğretim Yöntemleri dersi, tutum, ölçek geliştirme, müzik öğretmenliği lisans programı.

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Evaluation of the High School Students' Environmental Attitudes and Interest Levels: Kalecik-Turkey Sample

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Abstract

Problem Statement: In the environmental education works, environmental interest and attitude have an important place in related literature. However, the paucity of the studies dealing with environmental interest is remarkable, and the need for studies to be conducted at the high-school level comes to the fore.

Purpose of the Study: The purpose of the present study is to evaluate the environmental attitudes and interest levels of high school students in relation to the independent variables of gender, grade and school type.

Method: The study group of the present study consists of 613 students attending high schools in Kalecik province of Ankara in the 2007-2008 school year. As data collection tools, the "Personal Information Form," "Environmental Interest Scale" and "Environmental Attitude Scale" were developed by Uzun and Sağlam (2006) and were administered to the students. For statistical analysis of the data, the SPSS program package was used. After the qualitative data was analyzed, a t-test and variance analysis were carried out.

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Findings of the Study: At the end of the study, while no significant difference was found between the girl and boy students in relation to their environmental interest, significant difference favoring the girl students was found between the environmental attitude mean scores of the students. In the evaluation concerning the grade level of the students, the difference between the means of environmental attitude and interest was regarded to be significant.

The results of the ANOVA test considering the type of the school attended revealed that there is no significant difference among the environmental interest scores of the students attending different schools, yet there is a significant difference among their environmental attitude scores.

Results and Suggestions: In line with the literature, it was found that the environmental attitude and interest scores of the girls were higher. However, the difference between the attitude scores was found to be significant. Parallel to the increasing grade level, the interest and attitude scores were expected to increase, but in reality, they did not, and the difference between the scores was found to be insignificant. On the other hand, interest scores of the students from Anatolian Teacher Education High School and attitude scores of the students from Religious High School were found to be the lowest. While searching for the causes of the low interest and attitude scores, plans should be designed to raise the interest and attitude levels of the students. In order to fill in the gap seen in the studies concerning the field of environmental interest, similar studies should be carried out in the future.

Keywords: environmental education, environmental interest, environmental attitude, secondary education, Kalecik.

Since the mid-1900s, the emerging environmental problems have brought about the need of educating individuals sensitive to these problems who are willing to contribute to finding solutions and live in accordance with the environment by giving it fewer adverse effects. In parallel to this trend of environmental abuse, some people started to put forth efforts and great attention to environmental issues. Despite legal regulations put into force and efforts of the scientists and teachers to improve the environment, we still have some problems in educating environmentally-sensitive people. Increasing the number of people who have positive environmental interests and attitudes is of great importance to overcome these problems and to empower social development and enhance the quality of life.

In the entire world, and in our country, the number of people developing positive interest in and attitudes towards the environment is steadily increasing. However, at the point that economy and state policies intervene, and economic development and country interests escalate, the environmental consciousness lags behind. This is influential on the decrease of correlation between interest and attitude. At this point, the concept of sustainability comes to the fore, which means maintaining a balance

between the environment and development and enhancing the quality of life without overloading the capacity of the eco-system.

Many countries allocate resources for comprehensive studies aiming to determine the environmental attitudes of students (Paraskevopoulos, Padeliadu & Zafiropoulos, 1998; Kuhlemeier, Bergh & Van Den Lagerweıj, 1999). For this purpose, many programs have been developed for teachers and student teachers (Kopyla & Wahlström, 2000).

During the literature review of the present study, many studies were found aiming to determine the attitudes of the students towards the environment. In some of these studies, environmental attitudes of high school students (Gezer, Çokadar, Köse & Bilen, 2006; Uzun & Sağlam, 2007; Taskin, 2009) and primary school second-level students (Tuncer, Ertepınar, Tekkaya & Sungur, 2005; Gökçe, Kaya, Aktay & Özden, 2007; Aslan, Sağır & Cansaran, 2008; Atasoy & Ertürk, 2008; Sağır, Aslan & Cansaran, 2008; Akgün & Gülüm, 2009) were investigated. In addition to these studies, different studies from around the world were reviewed (Worsley & Skrzypiec, 1998; Makki, Khalick & Boujaoude, 2003). In the environmental-interest and attitude studies, not only was the survey method used, but also environmental science courses to raise awareness. Then, survey data was evaluated (Bradley, Waliczek & Zajicek, 1999). It was observed in the review that greater emphasis was put on evaluating the attitudes rather than evaluating the environmental interest. The present study is believed to make important contributions to the filling of this gap.

When the fact is considered that the students educated in our schools will be active members of the society, the study by Iversen and Rundmo (2002) gains particular importance. In this study, environmental interest levels and attitudes of Norwegians from different age groups and education levels were measured. The study revealed the importance of education in terms of developing positive attitudes, and individuals over 60 were found to have more positive interest than those under 30. The study conducted by Bjerke, Thrane and Kleiven (2006) supports the difference between females' environmental attitudes and interest and those of males. The present study also focuses on the same issue.

In the studies carried out so far, it was found that environmental education has great impact on the development of students, their perception of environmental responsibilities, their interests in environmental issues, and development of environmental protection strategies (Voughan, Gack, Solorazano & Ray, 2003; Hsu, 2004; Sebasto & Semrau, 2004).

In the present study, the environmental interests and attitudes of the secondary-school students in the Kalecik province of Ankara were evaluated in relation to gender, age and school-type variables. There are many studies conducted in different parts of Turkey on environmental attitudes (Ekici, 2005; Tuncer et al., 2005; Gezer et al., 2006; Aslan et al., 2008; Atasoy & Ertürk, 2008; Sağır et al., 2008; Akgün & Gülüm, 2009; Taskin, 2009). However, the number of the studies dealing with the issue of

environmental interest is quite low. Hence, the contribution of the present study to the literature is believed to be great.

The present study, considering the importance of environmental interest and attitude, seeks answers to the following questions:

a) Do the students' environmental interests and attitudes vary depending on the gender variable?

b) Do the students' environmental interests and attitudes vary depending on the grade-level variable?

c) Do the students' environmental interests and attitudes vary depending on the school-type variable?

Method

Study Model

In the present study, the "correlative survey" method was used. Correlative survey methods are research models aiming to determine the existence of correlative change and its extent between two or more variables (Karasar, 2004). In the present study, a correlative survey method was used to investigate whether the students' environmental attitude and interest levels vary depending on gender, class, and school-type variables.

Study Group

The study group of the present study consists of 613 students attending secondary schools in the Kalecik province of Ankara during the 2007-2008 school year. The present study includes students from Kalecik High School, Anatolian Teacher Education High School, Religious High School, Vocational Technical Education Center and Vocational School of Health, and the sampling was kept large enough to represent the universe of the study. Two hundred fifty-eight (42%) of the participants are girls and 355 (58%) are boys. The age range of the students is 14-19. Two hundred forty-nine (41%) of the students are 9th graders, 211(34%) 10th graders, 137 (22%) 11th graders and 16 (3%) 12th graders.

Data Collection Tools

In the present study, the "Personal Information Form," "Environmental Attitude Scale" and "Environmental Interest Scale" were used to collect data. The Personal Information Form aims to solicit personal information of the participants. The Environmental Interest Scale is a 27-item, five-point, Likert-type scale developed by the researcher and ranging from "I am very interested: 5" to "I am not interested at all: 1." The attitude scale is a 27-item, five-point, Likert-type scale developed by Uzun and Sağlam (2006) and ranging from "I strongly agree/always: 5" to "I strongly disagree/never: 1." The minimum score that can be obtained from both of the scales is 27, and the maximum score is 135.

The reliability and validity analyses of the scales were conducted. Content and face validity of the interest scale was verified through expert opinions. For construct validity of the environmental attitude and interest scales, factor analysis was conducted. The suitability for factor analysis of the data obtained from the Environmental Interest Scale was checked with the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Sphericity test (KMO coefficient = .931; significance for the Bartlett test = 000 p<.001). The data was found to be suitable for the factor analysis (Büyüköztürk, 2005). The factor analysis was used to test the construct validity of the scale, and the basic-components analysis was used as a factorization technique. In the analyses conducted, joint-factor variance of the factors for each variable, factor loadings of the items, and the line graph were examined. The factor loading of the items was determined to be at least .50. Factor loading over .30 is acceptable (Büyüköztürk, 2005). In order to examine the factor structures, the Varimax Basic Constituents Analysis was conducted. The analyses revealed that the scale is a seven-factor scale, and the total variance explained by these seven factors was found to be 62.61%. Joint variance of these seven factors defined in relation to the items of the scale was found to be ranging from .493 to .792.

The factor analysis applied to the data of the Environmental Attitude Scale revealed that the Kaiser-Meyer-Olkin (KMO) coefficient is .856, which complies with the original study. The Bartlett Sphericity test was found to be significant. Moreover, the analyses revealed that the scale is a five-factor scale, and the total variance explained by these five factors was found to be 51.97%. Joint variance of these five factors defined in relation to the items of the scale was found to be ranging from .415 to .770.

For the reliability analysis of the scales, the Cronbach's alpha and Spearman Brown split-half correlation was calculated. The Cronbach's alpha reliability coefficient of the Environmental Interest Scale was found to be α=.93, and the Spearman Brown split-half correlation was found to be .87. In the original study, the reliability coefficient of the environmental attitude scale was found to be α=.80; the Spearman Brown split-half correlation was found to be .76. In the present study, these values were found to be α=.80 and .79, respectively.

Statistical Analysis

For the statistical analysis of the data, SPSS 15.0 was used. In the first part of the analysis, descriptive statistics concerning the scores were evaluated. In the second part, the comparisons were carried out through t-test and variance analysis. For multiple-comparisons, the Tukey HSD test was used.

Findings and Discussions

In this section, the environmental interest and attitude scores of the students were evaluated in relation to gender, grade level and school-type variables. First, descriptive statistics of the variables were evaluated, and then the interpretations were enriched through statistical comparisons. For control of the variance

homogeneity required for the comparisons, Levene statistics were used, and the significance level was accepted to be 0.05.

Evaluation of the Students' Environmental Interest and Attitude Scores in Relation to the Gender Variable

In evaluation of the scores in relation to the gender variable, as can be seen in the following table, both the girls' environmental interest ($\overline{X}$=90.52) and environmental attitude ($\overline{X}$=97.40) scores were found to be higher than those of the boys ($\overline{X}$=89.82 and 90.64, respectively).

Table 1

T-test Results Showing the Significance Level of the Differences between Environmental Interest and Attitude Mean Scores In Relation to the Gender Variable

	Gender	N	Mean	Std. Deviation	df	t	Sig.
Environmental Interest Scores	Female	258	90.52	16.807	597.99	.468	.640
	Male	355	89.82	20.034			
Environmental Attitude Scores	Female	258	97.40	11.394	611	6.785	.000 (*)
	Male	354	90.64	12.723			

* p<.001

As a result of the t-test, the difference between the mean score for the girls' environmental interest and that of the boys' was found to be 0.7 favoring the girls. This is statistically insignificant ($t_{(597.99)}$=.468; p>.05). On the other hand, the difference between the environmental attitude scores was found to be 6.76 favoring the girls. This is statistically significant ($t_{(611)}$=6.785; p<.001).

Evaluation of the Students' Environmental Interest and Attitude Scores in Relation to Grade Level

In the evaluation performed, the 12th graders were excluded, as their number is lower than 30 (n=16).

Table 2

Descriptive Statistics of the Students' Environmental Interest and Attitude Scores in Relation to the Grade Level Variable

	Grade	N	Mean	Std. Deviation
Environmental Interest Scores	9. Class	249	90.16	17.499
	10. Class	210	90.60	19.888
	11. Class	137	89.85	19.218
	Total	596	90.25	18.737
Environmental Attitude Scores	9. Class	249	94.71	12.972
	10. Class	211	91.87	12.934
	11. Class	137	93.97	11.485
	Total	597	93.54	12.675

As can be seen in Table 2, the highest environmental interest score ($\overline{X}$=90.60) belongs to the 10th graders. The 11th graders have the lowest environmental interest score ($\overline{X}$=89.85). The environmental interest score of the 9th graders is $\overline{X}$=90.16. When the environmental attitude scores are considered, the highest mean belongs to 9th graders ($\overline{X}$=94.71), and the lowest attitude mean belongs to the 10th graders ($\overline{X}$=91.87). The mean score of the 11th graders is medium ($\overline{X}$=93.97).

Table 3

ANOVA Results Concerning the Significance Level of the Difference among the Environmental Interest and Attitude Scores of the Students in Relation to Grade Level

		Sum of Squares	df	Mean Square	F	Sig.
Environmental Interest Scores	Between Groups	49.559	2	24.779	.070	.932
	Within Groups	208850.191	593	352.193		
	Total	208899.750	595			
Environmental Attitude Scores	Between Groups	958.495	2	479.248	3.003	.050
	Within Groups	94805.750	594	159.606		
	Total	95764.245	596			

One-Way ANOVA revealed that the difference among the environmental interest and attitude scores of the students in relation to their grade level is statistically insignificant ($F_{(2-593)}$=.70; p>.05 and $F_{(2-594)}$=3.003; p≥.05).

Evaluation of the students' environmental interest and attitude scores in relation to the type of the school

In the evaluation carried out in relation to the type of school, it was found that the environmental interest score of the students from Kalecik High School is the highest ($\overline{X}$=93.07); this is followed by the students from the Religious High School with a 0.7 point difference ($\overline{X}$=92.37). The lowest environmental interest score was obtained by the students from the Anatolian Teacher Education High School ($\overline{X}$=88.22). The scores of the students from Vocational Technical Education Center and Vocational School of Health were found to be the same and moderate ($\overline{X}$=88.58).

Table 4

Descriptive Statistics of the Environmental Interest and Attitude Scores in Relation to the Type of School

	School Type	N	Mean	Std. Deviation
Environmental Interest Scores	Kalecik High School	168	93.07	19.105
	Vocational Technical Education Center	168	88.58	19.829
	Vocational School of Health	121	88.58	16.402
	Anatolian Teacher Education High School	97	88.22	19.989
	Religious High School	58	92.37	15.838
	Total	612	90.11	18.730
Environmental Attitude Scores	Kalecik High School	168	96.38	12.257
	Vocational Technical Education Center	169	90.62	12.571
	Vocational School of Health	121	96.75	10.070
	Anatolian Teacher Education High School	97	92.09	14.545
	Religious High School	58	89.01	11.809
	Total	613	93.49	12.622

When the students' environmental attitude scores are examined, it is seen that the highest score belongs to the students from Vocational School of Health ($\overline{X}$=96.75). This is followed by the students from Kalecik High School with a 0.37-point difference. The lowest environmental attitude score belongs to the students of

Religious High School ($\overline{X}$=89.01). The environmental attitude scores of the students from Vocational Technical Education Center and Anatolian Teacher Education High School are moderate ($\overline{X}$=90.62 and $\overline{X}$=92.09, respectively).

Table 5

ANOVA Results Concerning the Significance Level of the Difference among the Students' Environmental Interest and Attitude Scores in Relation to the Type of School

		Sum of Squares	df	Mean Square	F	p
Environmental Interest Scores	Between Groups	2788.312	4	697.078	2.000	.093
	Within Groups	211569.981	607	348.550		
	Total	214358.292	611			
Environmental Attitude Scores	Between Groups	5432.109	4	1358.027	8.968	.000 (*)
	Within Groups	92073.092	608	151.436		
	Total	97505.201	612			

* p<.001

In order look at the significance level of the difference among the means, an ANOVA test was conducted, and the test revealed that while the difference found among the environmental interest scores is not statistically significant ($F_{(4-607)}$=2.00; p>.05), the difference among the environmental attitude scores was found to be significant ($F_{(4-608)}$=.70; p<.001) (Table 5).

Table 6

Multiple-Comparison Test Results Concerning the Students' Environmental-Interest and Attitude Scores in Relation to the Type of School

	School Type (I)	School Type (J)	Mean Difference (I-J)	Std. Error	Sig.
Environmental Attitude Scores	Kalecik High School	Vocational Technical Education Center	5.75(*)	1.340	.000
		Vocational School of Health	-.37	1.467	.999
		Anatolian Teacher Education High School	4.28	1.569	.050
		Religious High School	7.36(*)	1.874	.001
	Vocational Technical Education Center	Kalecik High School	-5.75(*)	1.340	.000
		Vocational School of Health	-6.13(*)	1.465	.000
		Anatolian Teacher Education High School	-1.47	1.567	.882
		Religious High School	1.60	1.872	.912
	Vocational School of Health	Kalecik High School	.37	1.467	.999
		Vocational Technical Education Center	6.13(*)	1.465	.000
		Anatolian Teacher Education High School	4.65(*)	1.677	.045
		Religious High School	7.73(*)	1.965	.001
	Anatolian Teacher Education High School	Kalecik High School	-4.28	1.569	.050
		Vocational Technical Education Center	1.47	1.567	.882
		Vocational School of Health	-4.65(*)	1.677	.045
		Religious High School	3.07	2.042	.559
	Religious High School	Kalecik High School	-7.36(*)	1.874	.001
		Vocational Technical Education Center	-1.60	1.872	.912
		Vocational School of Health	-7.73(*)	1.965	.001
		Anatolian Teacher Education High School	-3.07	2.042	.559

* The mean difference is significant at the .05 level.

When the mean difference among the environmental attitude scores was examined, according to the multiple-comparison test, a significant difference was found among the students from Kalecik High School, Vocational Technical Education Center and Religious High School, favoring the students from Kalecik High School.

Also, a significant difference favoring the students from Vocational School of Health was found among the following schools: Vocational School of Health, Vocational Technical Education Center, Anatolian Teacher Education School and Religious High School. On the other hand, the differences found between Kalecik High School and Vocational School of Health, and between Vocational Technical Education Center and Religious High School were determined to be statistically insignificant (Table 6).

Results and Suggestions

The findings of the study and suggestions made in light of these findings are presented below.

In the evaluation carried out in relation to the gender variable, both the environmental interest scores and environmental attitude scores of the girls were found to be higher than those of the boys. The difference of the environmental interest scores found between the girls and boys was not found to be significant. In the environmental attitude scores, the score difference favoring the girls was found to be statistically significant. Based on this finding, it can be argued that gender is an important variable affecting environmental attitude scores. This finding concurs with the findings of some studies from Turkey and the world (Grifford, Hay & Boros, 1983; Chan, 1996; Worsley & Skrzypiec, 1998; Eagles & Demare, 1999; Tikka, Kuitunen & Tynys, 2000; Ekici, 2005; Tuncer et al., 2005; Bjerke et al., 2006).

In the evaluation carried out in relation to grade level, the highest environmental interest score was found to belong to 10th graders; on the other hand, the score of the 11th graders was found to be the lowest, and that of the 9th graders was found to be medium. When the environmental attitude scores are considered, while the highest mean belongs to the 9th graders, the lowest one belongs to the 10th graders. The mean score of the 11th graders is medium. The differences between the students' environmental interest and attitude mean scores were found to be insignificant. When the results are investigated, it is clearly seen that with the increasing grade level, interest and attitude scores do not increase, which is contrary to what is expected. In line with this finding, in their studies among the university students, Altın (2001) and Engin (2003) found that environmental attitudes of students do not vary depending on grade level. Makki et al. (2003), among the high school students and Sağır et al. (2003), among the primary school secondary-level students found that environmental attitudes do not vary depending on grade level; on the other hand, Ekici (2005) found that environmental attitudes may vary, favoring the lower grades.

In the evaluation carried out in relation to the type of school, it was found that the environmental interest score of the students from Kalecik High School is the highest, and this is followed by the students of Religious High School with a subtle difference. On the other hand, the interest score of the students from Anatolian Teacher Education High School was found to be the lowest. When it is considered that these students will be teachers in the future, it is very clear that the students they will educate will not be very sensitive to the environment. This indifference on the

part of the students of Anatolian Teacher Education High School is worth investigating.

While the highest environmental attitude score belongs to the students from Vocational High School of Health in relation to the type of school, they are closely followed by the students of Kalecik High School. The lowest attitude mean score belongs to the students of Religious High School. The attitude scores of the students from Vocational Technical Education Center and Anatolian Teacher Education High School are medium.

As a result of the analysis conducted in relation to the type of school, while the difference among the environmental interest mean scores was not found to be significant, the difference among the environmental attitude scores was found to be statistically significant. According to multiple-comparison results, the significant difference was found among the students from Kalecik High School, Vocational Technical Education Center and Religious High School favoring the students from Kalecik High School; and a significant difference favoring the students from Vocational School of Health was found among Vocational School of Health, Vocational Technical Education Center, Anatolian Teacher Education School and Religious High School. On the other hand, the differences found between Kalecik High School and Vocational School of Health, and between Vocational Technical Education Center and Religious High School were determined to be statistically insignificant. In the literature review of the study, no study considering the type of school has been found. On the other hand, in the literature, the paucity of the studies looking at environmental interest is remarkable. Hence, there is a need for studies dealing with environmental interest to fill in the gap in this field.

One plan for success in environmental education can be the organizing of in-class activities and encouraging all the students to participate in these activities in the required environmental-education course given at the high school level. The environmental interest and attitude of the students participating in such activities can be argued to differ from those of the students not participating in such activities (Leeming, Porter & Bryan, 1997).

Field studies have an important role in environmental education. It seems to be possible to educate individuals with positive environmental interest and attitude by organizing field work, first in the close surroundings and then in the far-away places. It was proved that the work carried out in the close surroundings helps the students to learn about environmental concepts (Fisman, 2005). Moreover, environmental education has an important contribution to solutions to environmental problems and the understanding of environmental bio-diversity (Lindemann-Matthies, 2002).

In addition, it is of great importance that the teachers who are models and guides for the students be knowledgeable about environmental education. It is important to equip student teachers with sufficient environmental information in their training. Hence, environmental-education training should be incorporated into the curriculum of the institutions educating student teachers (Meichtry & Harrell, 2002). The study by Heimlich, Braust, Olivolo, Ice and Smith (2004) supports this suggestion.

Teachers' willingness and eagerness is of great importance in providing more effective environmental education. All the teachers should be considered voluntary environmental educators, and care should be taken to train such teachers.

The number of the studies investigating environmental interest and attitude should be increased. The groups where the present study found low interest and negative attitude should be investigated further to find the reasons behind this indifference. Future studies can be conducted at different levels of education.

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Lise Öğrencilerinin Çevreye Yönelik Tutum ve İlgi Düzeylerinin Değerlendirilmesi: Kalecik Örneği (Özet)

Problem Durumu: Çevre eğitimi çalışmalarında çevresel ilgi ve tutum dünya literatüründe önemli bir yere sahiptir. Özellikle çevre sorunlarının artmasıyla ve daha sık gündeme gelmesiyle beraber bu değişkenlerin incelendiği, çeşitli bağımsız değişkenlere göre değerlendirildiği ve bu değişkenler arasındaki ilişkilerin temel alındığı çalışmaların çevre eğitimine önemli katkılar getirdiği bilim dünyasında kabul görmüştür. Diğer yandan özellikle çevresel ilgi alanında yapılan çalışmaların azlığı dikkatleri çekmekte, ortaöğretim düzeyinde yapılan bu tür araştırmaların gerekliliği ön plana çıkmaktadır. Çalışmada; "Öğrencilerin çevreye yönelik ilgi ve tutum puanları cinsiyete bağlı olarak değişmekte midir?", "Öğrencilerin çevreye yönelik ilgi ve tutum puanları sınıf düzeyine bağlı olarak değişmekte midir?" ve "Öğrencilerin çevreye yönelik ilgi ve tutum puanları okul türüne bağlı olarak değişmekte midir?" sorularına yanıt aranmıştır.

Araştırmanın Amacı: Bu çalışmada Ankara İli, Kalecik İlçesi'ndeki ortaöğretim öğrencilerinin çevreye yönelik ilgi ve tutumlarını cinsiyet, yaş ve okul türü değişkenlerine bağlı olarak değerlendirmek amaçlanmıştır.

Araştırmanın Yöntemi: Çalışmada ilişkisel tarama modeli kullanılmıştır. Çalışma grubunu, 2007–2008 eğitim-öğretim yılında, Ankara İli Kalecik İlçesi'ndeki ortaöğretim kurumlarında öğrenim gören toplam 613 öğrenci oluşturmuştur. Çalışmada, Kalecik İlçesinde yer alan Kalecik Lisesi, Anadolu Öğretmen Lisesi, Sağlık Meslek Lisesi, İmam Hatip Lisesi ve Mesleki Teknik Eğitim Merkezi'nde öğrenim gören öğrencilerin tamamı hedeflendiğinden, çalışma grubunun evrenin tamamını temsil ettiği kabul edilmektedir. Veri toplamak amacıyla, araştırmacılar tarafından "Kişisel Bilgi Formu" ve "Çevreye Yönelik İlgi Ölçeği" geliştirilmiş, Uzun ve Sağlam (2006) tarafından geliştirilen "Çevresel Tutum Ölçeği" öğrencilere uygulanmıştır. Ölçeklerin geçerlik ve güvenirlik analizleri yapılmıştır. Çevresel İlgi Ölçeğinin kapsam ve görünüş geçerliği uzman görüşü doğrultusunda sağlanmıştır. Çevresel Tutum ve İlgi Ölçeklerinin yapı geçerliği için faktör analizi yapılmış, güvenirlik analizi için ise Cronbach alfa ve Spearman Brown iki yarı test korelasyonu hesaplanmıştır. İlgi Ölçeğinin Cronbach alfa güvenirlik katsayısı α=.93 ve Spearman Brown iki yarı test korelasyonu .87 değerinde bulunmuştur. Orijinal çalışmada, Çevresel Tutum Ölçeğinin Cronbach alfa güvenirlik katsayısı α=.80; Spearman Brown iki yarı test korelasyonu .76 olarak saptanmıştır. Bu çalışmada ise bu değerler α=.80 ve Spearman Brown iki yarı test korelasyonu=.79 olarak hesaplanmıştır. Verilerin istatistiksel analizinde SPSS programı kullanılmış, verilerle ilgili betimsel istatistikler değerlendirildikten sonra karşılaştırmalar t-testi ve tek yönlü varyans analiziyle yapılmıştır. Analizlerin yapılabilmesi için, karşılaştırılacak grupların varyanslarının homojenliğinin kontrolünde Levene testinden faydalanılmış, çoklu karşılaştırmalarda ise Tukey HSD testi kullanılmıştır.

Araştırmanın Bulguları: Cinsiyete bağlı olarak yapılan değerlendirmede, kız öğrencilerin hem çevresel ilgi hem de tutum puanları erkek öğrencilerin

puanlarından yüksek bulunmuştur. Kız öğrencileri ile erkek öğrenciler arasında tespit edilen çevresel ilgi puan farkı istatistiksel olarak anlamlı bulunmamıştır. Çevresel tutum puanlarında, kız öğrencilerin lehine görülen ortalama farkı ise istatistiksel olarak anlamlı bulunmuştur. Sınıf düzeyine bağlı olarak yapılan değerlendirmede, en yüksek çevresel ilgi puanı 10. sınıfta öğrenim gören öğrencilere ait bulunmuştur. 11. sınıf öğrencileri de en düşük çevresel ilgi ortalamasına sahiptir. 9. sınıf öğrencilerinin çevresel ilgi puanları ise orta düzeydedir. Çevresel tutum puanları dikkate alındığında, en yüksek ortalama 9. sınıfta öğrenim gören öğrencilere ait iken, en düşük tutum ortalaması da 10. sınıf öğrencilerine aittir. 11. sınıf öğrencilerinin puanları ise orta düzeydedir. Sınıf düzeyine göre öğrencilerde tespit edilen çevresel ilgi ve tutum ortalamaları arasındaki söz konusu farklılıklar, istatistiksel olarak anlamlı bulunmamıştır. Okul türüne bağlı olarak yapılan değerlendirmede, Kalecik Lisesi'nde öğrenim gören öğrencilerin çevreye yönelik ilgi puanları en yüksek değere sahipken, bunu İmam Hatip Lisesinde okuyan öğrenciler küçük bir puan farkıyla takip etmektedir. En düşük ilgi puanı ise Anadolu Öğretmen Lisesi'nde okuyan öğrencilere aittir. METEM ile Sağlık Meslek Lisesinin puanları ise denk olup ortalama değerlere sahiptir. Okul türüne göre, en yüksek çevresel tutum puanı Sağlık Meslek Lisesi öğrencilerine aitken, bunu Kalecik Lisesi öğrencileri küçük bir farkla takip etmektedir. En düşük tutum ortalaması ise İmam Hatip Lisesi'nde öğrenim gören öğrencilere aittir. Bunun yanında, METEM ile Anadolu Öğretmen Lisesi'nde okuyan öğrencilerin tutum puanları orta düzeyde bulunmuştur. Okul türü dikkate alınarak yapılan analiz sonucunda, çevreye yönelik ilgi puanları arasında tespit edilen ortalama farkları anlamlı bulunmazken, çevresel tutum puanlarındaki farklılığın istatistiksel olarak anlamlı olduğu saptanmıştır. Çoklu karşılaştırma testine göre, Kalecik Lisesi ile METEM ve İmam Hatip Lisesi öğrencileri arasında Kalecik Lisesi lehine; Sağlık Meslek Lisesi ile METEM, Anadolu Öğretmen Lisesi ve İmam Hatip Lisesi arasında Sağlık Meslek Lisesi lehine anlamlı bir farklılık tespit edilmiştir. Diğer yandan, Kalecik Lisesi ile Sağlık Meslek Lisesi, METEM ile İmam Hatip Lisesi arasında tespit edilen ortalama farkları istatistiksel olarak anlamlı bulunmamıştır.

Araştırmanın Sonuçları ve Önerileri: Literatürle uyumlu olarak, kız öğrencilerin hem çevreye yönelik tutum hem de ilgi puanlarının kız öğrencilerin lehine yüksek olduğu sonucuna ulaşılmıştır. Ancak, sadece tutum puanlarındaki farklılık anlamlı olarak değerlendirilmiştir. Sınıf düzeyi arttıkça öğrencilerin ilgi ve tutum puanlarının beklenildiği gibi sınıf düzeyine paralel olarak artmadığı ve puanlar arasındaki farklılığın da istatistiksel olarak anlamlı bulunmadığı gözlenmiştir. Diğer yandan, Anadolu Öğretmen Lisesindeki öğrencilerin ilgi puanları ve İmam Hatip Lisesindeki öğrencilerin tutum puanları en düşük düzeyde bulunmuştur. Öğrencilerde görülen ilgi ve tutum düşüklüğünün nedenleri araştırılarak, bireylere çevresel ilgi ve tutum kazandıracak planlamalar yapılmalıdır. Çevresel ilgi alanındaki mevcut çalışma boşluğunun doldurulması için bu tür çalışmaların arttırılmasının gerekli olduğu düşünülmektedir.

Anahtar Sözcükler: çevre eğitimi, çevreye yönelik ilgi, çevreye yönelik tutum, ortaöğretim, Kalecik.

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Faculty Members' Efficiency in Learner-centred Approach: Perspectives From the Social Sciences Faculties *

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Abstract

Problem Statement: Learner-centred approach is considered to be more effective than the teacher-centred approach. But there are some studies which reveal that learner-centred approach has not been applied sufficiently in institutions of higher education. Also, according to the findings of several studies, there are a number of variables that seem to have effects on learner-centred approach.

Purpose of the Study: The purpose of this study is to investigate the faculty members' opinions and the students' opinions about faculty members' efficiency in learner-centred approach and whether some variables affect their opinions.

Method: The data of this survey study were collected from 97 faculty members and 2235 students. They filled out a 48–item scale with parallel forms which were based on the learner-centred principles. *T*-test and ANOVA (One Way Analysis of Variance) were used for the analysis of the data.

Findings and Results: When the opinions of the faculty members are considered, the level of efficiency in learner-centred approach is found out to be significantly higher than the level of efficiency declared in students' opinions. The independent variables that are investigated in terms of their effects on faculty member's application of learner-centred approach are

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observed to be significantly ineffective in faculty members' opinions. When the opinions of the students are considered, it is seen that the opinions of female students are more positive than the opinions of male students about the faculty members' efficiency in learner-centred approach. Additionally, students have considered the faculty members with teaching experience of five years or less, more learner-centred compared to the faculty members with teaching experience of six–10 years.

Conclusions and Recommendations: The study shows that faculty members' opinions are significantly different from the students' opinions about faculty members' efficiency in learner-centred approach. However, the results related to the faculty members' and students' characteristics confirm some previous studies. Characteristics of the faculty members and their students generally do not have effects on applying learner-centred approach. So, if the institutions of higher education implicate principles of learner-centred approach in faculty members' training programs and make the faculty members participate in studies about their teaching fields, the faculty members will apply learner-centred approach more properly on a larger scale.

Keywords: Learner-centred approach, faculty member, efficiency, student evaluation

The institutions of higher education of Bologna Signatory States aim to establish learner-centred learning beyond 2010 (European University Association [EUA], 2007). In one of these states the Council of Higher Education prepared a strategy report for her institutions of higher education in 2007. In this report, as it is noted also by Nixon (1996), teaching is stated to be one of the functions of institutions of higher education.

Today, faculty members are expected not only to be experts in their field but also to know how to teach the skills and behaviours of their field (Badley, 2000; Korkut, 2002). According to Ballantyne, Bain and Packer (1999), to facilitate optimal student learning, effective faculty members employ widely differing techniques and creative variations in teaching methodologies. Student-focused or learner-centred approach is considered to be more effective than the teacher-focused or content-focused approach (MacLellan & Soden, 2004; Postareffa, 2008; Prosser, Ramsden, Trigwell & Martin, 2003; Young & Shaw, 1999). Consistently, most studies on conception of teaching include student-focused (Samuelowicz & Bain, 2001) or learning-centred terms (Kember & Kwan, 2000) along with positive student views on learner-centred approach (Girgin & Stevens, 2005; Lea, Stephenson & Troy, 2003). McCombs and Whisler's (1997) definition of learner-centered is as follows:

> The perspective that couples a focus on individual learners (their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs) with a focus on learning (the best available knowledge about learning and how it

occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners). (p. 9)

According to Ballantyne et al. (1999) and Tekeli (2003), faculty members cannot always teach effectively. Moreover, as marked by Alters and Nelson (2002), the teaching styles of most faculty members appear to focus on teacher-centred rather than the learner-centred approach. There are also other studies which reveal that learner-centred approach has not been applied sufficiently in institutions of higher education (i.e. Altıparmak & Nabikoğlu, 2004; Erişti, 1998).

However, Pierce and Kalkman (2003) address the importance of learner-centred approach applications as now being recognized a greater extent by the educators in the later stages of education. Accordingly, the administrators of the higher education institution where this study was carried out have asserted that they attach great importance to the fact that teaching should be sufficient and student-centred. Therefore, it is believed that the findings of the study provide evidence for the application of learner-centred approach in this institution.

According to the findings of several studies, there are a number of variables that seem to have effects on learner-centred approach. Gender of the faculty members and students is one of these variables. Marsh and Roche (1997) reviewed that gender of instructors or students had little or no effect on students' ratings. For example, while in some studies it is revealed that female students have a more positive opinion about the learner-centred competence of their faculty members (Fernández & Mateo, 1997), the gender of the students participated in studies of Crawford and Macleod (1990) and Gömleksiz, Bulut and Kan (2005) has no effect on their opinions about the faculty members' efficiency in learner-centred approach.

Year of teaching experience of the faculty members is another variable which also has effects on their teaching approaches (Prosser et al., 2003). For example, Walker, Gleaves and Grey (2006) found out that the novice faculty members felt that they had to give priority to their teaching over research. In another study, at the end of the training given to two faculty members who were considered inefficient by the students, the less experienced one (three years) seemed to improve more than the more experienced one (25 years) (Hativa, 2000).

Class size is another variable which is a crucial concern for the learning environments. Crawford and Macleod (1990) suggest that students' participation, self-confidence, ability to communicate with the faculty member individually along with their positive opinions about the faculty member's behaviours are improved more in classes where the class size is below 20 compared to the classes where the class size is above 20. Prosser and Trigwell (1997) also found out a significant relationship between learner-centred activities and the appropriate class size in the faculty members' opinions. Exceptionally, Centra (2003) indicated that class size had no effect on faculty members' teaching efficiency.

As indicated above, both the opinions of the faculty members and the students about faculty members' efficiency in learner-centred approach seem to be affected by some variables. Therefore, the main purpose of this study is to investigate the faculty

members' opinions and the students' opinions about faculty members' efficiency in learner-centred approach and whether some variables affect their opinions. To this end, it posed the following questions:

(1) To what extent are the faculty members considered efficient in learner-centred approach by themselves and their students?

(2) Is there a significant difference between faculty members' opinions of their efficiency in learner-centred approach and the students' opinions about the subject?

(3) Do the faculty members' opinions of their efficiency in learner-centred approach differ significantly from the students' opinions about the subject according to the following variables?

(a) Gender of the faculty members

(b) Gender of the students

(c) Academic title of the faculty members

(d) Teaching experience of the faculty members

(e) Class size

(f) Total number of course hours of the faculty members per week

(g) Total number of courses taught by the faculty members per academic term

(h) Grade of the students

With these questions in mind the following assumptions can be stated as the hypotheses of the study:

(1) Both the faculty members and the students consider the level of efficiency for the faculty members as 'Partially Efficient' and 'Moderately Efficient' in learner-centred approach.

(2) Faculty members consider themselves more efficient in learner-centred approach than their students think they are but this difference might not be statistical.

(3) Gender of the faculty members and of the students as well as the grade of the students might not be effective on applications of the learner-centred approach.

(4) The increase in the academic title, the year of teaching experience, total numbers of course hours per week, total number of courses taught per academic term and the class size might cause more negative effects on the opinions of the participants.

Method

Sample

In this survey study, systematic sampling (based on the faculties and academic titles) and random sampling methods were administered. Therefore, 97 out of 192 faculty members teaching undergraduate courses at the Faculty of Letters, Faculty of Education, Faculty of Administrative and Economic Sciences, and Faculty of Communication in Ege University during the Fall semester of the academic year 2005–2006 participated. 53 male and 44 female faculty members' scales were also analysed. 47 of them have been working in the Faculty of Letters, 19 of them in the Faculty of Education, 15 of them in the Faculty of Economics and Administrative Sciences, and 16 of them in the Faculty of Communication. 22 were professors, 14 were associate professors, 43 were assistant professors, and 18 were lecturers. The teaching experience of 15 faculty members was five years or less, of another 15 faculty members was six–10 years, of 18 of them was 11–15 years, of 25 of them was 16–20 years and of 24 of them was 21 years or more. Class sizes were 15 or less in two classes, 16–25 in seven classes, 26–35 in 16 classes, 36–45 in 28 classes, and 46 or more in 44 classes. 26 faculty members taught first grade students, 23 taught second grade students, 21 taught third grade students, and 27 taught fourth year students.

Data were also collected from 3239 of 5109 the students. Students in one of the undergraduate courses of each faculty member participated in the study. Therefore, sometimes a student gave an opinion about more than one teacher. Although the analysis was made on the total points of the scale, the scales with gaps in any of the items and the unreliable scales were not analysed. So, only 2235 instruments were analysed. The students who filled these instruments were in four different grades: 657 of them in first grade, 512 of them in second grade, 489 of them in third grade, and 577 of them in fourth grade. Additionally, for each faculty member the number of student scales in the analysis ranged between three and 47.

Instrument

The instrument including 48 items, 4-point Lickert scale, was developed in parallel forms (only the expressions of the items changed according to the sample groups). The items of the scale were composed of the behaviours expected from a faculty member who applies learner-centred approach which is based on the learner-centred principles (McCombs & Whisler, 1997). For example, in the student's scale there are items such as "The faculty member asks us to determine the objectives that we are going to achieve by the end of the course.", "He or she enables us to look at the subject from different points." and "He or she appreciates each of us as an individual." There is also a column for the participants to write their explanations -if they like- for each item on the scale. An explanatory factor analysis was made on the draft scale (64–items) which had been filled in by 16 faculty members and 358 students in the four faculties mentioned above in the spring semester of the academic year 2004–2005 and the items with the factor load value .45 or above were selected to

give the scale its final form. Cronbach alpha reliability coefficient was calculated .95 (mean= 122.76, stand. dev. = 16.69) in the final form of the scale.

Procedure

The researcher and author obtained approval for this study from administrators of the faculties mentioned above. The data were collected on the last three weeks of the fall semester of the academic year 2005–2006 between the dates of 9 December 2005 and 5 January 2006. The researcher applied the scales with the help of a lecturer, a research assistant, a PhD student and five MS students who have knowledge on the scales. The volunteer students filled out the scales during the class session of the faculty member in 15 to 25 minutes. Most of the faculty members accepted to leave the class during the application process. The ones who did not want to leave the class were asked to sit apart from the students and not to influence them.

Data Analysis

In order to identify the faculty members' efficiency level in learner-centred approach, the standard deviation 28.85 was used to determine the five groups of efficiency scale ranging from lowest point 49 to highest point 192: 47–75 points: Inefficient, 76–104 points: Partially Efficient, 105–134 points: Moderately Efficient, 135–163 points: Efficient, 164–192 points: Very Efficient. The *t*-test was applied to discover whether there is a significant difference between the faculty members' and the students' opinions about faculty members' efficiency in learner-centred approach. The faculty members' and the students' opinions were analysed depending on the independent variables by using *One Way Analysis of Variance (ANOVA)*. Since the explanations written on the open-ended question section of the scale were too limited to analyse, they were not analysed separately. However, they have been referred to during the interpretation of the quantitative data.

Results

Table 1 indicates that 95% of the faculty members regard themselves as "efficient" and "very efficient" in learner-centred approach whereas 64.9% of the students consider their teachers' efficiency in learner-centred approach as "efficient" and "very efficient." None of the faculty members regard themselves as "partially efficient" or "inefficient," however, it is interesting that the 6.2% of the students consider their teachers as "partially efficient" or "inefficient" in learner-centred approach. The t value shows that the faculty members consider themselves more efficient in learner-centred approach (mean= 4.40) compared with the students (mean= 3.68).

Table 1

Faculty Members' Level of Efficiency in Learner-centred Approach

Sample group	Level of efficiency in learner-centred approach (%)						Mean	SD	T-Value[a]
	Inefficient	Partially Efficient	Moderately Efficient	Efficient	Very Efficient	Total			
Students	1.0	5.2	28.9	54.6	10.3	100.0	3.68	.77	-7.324*
Faculty members	-	-	5.1	49.5	45.4	100.0	4.40	.59	

* p<001

a= *T*- value was calculated using the total points of the faculty members' and the students' learner-centred approach scales, degrees of freedom is 192.

According to Table 2, the genders, titles, years of teaching experiences, total number of course hours of the faculty members per week and total number of courses of the faculty members per academic term and grade of the students revealed no difference between the faculty members' opinions about their efficiency in learner-centred approach. The students' opinions about the faculty members' efficiency in learner-centred approach revealed no difference in most of those variables. However, the opinions of the female students about the faculty members' efficiency in learner-centred approach are more positive compared to the male students, F (1, 2233) = 8.04, $p < .01$. In addition, the students think that the faculty members who have experience of 5 years or less, are more learner-centred compared to the faculty members who have 6-10 years experience, F (4, 92) = 3.60, $p < .01$.

Table 2

Analysis of Variance for Some Variables

	Dependent variables									
	Faculty members' opinions					Students' opinions				
Independent variables	N	Mean	SD	F-Value[a]		N	Mean	SD	F-Value[b]	
Gender of the faculty members	97	160.07	14.66	.971	ns	97	138.29	19.07	.842	ns
Gender of the students						2235	137.63	28.85	8.038[c]	*
Academic title of the faculty members	97	160.07	14.66	.796	ns	97	138.29	19.07	.282	ns
Teaching experience of the faculty members	97	160.07	14.66	1.080	ns	97	138.29	19.07	3.598[d]	*
Class size	97	160.07	14.66	1.252	ns	96	138.20	19.15	.831	ns
Total number of course hours of the faculty members per week	97	160.07	14.66	.187	ns	96	138.20	19.15	.883	ns
Total number of courses of the faculty members per academic term	97	160.07	14.66	.339	ns	97	138.29	19.07	1.002	ns
Grade of the students	97	160.07	14.66	1.078	ns	2235	137.63	28.85	.938	ns

* p<01, ns= no significance.

a= Findings of the descriptive analysis of the F-Values were given as totally for the faculty members' scales.

b= Findings of the descriptive analysis of the F-Values were given as totally for all the students' scales for each faculty member.

c= Significant difference is in favour of the female students.

d= Significant difference is in favour of the teachers with 5 years or less experience compared to the teachers with 6-10 years experience.

Discussion

The study reveals that most of the faculty members regard themselves as 'Efficient' and 'Very Efficient' in learner-centred approach. However, compared to faculty members' self-assessments about their efficiency in learner-centred approach, the students consider the faculty members less efficient in this approach. This result of the study does not verify the first hypothesis of this study. The estimation in this hypothesis that faculty members would not be 'Efficient' or 'Very Efficient' in learner-centred approach is based on the findings of some studies which show that the learner-centred approach is not applied efficiently in institutions of higher education (i.e. Altıparmak & Nabikoğlu, 2004; Erişti, 1998; Akpınar-Wilsing & Paykoç, 2004).

In faculty members' opinions the levels of efficiency in learner-centred approach are significantly higher than the levels stated in the students' opinions. Roche and Marsh (2000) also revealed that the points given by the teachers for their own teaching skills and the students' points were significantly different. Although a difference between the opinions of the faculty members and the students' opinions has been estimated, as can be seen in the second hypothesis of the study, it was not expected to be significant statistically. Such a result arouses suspicion regarding the objectivity of the faculty members' self assessment. In fact, self assessment is considered to be one of the main duties of institutions and of persons. In the institution where this study was carried out, self assessment applications were started to be employed simultaneously with this study. Yet, it is hardly possible to admit that self assessment applications have been institutionalised and conceptualised. Subsequently, it can be asserted that self assessment skills of the faculty members have not been developed sufficiently.

On the other hand, in the institution the study was carried out to investigate the faculty members' teaching skills through student evaluations, it is found out that there has been no consistent study concerning student evaluation. It is observed that in the past, from time to time, there had been such studies which involved student evaluations in the institution. Yet, when problems that are thought to be faced during the adaptation period arouse (i.e. students' emotional attitude in the evaluation), the studies were given up. Through own experience, we can admit that although the faculty, the department or the faculty member has tried to gather student opinions from time to time independent of the institution, such applications could not show regularity or consistency. In short, it can be stated that different results would be achieved if the data were collected from students who are used to evaluating their faculty members.

In the third hypothesis of the study, it is asserted that the opinions of the faculty members and the opinions of the students about faculty members' efficiency in learner-centred approach may not change depending on their gender. The gender of the faculty members revealed no difference in their opinions of efficiency in learner-centred approach but the students' opinions about the subject were significantly different. Thus, while the opinions of the faculty members verify the hypothesis

concerning the gender variable, the opinions of the students do not. However, Das and Das (2001) suggest that the female students' opinions about the faculty members' efficiency in learner-centred approach are more positive than the male students' opinions. On the other hand, Crawford and Macleod (1990) and Gömleksiz et al. (2005) found out that the students' opinions about the faculty members' teaching skills do not significantly vary depending on their gender.

Lastly, the hypothesis that the teaching experience, academic title, total numbers of course hours per week, total number of courses taught per academic term of the faculty members, and the class size might affect the participants' opinions or opinions is evaluated. The increase in the variables in this hypothesis is thought to be a decreasing factor for the faculty members' efficiency in learner-centred approach. According to the study, although the teaching experience of the faculty members revealed no difference in their opinions of efficiency in learner-centred approach, the students' opinions about the subject show significant difference statistically. The students think that the faculty members with an experience of five years or less are more efficient in learner-centred approach than the ones with an experience of six-10 years. The group with the least teaching experience differs significantly from the one with the closest teaching experience; however, surprisingly, it does not differ significantly from the group with an experience of 11 years or more. This may stem from the fact that the novice faculty members prepare themselves better for the class and pay more attention to teaching applications as they teach the courses for the first time. As Lea et al. (2003) notes the teachers with 6-10 years of experience concentrate on their research more than teaching and attach less importance to teaching in order to satisfy the expectations of the faculty for academic promotion. On the other hand, it is interesting that the students indicate similar levels of efficiency for both less experienced and more experienced faculty members. In this respect, it can be concluded that there seems to be gaps in the guidance of novice faculty members about the new concepts in the literature.

The study reveals that the faculty members' opinions of their efficiency in learner-centred approach and the students' opinions about the subject do not significantly vary depending on the academic titles of the faculty members. One plausible explanation for this might be that the faculty members have considered their teaching and their academic promotion separately. This also complies with the expectation that the faculty members' devotion to research does not prevent them from fulfilling their teaching duties.

The faculty members' opinions of their efficiency in learner-centred approach and the students' opinions about the subject do not vary according to the class size either. This finding is very surprising because 74% of the faculty members' teach in classes with 36-45 and 46 and more students. While the study's findings about the class size approve Centra's opinion (2003) that 'the class size has no significant effect on the points given by the students for the teachers' teaching skills', they are in contradiction with most of the previous studies and the literature (Crawford & MacLeod, 1996; Das & Das, 2001; Marsh & Roche, 1997; McKeachie, 1997; Prosser & Trigwell 1997). One of the five sub-scales on the Teaching Environment Perception

Survey by Prosser and Trigwell also gives the appropriate number of students in classes.

Total number of course hours of the faculty members per week do not have a significant effect on faculty members' opinions of their efficiency in learner-centred approach and the students' opinions about the subject. This result is understandable because faculty members in faculties of education countrywide have more than 20 hours of courses a week. Since the faculty members involved in this study are used to this quantity of course hours, psychologically, they may have failed to consider this as a negative factor that affects teaching.

Total number of courses of the faculty members per semester also does not affect the faculty members' perceptions of their efficiency in learner-centred approach and the students' opinions about the subject. Among the faculty members involved in this study 50.6% teaches 5 or more different courses per semester, 11.3% teaches one or two different courses and 38.1% teaches three or four different courses. It is interesting that the study reveals no significant difference in the levels of efficiency in learner-centred approach of the faculty members who teach one or two courses compared to the ones who teach five or more courses. The increase in the number of courses causes an increase in the number of not only the course outlines but also the students. This will cause to spend more time for more students and therefore will raise the work load.

Lastly, the faculty members' opinions of their efficiency in learner-centred approach and the students' opinions about the subject do not vary according to the grade of the students. However, Gömleksiz et al. (2005) has stated that the students' opinions about the faculty members' efficiency in learner-centred approach are more positive in the fourth grade compared to the ones in the second grade. Likewise, during the interviews made with the faculty members to decide on the application of the scale, some teachers have stated that they motivate the fourth-grade students to do research and make presentations in the class, thus applying learner-centred activities to a greater extent.

In sum, all the results concerned with the third and the fourth hypotheses make one think that the faculty members involved in the study either have extraordinary teaching energy or that they apply learner-centred approach in the same way regardless of all conditions. In other words, whatever the gender, the number of students, the number of courses, the total course hours, the teaching experience or the grade of the students is, faculty members teach in similar ways. According to them, these ways of teaching are learner-centred enough, whereas these ways are more teacher-centred according to the students.

Conclusions and Recommendations

The results of the study demonstrate that most of the hypotheses have not been verified. Firstly, the study shows that faculty members' opinions are significantly different from the students' opinions about faculty members' efficiency in learner-centred approach and that the faculty members have given unexpectedly high points for themselves. These results bring about the question of why the difference exists between the faculty members' opinions and the students' opinions about this issue. Future research should investigate their opinions more reflectively. The studies that put forward the fact that student opinions concerning the teaching of the faculty members (i.e. Baş-Collins, 2002; Işık, 2005; Penny, 2004) are useful in the development of teaching should be taken into consideration. Furthermore, the evaluation should be applied under appropriate conditions for students to indicate their opinions in a more valid and reliable way. Informing the students about the evaluation adequately and in time, providing the validity and the reliability of the evaluation form, and providing the opportunity for the students to fill in the forms in an appropriate time for themselves (Baş-Collins) can increase the validity of the evaluation.

The results related to the faculty members' and students' characteristics confirm some previous studies: Characteristics of the faculty members and their students generally do not have effects on applying learner-centred approach. In order to put forward the factors which cause this result, more detailed studies should be carried out. Especially, the variables that are observed for their effects on the teaching of faculty members should be investigated in terms of their common effects on both the teaching and the research of the faculty members.

Senemoğlu (1994) found that the graduate students expect the faculty member take the pedagogical courses. Roche and Marsh (2000) also suggest that although the faculty members are expected to be good teachers and researchers, they get very little education on teaching. Since 1999, the PhD students in Turkey have started to take two more education courses (Development and Learning; Planning and Evaluation in Teaching) in addition to their field courses. However, the faculty members involved in this study have not taken these courses. Therefore, it should be investigated whether the level of efficiency in learner-centred approach of the faculty members who have taken these courses is higher than the ones who have not taken these courses. To conclude, it can be stated that if the institutions of higher education implicate principles of learner-centred approach in faculty members training programs and make the faculty members participate in studies about their teaching fields, the faculty members will apply learner-centred approach more properly on a larger scale.

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Öğretim Elemanlarının Öğrenci Merkezli Yaklaşımı Uygulama Yeterlikleri: Sosyal Alanlarda Eğitim Veren Fakültelerin Bakış Açısı

(Özet)

Problem Durumu: Günümüzde birçok eğitimci tarafından öğrenci merkezli yaklaşım, öğretmen merkezli yaklaşımdan daha etkili görülmektedir. Örneğin, Bologna Sözleşmesinde yüksek öğretim kurumlarının 2010 yılına kadar öğrenci merkezli öğrenmenin kurumsallaştırılması hedeflenmektedir. Fakat bu yaklaşımın yüksek öğretim basamağında yeterince uygulanamadığını ortaya koyan bazı araştırmalar bulunmaktadır. Bazı değişkenlerin öğrenci merkezli yaklaşımın uygulanmasına etkilerini inceleyen çalışmalar da vardır. Bu çalışmanın yapıldığı yüksek öğretim kurumunun stratejik planları da öğrenci merkezli yaklaşıma önem verildiğini ve bu yaklaşımın uygulama hedefleri arasında yer aldığını göstermektedir. Ancak kurumun öğrenci merkezli yaklaşımı uygulama düzeyine ya da öğretim elemanlarının bu yaklaşımı uygulama yeterliklerine ilişkin araştırma bulgularına rastlanmamıştır. Bu nedenle, çalışmanın öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerinin belirlenmesi yoluyla öğrenci merkezli uygulamaların geliştirilmesine katkı sağlayacağı düşünülmektedir. Bunun yanında, çalışmanın bulguları ileride yapılabilecek ilgili birçok çalışma için başlangıç noktası olabilir.

Araştırmanın Amacı: Çalışmanın amacı öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerini, kendilerinin ve öğrencilerin görüşlerine dayalı olarak ortaya koymaktır. Ayrıca öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerinin bazı değişkenlere (öğretim elemanı cinsiyeti, akademik unvanı, akademik hizmet yılı, bir dönemde okuttuğu ders sayısı, haftalık toplam ders saati, öğrenci cinsiyeti, sınıf düzeyi ve mevcudu) göre farklılaşıp farklılaşmadığı araştırılmıştır.

Araştırmanın Yöntemi: Tarama modelindeki bu çalışmada, büyük bir üniversitenin sosyal alanlarda eğitim veren dört fakültesinde (Edebiyat Fakültesi, Eğitim Fakültesi, İktisadi ve İdari Bilimler Fakültesi, İletişim Fakültesi) görev yapan 192 öğretim elemanından 97'si ve lisans öğrenimi gören 5109 öğrenciden 2235'inin görüşleri analiz edilmiştir. Çalışmanın verileri öğretim elemanları ve öğrenciler için paralel yapıda oluşturulan dört dereceli bir Likert ölçeği ile toplanmıştır. Ölçek maddeleri öğrenci merkezli ilkeler temele alınarak hazırlanmıştır. Ölçeğin 64 maddelik deneme formu adı geçen dört fakültede 16 öğretim elemanı ile 358 öğrenciye uygulanmıştır. Açıklayıcı faktör analizi yapılmış ve faktör yük değeri .45 ve üzerinde olan maddeler ölçeğin son haline alınmıştır. Ölçeğin 48 maddeyi içeren son halinin Cronbach alpha güvenirlik katsayısı .95 olarak hesaplanmıştır. Veriler 2005-2006 öğretim yılının güz döneminde toplanmıştır. Öğretim elemanları kendileri için hazırlanan ölçeği

doldururken, lisansta ders okuttukları bir sınıftaki öğrenciler onlar için hazırlanan ölçeği doldurmuştur. Öğretim elemanlarının yeterlik düzeyleri, ölçeklerin standart sapma puanı olan 28.85 sayısı, aralık katsayısı olarak kullanma yoluyla şu şekilde tanımlanmıştır: 47-75 puan: Yetersiz, 76-104 puan: Kısmen Yeterli, 105-134 puan: Oldukça Yeterli, 164-192 puan: Çok Yeterli. Bu tanımlamalar doğrultusunda öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterlik düzeyleri yüzdeleri hesaplanmıştır. Öğretim elemanı ve öğrenci görüşleri arasında anlamlı fark olup olmadığını bulmak için *t*-testi, bağımsız değişkenlerin hem öğretim elemanı hem de öğrenci görüşlerinde farka neden olup olmadığını saptamak için ise tek yönlü varyans analizi uygulanmıştır.

Araştırmanın Bulguları: Çalışmada öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerine ilişkin görüşleri, öğrencilerin görüşlerine göre anlamlı bir farklılık göstermiştir [t (192) = -7.324, $p < .01$]. Buna göre, öğretim elemanları öğrenci merkezli yaklaşımı uygulama konusunda kendilerini öğrencilere göre daha yeterli görmektedir. Örneğin, öğretim elemanlarının % 94.9'u kendilerini 'Yeterli' ya da 'Çok Yeterli' görürken, bu oran öğrenciler için %64.9'dur. Örneklemdeki hiçbir öğretim elemanı, öğrenci merkezli yaklaşımı uygulama konusunda kendini 'Yetersiz' ya da 'Kısmen Yeterli' olarak tanımlamazken, öğrencilerin %6.2'si öğretim elemanlarının yeterlik düzeyini bu şekilde tanımlamıştır. Öğretim elemanlarının görüşleri çalışmada ele alınan bağımsız değişkenlere göre anlamlı bir farklılık göstermemiştir. Buna karşın kız öğrencilerin, öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerine ilişkin görüşleri erkek öğrencilere göre anlamlı bir düzeyde olumlu bulunmuştur [F (1, 2233) = 8.04, $p < .01$]. Ayrıca öğrenciler beş yıl ve daha az deneyimi olan öğretim elemanlarının altı-10 yıl deneyimli olanlara göre öğrenci merkezli yaklaşımı uygulamada daha yeterli olduklarını düşünmektedir [F (4, 92) = 3.60, $p < .01$]. Öğretim elemanı cinsiyeti akademik unvanı, bir dönemde okuttuğu ders sayısı, haftalık toplam ders saati, sınıf düzeyi ve mevcudu ise öğrenci görüşlerinde de bir farklılığa neden olmamıştır.

Araştırmanın Sonuçları ve Önerileri: Çalışmanın bulgularından ilk olarak öğretim elemanlarının öğrenci merkezli öğretimi uygulama yeterliklerine ilişkin öğretim elemanı ve öğrenci görüşlerinin farklılık gösterdiği sonucuna ulaşılmaktadır. Bağımsız değişkenlere yönelik bulgular alanyazınla tutarlı biçimde öğretim elemanı ve öğrencilerin öğrenci merkezli yaklaşımı uygulama yeterliğine ilişkin görüşlerinde çoğu değişkenin farklılık oluşturmadığını ortaya koymaktadır. Öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerini daha üst düzeyde değerlendirmesi hem öğretim elemanlarının hem de öğrencilerin nesnelliğinin artması gereğini ortaya koymaktadır. Öğretim elemanı ve öğrencilerin daha nesnel bir bakış açısıyla değerlendirme yapmaları için geçerlik ve güvenirliği yüksek ölçeklerin kullanılması önerilmektedir. Ülkemizde her alandaki doktora öğrencileri için 1999 yılından bu yana iki

eğitim dersi (Gelişim ve Öğrenme; Öğretimde Planlama ve Değerlendirme) okutulmaktadır. Bu çalışmanın örneklemindeki çoğu öğretim elemanı bu dersleri almamış olduğundan, dersleri alan ve almayan öğretim elemanlarının öğrenci merkezli yaklaşımı uygulama yeterliklerinin farklılık gösterip göstermediği başka bir araştırma problemi olabilir. Son olarak yüksek öğretim kurumları öğretim elemanı yetiştirme programlarına öğrenci merkezli yaklaşım ilkelerini dâhil eder ve öğretim elemanlarının alan öğretimlerine ilişkin çalışmalara katılmalarını sağlarsa, öğrenci merkezli yaklaşım daha geniş çapta ve uygun şekilde uygulanabilir.
Anahtar Sözcükler: Öğrenci merkezli yaklaşım, öğretim elemanı, yeterlik, öğrenci değerlendirmesi

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Investigating Prospective Elementary Teachers' Understanding of Analogical Cases in Newton's Third Law

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Abstract

Problem Statement: Analogies are cognitive tools widely used in literature. Many instructors and educators point out the power of analogies to teach physics in science classrooms. Newton's third law is one of the key concepts of physics education which is difficult to learn and teach.

Purpose: The aim of this study was to analyze prospective teachers' understanding of analogical cases in Newton's third law. In addition, the focus of this analysis was concentrated mainly on the variables of gender and class level.

Methods: The participants of the study were 244 prospective elementary teachers at a public university in Ankara. Newton's third law analogy test (NTLAT) was adapted and used as a measuring tool in this study. The NTLAT was composed of four main questions including similar numbers of analogical cases to analyze four different misconceptions in Newton's third law. The final version of the NTLAT was applied to seven sections of students in three different class levels in the same term by the researcher. Two males and two females from each class level were randomly selected and interviewed. These semi-structured 12 interviews nearly lasted 15-20 minutes.

Results: The statistical data obtained from the NTLAT were analyzed by using MANOVA and folloew up ANOVA techniques. The main effect of the class level and interaction effect were statistically significant according to the Pillai-Bartlett Trace Test. Follow up ANOVAs indicated that class level univariate main effect on all dependent variables and interaction

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effect on three misconceptions (M1, M3, and M4) were statistically significant. In addition, the descriptive results showed that males had fewer misconceptions than females. The mean scores across class level were different for males and females. There was a drastic increase or decrease of male mean scores according to class level whereas the mean scores were nearly equal for females.

Conclusions/Recommendations: With its unusual nature, the NTLAT was itself an asset and contribution to this field. Educators may use the NTLAT as a quiz, assignment, measuring tool or an activity in their research or classes. In the light of the interviews, all descriptive results such as males had fewer misconceptions than females, males' mean scores changed drastically according to class level unlike females, and inferential results related to MANOVA and ANOVAs were discussed and accordingly some suggestions were offered.

Keywords: Analogy, science education, Newton's third law, misconception

With the shift in epistemological beliefs held by curriculum developers and science educators, constructivist views of learning in science education have become more prevalent than ever. These expanding advances in constructivist perspectives have affected education in Turkey. In parallel with the revisions in views, Turkey's Ministry of Education implemented a sophisticated reform of elementary education. As a natural reflection of this policy, the Turkish Council of Higher Education regulated ongoing programs of education faculties and implemented new programs in 2006 to upgrade undergraduate teacher preparation.

In general, science education is formed by three legs—physics, chemistry, and biology. Students in science education or in other field education programs as in elementary education are taking an equal number of courses for each branch through their undergraduate preparation. Students in elementary education had to take 149 credits of courses and 175 hours to graduate from the department under the old program. In the undergraduate science education program, students had to take seven courses of 19 credits and 22 hours. These seven courses were living science, chemistry, physics, environmental education, two science teaching courses, and a science laboratory. With the revisions made in 2006, the number of the courses was increased to eight by adding an extra science laboratory course. However, the class hours of these courses were decreased by one hour according to the proposed curriculum of the Turkish Council of Higher Education.

With this new curriculum, prospective elementary teachers can learn physics concepts most probably in a general physics course, two science laboratories and maybe barely in two science teaching courses. Soon, they may have the opportunity to learn physics in courses of 10 credits and 12 hours from the new curriculum courses of 154 credits and 175 hours. This decrease in class hours makes the fruitfulness and efficiency of these class hours, particularly the general physics course, more important than before. Considering the course content of this general

physics course and the science laboratory courses, mechanics concepts comprise a large part of them. In other words, mechanics concepts and their applications form an important part of the science dimension of undergraduate preparation of prospective elementary teachers. Besides graduating satisfactorily from the department, they need to know physics in general and can use and integrate physics knowledge in their life. Moreover, they can facilitate this bulk of knowledge to teach compasses, states of matter and other related concepts in life knowledge courses in primary schools. Therefore, a prospective elementary teacher who wants to be better than their peers or distinguished should care for science education, physics and mechanics concepts in addition to their major field.

In general, mechanics is one of the two (electricity is the second) extensively researched fields in science education and particularly in physics education. In fact, most experimental research and studies (Clement, 1982; Hake, 1998; Halloun & Hestenes, 1985a) on student understanding and conceptions might be conducted in mechanics. However, teachers and students still have undeniable difficulties to teaching and learning mechanics concepts. Physics concepts such as "force" and "velocity" are used different in daily life considerations. In addition, most of the students can point out Newton's laws by using similar sentences without conceptually comprehending the concepts indeed. Moreover, the difficulties in learning and teaching mechanics cannot be figured out by merely using appropriate formulations. Newton's three laws are the core of mechanics. Students should integrate these three laws well enough in order to understand the concept of force and minimize the difficulties they might have in mechanics. Studies related to mechanics and to Newton's third law (Brown, 1989; Montanero, Suero, Perez, & Pardo, 2002; Savinainen, Scott, & Viiri, 2005) showed that students and prospective teachers still have problems teaching and learning these topics.

Students generally consider physics not only difficult and complicated but also entirely abstract and incomprehensible. Besides several other factors, this feature of physics including idealization and abstraction forms the basis of learning difficulties and misconceptions in this course. The concepts of "misconception" or "alternative conception," which are used interchangeably in the literature, are defined by Clement (1993) as "a preconception that can conflict with currently accepted physical theory" (p. 1241). In other words, student intuitive ideas or prior conceptions that are false in terms of accepted scientific knowledge can be regarded as misconceptions. They should not be perceived simply as errors or mistakes that can be fixed easily. In fact, it requires too much effort to remediate them. As Minstrell (1982) mentioned, they are common, deep-seated, and form inflexible obstacles standing in front of conceptual understanding. Previous studies (Brown, 1992; Clement, 1982; Eryılmaz, 2010; Halloun & Hestenes, 1985a; Minstrell, 1982; Yılmaz, 2007) revealed that students of different ages, lazy or clever students, preservice teachers, and even in-service teachers have misconceptions in mechanics and Newton's third law. Several approaches were proposed and used to deal with misconceptions in the literature, and the use of analogies was one of those approaches.

Science classrooms are a milieu in which analogies are facilitated as a cognitive tool to advance learning. Analogies, widespread in many educational settings, are a prehistoric tool used to think, transfer, construct ideas and assess new knowledge. An analogy is composed of two parts. The analog is the domain that can be regarded as a source of knowledge, while the target case is the domain to be explained. If the target and analog share similar features, an analogy can be drawn between them. Duit (1991) highlighted the importance of analogies in progressing understanding by relating scientific concepts and the students' daily-life experiences. In the literature, many studies (Duit, 1991; Heywood, 2002; Mason, 1994; Suzuki, 1994; Wong, 1993) were conducted to analyze analogies and their effects on understanding. Some research (Brown, 1992; Clement, Brown, & Zietsman, 1989; Glynn & Takahashi, 1998; Heywood & Parker, 1997) has demonstrated specifically that properly integrated analogies could improve a student's conceptual learning. Moreover, various instructional analogy approaches were developed and introduced in the literature with the help of several studies (Brown & Clement, 1989; Dagher, 1995; Glynn, 1991; Kolodner, 1997; Wong, 1993; Zeitoun, 1984).

In most of the recent studies (Baker, 1998; Farenga & Joyce, 1997; Haussler & Hoffmann, 2002; Stadler, Duit, & Benke, 2000; Taşlıdere & Eryılmaz, 2009; Yılmaz, 2007; Yılmaz, Eryılmaz, & Geban, 2006) of science and teacher education, gender is another important variable usually considered. The term "gender" is a social constitution that refers to the biology of an individual. Educators generally come across the difficulty of teaching students in undergraduate education programs who realize the subtle distinctions of gender influences on prospective teachers and science and physics learning. Baker (1998) pointed out that males dominate science and physics education. In other words, the inequalities and variation in achievement, attitude and participation in science and educational programs still exist regarding the variable gender on behalf of males. Likewise, students' alternative conceptions in physics, specifically in mechanics and Newton's third law are gender dependent. The result of the previous studies (Halloun & Hestenes, 1985b; Yılmaz et al., 2006) indicated that females had much more misconceptions in this field than males. In addition, Stadler et al. (2000) claimed that males and females had distinctive perspectives in the philosophy of understanding physics. In short, males are much more utilitarian and realistic, and they presumably prefer to consider physics as worthy in itself, whereas females feel that they can comprehend a concept only if they can place it into a nonscientific context so they can integrate and visualize physics and the world together. Considering these subjects and variables, the purpose of this study was to analyze preservice elementary education teachers' understanding of Newton's third law via analogical cases according to their gender and class level.

Method

Participants

Study participants were students who enrolled in the elementary teacher education department. Seven classes from the same public university in Ankara and 244 elementary teacher education department students were involved in this study. Nearly 41 percent of the students were freshman, 35.3 percent were sophomores and the others were juniors in the elementary teacher education department. The ages of most of the students ranged from 18 to 22 (95.9 percent).

Measuring Tools

Newton's third law analogy test (NTLAT) is the revised version of the Anchoring Analogy Diagnostic Test (AADT) developed by Yılmaz (2007). The AADT was composed of seven questions that each assessed a different misconception, 141 analogical cases and a total of 193 reasons. Most of the analogical cases in the AADT were derived from the related studies (Bao, Hogg, & Zollman, 2002; Brown, 1992; Camp & Clement, 1994; Clement et al., 1989; Hestenes, Wells, & Swackhamer, 1992; Maloney, 1984; Montanero et al., 2002). Throughout the development process, one graduate student, one instructor and four research assistants working in three universities were asked to control the analogical cases, items and the test itself in terms of accepted scientific knowledge and to contribute to the formation of the AADT with their valuable feedback.

All questions of the AADT had 20-30 analogical cases. Sub-questions were selected and formed the NTLAT. Therefore, the NTLAT was designed to detect four misconceptions with 110 analogical cases. These misconceptions were as follows:

1. When two bodies collide, the body that breaks (fragile) exerts the smaller force.
2. When two bodies push on each other or collide, the harder one exerts/pushes with a greater force than the softer one.
3. When two moving bodies interact, the body moving fastest exerts the largest force.
4. When two bodies collide, the body having the larger mass exerts the greater force.

As in the AADT, students were asked to give three types of answers for each analogical case to complete the NTLAT. First is the answer of the analogical case as yes "Y" or no "N," the second is their level of confidence for this answer as 1, 2, and 3 representing "not confident", "almost confident" and "absolutely confident" consecutively, and third, a short explanation related to the causes of their answers. However in the NTLAT, students were not bound to explain the analogical cases previously specified by the researcher. All analogical cases had places to be filled where students could give their short explanations related to their answers. Students were asked to write down a minimum of three causes for each question in the NTLAT. They were also informed that "much short explanation or cause was

appreciated" and "if they want, it was also valuable for us to have the causes of their answers for each analogical case of each misconception." Theoretically, a student could write between 12 and 100 causes, but practically, most students gave 16-20 causes and the overall time for students to complete the NTLAT varied in between 15 to 30 minutes. Figure 1 shows examples of one analogical case from each misconception with a common question.

For validity considerations, the researcher prepared a table including misconceptions and the number of analogical cases in each of them. A specialist in a related field checked this table and the final form of the NTLAT for content-related validity evidence. The correlation between prospective elementary teachers' "yes/no" responses to examples in the NTLAT and their level of confidence were used to obtain evidence for construct validity. This correlation coefficient was found as .22 and significant at the .01 level (two-tailed). Cronbach's alpha reliability coefficients for teachers' "yes/no" responses to analogical cases, their level of confidence, and a combination of these two answers were calculated related to the reliability properties of the measuring tool. These three values, indicating a relatively high reliability for a diagnostic test were calculated as .77, .87, and .79 respectively.

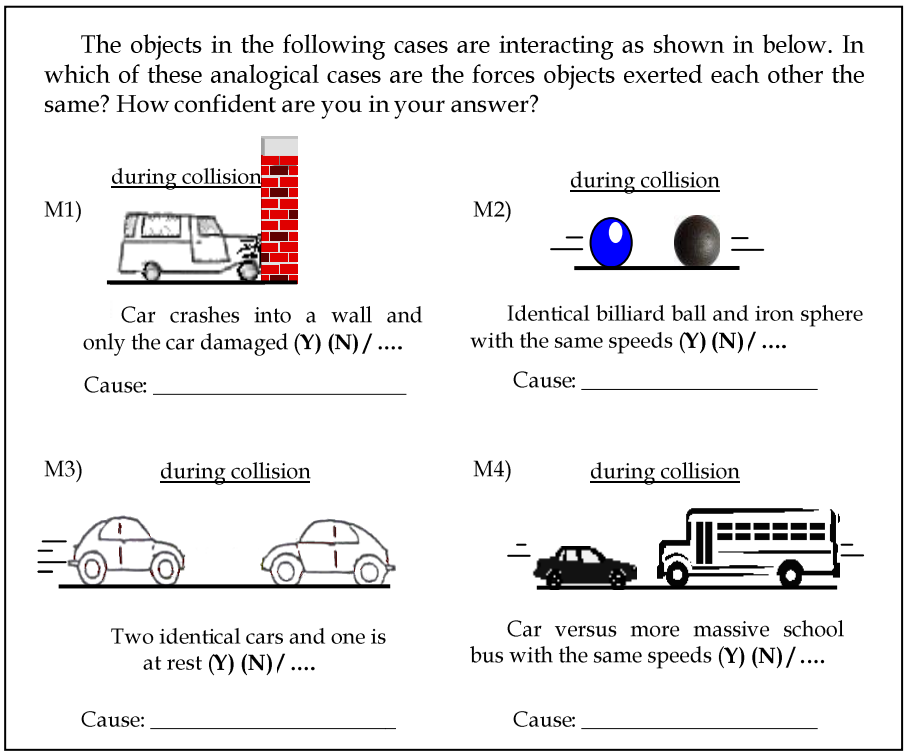

Figure 1. Example of analogical cases for each misconception used in the NTLAT

Procedure

First, the researcher revised and adapted the NTLAT. Next, the test was applied to 249 prospective elementary teachers from the same public university. Although they were asked to respond to all analogical cases, several students did not answer some questions. The data of five students who left more than 22 cases unanswered were discarded from the study. The researcher had 21 of the remaining students who did not answer a few of the analogical cases complete the test with the help of their advisors. Then, two males and two females were selected from each class level and interviewed.

The main purpose of these interviews was to have a general idea about the issue under consideration. Therefore, no examples or quotations from the interviews were introduced in this quantitative work as in ordinary qualitative studies. The interviews in this study were semi-structured. Before the interviews, questions such as "Which of the analogical cases is most complicated and which one is the easiest?", "Do you like the instructor and general physics course?", "What do you think about the importance of learning physics?", "Is this course essential for your future career?" were written. Students' answers were not audio-taped; instead only short notes were taken. In addition, warm up questions such as, "What is your name?" and "Where were you born?" were used. No outsider was there during the interviews. Each student was informed about confidentiality of their responses and intention of the study. Interviews generally lasted 15-20 minutes.

Results

Elementary teacher education students' "yes/no" responses to analogical cases in the NTLAT and their level of confidences were used to obtain the data used in this study. All causes/reasons taken as a third step with the NTLAT were analyzed before going further. The researcher used them to control and check the consistency of the data (response, confidence level, and the reason). If there was evidence of inconsistency, responses were revised. By using MS Excel, all the data were recoded as shown in Table 1. According to this coding, students' responses were regarded as two extreme ends of a response spectrum. On one edge of the spectrum there was the code of "0" as an indicator of a misconception (being sure of a wrong answer) and the code of "5" on other edge represented the opposite of the concept of misconception or the valuable scientific true knowledge (being sure of the correct answer). The purpose of conducting this kind of coding was to use all the data and to represent and reflect the students' responses. Furthermore, it enabled us to consider two of the three important elements of the concept of misconception (wrong answer, reason parallel to this answer and confidence level) and to convert this valuable information into workable statistical data.

Table 1

Criteria Used to Recode the Data

Response	Function	Confidence Level	Code
Yes	AND	Absolutely sure	5
Yes	AND	Almost sure	4
Yes	AND	Not sure	3
No	AND	Not sure	2
No	AND	Almost sure	1
No	AND	Absolutely sure	0

The questions of the NTLAT were designed to investigate four misconceptions (M1, M2, M3 and M4). It was composed of 22, 26, 24, and 28 analogical cases consecutively. Therefore, the mean of all cases of each question in the NTLAT were calculated in order to compare misconceptions to each other. Therefore, the highest NTLAT score could be five (maximum recode value). The descriptive statistics related to students' NTLAT scores for the first misconception are shown in Table 2.

Table 2

Descriptive Statistics for the First Misconception

	First Year			Second Year			Third Year			All		
Gender	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Male	20	2.90	0.70	20	3.69	0.64	15	2.61	0.82	55	3.11	0.84
Female	80	2.87	0.72	66	2.87	0.64	43	2.79	0.68	189	2.85	0.68
Both	100	2.87	0.71	86	3.06	0.73	58	2.74	0.72	244	2.91	0.73

As seen in Table 2, only one of the mean scores of males and females was higher than three (second year males=3.69). In these tables, scores converging to the highest value (five) imply the desired results or valuable conceptions, whereas the mean NTLAT scores converging to the lowest value (zero) point out the misconceptions. In this regard, the students' scores for the first misconception were not that high. The overall mean scores of 3.11 and 2.85 for males and females respectively indicated that this first misconception was much more prevalent in females. Standard deviation values of males and female mean scores were similar and they were less than one.

Table 3 indicates the basic descriptive statistics related to the students' scores for the second misconception. The overall mean score of 2.58 for males was higher than that of females. Likewise, male mean scores of the first two years also were higher than the scores of females. All mean scores in this table were lower than three, indicating that this misconception was much more deep-seated than the first. Furthermore, two of the males interviewed and three of females said that cases related to this one were harder than the others.

Table 3

Descriptive Statistics for the Second Misconception

	First Year			Second Year			Third Year			All		
Gender	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Male	20	2.58	0.99	20	2.91	1.09	15	2.12	0.86	55	2.58	1.03
Female	80	2.32	0.84	66	2.48	0.65	43	2.42	0.87	189	2.40	0.78
Both	100	2.37	0.87	86	2.58	0.79	58	2.34	0.87	244	2.44	0.85

As seen in Table 4, the mean scores of males and females were approximately three. This result might indicate that the third misconception was not as deep-seated as the first two. The overall, first year and second year mean scores of males were higher than that of females. Most of the standard deviation values in this table were lower than the related values in other misconceptions. Additionally, the interviewees felt the analogical cases related to this misconception were the easiest.

Table 4

Descriptive Statistics for the Third Misconception

	First Year			Second Year			Third Year			All		
Gender	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Male	20	3.01	0.54	20	3.71	0.61	15	2.98	0.61	55	3.26	0.67
Female	80	2.94	0.65	66	2.96	0.76	43	3.14	0.71	189	2.99	0.70
Both	100	2.96	0.62	86	3.14	0.79	58	3.10	0.68	244	3.05	0.70

The descriptive results related to the misconception emerging from misinterpretation of the interrelation of Newton's third law and the concept of mass are given in Table 5. Similar results of the first three misconceptions can be seen when comparing the mean scores of males and females. The important point related

to these results was that the overall mean score of all students for this misconception was the lowest of the study. Moreover, each of the three males interviewed and females mentioned this one as the hardest.

Table 5

Descriptive Statistics for Fourth Misconception

	First Year			Second Year			Third Year			All		
Gender	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Male	20	2.46	0.82	20	2.96	0.89	15	2.16	0.94	55	2.56	0.92
Female	80	2.30	0.73	66	2.40	0.57	43	2.40	0.89	189	2.36	0.72
Both	100	2.33	0.75	86	2.53	0.69	58	2.33	0.90	244	2.40	0.77

Students' mean scores related to the NTLAT and overall picture indicating variables of the statistical model are given in Table 6. It is understood from this summary table that the males' mean scores were higher than the females when considering results for first year, second year, and overall. However, for the third year, the mean scores of males were lower than the females in four of the misconceptions. Another important result was that the mean scores of males increased sharply from the first to second year and then drastically decreased for students in the third year. This first increase then decreasing trend/case for the means scores of males was valid in four of the misconceptions, whereas there was not a regular order for females.

Table 6

Means of Students' Scores According to Gender and Class Level for All Misconceptions

Item	Gender	First Year	Second Year	Third Year	All
1	Male	2.90	3.69	2.61	3.11
	Female	2.87	2.87	2.79	2.85
2	Male	2.58	2.91	2.12	2.58
	Female	2.32	2.48	2.42	2.40
3	Male	3.01	3.71	2.98	3.26
	Female	2.94	2.96	3.14	2.99
4	Male	2.46	2.96	2.16	2.56
	Female	2.30	2.40	2.40	2.36

Inferential statistics. The MANOVA has assumptions of multivariate normality, homogeneity of variance-covariance matrices, random sampling, and independency of observations. The researcher consulted to skewness and kurtosis values, Levene Test, Box's M test, and small numbers of dependent variables (less than 10) to facilitate testing and verifying these assumptions and then using two-way MANOVA as a further statistical analysis. However, the group sizes of factors (gender and class level) were not equal in this study. Since Box's Test was affected highly from multivariate normality assumption and very sensitive to outliers, the researcher checked Mahalanobis distances to identify cases with extreme values. As a result, I deleted four cases before analyzing the data. Moreover, I used Box's M test with more radical value of p=.001 to reflect and control the weakness of the study emerging from the use of unequal group sizes. Under these circumstances, the assumptions of MANOVA were tested and verified.

The 3x2 MANOVA was used to detect the effects of class level and gender on the collective dependent variables of the four misconceptions (M1, M2, M3, and M4). As a rule of thumb for unequal group sizes, Field (2005) suggested as "check the assumption of homogeneity of covariance matrices using Box's test; if this test is non-significant, and if the assumption of multivariate normality is tenable, then assume that Pillai's trace is accurate" (p. 594). Therefore, the researcher used the more robust Pillai-Bartlett trace to test the null hypothesis. The multivariate main effect of class level (Pillai's V=0.10, F (8, 472)=3.18, p=.002) and the interaction (class*gender) effect (V=0.10, F (8, 472)=2.97, p=.003) were rejected, whereas the main effect of gender (V=0.03, F (4, 235)=1.60, p=.176) were not rejected according to the MANOVA results. In other words, there were statistically significant mean differences between the factors of class level and interaction effect on the collective dependent variables of the four misconceptions.

Table 7 shows the results of ANOVAs on each dependent variable conducted as follow-up tests to the MANOVA. As Table 7 indicated, the main effects of class level and three (M1, M3, and M4) of the interaction effects were statistically significant. Tukey HSD used to test pairwise comparisons associated with class level indicated only the difference between the mean scores of second and third year students for M1 as being statistically significant. The values of observed powers and eta-squares (η^2) are also given in Table 7. In general, η^2 is interpreted as the proportion of variance of the dependent variable related to the factor. Eta-square ranges between 0 and 1. Traditionally, the cutoffs of .01, .06, and .14 are considered the rule of thumb for small, medium, and large effect sizes, respectively.

Table 7

ANOVA Results for the Dependent Variables

Source	Dependent Variable	Df	F	Sig.	Eta Squared	Observed Power
Class Level	M1	2	10.17	.000	.08	.99
	M2	2	3.48	.033	.03	.65
	M3	2	4.77	.009	.04	.79
	M4	2	4.23	.016	.03	.74
Gender	M1	1	4.47	.036	.02	.56
	M2	1	1.05	.307	.01	.18
	M3	1	4.33	.039	.02	.54
	M4	1	1.78	.184	.01	.26
Class Level	M1	2	8.17	.000	.06	.96
* Gender	M2	2	2.60	.076	.02	.52
	M3	2	6.81	.001	.05	.92
	M4	2	3.59	.029	.03	.66

Discussion, Conclusions and Implications

The general intention of this research was to analyze preservice teachers' understanding of analogical examples in Newton's third law according to their gender and class level. Contrary to standard types of measuring tools including only misconception questions used in most misconception research, the NTLAT with its different structure was facilitated in this study. In this regard, analogical cases with the potential to indicate students' misconceptions (cases recoded as zero or one like in aforementioned coding system) in Newton's third law and various examples from the related analogy spectrum pointing out scientifically true attributes (cases recoded and claimed as four or five by most of the students) were used in the NTLAT. In other words, student responses to analogical cases specific to each misconception were considered and transformed into statistical data with the help of the NTLAT and this coding system. This analysis of students' understanding of Newton's third

law by using analogical cases indicated valuable concepts according to the majority of students (Clement et al. in 1989 tagged them as anchoring analogy or simply as anchor). Cases indicating false conceptions (misconceptions or target cases used interchangeably in the literature) might have both advantages or limitations and disadvantages. In fact, national or international researchers could investigate this issue in several ways.

Smith, diSessa and Roschelle (1994) criticized misconception research aimed at conceptual change. They pointed out that misconceptions were non-productive knowledge and should be regarded as static; therefore conceptual change strategies could not add extra information. It would be better to study more productive analogies (anchors) instead of misconceptions (target analogies). The NTLAT used as a measuring tool in this study was designed to analyze analogies from this perspective. In this study, I did not use the NTALT to analyze anchors, or to determine their common features or differences between target cases regarding the variables gender and class level. I recommend that researchers examine and study these issues in their research. On the other hand, the main advantage of using the NTLAT in this study was that it enabled us to analyze students' understanding of Newton's third law by using their true and false knowledge. I also recommend that researchers or teachers employ the NTLAT as an in-class activity, quiz, exam or measuring tool in their classes or research. Researchers can develop measuring tools like the NTLAT to analyze various concepts in other topics of science and physics education.

The outcome derived from the results of the NTLAT sustained some of the results of earlier studies (Brown, 1989; Clement, 1993; Yılmaz et al., 2006) that showed that most students had misconceptions in Newton's third law. The mean NTLAT scores of students demonstrated that even prospective teachers had problems with the law. The descriptive results implied that the fourth misconception was the most deep-seated of the misconceptions assessed in this study.

The results of MANOVA indicated that prospective teachers' understanding of Newton's third law differed with respect to their class level, whereas the existing mean difference according to their gender was statistically insignificant. In addition, there was a significant interaction effect of gender and class level on students' misconception scores. The main effects of class level and three (M1, M3, and M4) of the interaction effects differed across the factors according to the follow up ANOVAs. Similar outcomes also might be concluded from the descriptive results. In fact, males' mean NTLAT scores changed drastically across class levels so the second year students' mean scores were drastically higher than the first class students' and the mean scores of third class students were quite a bit lower than that of the second class students' scores. However, this trend of increasing then decreasing mean scores was not valid for females. Students in the elementary teacher education department were taking general physics courses in the second year of their undergraduate education. The effect of the general physics course could differ according to gender and these two trends specific to each gender could affect the results.

In light of the interviews, I should mention that prospective elementary teachers do not regard physics courses as crucial for their future career. They know that they probably will not teach physics after graduation. Therefore, they think it is futile to learn physics. Although 11 of 12 students interviewed think this way, what might cause this difference between males and females? Could the intuitive biological and psychological differences between males and females be the reason? What about the effect or implication of general physics courses? How can we explain higher mean scores in the second year and then a severe decrease or very low mean scores in the third year for males but nearly stationary low mean scores for females even after taking a general physics course? Did taking physics conceptually affect males and females in different ways? Why? In fact, I cannot answer these questions with the data obtained and design of the study. I can suggest that researchers should analyze these issues by using larger samples including equal size groups by making longitudinal studies.

As a result of the interviews and this study, the following can be concluded and suggested: although both males and females did not regard physics as important and study as expected, male students generally claimed that they were interested in the examples given in the physics classroom. However, females mentioned that they generally were not interested in physics; they usually had difficulty in this course and could not construct effective communication with the instructor of the course. Teachers and instructors should behave equally to males and females and be the same distance apart from them. Examples and analogies should connect to and describe daily life cases so they appeal to each gender. As future teachers, students in the elementary education department, who will be one of the first teachers young students come across, should be versatile, talented, qualified and have a high level of general culture and knowledge. They need to consider a physics course as a guide for an extensive amount of cases and daily life experiences instead of just a course in the curriculum. Accordingly, educators and curriculum developers should design physics courses such that its content, the examples used and the course itself should be interesting and contribute to a prospective elementary teacher's career or life. As an innocent solution, I can offer that prospective elementary teachers may take more physics content in their pre-service preparation instead of decreasing its class hours in the curriculum. This will increase both their science knowledge and confidence and make them feel that these courses also are important.

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Öğretmen Adaylarının Newton'un Üçüncü Kanunundaki Benzeşimsel Örnekleri Anlayışlarının İncelenmesi

(Özet)

Problem Durumu: Günümüzde en fazla dikkat çeken yaklaşımlardan biri olan yapılandırmacı eğitim, bireylerin sahip oldukları ön bilgilerin öğrenme sürecindeki önemli etmenlerden biri olduğunu ortaya koymaktadır. Sınıf içerisine taşınan bu ön bilgiler, öğrenilecek bilimsel bilgilerin öğrenilmesini ve öğretilmesini iyice zorlaştırabilmektedir. Özellikle günlük yaşamdan edinilen kişisel deneyimler, mekanik konularının ve Newton'un üçüncü kanununun öğrenilmesini bu bağlamda güçleştirebilmekte ve bu konularda öğrencilerde kavram yanılgıları oluşmasına sebep olabilmektedir. Öğrenme zorluklarıyla baş edebilmek ve bu kavram yanılgılarını giderebilmek için çok çeşitli yaklaşımlar

geliştirilmiştir. Analoji kullanarak kavramsal değişimi amaçlamak bunlardan biridir.
Aslında analojiler, günümüze kadar birçok eğitimcinin yararlanıp sıklıkla kullandığı etkili bir iletişim aracıdır. Somut ve idrak edilmesi kolay olmayan kavramları basit ve anlaşılır örneklerle anlatmaya çalışarak istenilen bilimsel bilgiye ulaşmada etkili olabilen, eğitimde sıkça kullanılmış yardımcı araçlardır. Yararlanılan analojiler arasındaki özelliklerin kolayca idrak edilip transfer edilebilmesi analojilerin kavramsal değişimi oluşturabilmesindeki başarısını belirler. Anlatılmak istenen kavram açısından başvurulan analojiler birbirine ne kadar benzerse transfer edilecek özellik ve yapılacak muhakeme o kadar kolay başarılır. Eğitimsel analojileri kullanarak çeşitli yaklaşımlar geliştiren ve bunların kavramları öğretmedeki etkilerini inceleyen fen ve fizik eğitiminde birçok çalışma yapılmıştır.

Araştırmanın Amacı: Bu çalışmada, öğrenilmesi ve öğretilmesi genel olarak zor olan Newton'un üçüncü kanunu irdelenmiştir. Çalışmanın amacı öğretmen adaylarının bu kanunu bilimsel açıdan nasıl algıladıklarını benzeşim örnekleri üzerinden özellikle cinsiyet ve sınıf düzeyleri değişkenleri açısından incelemektir.

Yöntem: Çalışmanın katılımcılarını, Ankara'daki bir devlet üniversitesindeki ilköğretim sınıf öğretmenliği bölümü öğrencisi olan 244 öğretmen adayı oluşturmuştur. Toplam yedi farklı şubedeki %40,9'u birinci sınıf, %35,3'ü ikinci sınıf ve diğerleri üçüncü sınıf olan bu öğrencilerin Newton'un üçüncü kanunu nasıl anladıklarını incelemek için araştırmacı tarafından daha önceden geliştirilen analoji testi adapte edilmiştir. Yedi kavram yanılgısına yönelik analoji örneklerinden oluşan bu ölçme aracından örnek sayıları benzer olan dört tanesi seçilmiştir. Ayrıca, her benzeşim örneğine verilen cevaba kısa açıklama yapılabilecek şekilde test yeniden düzenlenerek Newton'un üçüncü kanunu analoji testi (NÜKAT) oluşturulmuştur. NÜKAT'ı oluşturan benzeşim örneklerinin büyük kısmı ilgili alanyazındaki araştırmalardan alınmıştır. Alandan toplam 5 kişi testin oluşturulması ve incelenmesine dönütleriyle katkıda bulunmuş ve ayrıca analojiler önererek yardımcı olmuşlardır.
NÜKAT'ın son hali araştırmacı tarafından aynı dönemde tüm öğretmen adaylarına uygulanmıştır. Test için 15–30 dakika arası bir süre yeterli olmuştur. Teste giren her üç sınıf düzeyinden ikişer kız ve erkek olmak üzere toplam 12 öğrenci rasgele seçilmiştir. Bu öğrencilerle 15–20 dakikalık mülakatlar yapılmıştır. Verilerin analizinde betimsel istatistik teknikleri, sayıtlıları test edilerek 3x2 MANOVA ve devamında ANOVA kullanılmıştır.

Bulgular: Çalışmanın betimsel sonuçları, erkek öğrencilerin NÜKAT puanı ortalamalarının kızlarınkinden tüm kavram yanılgılarında daha yüksek olduğunu göstermiştir. Tüm öğrencilerin NÜKAT puanları incelendiğinde, dört kavram yanılgısı içerisinden "iki cisim çarpıştığında kütlesi büyük

olan daha fazla kuvvet uygular" kavram yanılgısı için hem kızların hem erkeklerin ortalamaları en düşük olarak bulunmuştur. Sınıf düzeylerine göre kızlar ve erkeklerin ortalamaları incelendiğinde ise kızların sınıf düzeylerine göre ortalamaları belirgin bir eğilim göstermeyip yaklaşık aynı kalmıştır. Fakat erkeklerin ortalamaları açısından bakıldığında birinci sınıfla ikinci sınıf arasında ciddi artış sonra ikinci sınıfla üçüncü sınıf arasında ciddi azalış şeklinde bir ortalama farkı eğilimi göze çarpmıştır. Genel bir fikir edinme amaçlı yapılan mülakatlara göre ise 12 öğretmen adayından 11'i genel fizik dersini kariyerleri açısından çok önemli görmemiş ve bu dersin alanlarına ve öğretmenlik yetilerine çok katkısı olmadığını ifade etmişlerdir. Özellikle kız öğrenciler mekanik konularıyla ilgili sınıfta verilen örneklerin kendilerine çok hitap etmediğini veya ilgilerini çekmediğini belirtirken erkekler genel olarak verilen örneklerden memnun olmakla birlikte bazı örneklerin ilgilerini daha çok çektiğini belirtmişlerdir.

Bulguların istatistiksel olarak anlamlılığını test etmek için MANOVA ve devamında ANOVA yapılmıştır. MANOVA sonuçlarına göre sınıf düzeyi ana etkisi ve etkileşim etkisi istatistiksel olarak anlamlı çıkmıştır. Takip eden ANOVA analizleri, sınıf düzeyinde tüm kavram yanılgıları için, etkileşim etkisi içinse farklı hasar, farklı sertlik ve farklı kütle durumlarında uygulanan kuvvetlerin eşitliği ile ilgili olan birinci, üçüncü ve dördüncü kavram yanılgılarında istatistiksel olarak anlamlı fark olduğunu ortaya koymuştur.

Sonuçlar ve Öneriler: Bu çalışmada, öğretmen adaylarının Newton'un üçüncü kanunu nasıl anladıkları benzeşim örnekleri spektrumundan oluşan bir ölçüm aracı (NÜKAT) ile incelenmiştir. Çoğu kavram yanılgısı çalışmasında incelenen konu, sadece bu analoji örnekleri zincirinin bir ucundaki kısmında bulunan üretken olmayan örnekler kullanılarak yani sadece kavram yanılgısı örneği olan hedef analojiler üzerinden incelenmektedir. NÜKAT ise bu spektrumun bir ucunda bulunan kavram yanılgısı (problemli bilgiyi gösteren-olumsuz uç) örneklerinden spektrumun diğer ucunda yer alan temel analojilere (bilimsel bilgiyle uyumlu olan-olumlu uç) kadar olan bütün aralıklardan örnekler kullanılarak oluşturulmuştur. Böylece, NÜKAT ve çalışmanın içerisinde belirtilen şekliyle kullanılan kodlama sayesinde öğrencilerin doğru veya yanlış tüm cevapları ve verdikleri cevaplardaki eminlik dereceleri istatistiksel verilere dönüştürülerek analoji örnekleri üzerinden konunun incelenmesi gerçekleştirilmiştir. Bu yaklaşımıyla çalışmamız alana katkıda bulunmaktadır.

NÜKAT, bu haliyle bazı araştırmalarda, eğitimlerde ve sınıflarda bir aktivite, ölçüm aracı, mini sınav veya test olarak kullanılabilir. Bunun gibi testler, diğer fizik konuları ve hatta diğer fen eğitimi alanları için geliştirebilir ve çeşitli çalışmalarda kullanabilirler.

Ayrıca, erkeklerin kızlara göre Newton'un üçüncü kanunu konusunda daha az kavram yanılgısına sahip olması, ilgili mekanik konularında

yapılan çalışmalarla örtüşmektedir. İncelenen dört kavram yanılgısından dördüncüsünün diğerlerine göre daha köklü ve yaygın olduğu görülmüştür. Sınıf düzeylerine göre kız öğrencilerin NÜKAT puanları yaklaşık aynı kalmışken erkeklerin puanları ikinci sınıfta ciddi derecede yükselme ve üçüncü sınıfta ise yine ciddi derecede düşüş göstermiştir. Erkek öğrencilerin ortalamasındaki belirgin yükselme ikinci sınıfta fizik dersi almalarına bağlanabilir. Erkeklerin, mülakatlarda fizik dersinin ve dersteki örneklerin kimi zaman ilgilerini çektiğini belirtmeleri ikinci sınıftaki bu farkın oluşmasını destekler niteliktedir. Ayrıca tüm adayların fizik dersini kariyerleri için önemli görmemeleri erkekler açısından önemli bir artış ile oluşan bu farkın tekrar ciddi derecede azalmış olmasıyla ilgili olabilir. Acaba fizik dersleri sınıf öğretmenliği öğretmen adaylarına fizik konuları açısından kavramsal olarak katkıda bulunmamış mıdır? Erkeklerin ortalamalarındaki artış yoksa bu katkıdan mı kaynaklanmaktadır? Yani bu bulgular fizik dersinin verilmesinden mi veya kızlarla erkek öğrenciler arasındaki farklılıklardan mı kaynaklanmaktadır? Araştırmacılar, cinsiyet ve sınıf düzeyi açısından olabildiğince eşit oranlı gruplardan oluşan örneklemlerle bu soruları daha detaylı çalışabilirler. Ama sonuç olarak mülakatların da ışığında, fizik derslerinde kullanılan örnek ve soruların sadece erkeklerin değil kızlar da dâhil çalışma grubundaki tüm öğrencilerin ilgisini çekecek ve olabiliyorsa sınıf içerisinde gösterileri yapılabilen farklı güçteki öğrencilerin duvarı itmesi veya bir öğrencinin diğerini sürüklemesi gibi örnekler olması gerektiği söylenebilir.

Anahtar Sözcükler: Analoji, fen eğitimi, Newton'un üçüncü kanunu, kavram yanılgısı

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