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## Effectiveness of Concept Maps in Vocabulary Instruction

M. Bahaddin Acat\*

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### Abstract

*Problem Statement:* Enriching vocabulary requires a person to learn words whose meanings he or she does not know and to use them. When the process is completed only with learning the sounds and the dictionary meaning of a word, such a learning activity cannot be regarded as meaningful. Several studies point out that various problems exist in teaching languages in Turkey. The problems encountered in reading, writing, speaking, and listening activities are mostly because of insufficient vocabulary. In order to solve such problems, one solution is to gain the ability to use these words by establishing meaning webs between the words. The present study investigates the effects of concept maps on vocabulary-enriching activities.

*Purpose:* This study's purpose is to determine the effectiveness of the use of concept maps in vocabulary instruction to enrich students' vocabulary.

*Research Questions:* 1. Is there a significant difference in determining the degree of a word's meaning between the students who are taught a word using concept maps and those who are taught with conventional methods?  
2. Is there a significant difference in determining the degree of the connections among words between the students who are taught words using concept maps and those who are taught with conventional methods?  
3. Is there a significant difference in the levels of using words in sentences between the students who are taught words using concept maps and those who are taught with conventional methods?

*Methods:* An experimental method was used in the study. The "pre-test post-test design with control group" method was employed. Two fourth-grade classes at a Turkish elementary school were included in the research. The data obtained at the beginning of the study and at the end of the study were compared, and a t-test analyzed whether there was any significant difference between them.

*Findings and Conclusions:* Concept maps are more effective than conventional approaches for teaching unknown words from the point of helping students acquire the ability to determine word meaning. Concept

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maps are more effective than conventional approaches in teaching unknown words from the point of helping students acquire the ability to use words in sentences.

*Suggestions:* Concept maps should be used for teaching unknown words in order to enrich the vocabulary of students. In the process of preparing textbooks for language teaching, concept maps should be used. Finally, the effectiveness and applicability of concept maps in teaching reading, writing, and listening skills should be studied.

*Keywords:* *concept maps, language teaching, vocabulary instruction, language learning, teaching Turkish*

Words are linguistic expressions of concepts. If concepts are to be described as labels that are used to express objects and events, words are linguistic expressions of these labels (Novak & Gowin, 1984). The processes of learning a word and a concept in a real sense coincide. Therefore, it is not enough for a person to recognize a label; that person should also be able to understand what it symbolizes. It is not possible to deduce that a word has been learned just by remembering it. The object represented should be recalled with similar objects, or differences should be remembered with opposite objects, and connections should be provided with related objects, events, and situations. All these features are possible by establishing a conceptual background (Gairns & Redman, 1998).

How can an individual grasp a meaning and build these meaning webs? Now it is a commonplace idea that such ability cannot be gained through imitation. Another common myth is that an individual discovers the meaning. Discovering may play a part in producing new information, but it is just one step among other learning activities. It is only in coordination with previously learned concepts that a person can construct a meaning web. In other words, knowledge cannot be discovered in the same way as gold or oil can. Rather, it is constructed like automobiles or pyramids (Novak & Gowin, 1984).

Learning is a process that takes place in a person's mind. Knowledge is not carried to a person's mind as it is. An individual constructs it during the learning process. The objects to be learned are constructed with those already learned via associations (Yaşar, 1998). During the construction process, an individual tries to form meaning around the incoming knowledge and makes it special to itself (Jonassen, 1994). A person does not discover an independent world outside the mind and is therefore not a passive receiver of knowledge. The knowledge perceived is constructed in an effective way (Slavin, 1994; Sönmez, 2004; Yaşar, 1992).

According to the concept of meaningful learning that Ausubel (1968) put forward individuals' associate new knowledge with previously learned concepts and propositions. New concepts and knowledge are assimilated into existing cognitive structures (Plotnick, 2001). On the other hand, in mechanical learning, new knowledge is only memorized word by word without interaction with existing knowledge and is then transferred into a person's mind. Mechanical learning does little to enrich a person's vocabulary. In order to realize meaningful learning by

constructing the words in a person's mind and forming meaning webs, it is necessary to determine what should be done. It has already been stated that a process similar to learning concepts is to be experienced (Gairns & Redman, 1998). It is suggested that concept maps should be used at this point to attain meaningful learning (Novak & Gowin, 1984). Various studies have proved that concept maps are effective teaching and evaluation tools, especially in science courses (Asan, 2007; Mintzes et al., 2001; Novak et al., 1983; Schau et al., 2001; Şen & Aykutlu, 2008). Some other studies prove that concept maps are effective in mathematics, computer programming, and statistics (Bolte, 1999; Cañas et al., 2001; Chen et al., 2001; Hershey, 2002; Jonassen, 1996; McLay & Brown, 2001). Several experimental studies indicate the benefits of concept mapping tools across several content areas (social studies, mathematics, Spanish as a second language, vocabulary, reading, and writing), multiple grade levels (first grade through senior high school), and different student populations (regular education students and students with learning disabilities) (Asan, 2007). Concept maps help to concretize concepts by forming images in a person's mind to help determine the relationships between concepts and to differentiate them. Concept maps are visual designs that are formed with graphical representations of concepts, events, phenomena, and ideas and the relationships between them (Erden & Akman, 1995; Gairns & Redman, 1998).

Concept maps are regarded as a learning strategy to achieve meaningful learning. They can be described as two-dimensional schemes that support the assimilation of new concepts in coordination with the ones that already exist in the mind and that show the relationships between new concepts. In other words, concept maps are useful to produce new ideas, systematize complex structures, accelerate the communication process, provide a better learning atmosphere by unifying old and new knowledge, evaluate the level of understanding, and diagnose misunderstandings (Novak & Gowin, 1983; Plotnick, 2001; White & Gunstone, 1992).

Words used to form concept maps are divided into two: those words having meanings by themselves and those that do not. Those words that do not have meanings on their own act as conjunctions and help the ones that carry meanings to form propositions (Novak & Gowin, 1983). It is important to use both of these word types together to enrich vocabulary. Words that do not form any proposition do not contribute anything to the vocabulary-enriching process because forming meaning webs only between words that are symbolic expressions of concepts can enrich vocabulary.

Previous studies have pointed out the relationship between the richness and adequacy of vocabulary and reading, writing, speaking, and listening skills (Beck, Perfetti, & McKeown, 1982; Demirel, 2002; Erden & Akkoyunlu, 1998; Kavcar, 1983; Kılıç, 2002; Laflamme, 1997; McKeown et al., 1983, 1985; Nagy & Scott, 2000; Özçelik, 1992; Sever, 2000; Vacca et al., 2003). Gauthier (1991) suggests that future research must strive to provide practitioners with viable strategies for direct, effective vocabulary instruction.

Enriching vocabulary requires a person to learn words whose meanings he or she does not know and to use them. When the process is completed only with learning the sounds and the dictionary meaning of a word, such a learning activity cannot be regarded as meaningful. Knowing the sounds and dictionary meaning of a word is only a part of vocabulary acquisition. The most important part of the process is using the word acquired. It is claimed that an average child can recognize 3,000 words in written language and 10,000 words in spoken language by fourth grade (Chall, 1987; Nagy & Anderson, 1984). Novak and Gowin (1984) state that an average person knows 10,000–30,000 words but that Shakespeare had only 3,000 words to use when he created his masterpieces.

There is an important degree of difference between knowing a word and using it. They differ from each other just as knowing a law in physics differs from using it in solving a problem. It does not necessarily mean that when a person knows a formula that he or she can solve any problem by using it. Similarly, when a person knows the sound and dictionary meaning of a word, he or she cannot always use it effectively in written and spoken language. Nagy and Scott (2000) stated that “a person who knows a word can recognize it, and use it, in novel contexts, and uses knowledge of the word, in combination with other types of knowledge, to construct meaning for a text.”

Words are abstract language forms that are used to express events, objects, emotions, and thoughts. The most difficult thing about learning a new word is the abstractness of a word. It only exists in the brain as a knowledge heap of a few sounds and does not contribute anything to enriching vocabulary. Donald Graves (1987) outlined six stages of word knowledge, which include learning to read a known word, learning new meanings of known words, learning new words that represent known concepts, learning new words that represent new concepts, clarifying and enriching meanings of known words, and moving words from receptive (listening and reading) to expressive (speaking and writing) vocabulary (Asselin, 2002). According to Perfetti (1985), the efficiency of a person in recognizing a word very much depends on reaching into his or her mental dictionary and retrieving the knowledge quickly. When a person acquires a word in a rich and organized way, it will be much easier to locate and retrieve.

Several studies point out that various problems exist in instructional activities and teaching language in Turkey (Acat, 2007; Demirel, 1992; Şahin, 2008; Sever, 2000). Most of them stem from inefficient activities in teaching language. Language courses have students look up words in dictionaries and use them in sample sentences, which is a mechanical activity and far from helpful in achieving the course's aim, which is to teach unknown words. The problems encountered in reading, writing, speaking, and listening activities stem mostly from insufficient vocabulary (Demirel, 2002; Erden & Akkoyunlu, 1998; Kavcar, 1983; Kılıç, 2002; Özçelik, 1992; Sever, 2000). Şahin (2008) indicated that the learning-teaching process is mainly teacher centered and teacher-led methods are used a lot more in Turkish schools. In order to solve such problems, one solution is to gain the ability to use these words by establishing meaning webs between the words. The present study

investigates the effects of concept maps on vocabulary-enriching activities. In other words, the research question of this study is as follows: Are there any significant differences between vocabulary levels of students who are taught unknown words through concept maps and those taught with conventional vocabulary-teaching methods?

### *Hypotheses of the Study*

1. There is a significant difference in determining the degree of a word's meaning between the students who are taught a word using concept maps and those who are taught with conventional methods.
2. There is a significant difference in determining the degree of the connections among words between the students who are taught words using concept maps and those who are taught with conventional methods.
3. There is a significant difference in the levels of using words in sentences between the students who are taught words using concept maps and those who are taught with conventional methods.

### **Methods**

The experimental method was used in the study. The "pre-test post-test design with control group" method was employed. Two groups were used in the research. The groups were randomly appointed as experimental and control groups. In the experimental groups, unknown words were taught in a Turkish course with an instructional program and teaching materials supported with concept maps, whereas in the control groups conventional teaching methods were used. The experimental design used in the study can be summarized as follows:

G1	T1	Language teaching through concept maps	T2
G2	T1	Conventional language teaching	T2

### *Participants*

Two fourth-grade classes at a Turkish elementary school were included in the research; 43 students from the 4/B class were placed into the experimental group, and 43 students from 4/A were placed into the control group. In order to make the groups equal, variables such as students' ages, cognitive and affective levels of readiness, as well as the teacher on duty were taken under control. To that end, portfolios of the students were analyzed, and their second- and third-grade marks were studied. Vocabulary pre-test results of the groups were compared in order to determine their present cognitive levels of readiness and their receptive readiness. In addition, their current attitudes toward language courses were investigated. No significant difference was found in the second- and third-grade school marks of the students in either group, and neither had any significant difference in the pre-test results as to vocabulary levels. Consequently, both groups were equal in terms of cognitive readiness. The attitude test prepared was given at the same time, and no



significant difference was found in the pre-test results between the groups. Thus there was no significant difference between the students in either group in terms of their attitudes toward Turkish courses, and they were determined to be equal in affective readiness. The teachers of both groups were equal in terms of seniority, educational status, and age.

### *Materials and Procedures*

In order to determine the effectiveness of concept maps, they were prepared to be used in Turkish courses in elementary schools. Reading texts to be used in courses were arranged for the term between March and April. In addition, the unknown words to be taught were listed. Concept maps were designed for 40 words in seven reading texts. Software called "Inspiration" was used to design the concept maps on a computer. Moreover, a curriculum to be used for the experimental group was designed in light of the principles of teaching through concept maps while the process of teaching unknown words was carried out. Experts and the teacher of the groups previewed the prepared materials, and necessary alterations were made.

In order to determine the levels of students in guessing the meanings of the words, establishing the connections between them, and finding their meanings in sentences and texts, multiple tests were prepared. Expert opinions were consulted to determine the validity of the tests. After the changes made, pre-tests were given, and the results obtained were compared with the school marks of the students. The correlation coefficient was found to be .45. The meaning levels of the correlation coefficients were tested, and the result was meaningful at .05 levels. Difficulty and differentiating levels of the test items were calculated, and the items having moderate difficulty and high differentiation levels were selected. Moreover, KR-20 reliability coefficients of the tests were calculated, and a reliability analysis was made. KR-20 reliability coefficient of the meaning-finding test was .79, and KR-20 reliability coefficient of finding the connections between the words was .73. Following these values, it was concluded that the tests were reliable. Thus the two multiple tests were reliable and valid and had moderately difficult and highly differentiated items. To determine the levels of the students in using the words in sentences, the researcher prepared an observation form.

After a seminar on concept maps was given to the teacher of the experimental group, pre-tests were given both groups. Then a sample course using concept maps was given to the teacher of the experimental group. Necessary explanations were made as to how the curriculum would be taught. The materials were given to the teacher, and he used them in his courses accordingly. The control group was taught the same texts with conventional methods. Following five weeks of coursework, pre- and post-tests were given to both groups. By giving these tests, the aim was to see, with the help of a t-test, whether there was any significant difference as to the students' ability (1) to find the meanings of the words, (2) to determine the connections between the words, (3) to use the words in sentences.

### Findings and Results

The data collected were analyzed using appropriate statistical techniques and were converted into tables and interpreted. The first hypothesis stated that there is a significant difference in teaching unknown words in terms of determining the meanings of the words between the students who are taught them using concept maps and those who are taught with conventional methods. Before the teaching started, both groups were pre-tested using a test consisting of 50 questions in order to determine their present ability to determine the meanings of the words. The same test was given to both groups as a post-test after the teaching had finished. Arithmetic means and standard deviations of pre-test, post-test, and gain scores were calculated, and a t-test was used to see whether there was any significant difference between gain scores of the control and experimental groups. The results are given in Table 1.

**Table 1**

*Results of the Pre-Test, Post-Test, Gain Scores, and Difference of Gain Scores of the Groups for Determining the Meanings of the Words.*

GRUP	N	Pre-test		Post-test		Gain		Gain Scores Difference	Standard Error	Dif.	df	t
		Mean	SD	Mean	SD	Scores	SD					
4/B (Experimental Group)	43	25.11	8.10	38.65	6.71	13.53	5.25	4.35	1.04	84	4.20**	
4/A (Control Group)	43	23.84	7.94	33.51	9.31	9.67	5.21					

\*\* $p < 0.01$

As is seen in Table 1, arithmetic means of pre-test, post-test, and gain scores of the experimental group were 25.11, 38.65, and 13.53, respectively, whereas the same results for the control group were 23.84, 33.51, and 9.67. When the difference between gain scores was analyzed, there was a difference of 4.35 means in the experimental group's favor. The difference between gain scores of the groups was analyzed with a t-test to see whether there was any meaningful difference [ $t(84) = 4.20; p < .01$ ]. Therefore, word meaning determination levels of the group that was taught with concept maps were significantly higher than the group taught with conventional educational methods.

The second hypothesis stated that there is a significant difference in teaching unknown words in terms of determining the connections among words between the students who are taught them using concept maps and those who are taught with conventional methods. Before starting the teaching, both groups were pre-tested using a test consisting of 38 questions to determine their ability to find the connections among the words. The same test was given to both groups as a post-test following the treatment. Arithmetic means and standard deviations of pre-test, post-test, and gain scores were calculated, and a t-test was used to see whether there was any significant difference between gain scores of the control and experimental groups. The results are given in Table 2.

**Table 2**

*Results of the Pre-Test, Post-Test, Gain Scores, and Difference of Gain Scores of the Groups for Determining the Connections Among the Words.*

GRUP	N	Pre-test		Post-test		Gain		Gain Scores Difference	Standard Error Dif.	df	t
		Mean	SD	Mean	SD	scores	SD				
4/B (Experimental Group)	43	15.42	5.08	26.42	4.53	11	4.23	4.35	1.36	84	4.19**
4/A (Control Group)	43	16.16	6.51	22.81	6.61	6.65	5.32				

\*\* $p < 0.01$

As is seen in Table 2, arithmetic means of pre-test, post-test, and gain scores of the experimental group were 15.42, 26.42, and 11, respectively, whereas the same results for the control group were 16.16, 22.81, and 6.65. When the difference between gain scores was analyzed, there was a difference of 4.35 means in the experimental group's favor. The difference between gain scores of the groups was analyzed with a t-test to see whether there was any meaningful difference [ $t(84) = 4.19; p < .01$ ]. Therefore, the levels of the students taught with concept maps in determining the connections among words were significantly higher than the group taught with conventional educational methods.

The third hypothesis stated that there is a significant difference in teaching unknown words in terms of the levels of using them in sentences between the students who are taught them using concept maps and those who are taught with conventional methods. Before starting the teaching, both groups were pre-tested with a vocabulary list consisting of 40 words, and they were instructed to use them in sentences. The same study was done for both groups when the teaching had finished. Arithmetic means and standard deviations of

pre-test, post-test, and gain scores were calculated, and a t-test was used to see whether there was any significant difference between gain scores of the control and experimental groups. The results are given in Table 3.

**Table 3**

*Results of the Pre-Test, Post-Test, Gain Scores, and Difference of Gain Scores of the Groups for Using New Words in Sentences.*

GRUP	N	Pre-test		Post-test		Gain		Gain Scores Difference	Standard Error	df	t
		Mean	SD	Mean	SD	Scores	S D				
4/B (Experimental Group)	43	23.19	6.26	41.81	9.27	18.63	9.88	12.86	1.53	84	7.51**
4/A (Control Group)	43	21.44	7.83	27.21	9.87	5.77	5.35				

\*\* $p < 0.01$

As seen in Table 3, arithmetic means of pre-test, post-test, and gain scores of the experimental group were 23.19, 41.81, and 18.63, respectively, whereas the same results for the control group were 21.44, 27.21, and 5.77. When the difference between gain scores was analyzed, there was a difference of 12.86 means in the experimental group's favor. The differences between gain scores of the groups were analyzed with a t-test to see whether there was any meaningful difference [ $t(84) = 7.51; p < .01$ ]. Therefore, the levels of the students in using the words in sentences from the group that was taught with concept maps were significantly higher than the group taught with conventional educational methods.

### Conclusions and Recommendations

It is possible to conclude from the results that word meaning determination levels of the group that was taught with concept maps were significantly higher than the group taught with conventional educational methods. Considering these findings, it could be stated that concept maps are more effective than conventional methods in helping students acquire the ability to determine the meanings of the words when teaching them unknown words. Including the visual factors in vocabulary teaching may have helped the students learn the meanings more easily. The idea that concept maps are effective in presenting abstract expressions in concrete and visual forms supports this view (Erden & Akman, 1995; Gairns & Redman, 1998; Novak & Gowin, 1984; Senemoğlu, 2007).

The primary problem in learning is the formation of knowledge in the mind and retrieving it when needed. The meanings web, which was formed by establishing connections between words, could have helped them to remember the meanings of the words more easily (Senemoğlu, 2007; Yaşar, 1992). Concept maps are visual forms that show the connections between concepts. Connection webs are formed in the knowledge acquired via concept maps, thus providing “meaningful learning” (Novak & Gowin, 1984). Using concept maps in the experimental group may have caused this difference by ensuring meaningful learning.

In various studies made in different fields, new results have been obtained as to the efficiency of teaching new concepts using concept maps, and these results parallel those of this study (Bolte, 1999; Cañas et al., 2001; Chen et al., 2001; Hershey, 2002; Jonassen, 1996; McLay & Brown, 2001; Mintzes et al., 2001; Schau et al., 2001; Şen & Aykutlu, 2008). Understanding the meaning of a word takes place with the formation of a conceptual structure. It is pointed out that in learning new concepts, recognizing and differentiating them are significant behaviors. This happens when an individual remembers related objects and situations and differentiates them from other objects and situations (Perfetti, 1985). Using concept maps not only facilitates remembering the meaning a word symbolizes, but it is also effective in showing the difference between words and may ensure that a new word is learned in accordance with the principles of the process of learning new concepts.

From the data analysis of the second hypothesis, it can also be concluded that levels of the students in determining the connections among words of the group that was taught with concept maps were high. Considering these findings, it might be claimed that concept maps are more effective than conventional methods in helping the students acquire the ability to determine the connections between words when teaching unknown words in Turkish courses. Concept maps are visual forms that associate words, which are labels for concepts, using lines. The conjunctions written on the lines form the propositions, which are the expressed forms of the connections between words (Novak & Gowin, 1984). Using concept maps in vocabulary teaching, the students might have seen other words related to the words in question and expressed them by forming propositions, and this might have caused the difference. The more organized the way a new concept is learned and the richer the situation in which a new word is learned, the easier it is to remember and retrieve (Perfetti, 1985). Concept maps may have caused such a difference by providing a rich and organized situation, making the experimental group more successful. Determining the connections between words includes telling one synonym and antonym of a word, stating the type of the connection such as usefulness, harmfulness, reason, result, and so on in relation to the upper and lower word classes. In order for an individual to grasp these meaning webs, he or she needs to learn a word with its associates, not the word alone. That is the main difference between meaningful learning and mechanical learning. The most criticized point of mechanical learning is that new knowledge is taken in haphazardly and placed in the mind, whereas in meaningful learning, newly acquired knowledge is associated with previous knowledge and concepts. Meaningful learning depends on the principle that new concepts and knowledge are

assimilated into prior concepts and knowledge (Ausubel, 1968; Novak, 1998; Novak & Gowin, 1983).

Using concept maps in the experimental group may have helped the students to learn the words not by themselves but by associating them with other words and to relate their previous knowledge to new knowledge. Thus meaningful learning may have occurred, which may account for the difference. The difference may be explained by the fact that the experimental group was taught with concept maps, whereas the control group was taught with mechanical learning. It is accepted that teaching with concept maps is characterized by meaningful learning and a constructivist point of view (Novak & Gowin, 1983). With concept maps, the aim is to construct knowledge in mind. The concepts or subjects to be learned are constructed by relating to previous ones. The individual forms meanings with the new knowledge on his or her own. Concept maps help an individual to associate previous vocabulary with new words and to form his or her own meaning world. He or she builds connections between the words already known and those to be learned, and the concept map presenting the knowledge will help construct the knowledge. This may have caused the difference in favor of the experimental group.

From the data analysis of the third hypothesis, it can also be concluded that the levels of the students in using the words in sentences of the group that was taught with concept maps were high. Considering these findings, it might be claimed that concept maps are more effective than conventional methods in helping students acquire the ability to use the words in sentences and to acquire related behaviors in teaching unknown words in Turkish courses. As stated earlier, there is a significant difference between using a word in written and spoken language. An average person recognizes more than 10,000 words but only uses part of them in written and spoken language. Learning a word mechanically does not ensure using it effectively in written and spoken language. On the other hand, in meaningful learning an individual is expected to assimilate old and new knowledge (Ausubel, 1968). Formed with meaning webs, it is easier to use new knowledge. With the help of concept maps, words are learned in a meaningful way and can be used effectively in written and spoken language. All of these factors might have caused the difference between the groups in using the words in sentences.

According to Kılıç (2002), giving only the meanings of the words in a text after students read it does not make any difference in their level of understanding, which supports the conclusion that mechanical learning does not ensure effective use of a word. To learn a language effectively, an individual can use various strategies to recall what was learned and show different speaking and writing styles depending on the context and content. Using concept maps may have helped the experimental group to acquire effective language skills and caused the difference between the groups. The conclusions of this study can be summarized as follows:

1. Concept maps are more effective than conventional approaches in teaching unknown words from the point of helping students acquire the ability to determine word meanings.

2. Concept maps are more effective than conventional approaches in teaching unknown words from the point of helping students acquire the ability to determine the relationships between words.

3. Concept maps are more effective than conventional approaches in teaching unknown words from the point of helping students acquire the ability to use words in sentences.

As suggested, it can be stated that, first of all, concept maps should be used in teaching unknown words in order to enrich the vocabulary of students. Second, in the process of preparing textbooks for language teaching, concept maps should be used. Third, the effectiveness of concept maps in enriching the vocabulary of higher-grade students should be determined. Finally, the effectiveness and applicability of concept maps in teaching reading, writing, and listening skills should be studied

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## Anlamı Bilinmeyen Kelimelerin Öğretiminde Kavram Haritalarının Etkililiđi

### (Özet)

*Problem Durumu:* Türkçe öğretimine ilişkin alan yazın incelendiğinde öğrencilerin kelime hazinelerini zenginleřtirmenin temel hedefler arasında sıralandıđı görölmektedir. Yapılan çalışmalarda kelime hazinesinin zenginliđinin ve yeterliliđinin ile bunun okuma, yazma, konuşma ve dinleme becerileriyle ilişkili olduđu yönünde çeřitli sonuçlar ortaya konmuřtur. Kelime hazinesi yada söz dađarcıđı TDK sözlüğünde “kiřinin bildiđi ya da kullandıđı kelimelerin tümü” olarak tanımlanmaktadır. Söz dađarcıđının zenginleřtirilmesi bireyin anlamını bilmediđi kelimelerin anlamını bilir duruma gelmesi ve bunu kullanması etkinliklerini gerektirir. Bu süreç kelimenin sadece sesinin ve sözlük anlamının bilinmesiyle sonuçlandıđında, anlamlı olmayan bir öğrenme faaliyeti olacaktır. Kelimeyi bilmekle, onu kullanmak arasında önemli bir düzey farklılıđı söz konusudur. Kelimenin sesinin ve sözlük anlamının bilinmesi de onun yazılı ve sözlü dilde bir sorununu çözümünde kullanılabilceđi anlamı taşımaz. Kelimenin temsil ettiđi anlam bireyin zihninde oluřmadıkça, kelimeyi bu soyutluktan kurtarmıř olamayız. Kelimeler kavramların dilsel formlarla ifadesidir. Kavramlar nesnelere ve olayları bir düzenlilikle tanıtmak amacıyla kullanılan etiketler olarak tanımlanırsa, kelimeler bu etiketlerin dilsel formda gösterimidir. İstenilen anlamda bir kelime öğrenmeyle, kavram öğrenme süreci örtüřmektedir. Yani sadece eteki tanımak deđil, o etekin temsil ettiđi anlamı yakalamak gerekir. Bir kelimenin öğrenilmiř olması temsil ettiđi nesne vb. hatırlamakla da sınırlandırılmaz. Temsil edilen varlıđın benzerleriyle ortak yönlerini, bařka nesne ve varlıklardan farkını, ilişkili olduđu diđer nesne durum ve olayları da çağrıřtırmalıdır. Bu özellikler kavramsal bir altyapının oluřturulmasıyla olanaklıdır.

Türkçe öğretiminde çeřitli sorunların yařandıđı birçok çalışmada ortaya konmuřtur. Bu sorunların önemli bir bölümü öğretmenlerin ve sınıfta yürütölen etkinliklerin yetersizliđi üzerinde odaklanmaktadır. Türkçe derslerinde anlamı bilinmeyen kelimelerin öğretiminde sözlükten kelimenin anlamının bulunması ve bunun bir cümlede kullanılması gibi mekanik etkinlikler zinciriyle yürütölen söz dađarcıđını zenginleřtirme çalışmaları dersi belirlenen hedefe ulařtırıcı olmaktan uzaktır. Türkçe okuma, yazma, konuşma ve dinleme becerileri konusunda görölen aksaklıklar önemli ölçüde söz dađarcıđının yetersizliđinden kaynaklanmaktadır. Bu sorunların çözümü bireyleri, kelimeler arasında anlam ađları kurarak bunları kullanacakları bir yeterliliđe ulařtırmaktır.

*Arařtırmanın Amacı:* Bu arařtırmada sorunun çözümünde etkili olabileceđi düřünölen kavram haritalarının söz dađarcıđını zenginleřtirme çalışmalarındaki etkisi ortaya konmaya çalışılacaktır.

*Arařtırmanın Soruları:* Bu çalışma ile řu üç sorunun yanıtlanması hedeflenmiřtir: Türkçe dersinde anlamı bilinmeyen kelimelerin öğretimi çalışmalarında kavram haritalarının kullanan öğrenciler ile Türkçe

dersinde anlamı bilinmeyen kelimelerin öğretimi çalışmalarını geleneksel anlayışla yürüten öğrencilerin;

1. Kelimelerin anlamını belirleyebilme düzeyleri arasında anlamlı bir fark var mıdır?
2. Kelimeler arası ilişkileri belirleyebilme düzeyleri arasında anlamlı bir fark var mıdır?
3. Kelimeleri cümlede kullanma düzeyleri arasında anlamlı bir fark var mıdır?

*Araştırmanın Yöntemi:* Araştırmada deneysel yöntem kullanılmıştır. Bu yöntemin "Kontrol Gruplu Ön Test, Son Test Deseni" işe koşulmuştur. Araştırmada iki grup kullanılmıştır. İlköğretim 4. sınıf Türkçe programı uygulanan Eskişehir ili Ahmet Sezer İlköğretim Okulunda bulunan 4. sınıf şubeleri araştırma kapsamına alınmış, rastsal olarak 4-B şubesinde 43 öğrenci deney, 4-A şubesinde 43 öğrenci kontrol grubu olarak seçilmiştir. Grupların denkliliğini sağlamak için, öğrencilerin, yaş, öğretmen, bilişsel ve duyuşsal hazır bulunuşluluk düzeyi değişkenleri açısından denklilikleri kontrol altına alınmıştır. Bu amaçla öğrencilerin ruhsal dosyaları incelenmiş, 2., 3. Sınıf karne notlarına bakılmış, uygulama öncesi Türkçe dersiyle ilgili bilişsel hazır bulunuşluluk seviyelerini belirlemek için söz dağarcığına ilişkin ön test sonuçları karşılaştırılmış, duyuşsal hazır bulunuşluluk seviyelerini kontrol etmek amacıyla da uygulama öncesi Türkçe dersine karşı tutumlarına bakılmıştır. Ön teste ve son teste kullanılmak üzere geçerliliği ve güvenilirliği kanıtlanmış, orta güçlükte ve ayrırcılıkları yüksek sorulardan oluşan iki çoktan seçmeli test hazırlanmıştır. Öğrencilerin kelimelerin cümlede kullanma düzeylerini belirlemek üzere araştırmacı tarafından gözlem formu geliştirilmiştir. Deney ve kontrol gruplarının eriş düzeyleri arasında anlamlı bir farkın oluşup oluşmadığı t testi ile yoklandı.

*Bu Araştırmanın Bulguları*

1. Kavram haritaları, Türkçe dersinde anlamı bilinmeyen kelimelerin öğretimi çalışmalarında kelimelerin anlamlarını belirleyebilme ile ilgili davranışları kazandırmada, geleneksel yaklaşımdan daha etkilidir.
2. Kavram haritaları, Türkçe dersinde anlamı bilinmeyen kelimelerin öğretimi çalışmalarında kelimeler arası ilişkileri belirleyebilme ile ilgili davranışları kazandırmada, geleneksel yaklaşımdan daha etkilidir.
3. Kavram haritalarının, Türkçe dersinde anlamı bilinmeyen kelimelerin öğretimi çalışmalarında kelimeleri cümlede kullanma ile ilgili davranışları kazandırmada, geleneksel yaklaşımdan daha etkilidir.

*Araştırmanın Önerileri:*

1. Anlamı bilinmeyen kelimelerin öğretimi çalışmalarında öğrencilerin söz dağarcığını geliştirmek amacıyla kavram haritalarından yararlanılmalıdır.
2. Ders kitaplarının dizaynında metinlerle ilgili kavram haritaları oluşturulmalıdır.
3. İlköğretim ikinci kademedeki söz dağarcığı zenginleştirme çalışmalarında kavram haritalarının etkiliği belirlenmelidir.
4. Türkçe öğretimi çalışmalarında okuma, yazma, dinleme becerilerinin öğretiminde kavram haritalarının kullanılabilirliği ve etkililiği araştırılmalıdır.

*Anahtar sözcükler:* Kavram haritaları, dil öğretimi, kelime öğretimi, dil öğretimi.

## Effectiveness of Project-Based Learning

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### Abstract

*Problem Statement:* The project technique is effective in imparting high level behaviours. Furthermore, this technique can help students acquire such skills as collective work in the affective domain and the ability to share information, skills and feelings. Studies both within the country and abroad support these arguments. The most important characteristic of the project technique is the formation of creative thinking by a student or students in classroom environments.

*Purpose of Study:* Does the delivery of a course through the project technique significantly affect student's opinions on cognitive, affective and psychomotor domains?

*Methods:* Along with quantitative and qualitative research methods, a semi-structured interviewing technique was used in the survey. The course was delivered through the method of project-based learning in the experimental group while the existing programme was used with the control group. Data were collected through a semi-structured group interview consisting of five questions and video recording. Opinions of experts were solicited regarding the scopewise validity of the interview form drafted for data collection and the assessment of project outcomes. The reliability of the interview and project assessment forms was found to be .73 and .84, respectively. As for the cognitive domain, fifteen questions were formulated at the practice level and the reliability coefficient was found to be .79 through K.R.21.

*Findings and Results:* The average cognitive domain achievement of the group in which the project-based technique was used was found to be significantly higher than the average for the other group. Based on these findings, it can be asserted that the project technique is effective in reaching targets in the cognitive domain. There is also a significant difference between the two groups in terms of pre- and post-test achievement averages in synthesis and the psychomotor domain in social studies.

Students stated that the project technique enhanced their creativity; helped them acquire high level information, affection and skills; improved joint

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work and collaboration with their classmates; and that separation into groups during the work consolidated affinity, trust and friendship.

*Conclusions and Recommendations:* Teachers may be given in-service training on how to deliver courses using this technique. While delivering a course through the project technique it must be ensured that original thought is developed in the class. By relating the technique to daily life, students may be motivated and encouraged to have interest in the course.

*Keywords:* Project technique, achievement, student's opinion, semi-structured interviewing technique

The project technique can be defined as formulating and planning for the solution of a specific problem, then implementing, observing and reporting the outcome (Sönmez, 2007). As can be inferred from this definition, the first thing to do in this technique is to identify the problem. Next, its possible solutions are considered. Then a specific way of solving is planned for and implemented. The last stage consists of observing and presenting the outcome (Balkı, 2003; Chard, 1998; CTCs, 1998).

According to Sönmez, there are two project techniques: creative and classical. Both of these can be used by teachers and students in education environments, but weight must be given to the creative project technique while priority is assigned to the classical one. Students must first learn to conduct scientific work through the classical project technique and then step forward to form new and original ideas through the creative project technique (Sönmez, 2007).

In the creative project technique, the student or a group of students first identify the problem. Then they go on with creative and original thinking regarding the solution to that problem. They pick one of these, plan for it in detail and implement it step by step. Finally, they observe and report the outcomes. Students may, for example, select one from among problems such as cancer, inflation, terrorist activities, environmental pollution or landslides. Next they develop questions such as "how can we tackle the problem of cancer?", "what can we do to eliminate inflation?" or "how can we prevent pollution?" This step is followed by developing suggestions for a solution. These are, in a sense, experimental. For a creative project technique, these solutions should be original and new. As stated by Sönmez (2007), for instance, responses such as "we should use the required volume of concrete, we should not build on fault lines, we should build earthquake resistant buildings, or houses should be of two storeys at most" etc. are not appropriate for this technique since they are not new or original. On the other hand, a suggestion like "Buildings should rise up during an earthquake and come down after it passes. This requires a mechanism, for example a spring, beneath buildings to raise them up during an earthquake. Or there may be air bags serving the same purpose" is new and original. Building models, small-scale experiments, writing an article, drawing pictures, sketching, etc. are all covered by this technique (Sönmez, 2007).

In the classical project technique, the problem is still first identified by students, but suggestions made for its solution are classical, not new or original. Eventually, these solutions may be tried. For example, for the question "how can we stop infla-

tion?" answers such as "by enhancing production, reducing consumption and controlling money in circulation" are all known and practiced ways. Nothing here is new or original. The student or a group of students may take up one of these solutions and examine it to report final observations to the class. They may even try out the solution proposed. This is a project too, but not a creative one (Sönmez, 2007).

As stressed above, the project technique is one of several techniques used in learning environments. In order to employ this technique successfully, students must have acquired desired behaviours in terms of building on existing information and grasping the essence of the area that is being worked on. Hence, before starting any project work, students must learn the concepts, principles and interrelations specific to the problem area (Sönmez, 2007; Gözütok, 2006; Erdem, 2002; Erdem & Akoyunlu, 2002; Cunha, 2005; Curtis, 2002; Grant, 2002).

In a sense, the project technique encompasses a process of scientific work (Yıldız, 2004; YonRu, 2005; Yurtluk, 2005). This scientific work may also involve techniques such as problem solving, decision making and brainstorming. According to Dewey, a scientific study can be defined a process involving problem identification and delimitation, establishing and testing experiments as well as accepting, rejecting or rectifying the findings (Dewey, 1933). Being aware of and delimiting a problem is the first step taken in a scientific study. In this step, indicators that point out the unique nature of the problem and its nature can be observed and identified. In other words, the very nature of the problem must be laid down. This is the process of distinguishing a specific problem from others. Next, the boundaries of the problem can be drawn. These boundaries should be drawn in such a way as to encompass all features of the selected problem, neither too narrow nor too large. If this step is taken correctly and in line with the characteristics of the problem, then a solution may come more easily.

In the context of the project technique, identifying the problem and drawing appropriate boundaries for it is the most important step (IISCM, 2006; Intel, 2004; Katz, 1994; NASA, 2006). Students must first be taught how to identify the problem and draw its boundaries. For this, they may be asked in classroom environments to identify problems related to their field of work. In this activity, techniques such as discussion, decision making and case study may be employed. Students may be asked to list which problems exist in relation to the theme, unit or subject under discussion and responses may be written on the board. The class or the group may then discuss their problems and draw their boundaries. The teacher must assume a guiding role in these activities and, when necessary, make warnings, but should never tell children what she or he thinks are relevant problems.

Groups identified may then start working on a project related to the known solutions. This work may be practical. Practice oriented work may be given priority to make it easier for students to learn about and get accustomed to project work (Sönmez, 2007), but things should not stop there. There is need to step into creative project work in order to help students reach targets at synthesis level.

Creative project work must satisfy at least three criteria: 1. The solution should be other than what is already known. In other words, the solution developed should be

entirely new, not thought of or implemented thus far. This means novelty and originality. For example, the solution “rising and then settling buildings” in relation to earthquakes is new and original. 2. Original and new solutions should be developed by a student or group of students in the class. 3. The solution found through the project technique should be such that it can be developed and presented by student(s) appropriately in a given time period. The period could be the whole school year or a semester.

Following the development of a specific solution, the group may elect a chair, vice-chair and a secretary, and may develop a division of work and a time schedule. This work may be conducted under the supervision of the teacher. The teacher should supervise and assess activities according to this plan. The where, when and to whom the project is to be presented and by whom it is to be evaluated must be set in advance (Regie Stites of SRI, 1998; Frank & Barzilai, 2004)

According to Sönmez (2007), when planning for education through the project technique, the following points (which may help in effective use of the technique) must be observed:

1. Achievements must occur at practice level at least, and there must definitely be an achievement at the synthesis step. Groups of students may focus on achievements either at the implementation-practice level or the synthesis level.

2. A critical question must be raised after earmarking achievements. This question must be related to the problem. Examples include “can world peace be sustained?”, “could there be an infinite source of energy?”, “can the environment be kept clean all the time?” or “could there be eternal life for human beings?”

3. There must be clarity on the content, structure and presentation of the final report. The project technique can be taken up in terms of both outcome and process. In this case, students must be aware of criteria relating to both outcome and process. Outcomes can be a scientific report, an investigation document, a drama, a poster, a picture, a poem, etc. Students need to determine how they are going to present their project and must be equipped accordingly. If a scientific report is required, then relevant scientific criteria must be observed (Sönmez, 2007).

4. The teacher or evaluators must set the criteria by which projects are to be assessed and a team of criteria must be organized. It must be made clear what to look for and refer to in each and every step. These must be announced in advance to groups (Sönmez, 2007).

5. Sub-problems must be identified. In this step, other works needed to solve the problem must be identified. The problem must be decomposed to its parts and an inductive inference must be made.

6. A time scale must be drafted for the project. This timeline may not be shorter than a semester. In a table, rows may include works to be done and time periods may be entered in columns. Assessors may evaluate the process and outcome by referring to this table. Students in groups should know what to do and when to do it by looking at this table. The table may show the way to proceed. They must submit their

work to assessors or teachers in due time. This is important to ensure a just assessment. Timetables must be drafted jointly by the teacher, students and experts. Except for valid reasons such as sickness or death, no compromise should be given from the original time table (Sönmez, 2007).

7. All sources related to the problem to be solved must be identified. If there are experts around, their opinions must be solicited and relevant websites must be searched. After having solicited the opinions of teachers and experts, books and articles must be gone through and data relevant for this step must be collected.

8. It must also be made clear how to organize and present data obtained. This organization must be made by students themselves. Sönmez (2007) suggests the following procedures for this:

- a) A concept analysis must be made. This process should proceed from general to specific. The writing sequence should start from the most general concept and then move down to specific aspects.
- b) Quotations should be relevant and used properly.
- c) Examples should be given.
- d) Passage from one paragraph to the next should be logical and fluent.
- e) The material should be supported by relevant charts, figures, photographs, pictures, etc.
- f) Remarks should be authentic.
- g) New solutions should be suggested.
- h) Justification and feasibility of new solutions should be given.
- i) There should be no faults and mistakes in terms of information provided as well as phraseology and spelling. (p.127)

An assessment can be made by referring to what is stated above. The final score obtained from these assessments will be the project score of the student or the group. Such an approach may yield a more reliable and valid outcome (Sönmez, 2007; Regie Stites of SRI, 1998; Frank & Barzilai, 2004). In this technique, first the necessary conditions must be satisfied. Then the class will be informed about how to use the technique. Another advantage of the project technique is that it builds confidence in students and helps them socialize and enter into good communication with others equipped with a will to be successful. (Sönmez, 2007; Gözütok, 2006; Moursund, 1999). The project technique may help to impart advanced level cognitive, affective and psychomotor skills. New and original ideas and products may be achieved. The creative project technique may lead to high level achievement. Students may build self-confidence, and this is indeed an important achievement. Furthermore, students may also be able to learn how to use their time effectively. In our present education system, however, these activities are often assigned as homework, which is mostly done by adults (including parents and close relatives) and students get grades without making any effort at all (Sönmez, 2004; Gözütok, 2006).



How did the delivery of the course through the project technique affect students in terms of their cognitive and psychomotor achievements and their ideas on the affective domain?

1. The cognitive achievement level of the group involved in the project technique was significantly higher than the other group's.
2. The achievement level of the project technique group in terms of synthesis and psychomotor skills was significantly higher than the other group's.
3. The ideas of the project technique group in relation to the affective domain were significantly higher than the other group's.

## Method

### *Research Design*

The survey was based on quantitative and qualitative survey methods and semi-structured interview techniques. Two classes from Grade 5 of a MoNE (Ministry of National Education) were randomly selected. These groups were made equivalent in terms of test scores on 15 questions relating to the content of "Dreams Realized", age, sex, report card grades in social studies and a 100 points project assessment scale. The groups were assigned as experimental and control groups. The survey was conducted in relation to the content "Dreams Realized" in the spring term of the school year 2006-2007 and lasted for a term. The course was delivered through the method of project-based learning in the experimental group while the existing programme was used in the control group, both of which were asked to conduct work on the topic throughout the term. Guided discussion, decision making, case study, problem solving, drama methods and techniques were used in both groups. In addition to these, in the experimental group, project technique through brain storming had sent on an errand in learning behaviours on the synthesis level.

### *Population and Sample*

There was no universe definition or sampling; working groups were selected instead. Two classes were selected from the 5<sup>th</sup> grade of a basic education school in Ankara. The number of students from these two classes was 42 (21 + 21). Experimental and control groups were equated in age, gender, average report card grades in social studies for the first semester and cognitive area pre-test score average fields.

### *Data Analyses*

Qualitative data were collected through a semistructured focus group interview consisting of five questions (two of which were descriptive questions) and video recording. Opinions of three experts were solicited on the validity of the five questions. The reliability value of the interview form was found to be .73. A project evaluation form and portfolio were used to evaluate the projects of the experimental group. Again, opinions of three experts were solicited on the validity, and the form's reliability was found to be .84. Cognitive achievement levels of the students on synthesis and psychomotor skills were determined with a project evaluation form. Moreover,

the study benefited from video records in scaling psychomotor skills. The items of the scale can be seen in Table V. Fifteen questions used for the cognitive success test were determined with a reliability study, and the reliability factor was found to be .79 through K.R.21. Application level achievements of students were calculated with this test.

### *Statistical Analysis*

For qualitative data, the opinions of students were taken. Students' answers were combined and commented. Furthermore, the study benefited from video records made while commenting. For quantitative data, an independent "t" test was employed to test differences between the groups. In the evaluation of the psychomotor domain (process and outcomes), products by students were evaluated by three experts using a form designed for this purpose.

## **Findings and Results**

### *Pre-test Scores of Groups*

Table I gives information relating to the pre-test scores of groups.

**Table 1**

*Average Scores of Groups in Cognitive Domain Pre-tests and t Tests*

Groups	N	Pre-test x	S	T
Experimental	21	3.1	1.72	.20
Control	21	3.2	1.73	

As can be seen in Table I, the pre-test scores of groups in the cognitive domain are 3.1 and 3.2 respectively for the experimental and control groups. There is no significant difference between the pre-test scores of groups in the cognitive domain.

The average report card grades of students in social studies for the first semester are given in Table II.

**Table 2**

*First Term Report Card Averages of Groups and t-Test scores*

Groups	N	Report card score x	S	T
Experimental	21	4.3	.68	.51
Control	21	4.2	.70	

The report card grades in social studies for the first semester are 4.3 and 4.2 for experimental and control groups, respectively. No significant difference was found

in these average scores and it can thus be said that groups were on equal footing in this regard.

To find out if there was a meaningful difference between the groups' gender distribution and average age, a "t" test was used for average age and a "t between percentages" test for gender distribution.

Age and gender information regarding the groups are given in Table III.

**Table 3**

*Age and Gender Data of the Groups*

Groups	N	Female	Male	Age=months x	S	T
Experimental	21	12	9	136.8	2.9	.70 =Age
Control	21	11	10	137.4	2.7	.006 Cin

There were 12 female and 9 males students in the experimental group while these figures were 11 females and 10 males in the control group. There is no significant difference between the groups in terms of age and gender distribution.

*Findings Related with First Hypothesis*

Table IV gives pre- and post-test average scores of the two groups in social studies.

**Table 4**

*Cognitive Domain Pre- and Post-Test Average Scores of Groups in Social Studies and t Tests*

Groups	n	Full Score	Pre-test x	Post-test x	Achievement x	S	Difference in achievement between experimental and control groups x	T
Experimental	21	15	3.1	12.7	9.6	1.6	6.40	13.46
Control	21	15	3.2	6.4	3.2	1.2		

As can be seen in Table IV, there is a significant difference between the groups in terms of their pre- and post-test achievement scores. In this context, the average

achievement score in the cognitive domain of the group with which the project technique was employed is significantly higher than that of the other group. Based on this finding, it is possible to state that the project technique is effective in ensuring the achievement of targets in the cognitive domain.

#### *Findings Related with the Second Hypothesis*

Tables V and VI show the average pre- and post-test scores of groups with respect to the assessment scale on outcome and process in social studies project work.

**Table 5**

*Pre- and Post-Test Score Averages of Groups in Social Studies Detailed Project Work*

	Full Score	N	Experimental Pre-test X	Experimental Post-test X	Control Pre-test X	Control Post-test X
Problem identification	5	21	.2	4.2	.2	.2
Planning for research and investigation	5	21	0	4.3	0	0
Suggesting a new and original solution	30	21	0	20.9	0	0
Examining ways of solution already known	15	21	7.1	12.4	7.1	8.6
Preparing materials and tools, finding and reading relevant sources	15	21	0	13.4	0	0
Collecting, analysing and interpreting data	20	21	0	15.5	0	0
Drafting and submitting the report	5	21	0	3.8	0	0
Working with classmates, teachers and experts	5	21	0	4.2	0	0
Total	100		7.3	78.7	7.3	8.8

Evaluation was made over 100 points for 8 items. Both control groups got 7.3 points from the pre-test. The experimental group got 78.7 and the control group got 8.8 from the post-test.

**Table 6***Pre- and Post-Test Score Averages of Groups in Social Studies Detailed Project Work and t-Tests*

Groups	N	Full Score	Pre-test x	Post-test x	Achievement x	S	Achievement between experimental and control groups	t
Experimental	21	100	7.3	78.7	71.4	8.6	69.9	36.87
Control	21	100	7.3	8.8	1.5	.52		

Table VI shows that there is significant difference between the groups in terms of pre- and post-test scores related to social studies course synthesis and psychomotor domains. According to the findings, the project work achievement score of the group with which the project technique was employed is significantly higher than that of the other group. Based on this, it can be said that the project technique is more effective in attaining higher levels in terms of synthesis and psychomotor domains.

#### *Findings Related with the Third Hypothesis*

The feelings of the group using the project technique in relation to the affective domain were gathered and interpreted through semi-structured group interviews.

*Did students enjoy working on the course through the project technique?* All 21 students in Class 5/C involved in the project technique gave positive responses to this question. The control group, on the other hand, stated no opinions. Responses from students in the experimental group are given below in summary and after making some minor grammar corrections:

*We were not used to working like this before. I used to go to science festivals and examine projects exhibited there. I asked how they did these, but responses I got didn't satisfy me. Speaking the truth, I didn't believe that these projects were actually developed by their stated authors. In my recent course, however, I found a project to work with on my own. And I enjoyed it.*

*Responsibility is crucial in this method. When we first formed a group we didn't actually know what to do. Then we decided what to do and when. At the beginning I thought, "they will do it and I'll just observe them", but it didn't turn out like that. They assigned me a responsibility. I was embarrassed when my friends told me what they were doing and how. So I decided to join in. I realized that it was nice to investigate and work along these lines. It was also rewarding to have interviews with some university academicians. I was so much impressed, it was nice to talk with them. I decided to be an academician; I was impressed by science labs. I was impressed by those academics I consulted during the project work. We, five students had on us the spell of what they said. It is nice to work collectively on something.*

It is clear from these comments that all students enjoyed the project technique. The division of work while preparing the project, consulting others' opinions and each member's commitment to fulfil his/her task are all factors that contribute to building self-confidence. Self-confidence is an important feeling. In fact, a person with self-confidence can tackle his/her work easier and overcome emerging problems better. This is actually what students stated. They were self-confident, they stuck with their project, they finished and delivered it in time. Appraisal of their work and support given by others may have motivated them (Bartscher, Gould & Nutter, 1995). In fact, they stressed this in their comments. The project technique may have influenced even some students' preference for future professions or jobs.

*In what ways does the project technique differ from other ways of studying/receiving a course?* All students in Class 5/C involved in the project technique said it was "very different." The project technique encompasses a process of learning and teaching that imparts high-level skills of reflection. In this technique, the student is actively involved. The teacher just gives the rules and principles relating to the work to be done and its timeline. He/she observes and ensures that the technique is employed in compliance with these rules. In this sense it differs widely from other techniques. It can sustain collective work by students; it can ensure its accomplishment, active participation and production. It can also establish linkages to all other courses. Responses of students in this regard are summarized below:

*In this technique we made everything, leaving aside some assistance from others. We made the decisions. There were some disputes, but we solved them. I liked consulting with other people. Our work was fully collective.... In other techniques we were not developing thoughts in the class.... The crucial part of the project technique is related to developing original thoughts.... This doesn't exist in other techniques.... In others, teachers lecture.... teachers solve and we do what is left out. It is different in this technique.*

Looking at these comments and responses it is clear that students stress developing thoughts in the class and the difference of the technique from others. The technique is also characterised by its requirement of working within a plan and time-frame and this point was stated by students. In fact, the project technique ensures the active participation of students in education environments, as well as the development of creative skills in thinking and collective work. Students stressed that they used computers to access information while surveys conducted actually confirm this statement (Özdener & Özçoban, 2004; Aşan & Haliloğlu, 2005).

*In what ways was the project technique useful for you? (Which feelings, thoughts and skills did it improve, and how?)* All students in Class 5/C involved in the project technique responded that the technique improved the following skills: Working and deciding together and complementing each others' work; taking responsibility; communicating; developing new ideas. The project technique may be effective in imparting desired behaviour in cognitive, affective and psychomotor domains. It may help students trust in themselves and their classmates. Further, it may help students share information, skills and feelings; raise the intellectual abilities and creative power of students; and enhance motivation and attitudes for learning (Demirel, Başbuğ, Uyangör & Bıyıklı,

2006; Gökmen, 2003; Yurtluk, 2003). These are indeed what students stressed in their comments:

*Now I have more confidence in myself.... I made up my mind to engage in science. I understand that I can work with my friends. Friendship is a good teacher.... So you need to consult from time to time with elders and well-informed people. I see that not all people think alike. During this work I had no fear and I didn't get bored. There were some debates with friends, but we overcame them together. This enhanced my trust in my friends. My parents and elders liked this technique too. And my teachers too said they learned a lot from the project technique.*

Basing on the comments given above it is possible to say that the project technique was effective in equipping students with advanced behaviour in the affective domain. It should be noted that in this technique students themselves found ways of resolving conflicts that emerged during the process. This is an important educational achievement. The identification of problems by students themselves and their collective solutions to these problems are essential elements in the affective, psychomotor and cognitive domains. In this way and through built-in consolidators, the student is able to exhibit a positive feeling towards achievements. Students add that there are positive changes in the thinking and feelings of their parents and teachers as well. Hence this technique might have influenced the thinking and feelings of these parties too (Moss & Duzer, 1998; Holst, 2003; Howard, 2002).

### **Conclusion and Recommendations**

According to the data, students stress that the project technique improved their creativity; equipped them with advanced information and skills; enhanced their joint work and cooperation with classmates; and that working in groups brought out and consolidated mutual trust and friendship. They learned by experience how important it is to plan work and accomplish it in a given time. Furthermore, students' success in finding new and original solutions to stated problems in classroom environments and without outside help and their translation of these solutions to actual practice are all significant achievements. It is expected that these achievements should be realized in education, and the project technique made this happen. In focus group discussion students said, "It is nice to do something together; I liked the project technique." This suggests that students actually developed interest in the technique and enjoyed it. In this respect, it is possible to say that the technique also serves the affective domain. Building models related to the project, drafting reports, developing new thoughts collectively and using teamwork are the cognitive, affective and psychomotor skills targeted for acquisition through this technique (Ravitz & Thorsen, 2004; Sabag, 2002; Soloman, 2003; Thomas, 2000; Ladewski, Krajcik & Harvey, 1994).

It was also found that delivering courses using this specific technique was to the enjoyment of students who found it different than other techniques. In fact, it was found that the technique was effective in enhancing communication, sharing and developing teamwork, and in significantly improving achievements in the affective, cognitive and psychomotor domains.

#### **Suggestions**

Based on the findings of the survey, the following suggestions can be made:

#### **A. Suggestions for teaching**

Teachers may be given in-service training on delivering courses using this technique. While working with a course with this technique, attention must be paid to ensure that original thought is developed within the class itself. By establishing connections between the project technique and daily life students can be motivated further. Individuals more sensitive to the problems of the country can be trained by materially and morally supporting those who come up with original projects. For tangible outcomes in this regard, contacts can be established with the TÜBİTAK and universities.

#### **B. Suggestions for further studies**

New and comparative studies can be conducted to explore the interests of students in this technique in different courses, grades and schools. Wider samples can also be taken.

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## Proje Temelli Öğrenmenin Etkililiği

### (Özet)

*Problem durumu:* Eğitim ortamında kazanımları öğrencilere mal ettirmek için pek çok teknik kullanılmaktadır. Bunlardan biri de proje tekniğidir. Proje tekniğinin üst düzey davranışların kazandırılmasında etkili olduğu söylenmektedir. Ayrıca bu teknikle duyuşsal alanla ilgili birlikte çalışma, bilgi, beceri ve duyguyu paylaşma da kazandırılabilir. Yurtiçi ve yurtdışında yapılan araştırmalar bu yargıları desteklemektedir. Proje tekniğinin en önemli özeliği, yaratıcı düşüncenin sınıf ortamında öğrenci ya da öğrencilerce oluşturulmasıdır. Eve ödev olarak verilince anne, baba, ağabey, tanıdık ve dostlar tarafından yaratıcı düşüncenin oluşturulması olasılığı bizim gibi ülkelerde baskındır. Bu durumda proje tekniğinin amaçladığı üst düzey kazanımlar gerçekleşemez. Tersine hazır konan, başkasının sırtından ve yaptıklarından geçinen, asalak tipler yetiştirilir. Proje tekniğinde hem ürün, hem de süreç açısından çalışmalar değerlendirilmelidir. Bu çalışma da proje tekniğinin ilköğretim 5. sınıf öğrencilerine bilişsel, duyuşsal ve devinişsel alanlarda neler kazandırdığı araştırılmak istenmiştir.

*Araştırmanın amacı:* Proje tekniğiyle ders işlemenin öğrencilerin bilişsel, duyuşsal ve devinişsel alanla ilgili görüşlerini anlamlı derecede etkileyip etkilemediği araştırılmak istenmiştir. Birinci amacı proje tekniği ile ders işlenen grubun bilişsel erişimi düzeyi, işlenmeyen grubunkinden anlamlı derecede daha yüksek olduğu, ikinci amacı proje tekniği ile ders işlenen grubun sentez ve devinişsel erişimi düzeyi, işlenmeyen grubunkinden anlamlı derecede daha yüksek olduğu, *son amacı ise* proje tekniği ile ders işlenen grubun duyuşsal görüşlerinin, işlenmeyen grubunkinden anlamlı derecede daha farklı olduğu araştırılmak istenmiştir.

*Araştırmanın Yöntemi:* Bu araştırmada, nicel ve nitel araştırma yöntemleri ile yarı yapılandırılmış görüşme tekniği kullanılmıştır. MEB bağlı Ankara'da bir ilköğretim Okulu 5. sınıflarından iki şube random yoluyla belirlenmiştir. Bu gruplar, Gerçekleşen Düşler içeriği ile ilgili olarak hazırlanan uygulama düzeyindeki 15 sorudan oluşan test puanları, yaş, cinsiyet, sosyal bilgiler dersi karne notları ortalamaları, yüz puanlık proje değerlendirme ölçeği puanları açısından denkleştirilmiştir. Gruplar deney ve kontrol grubu olarak atanmıştır. Araştırma 2006-2007 öğretim yılı bahar dönemi Gerçekleşen Düşler içeriği ile ilgili olarak yapılmış ve bir dönem sürmüştür. Deney grubunda projeye dayalı öğrenme, kontrol grubunda ise mevcut programa göre ders işlenmiş ve onlardan da bir dönem boyunca bu konuyla ilgili çalışmalar yapmaları istenmiştir. Beş sorudan oluşan yarı yapılandırılmış grup görüşmesi ve video kayıtları ile veriler toplanmıştır. Verilerin toplanması için hazırlanan görüşme formunun kapsam geçerliği ile projeye ürünlerinin değerlendirilmesi konusunda uzman görüşleri alınmıştır. Görüşme formunun güvenilirliği .73; proje değerlendirme formununki ise, .84 bulunmuştur. Bilişsel alanla ilgili ise, uygulama düzeyinde 15 soru hazırlanmış ve güvenilirlik katsayısı K.R.21 ile .79 hesaplanmıştır. Araştır-

mada nitel veriler için öğrencilerin görüşleri alınmıştır. Nicel veriler için ise, gruplar arası farkın test edilmesinde kullanılan bağımsız "t" testi işe koşulmuştur. Devinişsel alanın (süreç ve ürünün birlikte) değerlendirilmesinde ise, öğrencilerin ürünleri üç uzman tarafından proje değerlendirme formu kullanılarak yapılmıştır.

*Araştırmanın Bulguları:* Proje tekniğinin kullanıldığı grubun bilişsel alan erişimi ortalaması, kullanılmayan grubun bilişsel alan erişimi ortalamasından anlamlı derecede daha yüksek bulunmuştur. Bulgulara dayanarak proje tekniğinin bilişsel alanın uygulama düzeyindeki hedeflerini kazandırmada etkili olduğu söylenebilir. Grupların sosyal bilgiler dersi sentez ve devinişsel alan öntest ve sontest erişimi ortalamaları arasında anlamlı bir fark vardır. Bu verilere göre proje tekniğinin kullanıldığı grubun proje çalışması erişimi ortalaması, kullanılmayan grubun erişimi ortalamasından anlamlı derecede daha yüksektir. Bulgulara dayanarak proje tekniğinin sentez ve devinişsel alanın üst düzey hedeflerini kazandırmada etkili olduğu söylenebilir.

Öğrenciler proje tekniğinin, yaratıcılıklarını arttırdığı, üst düzey bilgi, duygu ve becerileri kazandırdığını, arkadaşlarıyla ortaklaşa çalışmayı ve işbirliğini geliştirdiğini; çalışma sırasında gruplara ayrılmanın arkadaşlarıyla yakınlaşmayı, güven ve dostluğu sağladığını vurgulamışlardır. Bir işi planlamanın ve zamanında yapıp ortaya koymanın ne denli önemli olduğunu yaşayarak öğrenmişlerdir. Ayrıca öğrencilerin sorunlara sınıf ortamında kimseden yardım ve destek almadan yeni ve özgün görüş oluşturması, bunları yapıp gerçekleştirmeleri üst düzey kazanımlardır. Eğitimde de bu üst düzey kazanımların gerçekleştirilmesi beklenir. Proje tekniği bunu sağlamıştır. Öğrenciler yarı yapılandırılmış grup görüşmesinde "Birlikte iş yapmak çok hoş. Her ders proje yapsak ne güzel olur öğretmenim. Biz daha önce başka tekniklerle de ders işlemiştik; fakat bu farklı... Beni etkiledi... Evdekiler bile etkilendiler... Kızım bilim kadını olacak dedi babam. Bu çok hoşuma gitti. Herkes çalışır, ben geçinirim dedim başta. Fakat öyle olmadı. Bana da görev verdiler. Yaptıklarımızı yazacaktım. Nelerin yapıldığını ve bilhassa nasıl yapıldığını anlattıkları zaman utandım. İşin içine ben de katıldım. Baktım ki çok güzel böyle incelemek, araştırmak. Hele görüşme yapmak. Bazı üniversite hocalarıyla görüşmeye gittim arkadaşlarla. Beni çok etkiledi. Onlarla konuşmak ne güzel... Anlatamam. Karar verdim üniversite hocası olacağım. Laboratuvarlar beni etkiledi. Proje sırasında danıştığım bilim adamları beni etkiledi. Biz beş kişi onların sözleriyle adeta büyüledik. Birlikte iş yapmak çok hoş. Sevdim proje tekniğini." diyerek görüşlerini belirtmişlerdir. Tüm bu verilere dayanarak öğrencilerin proje tekniğini sevdikleri ve hoşlandıkları söylenebilir. Böylece duyuşsal alana da hizmet ettiği savunulabilir. Projelerin maketlerinin hazırlanması, raporlarının yazılması, yeni görüşlerin birlikte oluşturulması, ekip halinde çalışılması bu teknikle kazandırılan bilişsel, devinişsel ve duyuşsal hedeflerdir.

*Araştırmanın Sonuçları ve Önerileri:* Bulgulara dayanarak proje tekniğinin bilişsel alanın uygulama düzeyindeki, sentez ve devinişsel alanın üst düzey

hedeflerini kazandırmada, öğrencilerin proje tekniğini sevdikleri ve hoşlandıkları söylenebilir. Böylece duyuşsal alana da etkili olduđu söylenebilir. Öğretmenlerin hizmet içi eğitimden geçirilerek bu teknikle ders işlemleri sağlanabilir. Bu teknikle ders işlenirken, özgün düşüncenin sınıfta üretilmesine dikkat edilmelidir. Proje tekniğinin günlük yaşamla ilişkilendirilmesiyle öğrenci motive edilerek derse ilgisi arttırılabilir. Özgün proje ürünlerinin bu ürünleri maddi ve manevi olarak desteklenerek, ülke sorunlarına daha duyarlı bireyler yetiştirilebilir. Bunun için TÜBİTAK ve Üniversitelerle ilişki kurularak, daha tutarlı sonuçlar elde edilebilir. Değişik ders, sınıf ve okul düzeyinde proje tekniğine karşı öğrencilerin ilgilerini belirleyen yeni karşılaştırmalı araştırmalar yapılabilir. Daha geniş bir örneklem üzerinde çalışılabilir.

**Anahtar sözcükler:** Proje tekniğı, erişi, öğrenci görüşü, yarı yapılandırılmış grup görüşmesi

## School Administrators' Perceptions of their Roles Regarding Information Technology Classrooms

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### Abstract

*Problem Statement:* It is a well-documented fact that school administrators have a crucial role in the integration of information and communication technology (ICT) in education and in the effective and efficient use of ICT for educational purposes. In the Turkish educational system, school administrators have important roles and duties regarding the integration of information technology (IT) classrooms (which are established through the Basic Education Project) for instruction and learning, for the utilization of the equipment in those classrooms, and for the utilization of those equipment in the classes by the community. The question arises, how do school administrators perceive their own roles regarding information technology classrooms? And what influences those perceptions?

*Purpose of the study:* This study aimed to determine how the school administrators themselves perceive their roles regarding information technology classrooms, and whether school administrators' levels of perception differ according to their gender, education, amount of in-service training in which they participate, job experience, and level of computer ability.

*Data Collection and Analysis:* Data was collected through an instrument developed by the researchers. After the validity and reliability study of the instrument, the instrument was sent to all primary school administrators whose schools have IT classrooms in Ordu province to determine the perceptions of school administrators of the Ordu province regarding their roles in IT classrooms. Of those administrators, 100 completed the instrument and returned it to the researchers. The mean scores and the standard deviation were computed. To analyze the data, the Mann-Whitney U-Test and Kruskal-Wallis tests were employed.

*Findings:* The dimensions of the roles of administrators regarding IT classrooms are staff development, communication, facilitator, maintenance

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of the infrastructure, ergonomics, supervision, leadership, public relations, mentoring, empowerment, and ethics. There was no significant difference in the mean scores of the perception levels of school administrators according to their gender, employment, education, job experience, amount of in-service training in which they participated, and perceived computer ability.

*Recommendations:* It is suggested as further study that the relationship between school principals' perceptions of roles regarding IT classrooms and their realization level should be investigated.

**Keywords:** School principals, Information Technology Classrooms, Perceptions, Basic Education Programme.

Technology is not solely responsible for effective instruction and learning in educational organizations. To increase the effectiveness of instruction by using technology, it should be used appropriately and effectively. Flecknoe (2002) claims that with information and communication technology (ICT), the traditional "Three R's" have changed into the new "Three R's": Raising Achievement, Reducing Bureaucracy and Reducing Exclusion. Flecknoe (2002) says that the current use of ICT in schools focuses on assisting pupils to achieve more by studying more effectively, and by reducing bureaucracy for teachers. There is also potential for the inclusion of more pupils who are presently excluded from education (p. 29). To integrate ICT in schools and best utilize it, school principals have important roles, especially in their leadership role view (Rockman & Sloan, 1993; Bailey, 2000; Akbaba-Altun, 2000; Turan, 2002; Flanagan & Jacobsen, 2003).

Current research confirms that school leaders have important roles in integrating ICT into education (see Micheal, 1998; Bailey, 2000; Schiller, 2003; Flanagan & Jacobsen, 2003; Quinn, 2003; Anderson & Dexter, 2005; Brockmeier, Sermon, Hope, 2005; Akbaba-Altun, 2006; Toprakçı, 2006). According to Bailey (2000), school administrators who consider themselves technological leaders should know about change, teaching/learning, staff development, planning, safety and security, infrastructure, ethics, curriculum, technology support and leadership as technological leaders. Expanding the need for technology responsibilities, the Collaborative for Technology Standards for School Administrators (TSSA) suggests that school administrators adhere to the following (2001, pp. 6-7):

- "Inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision.
- "Ensure that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching.
- "Apply technology to enhance their professional practice and to increase their own productivity and that of others.
- "Ensure the integration of technology to support productive systems for learning and administration.

- “Use technology to plan and implement comprehensive systems of effective assessment and evaluation.
- “Understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues.”

According to Flanagan and Jacobsen (2003), the arrival of digital technologies in schools has impacted the roles and responsibilities of principals in significant ways. In addition, Schiller (2003) stated that school principals are responsible for getting started using ICT in education in schools and for creating a climate for using ICT in instructional and administrative practices. Therefore, it would be fair to claim that since technology has a great impact on school principals’ daily routines, the principals should take a lead in the integration of technology in education. But how about the school administrators’ roles regarding integrating ICT in education?

In her study, Akbaba-Altun (2004) explored elementary school principals’ roles regarding IT classrooms. Her findings indicate that school principals have important roles in public relations, ethics, planning, facilitation, communication, leadership, supervision, coordination, staff development, empowerment, and security. Anderson and Dexter (2005) further assert that it is the school leaders who explicitly or implicitly propose administrative oversight for educational technology. In their research, Anderson and Dexter (2005) found that technology leadership has a greater influence on desired outcomes than does technology infrastructure and expenditure. Similarly, Akbaba-Altun (2006) concluded that integrating technology is not an investment only in infrastructure and other expenditures but also a matter of human resource management.

Brockmeier, Sermon, and Hope (2005) assert that achieving the promise of technology requires leadership with vision and expertise. According to these researchers, school principals need to use technology to accomplish tasks and facilitate its integration into teaching and learning. Once this threshold is maintained, the authors urge school principals who are not experts in technology leadership to consider the following as their responsibilities:

- (a) Become familiar with the capabilities of various technology devices;
- (b) Be able to use an array of technologies;
- (c) Understand how technology can be applied to teaching and learning; and
- (d) Become an enabler, one who promotes technology use as a user, collaborator, and facilitator.

The authors further add that while this expertise is absent in principal’s repertoire, the promise of technology in education remains in the distance.

In addition to instructional and administrative roles and responsibilities, Nance (2003) warns school administrators about other issues including pornography, computer acceptable use policies, freedom of expression online, equitable access to technology, privacy, digital copyright, and censorship. Similarly, Quinn (2003) points out that school leaders need to be mindful of these emerging legal conditions and



understand the importance of professional development training for educators on technology and the law.

In the Turkish educational system, school administrators have important roles and duties regarding the integration of IT classes, which are established through the Basic Education Project. These roles are related to instruction and learning, the utilization of the equipment in those classes, and the utilization of those classes by the community. In practice, these roles were explored by Akbaba-Altun (2004), who found that Turkish elementary school principals' self-reported IT classroom-related roles were facilitation, staff development, and communication. On the other hand, the expected roles for Turkish elementary school principals were leadership, supervision, communication, staff development, planning, coordination, public relations, ethics and security. Akbaba-Altun (2004) cautioned that in order to fulfill these crucial roles and duties, school administrators should be acknowledged and empowered. In her qualitative study, Akbaba-Altun (2004) concluded that there is a need for further study to discover how school principals perceive their IT roles. Therefore, the purpose of this study is to explore how school administrators perceive their roles regarding information technology classrooms. Whether school administrators' levels of perception differ according to their gender, education, the amount of in-service training in which they participated, job experience, and level of computer ability was also examined.

## Method

### *Participants*

110 school administrators from the Ordu province whose schools have IT classrooms were chosen to participate in this study. Of those 110, 100 returned the survey. As seen in Table 1, most of the school administrators were male (95 %), and assistant principals (66 %). As to participants' job experience, 34 % of them had worked as administrators for 1 to 5 years. In addition, more than half of them (56 %) had graduated from a faculty. Of the respondents, 43 % of them had not participated to any in-service training about the use of ICT in education. Finally, most of the administrators (73 %) perceive their own computer literacy skills to be at the intermediate level.



### *Data Collection*

Data were collected using a survey titled, "Questionnaire of School Administrators' Perceptions of Roles Regarding Information Technology Classrooms" which was developed by the researchers.

*Development of the survey.* The questionnaire employed in the study consisted of two parts with a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The first part included five statements regarding participants' demographic information. The second part consisted of 59 items chosen to determine the roles of school administrators regarding IT classrooms.

The development of this scale was based on Büyüköztürk's (2005a) propositions about instrument development phases. First, the research problem was determined. After that, the items were written within 11 dimensions with a 5-point scale. In order to determine the content validity of the items and the draft of the instrument, faculty from both Computer Education and Instructional Technologies, and Educational Administration examined the items and the instrument. From 99 initial draft items, the instrument was decreased to 85 items. Lastly, with random sampling, one region from each geographical region of Turkey was selected. The researchers posted the instruments to 316 primary school administrators for the pilot study. At the end of the pilot study, the instrument validity and reliability were calculated.

To define the factor structure of the instrument, factor analysis was conducted. The factor analysis deduced 11 factors for the instrument. The confirmatory factor analysis using LISREL software also revealed 11 factors for the instrument. The total number of items in the finalized instrument was 59. The Cronbach's alpha coefficient of the instrument is  $\alpha = .94$  with the following dimensions and their Cronbach's alpha coefficients: staff development (.90), communication (.84), facilitator (.84), maintenance of the infrastructure (.85), ergonomics (.80), supervision (.75), leadership (.85), public relations (.79), monitoring (.63), empowerment (.74), and ethics (.71).

### *Data Analysis*

The mean and the standard deviation scores were computed for each subscale and the overall questionnaire. To understand whether the groups' scores are distributed normally, first, the Shapiro-Wilk normality test was applied to each subgroup. It was observed that the scores of each subgroup violated the normality assumption. Therefore, it was decided to apply non-parametric tests (Büyüköztürk, 2005b). The Mann-Whitney U-Test was conducted to determine whether there was a significant difference between the mean scores of males and females, principals and assistant principals, and school administrators' levels of education. In addition, the Kruskal-Wallis test was employed to reveal whether the mean scores differ according to the amount of in-service training they attended, their job experience, and their perceived computer ability levels.

## Findings

The findings regarding the perceptions of school administrators on their roles regarding IT classrooms are presented below.

### *Staff Development*

School administrators have certain roles in regard to the effective use of IT classrooms. These roles are (a) to elect computer coordinators according to certain criteria, (b) to provide the necessary conditions to train them, and (c) to take measures to ensure that other content area teachers also make use of these classrooms. School administrators' staff development roles are presented in Table 2.

**Table 2**

### *Staff Development Factor*

Item No.	Item	$\bar{X}$	sd
1	The administrator takes into consideration the criteria while selecting the computer coordinator	4,75	,54
52	The administrator provides opportunities for professional development	4,66	,63
50	The administrator guides the computer coordinator regarding regulations	4,64	,68
54	The administrator plans for the utilization of IT classes by community	4,46	,93
55	The administrator plans for the professional development of the teaching staff	4,63	,60
57	The administrator provides coordination between the computer coordinators and other teachers	4,77	,57
56	The administrator supervises programs regarding the IT classrooms	4,71	,61
53	The administrator makes arrangements for the effective use of IT classrooms	4,72	,64
49	The administrator strives to provide in-service training about the integration of computers into education	4,66	,64
	Total	4,66	,65

Table 2 indicates that school administrators perceive the role of enhancing the coordination between the computer coordinators and other teachers at the highest level. On the other hand, they perceive the role of planning for the utilization of IT classrooms by community at the lowest level.

### Communication

To use IT classrooms effectively, school administrators need to communicate well with supervisors, directorates of cities and towns, computer coordinators, other teachers, and people in the neighborhood as well as with the firm who provides technical support for these IT classrooms. School administrators' perceived roles of communication regarding IT classrooms are presented in Table 3.

**Table 3**

#### Communication

Item No.	Item	$\bar{X}$	sd
46	The administrator always communicates with the administrators at the National Education Directory of the region and the town	4,80	,53
47	The administrator communicates with the firm that established the infrastructure and maintenance of the IT classrooms	4,75	,60
48	The administrator communicates with primary education supervisors regarding IT classrooms	4,55	,76
24	The administrator strives for the appointment of a computer coordinator to the school	4,74	,58
59	The administrator coordinates activities that are developed with other schools and his or her school	4,51	,91
45	The administrator calls the related firms or institutions if there is a breakdown within the IT classrooms	4,85	,48
26	The administrator initiates the appointment of computer teachers to the school	4,84	,40
33	The administrator takes precautions for the school to connect to the Internet	4,67	,67
TOTAL		4,71	,62

Table 3 shows that the highest mean score among the items is item 45, "The administrator calls the related firms or institutions if there is a breakdown within the IT classrooms," with a mean score 4.85. The lowest mean score among the items is item 59, "The administrator coordinates activities that are developed with other schools," with the mean score of 4.51.

### Facilitator

To make sure that IT classrooms are used effectively by students, teachers, and the people in the neighborhood, school administrators need to keep the classrooms available and accessible as well as motivate potential users. School administrators' perceived roles of facilitator regarding IT classrooms are presented in Table 4.

**Table 4*****Facilitator***

Item No.	Item	$\bar{X}$	sd
31	The administrator motivates students to use ICT	4,68	,60
25	The administrator prepares the environment for teachers to use the computers effectively	4,77	,59
30	The administrator motivates teachers to use ICT	4,67	,53
29	The administrator is knowledgeable about information technologies	4,42	,86
34	The administrator guides teachers about computer assisted instruction	4,77	,51
37	The administrator collaborates with the computer coordinators	4,82	,48
35	The administrator follows the regulations about IT classrooms	4,82	,52
TOTAL		4,71	,59

The findings of Table 4 regarding the facilitator role of school administrators show that the highest degree of perception is for the items “The administrator collaborates with the computer coordinators” and “The administrator follows the regulations about IT classrooms.” The item “The administrator is knowledgeable about information technologies” has the lowest mean score. 86.7 % of the administrators had not attended any or had attended only 1 or 2 in-service trainings about the use of IT classrooms.

***Maintenance of the Infrastructure***

School principals’ roles regarding the maintenance of the infrastructure of the IT classrooms include repair, maintenance, infrastructure-related problems, and renewal of computers and other materials in IT classrooms. Table 5 displays the perceptions of school principals’ roles regarding the maintenance of the infrastructure.

**Table 5*****Maintenance of the Infrastructure***

Item No.	Item	$\bar{X}$	sd
16	The administrator works to repair materials in IT classrooms	4,64	,74
15	The administrator makes an effort to provide technical support for IT classrooms	4,81	,45
18	The administrator ensures that computers in IT classrooms are regularly maintained	4,70	,66
9	The administrator supports the purchase of equipment for IT classrooms	4,48	,88
28	The administrator finds solutions for problems in the infrastructure	4,55	,75
27	The administrator supplies adequate equipment for IT classrooms	4,62	,65
32	The administrator takes precautions for the renovation of IT classrooms	4,52	,66
TOTAL		4,62	,68

Table 5 shows that, regarding the roles of school administrators for the maintenance of the infrastructure of IT classrooms, the mean score of school administrators' perception levels is highest for item 15, "The administrator makes an effort to provide technical support for IT classrooms," and the lowest mean score is for item 9, "The administrator supports the purchase of equipment for IT classrooms."

#### *Ergonomics*

School principals' roles have not been defined in the regulations that were sent to the schools by the Ministry of National Education (MoNE). The subfactor of ergonomics was constructed based on the literature review. School principals' roles in ergonomics include (a) checking the temperature and humidity in IT classrooms, (b) ensuring that the chairs are adjustable and easy to move, and (c) maintaining the necessary distance between each piece of equipment and tool in IT classrooms. These roles are summarized in Table 6.

**Table 6**

#### *Ergonomics*

Item No.	Item	$\bar{X}$	sd
22	The administrator maintains the temperature and moisture of the IT classroom at the appropriate level	4,43	,85
21	The administrator cares for the adjustability of the elevation of the desks, and that the desks are comfortable and have the ability to move	4,36	,97
23	The administrator cares that the students can move around the computers and the equipment	4,47	,91
20	The administrator takes precautions so that students do not take harm from the ultraviolet rays the computers disperse	4,44	,84
TOTAL		4,43	,89

It is obvious from Table 6 that, regarding the roles of school administrators regarding ergonomics, the highest mean score is for the administrator caring that students can move around the computers and the equipment. The lowest mean score is for the administrator caring for the adjustability, comfort level, and movability of the desks.

#### *Supervision*

School principals' roles regarding supervision have not been mentioned in the literature, but are stated in the regulations which were sent to schools by MoNE. These roles are presented in Table 7.

**Table 7**

#### *Supervision*

Item No:	Item	$\bar{X}$	sd
44	The administrator inspects whether IT classrooms are used actively	4,79	,50
43	The administrator supports computer coordinators in their work with IT classrooms	4,83	,47
42	The administrator prepares the vision of the school considering information technologies	4,85	,46
TOTAL		4,79	,50

When examining the roles of administrators regarding the supervision of IT classrooms as presented in Table 7, it can be said that administrators have a high level of perception of their role to prepare the vision of the school considering the information technologies. Here, it can be claimed that administrators are far away from the traditional supervision approach.

### **Leadership**

School principals' leadership roles in regard to IT classrooms are (a) to coordinate the activities in IT classrooms, (b) to meet the computer coordinators' needs at the school level, (c) to interpret and apply the regulations related to the practices in IT classrooms, (d) to be open to innovations in IT in education, and (e) to be the leader for computer coordinators and other teachers. These roles are displayed in Table 8.

**Table 8**

### **Leadership**

Item No:	Item	$\bar{X}$	sd
40	The administrator knows how to solve problems in IT classrooms	4,66	,61
58	The administrator controls the activities in the IT classrooms	4,72	,61
39	The administrator cares about the demands of computer coordinators	4,82	,46
41	The administrator can interpret the regulations and apply them	4,76	,61
38	The administrator is open to innovations in ICT	4,86	,43
36	The administrator leads the computer coordinators	4,67	,74
TOTAL		4,75	,57

It can be inferred from Table 8 that school administrators give the highest value to item 38, "The administrator is open to innovations in ICT."

### **Public Relations**

School administrators have certain roles regarding making IT classes available to be used by other schools and by the people in the neighborhood. The items regarding this subfactor are presented in Table 9.

**Table 9**

### **Public Relations**

Item No.	Item	$\bar{X}$	sd
3	The administrator takes precautions to see that IT classrooms are open to the public	3,87	1,26
1	The administrator opens IT classrooms for the public during weekends and evenings	3,39	1,43
2	The administrator facilitates opportunities for other schools to use the IT classrooms	4,57	,75
4	The administrator resort public cooperation about IT classroom-related activities	4,30	,96
5	The administrator prepares activities that make the school the center of education for the public	4,71	,52
TOTAL		4,17	,98



Table 9 shows that the administrators give the highest value to item 5 and the lowest value to item 1. Although there is a contradiction between these two items, how administrators use IT classrooms during weekends and evenings is organized with the regulations. The problems with the use of IT classrooms by the public may affect the responses of the administrators to the items.

### *Monitoring*

School administrators' monitoring roles are (a) to ensure that IT classrooms are used effectively by the students, (b) to prevent access to undesired web sites, and (c) to take precautions and certain measures against stealing. Items regarding this subfactor are presented in Table 10.

**Table10**

### *Monitoring*

Item No.	Item	$\bar{X}$	sd
14	The administrator encourage students to use computers sufficiently.	4,89	,38
10	The administrator takes precautions so that students do not enter unwanted web sites	4,87	,49
13	The administrator takes precautions to prevent computers from being stolen	4,98	,67
TOTAL		4,91	,51

It is obvious from Table 10 that the administrators give much attention to the monitoring of hardware and software in the classroom, and to the safety and security of the IT classrooms. Thefts in the region or in other regions may lead the administrators to be solicitous about the safety and security of the IT classrooms.

### *Empowerment*

School principals have roles to empower computer coordinators. Items regarding this subfactor are presented in Table 11.

**Table11**

### *Empowerment*

Item No.	Item	$\bar{X}$	sd
7	The administrator knows the duties of computer coordinators	4,75	,54
6	The administrator empowers computer coordinators	4,70	,65
8	The administrator trusts the computer coordinators in the use of IT classrooms	4,75	,50
TOTAL		4,73	,56

Table 11 tells us that the administrators know the duties of the computer coordinators and may authorize them regarding the use of IT classrooms and the integration of ICT in education. In addition, the MoNE authorized the computer

coordinators to act as the ICT integrators and instructional technology implementers in the primary schools.

### *Ethics*

School administrators have certain responsibilities regarding making sure that copyrights for CDs, books and other materials in IT classrooms are not violated, and that these items are used for an appropriate purpose. Therefore, they are responsible to raise ethical awareness in schools. Items dealing with this subfactor are presented in Table 12.

**Table12**

### *Ethics*

Item No.	Item	$\bar{X}$	sd
11	The administrator pays attention to copyright issues of materials (CD, books, etc.) in IT classrooms	4,79	,46
12	The administrator makes teachers and students conscious of the proper use of copyrighted materials	4,58	,74
19	The administrator provides enough storage space for the safekeeping of equipment in IT classrooms	4,72	,62
17	The administrator prevents the inappropriate use of materials in IT classrooms	4,67	,67
TOTAL		4,69	,62

Regarding the roles of administrators in the ethical dimensions of IT classrooms (Table 12), the administrators most highly perceive their role of caring for the copyright issues of materials (CD, books, etc.). The lowest perception is of their role of making teachers and students conscious of using the copyrighted materials properly.

The overall findings of the study can be summarized as follows:

1. School administrators' level of perception regarding their roles in IT classrooms is very high ( $\bar{X}$  =4.77, sd= .30).

2. School administrators' highest perception level of their roles in IT classrooms is for the monitoring dimension ( $\bar{X}$  =4.91); the lowest is for public relations ( $\bar{X}$  =4.17).

3. There is no significant difference in the mean scores of the perception levels of school administrators based on their gender ( $U=213.00$ ,  $p= .69 > .05$ ), employment ( $U=1059.00$ ,  $p= .64 > .05$ ), education ( $U=812$ ,  $p= .46 > .05$ ), job experience ( $\chi^2=4.85$ ,  $p= .30 > .05$ ), amount of in-service training in which they participated ( $\chi^2=.16$ ,  $p= .91 > .05$ ), or their perceived computer ability ( $\chi^2=2.14$ ,  $p= .34 > .05$ ).

### Conclusion and Discussion

This study found that the dimensions of the roles of administrators regarding IT classrooms are staff development, communication, facilitation, maintenance of the infrastructure, ergonomics, supervision, leadership, public relations, monitoring, empowerment, and ethics. It was also found that school administrators' levels of perception regarding their roles in IT classrooms is very high. The communication and supervision dimensions were not reported in the literature. Those dimensions are unique for Turkey. The perception levels of school administrators regarding their roles in IT classrooms are highest for the monitoring dimension and lowest for public relations. It seems that school administrators are good at monitoring but they need to develop public relation skills in order to use IT classrooms effectively. It is interesting that the leadership role is somehow in the middle.

Another result of this study is that there was no significant difference in the mean scores of the perception levels of school administrators based on their gender, position, education, job experience, amount of in-service training in which they participated, or perceived computer ability. Dawson and Rakes (2003) collected data through the School Technology and Readiness (STaR) scale and concluded that the technology integration of school administrators did not differ according to their gender and seniority of administration; however, it differed in terms of the amount of in-service training about technology integration in which they had participated. In our study, we did not observe any significant difference in terms of the in-service training. This might be due to the quality and content of the in-service training about technology integration and IT classrooms offered to administrators and teachers.

The CEO forum on education and technology (1999) claims that teachers should participate in training programs, and that these programs should be sustained and supported. School administrators in Ordu are conscious of their roles regarding the staff development of teachers about the use of ICT in education, and of the permanence and support of those training programs. Staff development has been identified in many studies as a key component in the successful implementation of technology (see Costello, 1997; MacNeil & Delafield, 1998; Micheal, 1998; Bailey, 2000; Akbaba-Altun, 2004). MacNeil and Delafield (1998) found that one of the inhibitors of technology implementation in the classroom is lack of time for professional development and planning. Bailey (2000) claims that one of the 21st century technology leaders' roles is staff development. Micheal (1998) reports that staff development should be continuous and individualized. Investment in teachers' and staff members' computer knowledge and skills is a wise investment for schools. Akbaba-Altun (2004) also says that there must be closer alignment between the amount of time for professional development with technology and its degree of perceived importance.

When ICT is integrated into the teaching and learning process, school principals have a facilitator role. Dawson and Rakes (2003) state that school administrators are expected to act as instructional leaders and provide the required materials and equipments to the teachers. MacNeil and Delafield (1998) claim that principals and

other school leaders must accept the challenge to create a supportive environment in which innovative uses of computers are encouraged. In line with these opinions, Akbaba-Altun (2004) found that computer coordinators emphasize a need for support and facilitation from school principals as technological leaders. The present study shows that school administrators collaborate with computer coordinators.

The present study also shows that school administrators make an effort to provide technical support for IT classrooms. They need to pay attention to procuring equipment for the IT classrooms. When IT classrooms were first established in primary schools, technical support was assured for three years. During this period, if there was a breakdown in the infrastructure, administrators could seek help by filling out and submitting a form. However, after the end of those three years, as schools' budgets are limited, they have difficulties maintaining the infrastructure and procuring new instructional materials. As one of his model tenets, Micheal (1998) says that technical support must respond promptly to users' needs in K-12 schools. The acquisition of hardware and software entails more than a last-minute rush to the computer store. A procurement strategy must be planned, purchases of hardware and software must be made with full attention to system compability, the IT system must fully support and enhance instructional activities and goals, and a replacement procedure must be carefully thought out. Akbaba-Altun (2006) found that infrastructure is one of the issues in Turkey in integrating computer technologies into education. She found that there were few computers, slow Internet connections, insufficient software in the native language, and a lack of periferial equipment at schools. Hardware and software investment and maintenance is an important step in computer integration.

Taking ergonomics issues under consideration is another role of school administrators. Micheal (1998) says that effective schools must have an expanded view of IT—a view that includes attention to room conditions and ergonomics. In Turkey, the establishment of IT classrooms and the procurement of materials and equipment were initially made by the Ministry, and the Ministry posted the materials to the schools directly. The administrators only selected the proper spaces to be the IT classrooms and took delivery of the equipment and the materials.

Dawson and Rakes (2003) emphasize that it is not important how much training teachers receive about technology integration if they do not have the leadership of their administrators; without it, teachers cannot apply what they learn in the training. In addition, Yuen, Law, and Wong (2003) state that successful technology integration is not about hardware, software, and computer literacy, but about supporting, empowering, and influencing teachers. After studying with school principals in New Zealand, Yee (1998) offers that administrators should have the five proposed technology leadership types: technology entrepreneur, technology caretaker, technology trainer, technology modeler, and technology learner.

When considering the effects of using information and communication technologies on teaching and learning environments, school administrators as the leaders of innovation in education have crucial roles. Therefore, many scholars

(Bailey, 2000; Turan, 2002; Flanagan & Jacobsen, 2003; Schiller, 2003; Akbaba-Altun, 2004a & 2006) state that administrators should have the skills to use technological innovations and have technological leadership characteristics. In their regulations, the MoNE expect school administrators to be technological leaders. This research's results show that school administrators are aware that they should behave as the technological leaders of the school. Their perceptions of technological leadership roles may be the indicators that they are knowledgeable about the duties that should be given to them.

One IT classroom-related role that has been determined for administrators is the ethics dimension. According to Bailey (2000), technology integration involves more than just teaching students how to use technological tools; it also requires helping them deal with ethical dilemmas that can arise when applying emerging technologies. Nance (2003) and Quinn (2003) also mention issues related to the infusion of technologies into schools, including pornography, acceptable use policies, freedom of expression, online and equitable access to technology, privacy, digital copyright, and censorship. Quinn (2003) says, "As with any advancement, there is always the prospect of misuse and abuse of new technologies....School leaders must be well informed in such matters to minimize the distractions and liabilities and to maximize the learning potential afforded by educational technology" (p. 205). Regarding the roles of administrators in the ethics dimension for IT classrooms, the administrators must care for the copyright issues of the materials (CD, books, etc.) in the IT classroom.

School principals' IT classrooms-related roles can also be considered as principals' technological leadership roles—indeed, most of these roles have been mentioned in the literature as principals' technological leadership roles. It is suggested as further study that the relationship between school principals' perceptions of roles regarding IT classrooms and their realization level should be investigated.

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## İlköğretim Okulu Yöneticilerinin Bilgi Teknolojisi (BT) Sınıflarına Yönelik Rollerine İlişkin Algıları

### (Özet)

*Problem Durumu* : Temel Eğitim Programı kapsamında ilköğretim okullarında kurulan Bilgi Teknolojisi (BT) Sınıflarının eğitim-öğretim ortamlarında etkili ve verimli bir şekilde kullanılabilmesi için okul yöneticilerine önemli roller düşmektedir. Bu rollerin yöneticiler tarafından yerine getirilebilmesi için yöneticilerin bu rollerin neler olduğu hakkında bilgiye sahip olması ve bu rollerin farkında olmaları gerekmektedir. İlgili literatür incelendiğinde, öğretimsel ve yönetsel amaçlarla eğitimde kullanılan Bilgi ve İletişim Teknolojilerinin eğitime entegrasyonunda ve eğitimde etkili ve verimli bir şekilde kullanılmasında okul yöneticilerinin önemli rolleri olduğu görülmektedir. 1998 yılında uygulamaya konulan Temel Eğitim Programı kapsamında temel eğitimin niteliğinin artırılması amacıyla kurulan BT Sınıfları'nın eğitime entegre edilmesinde, bu sınıflarda bulunan araçların etkin ve verimli kullanılmasında ve bu araçlardan daha geniş halk kitlelerinin yararlandırılmasında okul yöneticilerine önemli görevler ve roller düşmektedir. Bu görevlerin ve rollerin yöneticiler tarafından yerine getirilebilmesi için yöneticilerin bu görevlerin ve rollerin neler olduğu hakkında bilgiye sahip olmaları gerekmektedir.

*Araştırmanın Amacı* : Bu çalışmanın amacı bünyesinde BT Sınıfı bulunduran ilköğretim okullarının yöneticilerinin BT Sınıfı'na ilişkin rollerine ilişkin algılarının belirlenmesidir. Ayrıca, bu çalışmada, ilköğretim okulu yöneticilerinin BT Sınıflarına ilişkin rollerinin algılama düzeyleri; yöneticilerin katılmış oldukları hizmet - içi eğitim sayısına, yöneticilerin kıdemlerine, yöneticilerin cinsiyetine, yöneticilerin öğrenim durumuna ve yöneticilerin bilgisayar kullanma düzeylerine göre anlamlı bir fark gösterip göstermediği sorusuna cevap aranmıştır.

*Verilerin Toplanması* : Veriler, araştırmacılar tarafından geliştirilen "Okul Yöneticilerinin Bilgi Teknolojileri Sınıflarına Yönelik Rollerini Algılama Ölçeği" ile toplanmıştır. Araştırma problemi belirlendikten sonra ölçek maddeleri 11 boyutta 5'li ölçek olarak yazılmıştır. Bu hazırlanan taslak forum kapsam geçerliğinin belirlenmesi için hem BÖTE bölümünden hem de Eğitim Yönetimi bölümünden öğretim üyelerine verilmiş ve görüşleri alınmıştır. Oluşturulan 99 madde uzman görüşlerinden sonra 85 maddeye indirgenmiştir. Son olarak da Türkiye'deki 7 coğrafi bölgeden tesadüfi örneklem yoluyla seçilen yedi ilde pilot uygulama yapılmış ve 316 ilköğretim okulu yöneticisine uygulanmıştır. Uygulama sonucunda aracın geçerlik ve güvenilirlik çalışması yapılmıştır. Aracın güvenilirlik katsayısı alfa .94 olarak bulunmuştur. SPSS programı kullanılarak grupları belirlemek için faktör analizi (principal component) yapılmış ve 11 boyut olduğu görülmüştür. Daha sonra LİSTREL programında tekrar doğrulayıcı faktör analizi yapılmış ve çıkan boyutların

11 boyutu olduğu 59 madde olarak netleştirilmiştir. Belirlenen boyutlar personel yetiştirme, iletişim, kolaylaştırıcılık, alt yapının sürekliliğinin sağlanması, ergonomiyi gözetme, denetim, liderlik, hakla ilişkiler (halkın kullanımına açma), izleme (önleme), yetkilendirme ve etikdir.

Ölçme aracın geçerlik ve geçerlik çalışmasından sonra, okul yöneticilerinin BT sınıflarına yönelik rollerinin belirlenmesi için Ordu ilinde bünyesinde BT sınıfı bulunan okul yöneticilerinin tamamına uygulanmış ve 100 anket geri dönmüştür. Toplanan veriler analiz edilmiştir.

*Verilerin Analizi* : Okul yöneticilerinin öncelikle her boyuttaki rollerinin algılanma düzeyine bakılmış daha sonra da genelde BT sınıflarına yönelik rollerini bir bütün olarak nasıl algıladıklarına bakılmıştır. Bunun için maddelerin her boyutta ortalama ve standart sapmaları alınmıştır. Araştırma probleminin ve alt problemlerin analizinde hangi testin kullanılacağını belirlemek için her alt grup için Shapiro-Wilk normallik testi uygulanmıştır. Bu test sonucunda alt grupların tamamında normal dağılım olmadığı için parametrik olmayan testlerin kullanılmasına karar verilmiştir. Okul yöneticilerin cinsiyet, eğitim düzeyi ve görevlerine göre farkındalık düzeylerinde farklılığın olup olmadığını test etmek için Mann-Whitney U testi kullanılmıştır. Ayrıca, BT sınıflarına yönelik rollerin ilişkin algı düzeylerinin, okul yöneticilerinin, kıdemleri, hizmet içine katılma sıklıkları ve bilgisayar kullanma düzeyleri ile anlamlı olarak farklılaşıp farklılaşmadığını test etmek için de Kruskal-Wallis kullanılmıştır.

*Bulgular* : Araştırma sonucunda ilköğretim okulu yöneticilerinin BT sınıfına ilişkin rollerinin personel yetiştirme, iletişim, kolaylaştırıcılık, altyapıyı sürdürme, ergonomiyi sağlama, denetim, liderlik, hakla ilişkiler, izleme (önlem alma), yetkilendirme ve etik boyutlarında olduğu ortaya çıkmıştır. Araştırma sonuçlarına göre ilköğretim okulu yöneticilerinin BT sınıflarına yönelik rollerini algılama düzeylerinin oldukça yüksek olduğu görülmüştür. İlköğretim okulu yöneticilerinin BT sınıfına ilişkin belirlenen rolleri personel yetiştirme, iletişim, kolaylaştırıcılık, altyapıyı sürdürme, ergonomiyi sağlama, denetim, liderlik, hakla ilişkiler, izleme (önlem alma), yetkilendirme ve etikdir.

Araştırmanın sonucunda aşağıdaki bulgulara ulaşılmıştır.

1. İlköğretim okulu yöneticilerinin BT sınıflarına yönelik rollerini algılama düzeyi oldukça yüksektir ( $X=4.62$ ,  $ss= .35$ ).
2. İlköğretim okulu yöneticilerinin rollerini algılama düzeyi en yüksek izlemede (önlem alma) ( $X=4.88$ ), en düşük olarak da halkla ilişkiler ( $X=4.10$ ) boyutunda görülmüştür.
3. Okul yöneticilerinin BT sınıflarına yönelik rollerini algılama düzeyleri okul yöneticilerinin cinsiyetlerine ( $U=213.00$ ,  $p= .69 > .05$ ), görevlerine ( $U=1059.00$ ,  $p= .64 > .05$ ), eğitim durumları ( $U=812$ ,  $p= .46 > .05$ ), kıdemlerinde ( $\chi^2=4.85$ ,  $p= .30 > .05$ ), katıldıkları hizmet içi eğitimlerinin sayılarına



( $\chi^2=.16$ ,  $p= .91 > .05$ ), ve bilgisayar kullanma düzeylerine ( $\chi^2=2.14$ ,  $p= .34 > .05$ ) göre anlamlı farklılık göstermemektedir.

*Öneriler* : Okul yöneticilerinin BT sınıflarına yönelik rollerinin farkında olmaları ve bu düzeyin yüksek çıkması BT sınıflarının daha etkili kullanılabilceğinin göstergesi olabilir. Ancak, okul yöneticilerinin BT sınıflarına yönelik rollerini ne kadar gerçekleştirip gerçekleştirmedikleri ve farkındalık düzeyleri ile rollerinin gerçekleştirilme düzeyleri arasındaki ilişki çalışma konusu olarak önerilmiştir.

*Anahtar sözcükler*: Okul yöneticisi, Bilgi Teknolojisi Sınıfı, Algı, Temel Eğitim Programı.

## Assessing the Reliability and Validity of the Turkish Version of the Stages of Concern Questionnaire

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### Abstract

*Problem Statement:* The Stages of Concern Questionnaire (SoCQ) was developed to provide a quick-scoring measure of stages of concern and is applicable to almost any educational innovation. Although the SoCQ has been used in many studies, little critical analysis of the questionnaire has been attempted since its initial validation. Since the SoCQ construct might be specific to innovation, it must be validated during its administration in developing countries.

*Purpose of Study:* This study is intended to adapt the SoCQ to a Turkish context by means of assessing the reliability and validity of this questionnaire.

*Methodology:* The participants for this study were 621 faculty members of eight schools at a major university in Turkey. Iterated principal factor analysis (PCA) and confirmatory factor analysis (CFA) were used for the analyses of this study. For the reliability of the questionnaire, cronbach alpha coefficient was used.

*Findings:* The reliability for four of the seven stages was low ( $<.70$ ), and the intercorrelational matrix did not provide support the hypothesized relationships among the stages. Reorganized and shortened versions of the questionnaire suggested a reconceptualization of the original model. The four modified stages of concern (SoC) were labeled as follows: (1) Awareness, (2) Informational, (3) Impact, and (4) Collaboration. The four-stage 16-item model had alpha reliability estimates of .82 for Awareness, .75 for Informational, .66 for Impact, and .75 for Collaboration.

*Recommendations:* The four-stage model that is proposed in this study is intended to prompt researchers to give greater attention to psychometric and conceptual issues when using the SoCQ in different cultural contexts. A replication of the present study in different countries is worthwhile to detect any cultural differences. A larger sample that includes different institu-

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tions in the same context should be surveyed to gain a greater understanding of the perceptions of faculty with different educational concerns.

**Keywords:** Faculty concerns, stages of concern, CFA, EFA

Many studies have been conducted to investigate educational change. Those who initiate change typically do so with the expressed desire to encourage growth and improvement within the educational system. However, the individuals who must change or implement the change too often view it as something to avoid or circumvent, especially if they have not been a part of the decision-making process (Hinch, 2000). Individuals with limited experience with the innovation in question tend to be more anxious about its use. In many cases, this anxiety results in resistance to change. To overcome this challenge, we must carefully consider the concerns of “would be” innovators. Frances Fuller (1969) developed the Teacher’s Concern Model, which categorized various types of concerns regarding educational change. Through an expansion of Fuller’s model and further research, Hall, Wallace, and Dosset (1973) also examined concerns as they related to the adoption of an innovation. Out of the research of Hall et al. (1973), a model was developed addressing change, and it has been used extensively by staff developers in planning for educational change. The model in question is the Concern Based Adoption Model (CBAM) (Hall & Hord, 1987). One aspect of this model relates to the seven Stages of Concern (SoC) that educators typically experience during the change process (Hall & Loucks, 1978).

Concern is “the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task” (Hall, George, & Rutherford, 1998, p. 5). Research has indicated that certain demands related to an innovation are perceived as more important than others. Therefore, the type and degree of intensity of concern about an innovation will vary with the depth of one’s knowledge and level of use of an innovation. SoC describe how users perceive an innovation from the time they first became aware of it until they gain mastery with the innovation (Hall and Loucks, 1978). Through the research, seven SoC were identified and grouped to reflect the developmental changes occurring through the following four dimensions: unrelated, self, task, and impact.

The Stages of Concern Questionnaire (SoCQ), which was developed for administration within educational environments, is a standardized 35-item questionnaire to which responses are made using an eight-point Likert scale. The SoCQ was developed to provide a quick-scoring measure of SoC and is applicable to almost any educational innovation. Although the SoCQ has been used in many studies, little critical analysis of the questionnaire has been attempted since its initial validation (Anderson, 1997). The SoCQ was originally validated by Hall, George, and Rutherford (1979). The primary validation studies report correlations of internal consistency (i.e., alpha-coefficients) for each of the seven stages ranging from .64 to .83 (N=830) and test-retest correlation coefficients ranging from .65 to .86 (N=132).

Bailey and Palsha (1992) proposed two modified versions of the SoCQ. Their analysis suggested the use of a 5-factor model with 35 items or 15 items rather than

the 7-factor, 35-item CBAM. Shotsberger and Crawford (1996) proposed a 27-item, 5-factor instrument that closely matched the original CBAM. Cheung, Hattie, and Ng (2001) proposed a 22-item, 5-factor model that provided the best fit. In all of these studies, the researchers hypothesized that Awareness and Refocusing subscales may not be needed in the model. Most users of SoCQ ignore the alternative models that are proposed by researchers even though they have been affirmed to be psychometrically better than Hall's original SoCQ. Since the SoC construct might be innovation specific (Cheung, Hattie, & Ng, 2001), for this study, the original SoCQ was chosen for use since it was to be administered for *online technology* as the innovation for the first time.

## Methodology

### *Participants*

The participants for this study were faculty members of eight schools (i.e., Medicine, Education, Engineering and Architecture, Arts and Sciences, Economics and Administrative Sciences, Agriculture, Veterinary Medicine, and Theology) at a major university in Turkey. The population for the study was 725 full-time faculty members, including assistant professors, associate professors, and full professors. Since the questionnaire was a translation from the original, 10 faculty members were drawn from the population for a pilot study of the survey, leaving 715 faculty members for the questionnaire pool. At the time of the study, 94 faculty members were on leave for such reasons as military service, post-doctoral studies abroad, etc. The Turkish version of the questionnaire was piloted initially with 10 faculty members. After the pilot participants' recommendations were evaluated, the questionnaire was re-designed and distributed in person to 621 faculty members. 327 faculty members participated in the study, which equates to a 52.6 % response rate. Some of the participants elected to leave some questions unanswered, thereby creating omitted responses. Such responses were tabulated using the system-missing value feature in SPSS. This feature assigns a system-missing value for any omitted variable and calculates any statistical data only based upon variables that contain responses. Regarding the gender of the participants, the group consisted of 29.7% (i.e., 97) females and 70.3% (i.e., 230) males. This actually is similar to the overall ratio of female to male faculty members at the university, which is 2:5.

### *Instrumentation*

The instrumentation in this study involved a survey that included a consent form and a cover letter. The cover letter restated the purpose of the study and provided examples for completing the SoCQ. The survey that was distributed to the faculty was a combined instrument composed of two components. The first component was a combination of demographic and self report data. The second consisted of the SoCQ. The original SoCQ consisted of 35 items examining educators' concerns regarding any innovation. Items were grouped into the following 7 stages with 5 items in each: awareness, informational, personal, management, consequence, collabora-

tion, and refocusing. Responses to the items are made using an eight-point Likert scale. In this study, the SoCQ was modified with Gene Hall's permission to address "online technology" concerns. The included demographic data incorporated age, gender, academic rank, number of years teaching, teaching field, number of years using online technologies for professional use, number of years using online technologies for personal use, online technology training, and education abroad.

#### *Translation of the Questionnaire*

The Turkish questionnaire was developed with consideration of the recommendations made by many authors (Brislin, 1980; McGorry, 2000; Griffiee, 2001; Aydın, 2008) who have done research that requires translation of the questionnaire from English to another language. Special care was given to minimize the problem relating to the lack of equivalence between Turkish and English. The English version of the questionnaire was translated into Turkish and then back translated into English to check for translation inconsistency (Brislin, 1980). Different translators were used for these stages. When a major inconsistency occurred in the translation, the two translators discussed the issue in order to reconcile the differences. The precise wording of the questionnaire was decentered (Brislin, 1980) away from the original language version and adjusted so that it was smooth and natural sounding as well as equivalent in both languages.

The Turkish version was reviewed by two professors who specialize in educational measurement and survey development for content validity. The professors suggested several changes, modifications, and clarifications to various questions in the survey. Their suggestions were used to refine the survey instrument. The Turkish version was used in a pilot study with 10 faculty members to ensure that all of the items were clear and understandable to the participants of the study, to determine the required time for completing the questionnaire, to get the respondents' feedback about the questionnaire, to correct any misinterpretations that may occur, and to check for any flaws in the questionnaire items that may mislead the respondents.

## **Findings and Results**

### *Initial Analyses*

An analysis of the profile scores indicated that the participants did vary in terms of their responses; however, only three of the seven stages emerged as first-priority concerns as indicated in Table 1. Once individual raw scores for each stage were calculated, each score was then converted to a percentile using a percentile chart (Hall, George, & Rutherford, 1998). To test the psychometric properties of the SoCQ, the researchers conducted various analyses. First, a principal axis factor analysis with a promax rotation and a specified seven-factor solution was used to determine whether the items grouped themselves according to the original assignment of stages. Second, an internal consistency analysis using Cronbach's (1951) alpha coefficient was conducted to determine the reliability of the subscales. Items with poor item-total-score correlations were removed from the questionnaire. Then, a correla-

tional matrix consisting of the seven factors was generated to test the assumption that the scales or stage scores would be most highly correlated with adjacent scales, and that a decreasing correlation would be associated with an increased distance between subscales. Finally, a confirmatory factor analysis was used to examine the construct validity of the SoCQ data. Bartlett's test of sphericity (1954) was statistically significant ( $p < .001$ ), suggesting that the data was appropriate for factor analysis and that no evidence of multicollinearity or singularity was found (Tabachnick & Fidell, 2001). The Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser, 1974) was .85, indicating that the sample size was appropriate for the factor analysis.

**Table 1**

*Highest Stages of Concern frequencies for all participants (Highest to lowest)*

Stages of Concern	Frequency	Percentage
Informational (Stage 1)	109	33.3
Personal (Stage 2)	99	30.3
Awareness (Stage 0)	85	26.0
Collaboration (Stage 5)	21	6.4
Management (Stage 3)	8	2.4
Refocusing (Stage 6)	5	1.5
Consequence (Stage 4)	0	0.0
Total	327	100.0

#### *First Exploratory Factor Analysis*

An exploratory factor analysis (EFA) using principal axis factoring extraction and promax rotation was conducted. EFA with principal axis extraction was chosen instead of a principal components analysis (PCA) because the goal of the analysis was to uncover the structure of latent constructs, which is possible with an EFA (Tabachnick & Fidell, 2001). An oblique rotation method (i.e., promax) was used instead of an orthogonal rotation because based on theory, the researchers anticipated that any factors that emerged would be correlated with each other. The items on the original SoCQ were equally distributed across the seven stages with five items assigned by the authors to each stage. In the seven-factor solution, however, the loadings ranged from 2 to 10 items per factor.

#### *Internal Consistency*

Cronbach's alpha coefficient was calculated to determine the internal consistency of each original factor. The resulting coefficients were as follows: Stage 0 - Awareness (.55), Stage 1 - Informational (.80), Stage 2 - Personal (.80), Stage 3 - Manage-

ment (.64), Stage 4 - Consequence (.57), Stage 5 - Collaboration (.77), and Stage 6 - Refocusing (.57). The overall reliability coefficient was .87.

#### ***Relationships among stages***

The Pearson product moment correlation coefficients were computed to test the assumption that stage scores will be most highly correlated with adjacent stages (Hall et al., 1979). No support for these hypothesized relationships was found.

#### ***Scale Revision***

Due to the problems described in the factor analysis, the low reliability coefficients ( $< .70$ ) for four subscales, and the inconsistent findings in the correlational matrix, the researchers conducted an exploratory analysis to establish a scale that would be a more consistent and meaningful instrument for describing concerns. The analyses included exploratory factor analytic procedures, scale revision, and subsequent reliability and correlational analyses, followed by confirmatory factor analyses.

#### ***Second Exploratory Factor Analysis***

To determine the optimal factor solution, the researchers used the following three methods: the eigenvalue greater than one rule (Kaiser, 1960), the scree analysis (Cattell, 1966), and Horn's (1965) parallel analysis (Merenda, 1997). Seven factors emerged with eigenvalues greater than one, but the bend after the third factor in the scree plot suggested a three-factor solution. Because scree plot strategy requires judgment and is somewhat subjective (Thompson, 2004), the eigenvalues were compared to the ones in the parallel analysis. The parallel analysis suggested that a four-factor solution might be most appropriate.

A parallel axis factor analysis was conducted, followed by a promax rotation. The four-factor solution accounted for 49.5% of variance. The loadings of all items on each of the four factors are displayed in Table 2. An analysis of the data indicates that the resulting structure met the following three primary criteria for a satisfactory factor solution: (a) eigenvalues greater than 1.0 for each factor, (b) three or more items loading at .40 or greater, and (c) no items with equivalent loadings on multiple factors (Thompson, 2004).

Factor 1, i.e., Informational Concerns, contained eight items and accounted for 23.5% of the variance. These eight items included four items from the original Personal Concerns subscale (i.e., Stage 2) and four items from the Informational subscale (i.e., Stage 1). Factor 2, i.e., Collaboration Concerns, contained eight items and accounted for 36.6% of the variance. These eight items included five items from the original Collaboration subscale (i.e., Stage 5), one item from the Personal subscale (i.e., Stage 2), and two items from the Refocusing subscale (i.e., Stage 6). Factor 3, i.e., Awareness Concerns, contained seven items and accounted for 44.6% of variance. These seven items included four items from the original Awareness subscale (i.e., Stage 0) and three items from the Management subscale (i.e., Stage 3). Factor 4, i.e., Impact Concerns, contained six items and accounted for 49.4% of variance. Four items came from the original Consequence subscale (i.e., Stage 4), and one each came from Management (i.e., Stage 3) and Refocusing (i.e., Stage 6).

**Table 2**  
**Item Loadings on 29-item Four Factors**

Items	Factors			
	1	2	3	4
<b>Stage 0 - Awareness</b>				
Q13-Don't know what online technology is	.06	.02	<b>.60</b>	-.19
Q14-Not having enough time	.04	-.06	<b>.45</b>	.17
Q18-Conflict between interests and responsibilities	-.04	.09	<b>.43</b>	.15
Q26-Inability to manage	.27	-.12	<b>.45</b>	.11
Q31-Occupied with other things	.02	-.03	<b>.65</b>	-.17
Q33-Concerned about the area	.09	-.09	<b>.51</b>	.14
Q40-Not interested in learning	-.24	.06	<b>.68</b>	-.11
<b>Stage 1 - Informational</b>				
Q17-Effects on professional status	<b>.32</b>	.27	-.08	.09
Q24-Like to discuss possible use	<b>.73</b>	-.04	.06	-.11
Q25-What resources are available	<b>.75</b>	-.15	.05	-.03
Q27-How my tasks will change	<b>.61</b>	.12	.08	.04
Q36-Immediate requirements for use	<b>.78</b>	-.00	.02	-.17
Q38-Time and energy required	<b>.71</b>	.08	.03	.10
Q43-How my role will change	<b>.65</b>	.17	-.10	.08
Q45-How better than current practice	<b>.76</b>	-.08	-.07	.04
<b>Stage 3 - Impact</b>				
Q11-Students' attitudes toward online technology	-.06	-.12	-.17	<b>.70</b>
Q19-Revising use	-.15	.28	.29	<b>.47</b>
Q21-How it affects students	-.01	-.12	-.06	<b>.84</b>
Q29-Evaluating impact on students	-.03	.08	.14	<b>.63</b>
Q35-Time spent in nonessential tasks	.21	-.10	.24	<b>.29</b>
Q41-How to change	.07	.26	-.07	<b>.30</b>
<b>Stage 4 - Collaboration</b>				
Q15-Help colleagues with online technology	-.28	<b>.67</b>	-.10	.08
Q20-Develop relationships with colleagues	.02	<b>.68</b>	.02	-.13
Q23-Who will make the decisions	.28	<b>.38</b>	.05	-.08
Q28-Share progress with colleagues	-.13	<b>.76</b>	.09	-.01
Q30-Revising the approach	.33	<b>.46</b>	.04	-.05
Q32-Modify based on use	.24	<b>.30</b>	-.11	.15
Q37-Coordinate efforts with colleagues	.16	<b>.65</b>	-.02	-.13
Q39-Know about colleagues' work	.26	<b>.38</b>	-.12	.04

As evidenced in Table 2, considerable variability occurred in the magnitude of item loadings within each factor. Furthermore, six items had loadings of less than .40 on any factor, and some did not fit conceptually with the primary concerns of the factor. For example, items 23 (i.e., Who will make the decisions), 30 (i.e., Revising the approach), and 32 (i.e., Modify based on use) loaded most strongly on the Collaboration subscale. The researchers, therefore, decided to reduce the number of items to accomplish the following: (a) eliminate those items with low loadings and (b) include



only those items that were theoretically consistent with the factor. The goals were achieved by selecting the four items within each factor that had the highest factor loadings.

In order to check the original analysis, a new four-factor solution was conducted using only the remaining 16 items. The item loadings are displayed in Table 3. The four factors remained intact, and no significant multiple loadings were found.

**Table 3**

***Item Loadings on 16-item Four Factors***

Item	Factors			
	1	2	3	4
Stage 0 – Awareness				
Q13-Don't know what online technology is	.09	-.00	<b>.54</b>	-.07
Q31-Occupied with other things	.04	-.08	<b>.61</b>	-.08
Q33-Concerned about the area	.13	-.08	<b>.49</b>	.20
Q40-Not interested in learning	-.18	.02	<b>.66</b>	-.04
Stage 1 – Informational				
Q24-Like to discuss possible use	<b>.74</b>	.02	.20	-.02
Q25-What resources are available	<b>.74</b>	-.09	.01	.05
Q36-Immediate requirements for use	<b>.72</b>	.0	.04	-.12
Q45-How better than current practice	<b>.70</b>	.02	-.07	.11
Stage 3 – Impact				
Q11-Students' attitudes toward online technology	-.03	-.09	-.19	<b>.69</b>
Q19-Revising use	-.04	.19	.23	<b>.47</b>
Q21-How it affects students	.04	-.07	-.08	<b>.82</b>
Q29-Evaluating impact on students	.02	.09	.11	<b>.64</b>
Stage 4 – Collaboration				
Q15-Help colleagues with online technology	-.19	<b>.66</b>	-.09	.06
Q20-Develop relationships with colleagues	.11	<b>.62</b>	-.04	-.03
Q28-Share progress with colleagues	-.04	<b>.74</b>	.08	.02
Q37-Coordinate efforts with colleagues	.22	<b>.57</b>	-.08	-.06

***Internal Consistency***

Cronbach's alpha coefficient was calculated for each factor in both the long (i.e., 29-item) and short (i.e., 16-item) versions. The resulting coefficients are displayed in

Table 4. Three of the four subscales had acceptable levels of internal consistency; however, a drop in Factor 3 was observed. A comparison of the short and long versions indicates that the short version did not result in an appreciable reduction in scale reliability.

**Table 4**

*Alpha Coefficients for the Long and Short Versions for Four Factors*

Factor	Long version (29-item)	Short version (16-item)
1 - Informational	.87	.82
2 - Collaboration	.80	.75
3 - Awareness	.75	.66
4 - Impact	.74	.75

*Relationships among Subscales*

The Pearson product-moment correlation coefficients for stages were computed using the 29-item and 16-item instrument. The factors are displayed in their hypothesized stage order. The correlation matrix still does not support the assumption that the highest correlation should occur between adjacent factors or stages.

*Confirmatory Factor Analysis*

Faculty responses were subjected to confirmatory factor analysis using the LISREL program (Jöreskog & Sörbom, 1996). As Thompson noted (2000), "the fit of a single tested model may always be an artifact of having tested too few models" (p. 278). Given the lower reliabilities for the proposed 16-item questionnaire, the researchers carried out a validation study for both the 29-item and the 16-item four-factor modified SoCQ. LISREL produced several goodness-of-fit measures. Jaccard and Wan (1996) recommended the use of at least three fit tests, while Kline (1998) recommended at least four goodness-of-fit measures.

The following seven common indices of fit that were recommended in the literature (Hair, Anderson, Tatham, & Black, 1998; Jaccard & Wan, 1996; Kline, 1989) were employed in this study: Chi-square, Goodness-of-fit Index (GFI), Adjusted Goodness-of-fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Parsimony Goodness of Fit Index (PGFI), and Parsimony Normed Fit Index (PNFI). Table 5 lists the recommended values of various measures of model fit as suggested by Segars and Grover (1993). Poor goodness-of-model-fit indicates possible model misspecifications. Although guidelines exist for the acceptance of model fits, Bollen (1989) observed that these cut-offs are arbitrary. The researchers compared the goodness-of-fit results for both models (i.e., the 29-item and 16-item) in Table 5.

Table 5

*Comparison of Fit Indices*

Goodness of fit measures	Recommended values Segars and Grover	29 Item	16 Item
$\chi^2$	--	1128	265
df	--	371	98
GFI	$\geq .90$	.80	.91
AGFI	$\geq .80$	.77	.87
RMSEA	$\geq .10$	.08	.07
CFI	$\geq .90$	.90	.92
PGFI	$\geq .80$	.69	.65
PNFI	$\geq .90$	.79	.71

*Fit Indices for 29-item and 16-item Models*

The fit of the 29-item and 16-item models were evaluated with LISREL using the sample covariance matrix as input and a maximum likelihood solution. The models are statistically overidentified. Prior to analysis, the data for the covariance matrices were evaluated for multivariate outliers by examining leverage indices for each individual and defining an outlier as a leverage score 4 times greater than the mean leverage. No outliers were detected. Univariate normality was evaluated using statistical methods in LISREL. An examination of univariate indices of skewness and kurtosis revealed a skewness above an absolute value of 2.1 and 2.19 and a kurtosis value above an absolute value of 5.2 and 5.21 for the 29-item model and the 16-item model, respectively (Item 40).

A variety of indices of model fit were evaluated. The chi square tests of model fit were statistically significant (i.e., 29-item model:  $\chi^2(371) = 1128$ ;  $p = 0.0$ , 16-item model:  $\chi^2(98) = 265$ ,  $p = 0.0$ ). The RMSEA for the 29-item model was 0.08 with 90% confidence intervals of 0.075 to 0.085, and the RMSEA for the 16-item model was 0.07 with 90% confidence intervals of 0.062 to 0.083. The p values from the test of close fit for both models were less than 0.05. The CFI was 0.90 for the 29-item model and 0.92 for 16-item model. The GFI was 0.80 for the 29-item model and 0.91 for the 16-item model. The standardized root mean square residual was 0.09 for the 29-item model and 0.07 for the 16-item model. The PGFI and PNFI were slightly higher for the 29-item model as compared to the 16-item model.

**Table 6*****Four-stage Model of Concerns about an Innovation***

Stage	Description
Awareness	The faculty has little knowledge about the innovation but is interested in learning more about it.
Informational	The faculty is primarily concerned with getting information about using the innovation and with how the innovation will integrate with the traditional style of teaching, specifically focusing on required changes in roles, tasks, and expectations.
Impact	Concerns focus on the impact of the innovation on students. The focus is on the relevance of the innovation for students; the evaluation of student outcomes, including performance and competencies; and changes that are needed to improve student outcomes.
Collaboration	Concerns focus on coordination and cooperation with other colleagues to implement the innovation as well as sharing information about the innovation with others.

The results indicate that the correlations among the four latent SoC constructs did not follow the original assumptions for both models. Moderate effects were found between the Stages for both models. Although the fit indices point to bad model fits, the overall fit of the 16-item, four-stage model was better as compared to the 29-item, four-stage model. A proposed revision of the 16-item model is displayed in Table 6. Figure 1 represents the relevant standardized parameter estimates and errors, which appear in parentheses, for the 16-item model.

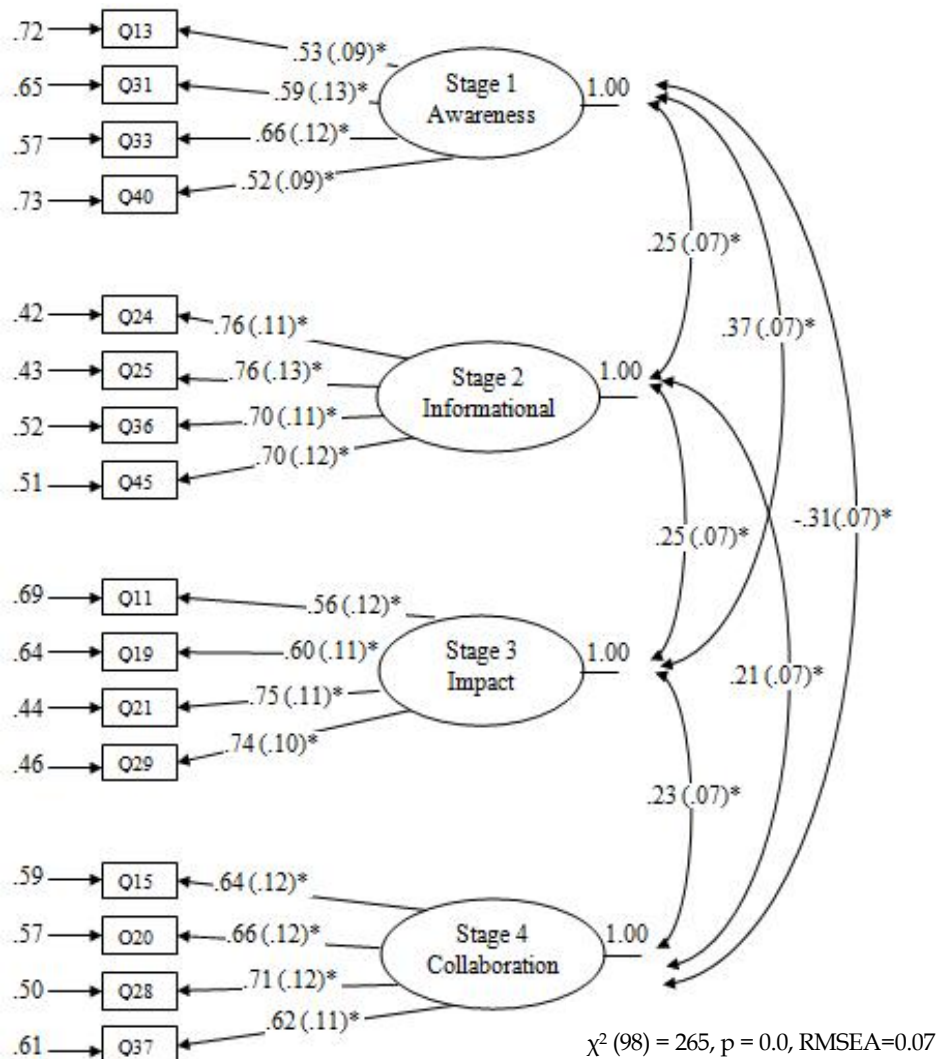


Figure 1. Standardized parameter estimates and errors (in parentheses) for the 16-item model

Since no alternative sample was available for the purpose of cross-validation in this study, the Expected Cross-Validation Index (ECVI) was calculated. The ECVI provides a useful means of assessing the likelihood that the model cross-validates across similar-sized samples from the same population (Browne and Cudeck, 1989). The model having the smallest ECVI value (i.e., smaller than independence and saturated models) exhibits the greatest potential for replication (Byrne, 1998). The ECVI was 3.918 for the 29-item model and 1.053 for the 16-item model. The ECVI results also indicated that the 16-item model is the best fitting model.

### Conclusion and Recommendations

Conceptual and psychometric problems associated with the SoCQ were documented. The data in this study provides considerable support for the broad assumptions of the Concern Based Adoption Model. However, we recommend some changes in the specific structure of the original model and in the way that concerns have traditionally been assessed. An iterated principal exploratory factor analysis did not support the subscale structure of the SoCQ. The reliability (i.e., Cronbach alpha) for four of the seven stages was low ( $<.70$ ), and the intercorrelational matrix did not provide support the hypothesized relationships among the stages. Reorganized and shortened versions of the questionnaire suggested the need for a reconceptualization of the original model. Unreliable items (i.e., 12, 16, 22, 34, 42, and 44) were removed from the original scale. The suggested model enhanced the psychometric properties of the instrument. The proposed revision of the model is displayed in Table 6. The four modified SoC were labeled as follows: (1) Awareness, (2) Informational, (3) Impact, and (4) Collaboration. The four-stage, 16-item model had alpha reliability estimates of .82 for Awareness, .75 for Informational, .66 for Impact, and .75 for Collaboration.

The SoC construct might be innovation specific. The four-stage model proposed in this study is not intended to be a prototypical model of faculty concerns about innovations. Instead, we hope that our findings encourage researchers to give greater attention to the psychometric and conceptual issues when using the SoCQ in different contexts. One of the limitations of this study is that it took place in only one institution in Turkey. A replication of the present study in different countries would be worthwhile in order to detect any differences. A larger sample that includes different institutions in the same context should be surveyed to gain a greater understanding of the perceptions of faculty with different concerns.

Because of the psychometric problems, the data that is generated from the SoCQ must be interpreted with caution, and a careful redesign of the questions and subscales of the SoCQ should be considered in order to more accurately measure the SoC in countries that have cultural and educational practices that significantly diverge from those in which the SoCQ was originally conceived and tested. More research is needed to assess this potential issue. More research should be conducted in international settings in order to evaluate the applicability of such instruments as the SoCQ in other countries. Based on the difficulties encountered in this study, the impacts of cultural and educational differences seemingly call into question the validity and reliability of such instruments when applied in developing countries.

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## Kaygı Evreleri Anketinin Türkçe Formunun Geçerlik ve Güvenirlik Çalışması

### (Özet)

*Problem Durumu:* Hızla gelişen teknoloji ve ihtiyaçlar, eğitim alanındaki değişimleri zorunlu kılmaktadır. Değişimi gerçekleştiren lider gruptaki bireylerin hedefi eğitim sistemimizi geliştirmek olmakla birlikte, değişime maruz kalacak olan diğerlerinin yenilikler hakkında kaygıları olması beklenen bir durumdur. Özellikle İnternetle ilişkili teknolojilerdeki hızlı gelişmeler, gelişmiş ve gelişmekte olan ülkelerin eğitim sistemlerinde artan oranlarda kullanılmaktadır. Fakat öğretmenlerin internet destekli teknolojilere alışkın olmaması ve internet teknolojilerini yeterince kullanamaması, beraberinde bazı problemler getirmektedir. Yapılması gereken şey, öğretmenlerin kaygılarını belirleyerek bu kaygıları ortadan kaldırmaya yönelik çalışmalar yapmaktır. Eğitim alanında yapılan yeniliklere yönelik kaygıları belirlemek amacıyla Kaygı Evreleri Anketi (KeA) hazırlanmıştır. Kaygı evreleri kavramı; bir bireyin bir yenilikle ilk karşılaştığı andan itibaren o yenilik hakkında detaylı bilgi sahibi olup sorunsuz şekilde kullanmaya başlamasına kadar olan süre zarfında geçirdiği evreler olarak tanımlanmaktadır. Yedi kaygı evresi sırasıyla şöyle isimlendirilmektedir: (0) farkında olma, (1) bilgi edinme, (2) kişisel, (3) organizasyon, (4) etkileme, (5) işbirliği ve (6) yeniden odaklanma. Öğretmenlerin eğitim alanındaki bir yenilikle karşılaşması durumunda bu evrelerden geçtiği kabul edilmektedir. KeA birçok araştırmada kullanılmış olan bir anket olmasına rağmen, gelişmekte olan ülkelerde ve farklı bir kültür ve eğitim ortamında kullanılması durumunda geçerlik ve güvenirlilik çalışmasının tekrar yapılması gerekmektedir.

*Araştırmanın Amacı :* Bu çalışmanın amacı, problem durumunda belirtilen gerekçelerden hareketle, Kaygı Evreleri Anketi'ni Türkçe'ye uyarlayarak, geçerlik ve güvenirlilik çalışmalarını yapmaktır.

*Araştırmanın Yöntemi :* Bu çalışmanın örneklemini Türkiye'deki bir üniversitenin sekiz fakültesinde görev yapan 186 bayan ve 435 erkek olmak üzere 621 öğretim üyesi oluşturmaktadır. Örneklemin %30'u yardımcı doçent, %25'i doçent ve %45'i profesör ünvanına sahiptir. Ölçeğin uyarlama çalışması için önce KeA araştırmacı tarafından Türkçe'ye çevrilmiştir. Daha sonra, çevirideki tutarlılığı test etmek amacıyla, alanında uzman yurtdışında görevli bir öğretim üyesinden (İngilizce'yi çok iyi derecede bilen) ölçeğin tekrar İngilizce'ye çevrilmesi istenmiştir. Ölçek, kapsam geçerliğini incelemek amacı ile ölçme ve değerlendirme alanında çalışan iki profesör tarafından gözden geçirilmiştir. Alınan görüş ve öneriler doğrultusunda ölçekte gerekli düzenlemeler yapılmıştır. Ölçekte yer alan

35 madde, öğretim üyelerinin online teknolojiler hakkındaki kaygılarını belirlemektedir. Ölçeğin faktör yapısını incelemek amacı ile yinelemeli temel faktör analizi (YTFA) ve doğrulayıcı faktör analizi (DFA) kullanılmıştır. Ölçeğin güvenilirliğini incelemek amacı ile Cronbach Alfa güvenirlik katsayısı kullanılmıştır.

*Araştırmanın Bulguları:* Ölçekte bulunan 7 evrenin 4'ünde cronbach alpha güvenirlik katsayıları (<0,70) düşük bulunmuştur. Ayrıca içsel korelasyon matrisi, asıl modelde bulunan kaygı evreleri arasındaki ilişkiyi desteklememiştir. Ölçeğin yapı geçerliğini sağlamak amacıyla; Kaiser-Meyer-Olkin testinin 0,85 ve Bartlett's testinin anlamlı çıkması üzerine ( $p<0,001$ ) faktör analizi teknikleri uygulanmıştır. Yapılan analiz sonucunda öncelikle Faktör yük değeri 0,40 ve üstündeki maddelerle, binişik olmayan maddelerin ölçekte kalması esas alınmıştır. Faktör yük değeri 0,40'ın altında olan maddelerin ölçekten çıkarılması uygun bulunmuştur. Optimal faktör sayısını belirlemek üzere 3 yöntem kullanılmıştır: öz değer büyüktür 1 kuralı, çizgi grafiğinin incelenmesi ve paralel analiz. Öz değeri 1'den büyük olan 8 faktör bulunmasına karşın, çizgi grafiği 3 faktör önermiştir. Çizgi grafiği sonuçlarının paralel analiz ile karşılaştırılması sonucunda ölçekteki maddelerin 4 faktör altında toplandığı görülmüştür. Birinci faktör (bilgi edinme evresi) ile ölçeğe ilişkin varyansın %23,5'inin; ikinci faktör (işbirliği evresi) ile ölçeğe ilişkin varyansın %36,6'sının, üçüncü faktör (farkında olma evresi) ile ölçeğin %44,66'sının ve dördüncü faktör (etkileme evresi) ile ölçeğin %49,4'ünün açıklandığı bulunmuştur. Elde edilen bulgular sonucunda, asıl modeldeki ölçeğin düzeltilmiş ve kısaltılmış bir formu önerilmiştir. Önerilen ölçekteki 4 evre (1) Farkında olma (2) Bilgi edinme (3) Etkileme ve (4) İşbirliği olarak tanımlanmıştır. Önerilen 16-maddelik bu ölçeğin iç tutarlılık katsayıları farkında olma evresi için 0,82, bilgi edinme evresi için 0,75, etkileme evresi için 0,66 ve işbirliği evresi için 0,75 olarak hesaplanmıştır. İç tutarlılığı Cronbach Alfa güvenirlik katsayısı kullanılarak belirlenen ölçeğin, güvenirliğinin yeterli olduğu belirlenmiştir. Elde edilen bulgulara dayanarak, bu ölçeğin sonuçlarının farklı kültürlerle göre değişiklik gösterebileceği söylenebilir.

*Araştırmanın Sonuçları ve Önerileri :* Eğiticilerin, eğitim alanındaki hızlı değişime uyum sağlamaları, ancak online teknolojileri etkin bir şekilde kullanmaları ile mümkündür. Bunu başarmanın en iyi yolu, eğiticilerin bu konu hakkındaki kaygılarını belirlemek ve bu kaygılarını ortadan kaldıracak ortamlar yaratmaktır. Bu çalışmada önerilen ölçek, bu bağlamda Türkiye'de bir ilk olma özelliği taşımaktadır. Bu araştırmada, önerilen dört evreden oluşan ölçeğin, araştırmacılar tarafından farklı ülkelerde uygulanması durumunda, ölçeğin özellikle kavramsal ve psikolojik temellerine dikkat edilmesi gerektiği vurgulanmaktadır. Ayrıca çalışma-

nın daha büyük bir örneklem ile ve farklı üniversitelerde tekrarlanması-  
nın benzer kültürdeki öğretim elemanlarının farklı görüşlerinin daha iyi  
algılanması açısından yararlı olacağı düşünülmektedir. Geliştirilen ölçek,  
ilköğretim ve ortaöğretimde görev yapan öğretmenler ile yükseköğre-  
timde görev yapan öğretim elemanlarına yönelik olarak araştırmacılar,  
ölçme değerlendirme uzmanları ve psikometristler tarafından uygulanabi-  
bilir.

**Anahtar Sözcükler:** Eğiticilerin kaygıları, kaygı evreleri, DFA, AFA.

## Discriminant Function Analysis: Concept and Application

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### Abstract

*Problem Statement:* Discriminant analysis is a multivariate statistical method that serves to set up a model to predict group memberships. The model consists of discriminant functions that appear based on a linear combination of predictive variables that provide the best discrimination between groups. These functions are derived from a sample whose group memberships are known. Afterward, they could be applied to new individuals or units with measures related to the same variables and unknown group memberships. Although discriminant analysis is not frequently used in behavioral sciences because its assumptions are not always easy to meet, it is a conceptually and mathematically powerful multivariate statistical method. Therefore, a description and illustration of the discriminant analysis method may help increase its use.

*Purpose of the Study:* The purpose of the present study is to describe discriminant analysis, provide basic information such as intended uses and interpretation of results, and determine convergence between discrimination application using the high-low-27-percent group method and classification through discriminant analysis.

*Methods:* The study group of the research conducted according to correlational research design consisted of a total of 244 volunteer students from Ankara University, Faculty of Educational Sciences, Department of Psychological Consulting and Guidance. Students were between years 1 and 4 in the 2006-2007 academic year. The students in the study were divided into two groups according to their scores from the Epistemological Beliefs Questionnaire, as groups with high and low belief levels in accordance with the high-low-27-percent group method. Hence, a total of

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132 students, 66 in each group, were included in the study, and 112 students with moderate epistemological belief levels were excluded. Then an attempt was made to determine how the scores from the subscales of Analyticity, Openmindedness, and Curiosity of the California Critical Thinking Disposition Inventory were successful in discriminating epistemological belief groups.

*Findings and Results:* The total accurate classification percentage of the discriminant function obtained from the analysis was found to be 75.80%. In other words, it was seen that the compatibility level of the classification through discriminant analysis with the initial discrimination using the high-low-27-percent group method was 75.80%. Moreover, the accurate classification proportion of discriminant analysis was higher than proportional chance criterion (75.80% > 50.00%). That is, the obtained discriminant function provided accurate classification beyond chance classification.

*Conclusions and Recommendations:* Discriminant analysis is used to discriminate between predetermined groups based on certain scores. Although there are some limitations to the common use of discriminant analysis (such as the fact that its strong assumptions are not easy to meet and that it is necessary to determine groups before analysis), they may not appear in every research problem. There might be some cases where assumptions of the analysis are easily met or the groups are clear. In such cases, its benefits must be considered, since it is a conceptually and mathematically powerful multivariate method.

*Keywords:* Discriminant analysis, multivariate statistics, high-low-27-percent group method, epistemological beliefs, critical thinking disposition

Individuals or units are grouped according to various features in different sciences with different goals. Such classification information helps complicated cases become clearer. Once such information is obtained, the new situation faced might be used in the classification of individuals or units, for instance, discriminating between normal children and those with learning disabilities in education; accurately classifying schizophrenics, depressives, or paranoids in psychology and psychiatry; discriminating between the sick and healthy in medicine. Similar classifications contribute much in practice, and they provide convenience. However, the important point is to have the right information or model to make accurate classifications.

Although discriminant analysis is not frequently used in behavioral sciences, it is a conceptually and mathematically powerful multivariate statistical method. It was put into practice in psychology within the scope of testing programs for staff assessment and recruitment. The practices served to provide efficient strategies in employment or placement in educational programs. Yet it is thought that actual areas

of usage are not confined to these and that it could potentially contribute to many applied problems (Nunnally & Bernstein, 1994).

Factor analysis is the most common way to examine similarities between variables in behavioral sciences. Besides factor analysis, the other three popular methods used to examine similarities between variables are cluster analysis, profile analysis, and discriminant analysis, although their purposes are not the same. In the following sections, similarities and differences between discriminant analysis and other methods will be briefly mentioned. However, it must not be forgotten that one of the most important criterion in deciding which method to use is the scale level and number of related variables, as in all statistical methods.

Discriminant analysis can be defined as the set of procedures used to classify individuals or units, with minimum error, under populations to which they belong (Tatlıdil, 1992). These groups could be different treatment groups formed by researchers in experimental research designs (test group, control group, and so forth) or naturally formed groups (male, female, and so on) (Diekhoff, 1992). Discriminant analysis attempts to determine one or more functions as a linear combination of variables that maximize differences between individuals in two or more groups (Çakmak, 1992).

Discriminant analysis can be used for the following different purposes (Garson, 2008):

- classify individuals or units using discriminant prediction equation (function)
- test theories of whether it is possible to classify individuals or units based on predictions
- examine differences between groups
- determine the most parsimonious way to classify groups
- determine the proportion of explained variance in dependent variables by independent variables
- assess the relative importance of independent variables in classification according to dependent variables
- eliminate unimportant variables in group classification

Discriminant analysis is also used to classify groups based on a linear combination of measurements after a significant F value obtained from MANOVA or to group individuals based on one or more measures. For discriminant analysis, every individual must have a score or scores related to one or more qualitative variables or a value related to a categorical variable that shows group membership. In discriminant analysis, qualitative variables are called independent variables, discriminative variables, or predictive variables. The variable that shows group membership is called the dependent variable or criterion variable. However, when

considered for discriminant analysis applied after a significant MANOVA, the terminology could be confusing. In MANOVA, contrary to discriminant analysis, qualitative variables are typically called dependent variables or criterion variables, whereas the categorical variable is called the independent variable or factor. In other words, discriminant analysis and MANOVA are two contrasting methods (Green, Salkind, & Akey, 2000; Poulsen & French, 2008).

At this point, an example should be given for better understanding. Recruitment of 120 teachers for a newly opened private school was considered. The applicants were given the Occupational Knowledge Test, Adaptation Scale, and the Attitude Scale Towards Teaching Profession. Grade point averages of their undergraduate studies were also considered. As such, 120 out of 300 who were expected to be successful were recruited, and they signed a one-year-contract. One year later, a committee of school administrators divided these 120 teachers into three groups according to their performance: low, moderate, and high performance levels. As a result, when considered in terms of discriminant analysis, the researcher had a total of five variables. These were the four predictive (independent) variables: Occupational Knowledge Test scores, Adaptation Scale scores, the Attitude Scale Towards Teaching Profession scores, and grade point averages. There was one grouping variable (dependent variable), that divided the teachers into three groups according to performance. However, given the same example, there is a direct contradiction in terms of MANOVA. Namely, the grouping variable that divided the teachers into three groups according to performance is an independent variable (or factor), and Occupational Knowledge Test scores, Adaptation Scale scores, the Attitude Scale Towards Teaching Profession scores, and grade point averages are dependent variables.

Consider the following research problem. Which teaching method, A, B, or C, is the most effective in mathematics achievement? The teacher obtained four different mathematics achievement scores at the end of the term after assigning 30 students to each method group randomly. The researcher applied MANOVA first and then discriminant analysis, following a significant F value. In MANOVA, teaching methods are independent variables (grouping variables or factors), whereas they are dependent variables in discriminant analysis. However, MANOVA and discriminant analysis are similar in terms of certain features and assumptions.

Discriminant analysis and cluster analysis are similar in that they are both used in grouping individuals. This is why they are sometimes confused with each other. However, the two methods have important differences. In discriminant analysis, the number of groups or clusters is known, and this number does not change during the analysis. The analysis is expected to place individuals under the clusters or assign them to the clusters. Moreover, discriminant functions obtained from discriminant analysis are likely to be used in the future. On the other hand, the number of clusters in cluster analysis is not known. If the number were known, the analysis would not be needed. Also, it would not likely be used in the future, since it produces results about the current situation (Tatludil, 1992).

Another method of grouping individuals is logistic regression analysis. Logistic regression is an analysis that enables the prediction of categorical results, for example, group memberships, with the help of a number of variables. Predictive variables can be constant, categorical, or dichotomous. Discriminant analysis also aims at predicting group memberships according to a number of predictive variables. Given these definitions, it is seen that, in fact, discriminant analysis and logistic regression analysis enable us to answer the same research questions.

Logistic regression analysis and discriminant analysis are similar in that they have a categorical dependent variable. Logistic regression produces better results when the dependent variable presents a dichotomous-like yes/no, correct/incorrect, successful/unsuccessful, sick/healthy, and so on. Nevertheless, independent variables can be categorical (nominal), ordinal, interval, or ratio. Discriminant analysis produces better results when the dependent variable has more than two groups or categories. However, the most important points to be considered when deciding which method to use are the following: distribution assumptions, correlations between independent variables, and the distribution of dependent variables. In other words, we must primarily test their typical assumptions to decide which method to use in case the dependent variable has more than two categories, since the two methods produce categorical results. In fact, at this point, the reason why logistic regression has become more popular and has been frequently used, especially over the last few years, is that logistic regression does not require discriminant analysis assumptions to be met. That is to say, it is much more flexible in assumptions.

Logistic regression analysis has great facilities in practice. It does not require normality, linearity, or homogeneity of variance-covariance matrix assumptions to be met. On the other hand, in case of assumptions that are met, discriminant analysis is a stronger and more effective analytical strategy than logistic regression. Although logistic regression can be used in more cases, since it does not require the aforementioned assumptions to be met, it also requires larger samples. Researchers need a group of at least 50 people in every independent (predictive) variable for an accurate hypothesis test, particularly in cases where the dependent variable has more than two categories or groups. In some resources, it is emphasized that this number must be a minimum of 20 for every independent variable and a minimum total of 60. On the other hand, discriminant analysis must be preferred to logistic regression analysis when sample sizes are the same and in cases where independent variables have multivariate normality in every category of the dependent variable (in the group) and homogeneity of variance and covariance matrix assumptions in every category are met. This is because discriminant analysis results in a more accurate hypothesis testing and classification when conditions are equal. In addition, we must say that it is easier to interpret the mathematical model obtained from logistic regression analysis (Akkuş & Çelik, 2004; Grimm & Yarnold, 1995; Kalaycı, 2005; Lea,



2008; Leech, Barrett, & Morgan, 2005; Poulsen & French, 2008; Tabachnick & Fidel, 1996; Tathdil, 1992).

### *Assumptions of Discriminant Analysis*

Assumptions of discriminant analysis are the same as those of MANOVA. Brief information about these assumptions is presented below.

**Sample size.** It is not necessary to have equal  $n$  in groups, namely an equal sample size. However, the most important rule is to ensure that the number of individuals or units in the smallest group is higher than the number of independent (predictive) variables. The best case is where the sample size is four or five times higher than the number of independent variables. For instance, when there are four or five independent variables, the size of each group must be at least 20 (Poulsen & French, 2008). Diekhoff (1992) suggests that the smallest group must be ten times higher than the number of variables.

**Normal distribution.** Qualitative variables (independent/predictive variables) must display a multivariate normal distribution. Multivariate normal distribution assumes that every variable is in accordance with a single-variable normal distribution and that a combination of these variables is normal as well. In this case, if a variable shows a multivariate normal distribution, it also shows a single-variable normal distribution. Yet the contrasting case may not always be true. Still, the fact that variables show a single-variable normal distribution will affect multivariate normal distribution because multivariate normality is based on a single-variable normality. As long as the violation of normality assumption is completely caused by skewness, the results of the significance test may still be reliable. Furthermore, in medium or large samples, it is possible to rely on discriminant analysis to produce relatively valid results in terms of Type I error. Although large samples reduce the effects of deviation from normal distribution, it must be attempted to obtain normal distribution for every variable, since deviations weaken the power of statistical tests (for example, accurate classification rate in discriminant analysis is affected) (Green, Salkind, & Akey, 2000; Kalaycı, 2005; Poulsen & French, 2008; Tabachnick & Fidel, 1996).

**Homogeneity of variance-covariance matrix.** Discriminant analysis is sensitive to the homogeneity of variance-covariance matrixes. It is strongly recommended that within-group variances and correlation matrixes be reexamined before reaching results in an important study. Homoscedasticity may be examined through a scatter diagram, and if necessary, it might be corrected using different transformation methods (Poulsen & French, 2008). Although this assumption is one of the basic assumptions of the method, discriminant analysis can be applied when the variance-covariance matrix is not equal. However, this time the method used differs. That is to say, linear discriminant analysis is used when covariance matrixes of all groups are

equal, and quadratic discriminant analysis is used when they are not equal (Özdamar, 2004).

The homogeneity of a variance-covariance matrix is assessed using Box-M statistics. A significant result from Box-M statistics ( $p < .05$ ) is interpreted to mean that the variance-covariance matrix is not homogeneous and the difference between the variance-covariance matrix is significant. Also, a significant result from Box-M statistics might be an indicator of an unequal variance-covariance matrix and, at the same time, a deviation from normality or both, since statistics used to test the homogeneity of a variance-covariance matrix is sensitive to normality (Kalaycı, 2005).

**Outliers.** Discriminant analysis is very sensitive to outliers as well. First of all, univariate and multivariate outliers in every group must be found and either transformed or omitted. Nevertheless, researchers must understand the reasons for outliers in order to decide which treatment (omission or transformation) to use. For example, some outliers might deviate despite reflecting population features. Transformation is needed for these outliers. On the other hand, if these outliers do not reflect population features, they must be omitted. If there are extreme outliers in a group, this will affect the average and increase variability. All significance tests are based on variance average of groups, namely, pooled variance. Therefore, significance tests of relative large averages (with large variances) will be based on relative pooled variance, and there will be inaccurate results in terms of statistical significance (Poulsen & French, 2008).

**Multicollinearity.** If one of the independent variables highly correlates with another independent variable, the problem of multicollinearity arises. Multicollinearity decreases predictive power of an independent variable according to the degree of correlation of an independent variable with other independent variables. As multicollinearity increases, the typical explained variance by independent variable decreases, whereas pooled variance proportion increases. As a result, general predictive power increases less, as high multicollinear variables are placed in the model, since pooled variance is taken into account once. It is even difficult to estimate unique contributions of the variable due to decreased typical variances of independent variables (Kalaycı, 2005). Moreover, when independent variables are correlated, standardized discriminant function coefficients are not reliable results in determining the relative importance of independent variables. Consequently, there must not be a problem of multicollinearity between independent variables (Poulsen & French, 2008). In some resources, measurement of multicollinearity is .70 (Kalaycı, 2005), whereas in some others it is .80 and above (Büyüköztürk, 2007; Gupta, 1999).

The general purpose of the present study is to provide researchers with basic information about the use and basic features of discriminant analysis and point out important points for interpreting results by using a sample application in education through data obtained from teacher candidates. The method has been generally

introduced up to now. In the following section, we would like to present an example of how to interpret results from the analysis.

## Method

### *Research Design*

The study model is a correlational survey. Correlational survey studies are those where correlation between two or more variables is examined without any intervention in these variables. It may be suggested that they are important studies that are efficient in revealing correlations between variables and determining the extent of such correlations and that they also provide necessary clues for further research on these correlations. (Büyüköztürk et al., 2008).

### *Study Group*

The study group consists of a total of 244 volunteer students in years 1 to 4 from Ankara University, Faculty of Educational Sciences, Department of Psychological Consulting and Guidance during the 2006–2007 academic year. After gathering data, the students were divided into two groups according to their scores from the Epistemological Beliefs Questionnaire, as groups with high and low belief levels in accordance with the high-low-27-percent group method. Hence, a total of 132 students, 66 in each group, were included in the study, and 112 students with moderate epistemological belief levels were excluded. When distribution of the total 132 students according to gender was examined, it was seen that 84 of them were (63.60%) female and 48 (36.40%) were male. When distribution according to age was examined, it was determined that 117 students (88.64%) were between ages 18 and 22 and that 15 students (11.36%) were age 23 and above. When distribution according to year level was examined, it was seen that 37 students (28.00%) were in the first year, 28 (21.20%) were in the second year, 32 (24.20%) were in the third year, and 35 (26.50%) were in the fourth year.

### *Data-Gathering Tools*

In the present study, the Epistemological Beliefs Questionnaire, which was translated into Turkish by Deryakulu and Büyüköztürk (2002), and the California Critical Thinking Disposition Inventory, which was translated into Turkish by Kökdemir (2003), were used.

*Epistemological Beliefs Questionnaire.* The Epistemological Beliefs Questionnaire (EBQ) was developed by Schommer (1990) in order to measure beliefs of individuals about learning and knowledge. Deryakulu and Büyüköztürk (2002) adapted the EBQ to Turkish culture, and it was tested in terms of validity and reliability in a group that consisted of 595 Turkish university students. The original scale is in English and consists of 63 items under a four-factor structure. In their initial study, Deryakulu and Büyüköztürk (2002) determined that the scale had a three-factor structure in Turkish culture. The first factor was called “Beliefs about Effort-Based Learning,” the second “Beliefs about Ability-Based Learning,” and the third “Belief About the Single

Truth.” The EBQ had 35 items in total: 17 negative items and 1 positive item for a total of 18 items in the first factor, 9 positive items in the second factor, and 8 positive items in the third factor. Cronbach alpha internal consistency coefficients calculated for testing reliability of the scale were found to be .83 for the first factor, .62 for the second, and .59 for the third. The Cronbach alpha internal consistency coefficient was found to be .71 for the whole scale.

The second study conducted by Deryakulu and Büyüköztürk (2005) included a group of 626 university students. One item in the second factor of the first study was omitted from the scale, as it showed a very low item-total correlation. Moreover, it was observed that one item previously appearing in the first factor was high-factor loaded in the second factor. Moreover, it was seen that the scale kept its three-factor structure. Furthermore, as a result of the confirmatory factor analysis applied, fit indexes were found to be GFI = 0.89, AGFI = 0.87, RMS = 0.09 (standardized RMS = 0.07). It was also stated that the RMSEA value calculated as 0.05 was acceptable for model fit and the three-factor structure of the EBQ was an applicable and valid model. Cronbach alpha internal consistency coefficients were found to be .84 for the first factor, .69 for the second factor, .64 for the third factor, and .81 for the whole scale.

The present study used the 34-item form of the EBQ employed in the second study conducted by Deryakulu and Büyüköztürk in 2005. Therefore, there were a total of 17 items in the first factor, 9 items in the second factor, and 8 items in the third factor. The items were answered using a five-point Likert-type scale, ranging from “I totally disagree” to “I totally agree.” The positive items were scored from one to five, whereas the negative items were scored from five to one.

**California Critical Thinking Disposition Inventory.** The California Critical Thinking Disposition Inventory is a tool to measure critical thinking dispositions of individuals, and it was the result of the Delphi Project implemented by the American Philosophical Association in 1990. It contains seven subscales, which have been theoretically defined and psychometrically tested. The original form is in English and consists of 73 items. The Turkish form adapted by Kökdemir (2003) contains six subscales and 51 items. However, some items changed places between factors and the two factors are combined. In addition, it was observed that the Turkish version was not so different from the original scale in factor structure. Cronbach alpha internal consistency coefficients of the subscales are as follows: Analyticity,  $\alpha = .75$ ; Openmindedness,  $\alpha = .75$ ; Curiosity,  $\alpha = .78$ ; Self-Confidence,  $\alpha = .77$ ; Seeking the Truth,  $\alpha = .61$ ; Systematicity,  $\alpha = .63$ ; for the whole scale,  $\alpha = .88$  (Kökdemir, 2003).

Kökdemir (2003) suggests that in order to determine critical thinking disposition, a scoring system that consists of all these subscales might be used and that it is possible to assess the subscales separately. In the present study, instead of critical thinking disposition total scores, subscale scores from Analyticity, Openmindedness, and Curiosity were used.

### Data Analysis

In order to predispose data for discriminant analysis, the students were divided into two groups—high and low epistemological belief levels—according to their Epistemological Beliefs Questionnaire scores. The treatment was based on the high-low-27-percent group method, and the data became categorical. In other words, a dependent variable of discriminant analysis (criterion variable or grouping variable) was obtained.

Independent or predictive variables were scores from Analyticity, Openmindedness, and Curiosity subscales of the California Critical Thinking Disposition Inventory. These variables are quantitative variables obtained at interval-scale level. In this example, our goal was to determine how accurately scores from Analyticity, Openmindedness, and Curiosity subscales could divide (classify) the students with high and low epistemological belief levels scores based on the high-low-27-percent group method.

### Findings

In this section, Table 1 presents independent samples *t* test results for classifying students according to Epistemological Beliefs Questionnaire scores using the high-low-27-percent group method.

**Table 1**

*Comparison of Scale Scores of the Groups Formed According to the Epistemological Beliefs Questionnaire Using the High-Low-27-Percent Group Method*

Epistemological Belief Level	N	$\bar{X}$	S	t	sd	P
High-27%	66	144.41	5.03	23.83	104.715	0.00
Low-27%	66	115.15	8.61			

It is clear from Table 1 that there is a significant difference between epistemological belief levels of the high-low-27-percent groups ( $t_{(104.715)} = 23.83$ ;  $p < .01$ ). Accordingly, the average of the high-27-percent group with a high epistemological belief level is  $\bar{X} = 144.41$ , whereas that of the low-27-percent group with a low epistemological belief level is  $\bar{X} = 115.15$ .

In Table 2, descriptive statistics of scores from Analyticity, Openmindedness, and Curiosity subscales (independent variables) in the groups with high and low epistemological belief levels (dependent variable) are presented, and then assessments through discriminant analysis are given.

**Table 2**

*Descriptive Statistics of Analyticity, Openmindedness, and Curiosity Scores of Groups with High and Low Epistemological Belief Levels*

Puanlar	Epistemological Belief Groups	N	$\bar{X}$	S
Analyticity	High	66	49.44	4.25
	Low	66	46.67	3.86
Openmindedness	High	66	59.12	5.72
	Low	66	50.98	6.71
Curiosity	High	66	38.92	4.32
	Low	66	36.70	4.74

As mentioned previously, the high epistemological belief group presented in Table 2 consists of students included in the high-27-percent group with high Epistemological Beliefs Questionnaire scores, and the low epistemological belief group consists of students included in the low-27-percent group with low Epistemological Beliefs Questionnaire scores. Clearly, scores of the students in the high epistemological belief group for Analyticity, Openmindedness, and Curiosity subscales of the California Critical Thinking Disposition Inventory are higher than those of the students in the low epistemological belief group.

#### *Interpreting Discriminant Analysis Results*

For the assessment of homogeneity of the variance-covariance matrix, one of the discriminant analysis assumptions, Box-M statistics were used. It was seen that the F value related to Box-M statistics was not significant ( $F_{(6, 122445.3)} = 1.007, p > .05$ ). This finding shows that the variance-covariance matrix of the groups is homogeneous. At the same time, it can be seen as a proof that shows normal distribution assumptions were met.

Moreover, correlations between independent variables were examined in order to observe the multicollinearity problem. The related correlation matrix is presented in Table 3.

**Table 3**

*Correlations among Independent Variables*

Variables	Analyticity	Openmindedness	Curiosity
Analyticity	-	-	-
Openmindedness	.34**	-	-
Curiosity	.42**	.13	-

\*\* $p < .01$

Table 3 shows that there is no correlation of .70 and above between independent variables and that there is no multicollinearity problem.

In discriminant analysis, functions that are called discriminant functions are produced by a linear combination of one or more quantitative predictive variables. The possible number of functions is determined by taking the number of groups ( $ng$ ) or predictive variables ( $p$ ), with preference for the lower number. In other words, the number of functions is equal to  $ng - 1$  or  $p$  (Green, Salkind, & Akey, 2000).

Let us consider again the example of A, B, C teaching methods in mathematics achievement. The problem was to determine which method was the most efficient. When the three different teaching methods, namely, the three groups and the four predictive variables (the four different mathematical scores), are taken into account, the number of the functions is 2, since 2 is the lower value. That is to say, the possible number of functions is 2 because of the following equations:  $ng - 1 = 3 - 1 = 2$ ;  $p = 4$  (Green, Salkind & Akey, 2000).

In discriminant analysis, the first discriminant function maximizes the difference between groups under examination. The second function maximizes the difference between groups, but this time it is limited in that it cannot correlate with the first function. Other functions are obtained in this way, but every time the limitation applies: they cannot be correlated with the previous one (Green, Salkind, & Akey, 2000).

A discriminant function or canonical root is, in fact, a latent variable produced by a linear combination of discriminant or independent variables (Garson, 2008). Eigenvalue, canonical root, and Wilks' Lambda statistics are taken into account in the assessment of importance of discriminant function or functions.

*Eigenvalue* is also called the characteristic root of every discriminant function, and it reflects the proportion of explained variance ratio in a dependent variable. Every discriminant function has an eigenvalue. As in the example given here, only one discriminant function ( $ng - 1$ ), and thus only one eigenvalue, is produced when a dependent variable has two categories. In this case, the proportion of explained variance is 100%. In other words, this function concerns 100% of the explained variance. When there is more than one discriminant function, the first function is the most important one with the most explanatory power. The second function is the second-most important function with secondary explanatory power, and so on. The proportion of eigenvalues shows relative discriminative power of discriminant functions. Relative discriminative power is obtained by dividing an eigenvalue of one function by the sum of the eigenvalues of all the functions in the model. The percentage of discriminant power of the model is used to determine how many of the discriminant functions are important (Garson, 2008). The eigenvalue of this analysis was found to be .51. The difficulty in interpreting an eigenvalue is caused by the lack of an upper limit. However, Kalaycı (2005) suggests that eigenvalues above .40 can be accepted as "good," although there is no certain limit.

*Canonical correlation* is correlation between groups formed by dependent variables and the discriminant function. If the canonical correlation is zero, then there is no correlation between groups and function. When the canonical correlation is high, the higher the correlation between these groups and discriminant functions. In this analysis, canonical correlation was found to be .58. It might be suggested that this finding shows that function is moderately effective in classifying groups.

Table 4 presents Wilks' Lambda ( $\lambda$ ) statistics and the related chi-square value and significance level.

**Table 4**

*Wilks' Lambda Statistics*

Function	Wilks' Lambda	Chi-square	df	P
1	.66	53.01	3	.000

First, it must be stated that the Wilks' Lambda value given in Table 4 is related to the model. Wilks' Lambda is used to determine how many discriminant functions are significant. This number could be one or more. Wilks' Lambda tests the significance of eigenvalue statistics for every discriminant function. In Table 4, there is only one function and chi-square value related to Wilks' Lambda statistics:  $\chi^2(3) = 53.01$ ;  $p < .00$  is significant. In other words, discriminative power of the function is significantly high, or groups can be classified by a discriminant function.

In Table 5, the results related to Wilks' Lambda groups' means equation test are presented. The F test results given in Table 5 are used to determine whether the concerned independent variables have a significant variety in classification decisions and which variable is more important in classification. The results are tested by the F test (Güzeller, 2006).

**Table 5**

*Wilks' Lambda Groups' Means Equation Test*

Scores	Wilks'				
	Lambda	F	df <sub>1</sub>	df <sub>2</sub>	P
Analyticity	.89	15.38	1	130	.00
Openmindedness	.70	56.19	1	130	.00
Curiosity	.94	7.98	1	130	.00

The point that needs careful attention here is that Wilks' Lambda statistics in Table 5 is related to variables, unlike the one in Table 4. The lower the Wilks' Lambda value related to an independent variable, the more it contributes to variable



discriminant function. Wilks' Lambda is valued between 0 and 1.  $\lambda = 0$  means groups' means are different, whereas  $\lambda = 1$  means groups' means are similar or there is no discrimination between groups (Diekhoff, 1992; Garson, 2008).

When significance levels of each variable given in Table 5 are examined, it is seen that all the differences between the groups in Analyticity ( $F_{(1,130)} = 15.38; p < .01$ ), Openmindedness ( $F_{(1,130)} = 56.19; p < .01$ ), and Curiosity ( $F_{(1,130)} = 7.98; p < .01$ ) subscale scores of the California Critical Thinking Disposition Inventory are significant. As was mentioned before, values of Wilks' Lambda statistics close to 1 show that subtests do not have a strong discriminant effect on group classification.

In Table 6, standardized coefficients related to discriminant function are listed. Standardized discriminant function coefficients show the relative importance of independent variables in the prediction of every dependent variable, that is, the unique contribution of the variable to discriminant function. In this sense, they correspond to beta coefficients in regression analysis (Garson, 2008; Kalaycı, 2005). Also, every discriminant function is named after the variable having the highest correlation. In case of more than one discriminant function, different coefficients are produced for every function.

**Table 6**

*Standardized Coefficients in Discriminant Function*

Scores	Coefficients
Analyticity	.19
Openmindedness	.88
Curiosity	.28

As it is clear from Table 6, Openmindedness is the most contributive independent variable to group classification, for the highest coefficient (.88) belongs to that variable. It is also observed that contributions by the other variables are low.

In Table 7, coefficients of structure matrix are presented. A structure matrix shows correlation of every variable with every discriminant function and is used to assess the importance of independent variables. These are simple Pearson correlations, and coefficients of a structure matrix are called correlations or discriminant loads.

**Table 7***Structure Matrix Coefficients*

Subscale Scores	Coefficients
Analyticity	.92
Openmindedness	.48
Curiosity	.35

As is clear from Table 7, the independent variable with the highest correlation with discriminant function is Analyticity, whereas the one with the lowest correlation is Curiosity.

Table 8 presents classification results obtained from discriminant analysis. The success of discriminant analysis depends on a highly accurate classification percentage.

**Table 8***Classification Results*

Group	High Epistemological Beliefs		Low Epistemological Beliefs		Total	
	f	%	f	%	f	%
	High Epistemological Beliefs	51	77.30	15	22.70	66
Low Epistemological Beliefs	17	25.80	49	74.20	66	100.00

Total Accurate Classification Percentage = 75.80%

Table 8 shows that 51 out of 66 students (77.30%) in the high epistemological belief group (high-27-percent group) were classified "accurately," in other words, in accordance with high-27-percent group classification. In the low epistemological belief group, 49 out of 66 students (74.20%) (low-27-percent group) were classified "accurately," that is, in accordance with low-27-percent group classification. The total accurate classification percentage of discriminant function is 75.80%. In addition, it is necessary to calculate relative chance criterion and the maximum chance criterion in order to assess classification accuracy properly (Kalaycı, 2005). Here the sample consists of 132 people with 66 people in each group. In other words, 50% of the study group is in the first group and 50% in the second. Therefore, the chance value is 50%. The accurate classification value as a result of the analysis is 75.80%. Classification accuracy of the analysis is higher than chance criterion, since this value is higher than 50%. That is to say, the discriminant function obtained classified accurately, beyond classification by chance.

## Results

The study group of the research consisted of 132 students in years 1 to 4 from Ankara University, Faculty of Educational Sciences, Department of Psychological Consulting and Guidance during the 2006–2007 academic year. The students were divided into two according to their scores from the Epistemological Beliefs Questionnaire, as groups with high and low belief levels in accordance with the high-low-27-percent group method. Hence, there were 66 students in each group. Then it was attempted to determine how the scores from the subscales of Analyticity, Openmindedness, and Curiosity of the California Critical Thinking Disposition Inventory were successful in discriminating epistemological belief groups. The total accurate classification of the discriminant function obtained as a result of the analysis was found to be 75.80%. Also, it was seen that the obtained discriminant function classified the participants accurately, beyond classification by chance.

Discriminant analysis is used to discriminate between predefined groups based on certain scores. However, as mentioned previously, there are some limitations to the common use of discriminant analysis. One limitation is the fact that strong assumptions of discriminant analysis are not easy to meet. Another is the necessity to determine groups before analysis. Although these groups are clear for some research problems (like male and female or students in different departments), they are not always clear (Nunnally & Bernstein, 1994).

Moreover, it is not always correct to assume that if an individual is already a member of a definable group that he or she should be included in the groups. For example, people could have become members of groups as a result of inaccurate classifications according to certain variables. Discriminant analysis and some similar methods might serve to continue that classification, rather than correct the inaccurate classification. Hence it is more useful to determine the structure of differences between group centers, rather than classification. In other words, discriminant functions do not generally explain high variance rates. There might be significant differences between groups, but at the same time we should not disclaim that within-group variances could be high. This case will lead to a difficult classification (Nunnally & Bernstein, 1994).

As a result of the examinations and assessments within the scope of the present study, we might suggest that discriminant analysis can be used for different purposes in practice and will have important contributions. However, it should not be forgotten that these advantages are likely to appear when used correctly, as in all statistical methods. Moreover, some difficulties and limitations of the method should be taken into account to achieve valid results.

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## Diskriminant Fonksiyon Analizi : Kavram ve Uygulama

### (Özet)

*Problem Durumu:* Diskriminant fonksiyon analizi ya da diskriminant analizi, grup üyeliklerini yordamaya yönelik bir model kurma amacına hizmet eden çok değişkenli bir istatistiksel tekniktir. Model, gruplar arasında en iyi ayrımı yapmayı sağlayan yordayıcı değişkenlerin doğrusal bir kombinasyonuna dayalı olarak ortaya çıkan diskriminant fonksiyonlarından oluşur. Bu fonksiyonlar, grup üyelikleri bilinen bir örneklemden yola çıkılarak üretilir ve sonrasında aynı bağımsız değişkenlere ilişkin ölçümleri bulunan, ancak grup üyelikleri bilinmeyen yeni birey ya da birimlere uygulanabilir. Diskriminant analizi; diskriminant yordama eşitliği (fonksiyonu) kullanılarak bireyleri ya da birimleri sınıflamak, bireylerin ya da birimlerin tahminlere dayalı olarak sınıflanıp sınıflanamayacağına ilişkin teorileri test etmek, gruplar arasındaki farklılıkları araştırmak, grupları ayırmadaki en tutucu yolu belirlemek, bağımlı değişkende, bağımsız değişkenlerce açıklanan varyans oranını belirlemek, bağımlı değişkene göre yapılan sınıflamada, bağımsız

değişkenlerin göreceli önem sırasını değerlendirmek, grupları ayırmada çok az önemi olan ya da bir başka deyişle önemsiz olan değişkenleri elemek ve benzeri bazı amaçlarla kullanılır. Diskriminant analizi sayıtlılarının karşılanmasının her zaman çok kolay olmaması gibi nedenlerden dolayı davranış bilimlerinde çok fazla kullanılmasa da, kavramsal ve matematiksel olarak güçlü bir çok değişkenli istatistiktir. Bu nedenle de diskriminant analizi tekniğinin tanıtılması ve örneklendirilmesinin, kullanım yaygınlığının artmasına hizmet etmesi açısından yararlı olacaktır.

*Araştırmanın Amacı :* Bu çalışmanın genel amacını, diskriminant analizinin temel özellikleri ve kullanımı hakkında araştırmacılara temel nitelikte bilgi sunmak, bireyleri ya da birimleri sınıflamada kullanılan lojistik regresyon, kümeleme analizi ve benzeri bazı tekniklerle benzerlik ve farklılıklarını tartışmak oluşturmaktadır. Çalışmada öğretmen adaylarından elde edilmiş verilerle eğitim alanına ilişkin bir örnek uygulama yapılarak, sonuçların değerlendirilmesindeki önemli noktalara değinilmiştir. Ayrıca alt-üst %27'lik grup mantığı ile yapılan ayırma işleminin, diskriminant analizi ile yapılan sınıflama ile uyumu belirlemek de çalışmanın bir diğer amacını oluşturmaktadır.

*Araştırmanın Yöntemi :* Bu çalışmanın modeli korelasyonel araştırmadır. Korelasyonel araştırmalar, iki ya da daha çok değişken arasındaki ilişkinin, herhangi bir şekilde bu değişkenlere müdahale edilmeden incelendiği araştırmalardır. Korelasyonel araştırmalar, değişkenler arasındaki ilişkilerin açığa çıkarılmasında, bu ilişkilerin düzeylerinin belirlenmesinde etkili ve bu ilişkilerle ilgili daha üst düzey araştırmaların yapılması için gerekli ipuçlarını sağlayan önemli araştırmalar oldukları söylenebilir. Bu çalışmanın araştırma grubunu, 2006-2007 Eğitim-Öğretim yılında Ankara Üniversitesi Eğitim Bilimleri Fakültesi Rehberlik ve Psikolojik Danışmanlık bölümünün 1-4. sınıflarında öğrenim görmekte olan ve çalışmaya gönüllü olarak katılmayı kabul etmiş toplam 244 öğrenciden oluşturmaktadır. Araştırma grubunu oluşturan öğrenciler Epistemolojik İnanç Ölçeği'nden aldıkları puanlara göre öncelikle alt-üst %27'lik grup mantığı ile "düşük ve yüksek epistemolojik inanç" düzeyine sahip gruplar olmak üzere ikiye ayrılmıştır. Böylece her iki grupta da 66 öğrenci olmak üzere toplam 132 öğrenci araştırma kapsamına alınmış, orta düzeyde epistemolojik inanca sahip olan 112 öğrenci ise çalışma dışında bırakılmıştır. Ardından "Kaliforniya Eleştirel Düşünme Eğilimi Ölçeği"nin "Analitiklik", "Açık Fikirlilik" ve "Meraklılık" alt ölçek puanlarının epistemolojik inanç gruplarını ayırmada ne kadar başarılı olduğu belirlenmeye çalışılmıştır.

*Araştırmanın Bulguları:* Analiz sonucu elde edilen diskriminant fonksiyonunun toplam doğru sınıflandırma yüzdesi %75.80 olarak belirlenmiştir. Bir başka deyişle diskriminant analizi ile yapılan

sınıflamanın, başlangıçta alt-üst %27'lik grup mantığı ile yapılan ayırma işlemiyle %75.80 oranında uyumlu sınıflama yaptığı belirlenmiştir. Ayrıca diskriminant analizinin sınıflandırma doğruluğu, şans kriterinden yüksek bulunmuştur. Bir başka deyişle elde edilen diskriminant fonksiyonu, şansla sınıflandırmanın ötesinde doğru sınıflandırma yaptığı belirlenmiştir.

*Araştırmanın Sonuçları ve Öneriler* : Diskriminant analizi, belirli puanlara dayalı olarak önceden tanımlanan grupları birbirinden ayırt etmede kullanılır. Ancak daha önce de değinildiği gibi, diskriminant analizinin yaygın olarak kullanımını sınırlayan noktalar bulunmaktadır. Bunlardan biri diskriminant analizinin güçlü sayıtlarının karşılanmasının kolay olmayışı, bir diğeri ise grupların analizden önce belirlenmesi gerekliliğidir. Bazı araştırma problemleri için bu gruplar çok açık olmakla birlikte (farklı bölümlerde öğrenim gören öğrenciler, kadınlar-erkekler gibi), her zaman bu kadar açık olmadığı kesindir. Ayrıca bir bireyin hali hazırda tanımlanabilir bir grup üyesi olmasının, bu gruplarda yer alması gibi bir gerekliliği ortaya çıkardığını varsaymak da her zaman uygun değildir. Örneğin insanlar bazı değişkenlere göre yapılan hatalı sınıflamalardan dolayı belli grupların üyesi olmuş olabilirler. Discriminant analizi ve benzeri bazı yöntemler, bu yanlış sınıflandırmayı ortadan kaldırmaktan çok, bunun devamına hizmet edebilir. Dolayısıyla sınıflamadan çok, grup merkezleri arasındaki farklılıkların yapısının anlaşılmasında kullanılmasının daha yararlı olacağı bilinmelidir. Diğer bir deyişle, discriminant fonksiyonları genellikle büyük varyans oranlarını açıklamaz. Gruplar arasında anlamlı farklılıklar olabilir; ancak aynı zamanda grup içi varyansların da büyük olabileceği yadsınmamalıdır. Bu durum da sınıflamayı güçleştirir.

Bu çalışma kapsamında yapılan incelenme ve değerlendirmeler sonucunda, diskriminant analizinin pratikte farklı amaçlar için kullanılabilmesi ve önemli katkılar sağlayacağı söylenebilir. Ancak bu avantajların diğer tüm istatistiksel yöntemlerde olduğu gibi, doğru kullanım ile mümkün olduğu unutulmamalıdır. Ayrıca yöntemin bazı güçlük ve sınırlılıklarının da göz önünde bulundurulması, geçerli sonuçların elde edilmesi açısından yararlı olacaktır.

**Anahtar Sözcükler:** Diskriminant analizi, çok değişkenli istatistik, alt-üst-%27'lik grup, epistemolojik inanç, eleştirel düşünme eğilimi

## Transformational Leadership and Collective Efficacy: The Moderating Roles of Collaborative Culture and Teachers' Self-Efficacy

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### Abstract

*Problem Statement:* Transformational leadership plays an important role in promoting and managing school development by influencing subordinates both directly and indirectly. Previous research has found that transformational leadership contributes to teacher outcomes, including teacher beliefs about their individual and collective capacity and collaborative culture. No previous study has examined the mechanisms through which this influence occurs. This research was designed to specify the direct and indirect relationship of transformational leadership practices with collective teacher efficacy.

*Purpose of Study:* The purpose of this study was to investigate the direct relationship of transformational leadership practices with collective teacher efficacy and the indirect relationship of transformational leadership with collective teacher efficacy via the self-efficacy of teachers and collaborative school culture.

*Methods:* Data were collected from 66 elementary schools in the province of Edirne, Turkey. A total of 218 teachers (97 men and 121 women) participated in the study. The mean experience of the participants was 10.55 years. Four constructs (transformational leadership, collective efficacy, self-efficacy, and collaboration climate) were measured in this study using multiple-item perceptual scales for each. All items were measured using a five-point Likert scale. The model was tested using LISREL 8.3 with maximum likelihood estimation. The model's overall fit with the data was evaluated using common model goodness-of-fit measures.

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*Findings and Results:* The model was specified and tested using structural equation modeling and was found to fit the data reasonably. The study findings show that the transformational leadership behaviors of principals explained 35% of the variance of collective teacher efficacy, 49% of the variance of self-efficacy of teachers, and 58% of the variance of collaborative school culture. The self-efficacy of teachers explained 42% of the variance of collective teacher efficacy. Collaborative school culture also explained 18% of the variance of collective teacher efficacy. The transformational leadership behaviors of principals, the self-efficacy of teachers, and collaborative school culture together explained 53% of the variance in collective teacher efficacy.

*Conclusions and Recommendations:* Previous research has demonstrated that transformational leadership contributes to teachers' self-efficacy, collective efficacy, and collaborative culture. This study strengthened these results by finding similar relationships of transformational leadership with teachers' self-efficacy, collective efficacy, and collaborative culture. In addition, this study has provided evidence that teachers' self-efficacy and collaborative school culture moderated the relationship between transformational leaders and collective teacher efficacy.

*Keywords:* Transformational leadership, collective efficacy, self-efficacy, collaborative culture

It is a fairly common phenomenon in developing countries that public schools undergo rapid changes associated with the government-initiated reform movement. Schools continue to be challenged, in the name of restructuring, to change governance structures, open themselves up to community influence, become more accountable, clarify standards for content as well as performance, and introduce related changes in their approaches to teaching and learning. There is widespread acceptance of the key role that leadership plays in promoting and managing school development and change and in developing and sustaining schools as communities of learners (Leithwood, Jantzi, & Steinbech, 1999). Transformational leadership has also been linked to the promotion of change and innovation in organizations (Bass, 1985; Howell & Avolio, 1993; Howell & Higgins, 1990; Leithwood & Jantzi, 1997; Pawar, 2003; Gilley, Dixon, & Gilley, 2008). According to Leithwood et al. (1999), transformational leadership is seen to be sensitive to organization building, developing shared vision, distributing leadership, and building school culture necessary to current restructuring efforts in schools.

### *Transformational Leadership*

Bass (1990) specified that transformational leadership occurs when leaders broaden and elevate the interests of their employees, when they generate awareness and acceptance of the purposes and mission of the group, and when they stir their employees to look beyond their own self-interest for the good of the group. Yukl (1998) asserted that the transformational leader articulates the vision in a clear and

appealing manner, explains how to attain the vision, acts confidently and optimistically, expresses confidence in the followers, emphasizes values with symbolic actions, leads by example, and empowers followers to achieve the vision. In essence, transformational leadership is a process of building commitment to organizational objectives and then empowering followers to accomplish those objectives.

According to Bass (2000), transformational leadership refers to the leader's moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration. Transformational leaders may also be characterized as paying attention to the individual subordinate by understanding and sharing in the subordinate's concerns and developmental needs and treating each subordinate individually (Bass, Waldman, Avolio & Bebb, 1987; Smith, Montagno & Kuzmenko, 2004). Leithwood (1992) suggested school leaders are constantly striving for three fundamental goals: helping staff members develop and maintain a collaborative and professional school culture; fostering teacher development; and helping them solve problems together more effectively. School leaders who demonstrate transformational leadership behaviors empower teachers to rise above their personal expectations and help create and encourage belief in common goals. Transformational leaders have the ability to transform and shift followers' motives from the level of self-interest to the level of common interest. Thus, transformational leadership creates a more collectivistic belief about their capability among followers.

### *Collective Efficacy*

Collective efficacy is a relatively new concept and is based on social cognition theory proposed by Bandura (1993). Collective teacher efficacy refers to "the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students" (Goddard, Hoy, & Hoy, 2000, p. 480). Collective efficacy is significantly related to achievement at the school level. According to Bandura (1993), the stronger the faculty's shared beliefs in their instructional efficacy, the better the students performed academically. High levels of perceived collective efficacy are associated with a robust sense of purpose that helps groups see setbacks as temporary obstacles to be overcome rather than evidence confirming their inefficacy (Goddard & Skrla, 2006). Therefore, when faced with obstacles, people who have high collective efficacy are more likely to persist in trying to solve problems.

Collective efficacy belief stems from the effects of mastery and vicarious learning experiences, social pressure, and the emotional tone of the school organization (Tschannen-Moran & Barr, 2004). According to Ross and Gray (2006), transformational leadership might contribute to collective teacher efficacy through each of these four mechanisms identified as sources of efficacy information. By setting feasible goals, clarifying standards, developing a collaborative school culture, and linking actions of teachers to student outcomes, a principal influences teacher

self-assessments that contribute to efficacy beliefs. Thus, transformational leadership may have an effect on collective efficacy through two moderating factors: self-efficacy and collaborative culture.

**Collective efficacy and self-efficacy.** Bandura (1997, p. 2) has defined perceived self-efficacy as “beliefs in one’s capabilities to organize and execute courses of action required in managing prospective situations”. Self-efficacy does not represent a generalized feeling of control, but rather individuals’ comprehensive judgment of their capability to perform a particular job (Gist & Mitchell, 1992). For example, Ross and Gray (2006) defined teacher efficacy as a set of personal efficacy beliefs that refer to the specific domain of the teacher’s professional behavior. In other words, self-efficacy is persons’ beliefs in their ability to perform a particular task.

Self-efficacy has been widely used in organizational research. Several studies have demonstrated the importance of self-efficacy for improving performance in the organizational context (Gist & Mitchell, 1992; Baker, 2001). Stajkovic and Luthans (1998) asserted that especially relevant to human performance in organizations is that employees who perceive themselves as highly efficacious will activate sufficient effort which, if well executed, produces successful outcomes. On the other hand, employees who perceive low self-efficacy are likely to cease their efforts prematurely and fail at the task.

Collective teacher efficacy differs from teachers’ individual sense of efficacy in that collective teacher efficacy is a property of the school (Bandura, 2000). Bandura (1997) argued that “collective efficacy is rooted in self-efficacy”. According to Goddard and Goddard (2001), teachers’ self-efficacy beliefs are based on perceptions of individual performance, whereas collective teacher efficacy beliefs are social perceptions based on an assessment of the capability of the school faculty as a whole. However, the sources of individual and collective efficacy belief are similar. Among the determinants of self-efficacy are mastery experience, vicarious experience, verbal persuasion, and physiological arousal, all of which serve to increase self-efficacy perceptions (Gist and Mitchell, 1992; Stajkovic and Luthans, 1998). Some researchers have studied the relationship between collective efficacy and self-efficacy. Goddard and Goddard (2001) found that teachers’ collective efficacy was related to their self-efficacy. According to Bandura (1997), group members’ appraisals of their group may be highly influenced by their self-efficacy, especially those members who have key roles. Even though individual and collective efficacies are different constructs, they nevertheless influence one another in reciprocal ability of the school faculty as a whole.

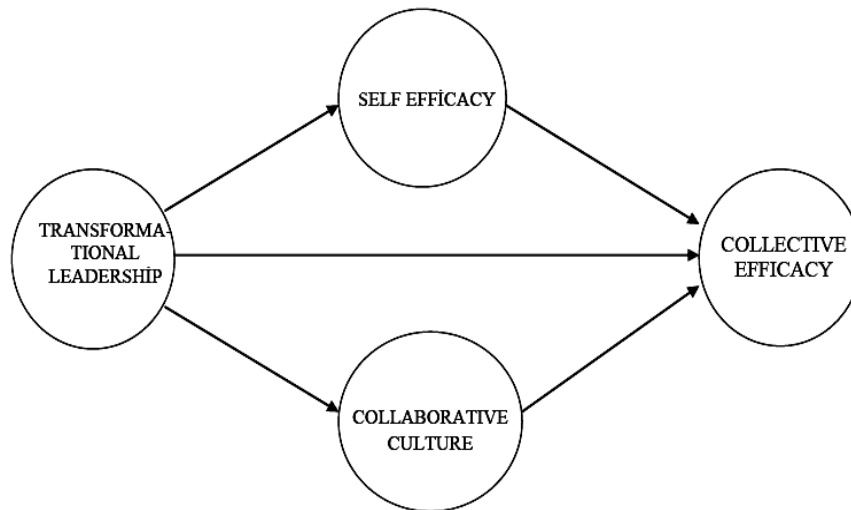
**Collective efficacy and collaborative school culture.** According to Flores (2004, p. 300), collaborative cultures refer “to working relationships which are spontaneous, voluntary, evolutionary, and development-oriented”. Schools should be places where all stakeholders share purpose and vision, subscribe to norms of collegiality and hard work through professional development, celebrate success, and learn from the rich social history and stories that cultural diversity provides (Friedman, 2004). A norm of collaboration within an organizational culture is likely to enhance teachers’

capacity beliefs since responsibility for accomplishing organizational goals is shared (Yu, Leithwood & Jantzi, 2002). This means that staff members often talk, observe, critique, and plan together. Norms of collective responsibility and continuous improvement encourage them to teach each other how to teach better.

Bandura (1997) emphasized that collective teacher efficacy constitutes a powerful factor affecting different arenas of the school organization, influencing attitudes and affective, motivational, and behavioral aspects of teacher functioning within the school. Collective teacher efficacy is significantly affected by the collaboration of the staff as they develop their beliefs and social systems within the school.

The leader is the key factor in creating the culture of collaboration. By creating structures which encourage staff to work together and by involving them in aspects of decision making, the leader can develop an expectation that it is normal to work together, share each other's problems and successes, and reflect together on the practice of teaching (Dean, 1998). Transformational leaders involve staff in collaborative goal setting, reduce teacher isolation, use bureaucratic mechanisms to support cultural changes, share leadership with others by delegating power, and actively communicate the school's norms and beliefs.

In summary, previous research has found that transformational leadership contributes to teacher outcomes, including teacher beliefs about their individual and collective capacity and collaborative culture. There are also some studies (Çelik, 1998; Karip, 1998; Akbaba Altun, 2003; Şahin, 2006) related to features of transformational leadership of principals in Turkey. However, no previous study has examined the mechanisms through which this influence occurs.



**Figure 1. The theoretical model of the relationship of transformational leadership with collective efficacy**

Figure 1 presents the posited structural model specifying the direct relationships of transformational leadership practices with collective teacher efficacy, the self-efficacy of teachers and collaborative school culture, and the indirect relationship of transformational leadership with collective teacher efficacy via the self-efficacy of teachers and collaborative school culture. Based on the theoretical notions and model described above, this research was designed to address the following hypotheses:

H1: The transformational leadership behaviors of principals will be positively related to the collective teacher efficacy.

H2: The transformational leadership behaviors of principals will be positively related to the self-efficacy of teachers.

H3: The transformational leadership behaviors of principals will be positively related to the collaborative school culture.

H4: The self-efficacy of teachers will be positively related to their collective efficacy beliefs.

H5: The collaborative school culture will be positively related to collective teacher efficacy.

H6: The relationship between the transformational leadership behaviors of principals and collective teacher efficacy will be moderated by both the self-efficacy of teachers and collaborative school culture

## Method

The hypothesized structural equation model is developed as a theoretical basis for explaining principals' transformational leadership behaviors that related to collective teacher efficacy. In the following paragraphs, the methodological details of the current work are discussed.

### *Participants*

Data were collected from 66 elementary schools in the province of Edirne, Turkey. A total of 218 teachers (97 men and 121 women) participated in the study. The mean experience of the participants was 10.55 years (SD=7.95, median 9, range 1-33).

### *Measurement*

The measures which were used to operationalize the constructs included in the investigated models were mainly adapted from relevant prior studies (Goddard et al., 2000; Leithwood & Jantzi, 1990; Ross, Hogaboam-Gray, & Gray, 2004; Denzine, Cooney, & McKenzie, 2005; Bandura, 1997; Cremer, 2006; Yukl, 1998; Ross & Gray, 2006; Goddard & Goddard, 2001; Yu et al., 2002). Four constructs (transformational leadership, collective efficacy, self-efficacy, and collaboration culture) were measured in this study using multiple-item perceptual scales for each. All items were measured using a five-point Likert scale ranging from 5="strongly agree" to 1="strongly disagree".

Thirteen items were used to measure principals' transformational leadership behaviors. The transformational leadership behaviors contain the following

behavioral components: individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence. The scale was used to measure teachers' perceptions of their principals' transformational leadership behaviors. The following is an example: "Our principal has stimulated us to think about problems in new ways". Collaborative school culture was measured with seven items (e.g., Teachers at this school are reluctant to tell colleagues about professional experiences). The measurement of teacher self-efficacy consisted of six items. The following is one example: "I can solve difficult problems if I try hard enough". Collective teacher efficacy was assessed with six items (e.g., I believe teachers in this school are able to get through difficult tasks). The Collective Teacher Belief Scale is used to indicate a teacher's belief about the collective ability to achieve.

Using the data, which were obtained from a pilot study, the corrected-item total correlation and reliability (alpha) for each of the four scales were calculated to enable the evaluation of the instrument's validity in terms of internal consistency. As shown in Table 1, based on the data collected, all constructs exhibited a  $\alpha$ -value greater than 0.70, a common threshold for exploratory research (Dewberry, 2004). Item-total correlations are greater than 0.60 (see table 2). Thus, the internal consistency of each construct is fairly high. Table 1 presents descriptive statistics and  $\alpha$ -values of the constructs.

**Table 1**

*Mean, Standard Deviations and Bivariate Correlations of Research Variables*

Variables	Mean	SD	Alpha	CEFFICACY	TLEADER	CCULTURE
CEFFICACY	24.17	3.59	0.89			
TLEADER	56.80	8.01	0.96	0.49(**)		
CCULTURE	34.01	5.01	0.93	0.47(**)	0.56(**)	
SEFFICACY	25.06	2.99	0.86	0.62(**)	0.44(**)	0.38(**)

\*\*p<0.001

As shown in Table 1, Pearson's correlation coefficients pointed out that collective teacher efficacy (CEFFICACY) was positively associated with principals' transformational leadership behaviors (TLEADER), teachers' self-efficacy beliefs (SEFFICACY), and collaborative culture (CCULTURE). Principals' transformational leadership behaviors were also positively correlated with teachers' self-efficacy beliefs and collaborative culture.

The instrument's construct validity was assessed by using a principal components factor analysis of Varimax with Kaiser Normalization Rotation and factor correlation matrix. Kaiser-Mayer-Olkin Measure of Sampling Adequacy was 0.92, and Bartlett's Test of Sphericity was significant by 0.001. By and large, an instrument is considered to exhibit satisfactory construct validity when measurement items load more highly on the respective constructs than on others. Using the data

collected from the responses, a total of four constructs were extracted with eigenvalues exceeding 1.0, i.e. exactly equal to the number of constructs specified in the model.

**Table 2**

***Factor Analysis Results and Item Total Correlations***

Items	Factor Loadings				Item-Total Correlation
	1	2	3	4	
TLEADER1	<b>0.835</b>	0.250	0.157	0.083	0.860
TLEADER2	<b>0.826</b>	0.178	0.177	0.089	0.833
TLEADER3	<b>0.809</b>	0.157	0.234	0.062	0.812
TLEADER4	<b>0.788</b>	0.092	0.214	0.077	0.771
TLEADER5	<b>0.773</b>	0.295	0.133	0.160	0.826
TLEADER6	<b>0.759</b>	0.028	0.197	-0.003	0.700
TLEADER7	<b>0.752</b>	0.378	0.093	0.175	0.824
TLEADER8	<b>0.748</b>	0.302	0.031	0.266	0.797
TLEADER9	<b>0.736</b>	0.058	0.240	0.172	0.727
TLEADER10	<b>0.730</b>	0.318	0.048	0.299	0.798
TLEADER11	<b>0.723</b>	0.308	-0.072	0.253	0.746
TLEADER12	<b>0.722</b>	0.285	0.109	0.237	0.776
TLEADER13	<b>0.692</b>	0.163	0.356	0.022	0.715
CCULTURE1	0.231	<b>0.860</b>	0.062	0.100	0.850
CCULTURE2	0.183	<b>0.851</b>	0.190	0.136	0.846
CCULTURE3	0.202	<b>0.844</b>	0.176	0.101	0.846
CCULTURE4	0.235	<b>0.827</b>	0.130	0.105	0.825
CCULTURE5	0.255	<b>0.755</b>	0.092	0.119	0.745
CCULTURE6	0.205	<b>0.739</b>	0.330	-0.004	0.743
CCULTURE7	0.285	<b>0.645</b>	0.148	0.136	0.657
CEFFICACY1	0.211	0.170	<b>0.799</b>	0.225	0.806
CEFFICACY2	0.240	0.154	<b>0.748</b>	0.244	0.758
CEFFICACY3	0.097	0.142	<b>0.716</b>	0.287	0.683
CEFFICACY4	0.215	0.158	<b>0.701</b>	0.213	0.681
CEFFICACY5	0.112	0.217	<b>0.676</b>	0.209	0.644
CEFFICACY6	0.299	0.119	<b>0.593</b>	0.296	0.624
SEFFICACY1	0.093	-0.027	0.078	<b>0.772</b>	0.602
SEFFICACY2	0.136	0.098	0.273	<b>0.704</b>	0.683
SEFFICACY3	0.207	0.088	0.296	<b>0.696</b>	0.692
SEFFICACY4	0.064	0.158	0.384	<b>0.683</b>	0.669
SEFFICACY5	0.233	0.207	0.188	<b>0.667</b>	0.611
SEFFICACY6	0.174	0.148	0.274	<b>0.614</b>	0.602
Eigenvalues	8.340	5.417	4.040	3.708	
% Variance Explained	26.063	16.929	12.781	11.578	
%Cumulative Variance Explained	26.063	42.992	55.773	67.361	

As shown in Table 2, factor loadings for all variables are greater than 0.59, and are considered high. Using the Kaiser eigenvalues criterion, four factors extracted that collectively explained 67.36% of the variance, thus suggesting the instrument exhibited satisfactory construct validity.

### Results

The theoretical model was tested using LISREL 8.3 with maximum likelihood estimation. In this model, principals' transformational leadership behaviors, collective teacher efficacy, and two moderate variables (teachers' self-efficacy beliefs and collaborative culture) were identified as latent variables. The model's overall fit with the data was evaluated using common model goodness-of-fit measures. In general, the model exhibited a reasonable fit to the data for the responses collected. Based on the data from the responses, the model resulted in 1.43 in the  $\chi^2$  to df. ratio, which was satisfactory with respect to the commonly recommended value of 3.0 (Kline, 1998). The model fit was assessed using other common fit indexes: comparative fit index (CFI), normed fit index (NFI), root mean square residual (RMR), root mean square error of approximation (RMSEA), goodness of fit index (GFI), and adjusted goodness of fit index (AGFI). In general, an adequate to good fit was suggested by RMSEA and RMR values below or approaching 0.05, and by fit index values between 0.80 and 1.00. The model exhibited a fit value exceeding the commonly recommended threshold for the respective indexes (Pedhazur & Schmelkin, 1991). The fit statistics in Figure 3 indicate that the research model provides a reasonably good fit to the data ( $\chi^2=592.17$ ,  $df=415$ ,  $p=0.00$ ,  $CFI=0.96$ ,  $NFI=0.90$ ,  $RMR=0.04$ ,  $RMSEA=0.03$ ,  $GFI=0.85$ ,  $AGFI=0.81$ ).

Hypothesized relationships are tested by examining the direction and significance of the path coefficients in the research model. Figure 2 depicts overall explanatory power, estimated path coefficients, and associated t-value of the paths.



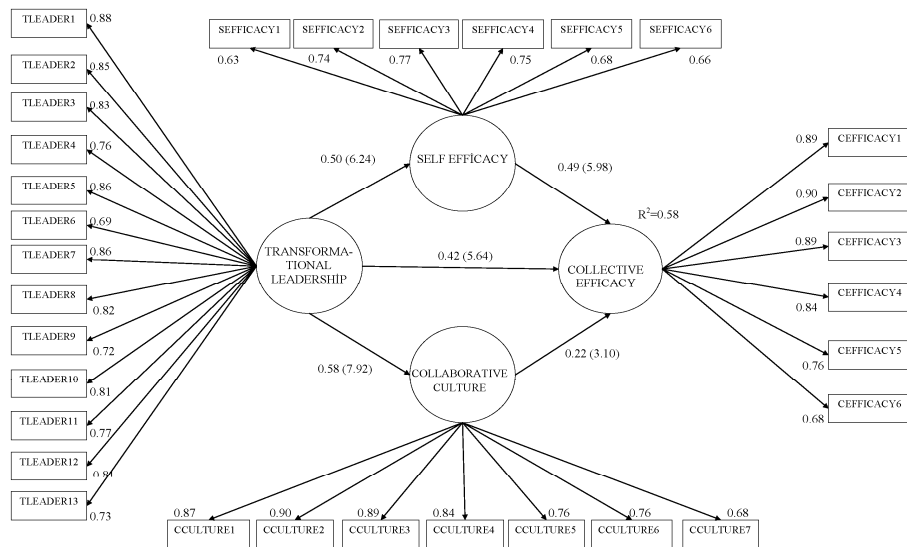


Figure 2. Path models for the relationship of transformational leadership with collective efficacy

It was found that transformational leadership behaviors of principals were significantly related to collective teacher efficacy ( $\beta=0.42$ ,  $p<0.001$ ), supporting hypothesis H1. The transformational leadership behaviors of principals were found to have a significant relationship with the self-efficacy of teachers ( $\beta=0.50$ ,  $p<0.001$ ), supporting hypothesis H2. The transformational leadership behaviors of principals were found to be significantly related to the collaborative school culture ( $\beta=0.58$ ,  $p>0.001$ ). Therefore, H3 was supported. The self-efficacy of teachers was found to be significantly related to their collective efficacy beliefs ( $\beta=0.49$ ,  $p<0.001$ ), supporting hypothesis H4. Hypothesis 5 was supported with a statistically significant relationship between the collaborative school culture and collective teacher efficacy ( $\beta=0.22$ ,  $p<0.001$ ). Summarized results for the hypothesis tests are shown in Table 3.

Table 3

Hypothesis Testing Result of Direct Relationships

Hypothesis	Path	Path Coefficient	Result
H1	LEADER→CEFFICACY	0.42***	Supported
H2	LEADER→SEFFICACY	0.50***	Supported
H3	LEADER→CCULTURE	0.58***	Supported
H4	SEFFICACY→CEFFICACY	0.49***	Supported
H5	CCULTURE→CEFFICACY	0.22***	Supported

\*\*\* $p<0.001$

Standardized regression coefficients indicated that the transformational leadership behaviors of principals explained 35% of the variance of collective teacher efficacy, 49% of the variance of the self-efficacy of teachers, and 58% of the variance of collaborative school culture. The self-efficacy of teachers explained 42% of the variance of collective teacher efficacy. Collaborative school culture also explained 18% of the variance of collective teacher efficacy. The transformational leadership behaviors of principals, the self-efficacy of teachers, and collaborative school culture together explained 53% of the variance in collective teacher efficacy. Therefore, H6 was also supported. Collective teacher efficacy was found to be jointly determined by the indirect and direct influences of the transformational leadership behaviors of principals.

### Discussion

The purpose of this study was to investigate the direct relationship of transformational leadership practices with collective teacher efficacy and the indirect relationship of transformational leadership with collective teacher efficacy via the self-efficacy of teachers and collaborative school culture. In order to explore the above relationships, a survey study was undertaken in primary schools in Edirne, where data were collected from a sample of primary school teachers.

The model was specified and tested using structural equation modeling and was found to fit the data reasonably. Overall, the result of the study provides support for the adequacy of the transformational leadership behaviors of principals for predicting and understanding collective teacher efficacy. The study also supported the idea that the self-efficacy of teachers and collaborative school culture are the antecedents of collective teacher efficacy.

The study findings show that the transformational leadership behaviors of principals had a moderate positive relationship to collective teacher efficacy, the self-efficacy of teachers, and collaborative school culture. These results of the study confirm results obtained in prior studies conducted in educational settings in which it was also found that transformational leadership had a strong positive influence on the outcome variables, including collective teacher efficacy (Ross & Gray, 2006; Walumbwa, Lawler, Avolio, Wang & Shi, 2005; Kark, Shamir ve Chen, 2003; Capara, Barbaranelli, Borgogni, & Steca, 2003), self-efficacy of teachers (Hipp & Bredeson, 1995; Pillai & Williams, 2004; Nir & Kranot, 2006), and collaborative school culture (Ross et al., 2004; Evans, 1996; Charbonneau, 2004; Leithwood & Jantzi, 1990).

First of all, as predicted, transformational leadership had a moderate and significant relationship with collective teacher efficacy. This result supported the argument that transformational leadership behaviors influence subordinates both

directly and indirectly. Transformational leadership behavior is directly related to collective efficacy and indirectly related to collective efficacy through the self-efficacy of teachers and collaborative school culture. The direct relationship of transformational leadership was not as strong as the self-efficacy of teachers (the strongest relationship), but it was substantially stronger than collaborative school culture. However, the direct and indirect influence of transformational leadership behaviors together had a stronger relationship with collective teacher efficacy than the self-efficacy of teachers and collaborative school culture.

The transformational leadership behaviors of principals were found to have a significant relationship with the self-efficacy of teachers in this study. This is consistent with previous studies. For instance, according to Podsakoff et al. (1990), transformational leadership enhances the development of followers, challenging them to think in ways which they are not accustomed to, inspiring them to accomplish beyond what they felt was possible. Redmond et al. (1993) also showed that leader behavior aimed at increasing follower self-efficacy resulted in higher levels of subordinate creativity in problem-solving situations. It would, therefore, be important for transformational leaders to enhance followers' beliefs, as together they would be able to find a solution for the problem at hand. In summary, transformational leadership, as conceived by Bass (1985), not only emphasizes leader behaviors that galvanize a unified spirit among subordinates but also stresses individual attention to each follower. Thus, collective and personal efficacy beliefs should be nurtured under such direction.

The results of this study show that the transformational leadership behaviors of principals have a significant relationship with the collaborative school culture. The transformational leader disburses personal attention to followers based on the individual follower's needs for achievement and growth (Avolio & Bass, 2002). To do this, the leader acts as a mentor or coach (Bass, 1998), developing followers in a collaborative culture to higher levels of potential.

The three contextual predictors of this study accounted for a significant proportion of variance in perceptions of collective teacher efficacy. With data in this study, the contextual variables of transformational leader, self-efficacy, and collaborative school culture did influence the formation of the level of collective teacher efficacy. This finding lends empirical support for the theoretical proposition that contextual factors are sources of collective efficacy beliefs. For instance, the relationship between collective efficacy and self-efficacy was also consistent with previous studies, and theoretical assumptions (e.g., Bandura, 1997) suggested that "collective efficacy is rooted in self-efficacy". These beliefs are conceptually different but related. In reality, they usually go together because people have to rely, at least to some extent, on others in accomplishing their tasks. A teacher's belief in the capabilities of her or his professional colleagues for performing collective tasks may

partly be influenced by his or her own personal capabilities for collective work. In addition, an efficacious teacher in collective work may improve the whole teachers' capabilities for performing its tasks by facilitating collective work. Thus, it is argued that the more a teacher believes in her or his capability for collective work, the more likely she or he will develop a belief that her or his professional colleagues are capable of performing tasks.

Collaborative culture was found to have significant relationship with the collective teacher efficacy in this study. These results of the study confirm results obtained in prior studies in which it was also found that teachers' collaborative culture predicts collective efficacy (Ross & Gray, 2006; Raudenbush et al., 1992). Bandura (1997) asserted that collective teacher efficacy is significantly affected by the collaboration of the teachers as they develop their beliefs within the school. Ross, et al. (2004) also stated that collaboration among teachers might influence collective efficacy beliefs by providing a culture that legitimizes help seeking, joint problem-solving, and sharing instructional experimentation.

In conclusion, the study also has implications for school leadership. Previous research has demonstrated that transformational leadership contributes to teacher's self-efficacy, collective efficacy, and collaborative culture. This study strengthened these results by finding similar relationships of transformational leadership with teacher's self-efficacy, collective efficacy, and collaborative culture. In addition, this study provided evidence that leaders influence collective teacher efficacy through teacher's self-efficacy and collaborative culture.

Collective efficacy beliefs might develop when there are opportunities for teachers to interact and share knowledge. A principal that encourage teachers to collaborate is likely to increase collective teacher efficacy. Collective performance is affected by not only the individuals' capabilities but also by the nature of the relationships among teachers, as for example, the needed levels of collaboration. The principal should become a model for the collaboration of the school community. Principals can help create structures that promote collaboration. Therefore, when a principal has the belief that a collaborative way of working is the most effective way to achieve school goals, the actions undertaken by the principal must be collaborative in nature in order that these beliefs are seen as being an operative aspect of the school culture. The amount of teachers' collaboration along with strong principal leadership are important factors in shaping school climate.

The principal, as a transformational leader, should influence teachers by role modeling the appropriate behaviors. Then teachers will identify with role models who are perceived in a positive light, which serves to empower them to achieve the collective task of school through the development of self-efficacy. Furthermore,

principals who empower their staff by sharing decision making on these issues contribute to higher teacher efficacy.

In light of the role a principal plays in the development of collective efficacy, it seems prudent to incorporate collaborative school culture and to increase teachers' self-efficacy practices into professional development programs for principals. Finally, positive emotions might reinforce members' beliefs in their collective capabilities. In addition, training programs will be developed on the individual level to enhance self-efficacy perception, and collaboration culture can be developed to enhance collective teacher efficacy on the school level.

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## **Dönüşümcü Liderlik ve Kolektif Yeterlik İnancı: İşbirliği Kültürü ve Özyeterlik İnancının Rolü**

### **(Özet)**

*Problem Durumu* : Dönüşümcü liderler, astlarının mesleki gelişim gereksinimlerine duyarlı, onları örgütün ortak amaçlarını gerçekleştirmek için güven, saygı ve paylaşım temellerine dayalı olarak birlikte çalışmaya yönlendiren liderlerdir. Bir öğretmenin böyle bir işbirliğine gönüllü olması, öncelikle görev yaptığı okuldaki tüm çalışanların ortak amaçları gerçekleştirebilecek yeterlikte olduklarına inanmalarına bağlıdır. Bu inanç "kolektif öğretmen yeterliğine inanç" olarak adlandırılır. Dönüşümcü lider olarak okul yöneticisi, öğretmenlerin başta öğrenci başarısı olmak üzere, okulun amaçlarını gerçekleştirmek için birlikte çalışmalarını için birbirlerinin yeterliğine olan inançlarını güçlendirmelidir. Bir okul lideri kolektif yeterlik inancını



güçlendirebilecek doğrudan girişimlerde bulunabileceği gibi, söz konusu inancın gelişip güçleneceği koşulları sağlama yollarına da başvurabilir. Bunlardan biri öğretmenin özyeterlik inancıdır. Bir bireyin belli bir görevi başarı ile gerçekleştirebileceğine inancı olarak tanımlanabilecek özyeterlik inancının, kolektif yeterlik inancının da temelinde yer aldığı öne sürülmektedir. Dönüşümcü liderin öğretmenlerin kolektif yeterlik inancını güçlendirmesine yardımcı olacak diğer bir etken okulda işbirliği kültürü oluşturmak veya böyle bir kültür mevcut ise desteklemek olabilir. İşbirliği kültürü çalışanların birbirlerine destek olabilecekleri, gelişimlerini destekleyebileceği gönüllü bir paylaşım içinde çalıştıkları bir okul ortamı olarak tanımlanabilir.

Alanyazında okul yöneticilerinin dönüşümcü liderlik davranışlarının öğretmenlerin özyeterlik inancı, kolektif öğretmen yeterliği inancı ve okulda işbirliği kültürünün oluşturulması üzerindeki etkisini birbirinden bağımsız olarak ortaya konulmuştur. Ancak, dönüşümcü liderlik davranışlarıyla öğretmenlerin kolektif yeterlik inançları arasındaki ilişkiyi sürecin işleyişi açısından inceleyen bir çalışma bulunmamaktadır. Bu çalışmada, ilköğretim okulu yöneticilerinin dönüşümcü liderlik davranışlarının, kolektif öğretmen yeterliği inancı ile hem doğrudan, hem de öğretmenlerin özyeterlik inançları ve okulun işbirliği kültürünün etkisi aracılığı ile dolaylı ilişkisini gösteren bir model geliştirilerek, test edilmiştir.

*Araştırmanın Amacı* : Bu araştırmanın amacı ilköğretim okul yöneticilerinin dönüşümcü liderlik davranışlarının, kolektif öğretmen yeterliği inancıyla doğrudan ve dolaylı ilişkisini incelemektir.

*Araştırmanın Yöntemi* : Araştırmanın örneklemini Edirne ilindeki 66 ilköğretim okulunda görev yapan 218 öğretmenden oluşmaktadır. Araştırmaya katılan öğretmenlerin 97'si erkek, 121'i kadındır ve ortalama mesleki deneyimleri 10.55 yıldır. Veri toplama aracında öğretmenlere ilişkin kişisel bilgileri toplamaya yönelik sorular dışında dört ölçek yer almaktadır. Ölçekler likert tipi beşli dereceleme ölçekleri olarak geliştirilmiş ve seçenekleri, "Kesinlikle Katılmıyorum" ile "Tamamen Katılıyorum" arasında sıralanmıştır. Dönüşümcü Liderlik Davranışları Ölçeği onüç, Okul İşbirliği Kültürü Ölçeği yedi, Özyeterlik Ölçeği altı ve Kolektif Öğretmen Yeterliği Ölçeği altı maddeden oluşmaktadır. Ölçeklerin güvenilirlik çalışmaları için, bir iç tutarlılık yaklaşımı olan Cronbach Alpha Katsayısı formülü kullanılmıştır. Alpha iç tutarlılık katsayıları Dönüşümcü Liderlik Davranışları Ölçeği için 0.96, Okul İşbirliği Kültürü Ölçeği için 0.93, Özyeterlik Ölçeği için 0.86 ve Kolektif Öğretmen Yeterliği Ölçeği için 0.89 olarak hesaplanmıştır. Ölçeklerde yer alan maddelerin madde-toplam korelasyonları .60 ile .86 arasında değişmekte ve maddelerin ayırıcı güçlerinin yüksek olduğunu göstermektedir. Modelin yapı geçerliği açımlayıcı faktör analizi ile sınanmıştır. Model testi çalışmasının bir gereği olarak dört ölçekte yer alan tüm maddeler açımlayıcı

faktör analizine alınmış ve modelde ele alınan 32 gözlenen değişkenin 4 gizil değişkenle tanımlanabileceği kanıtlanmıştır. Ölçeklerde yer alan maddelerin faktör yükleri Dönüşümcü Liderlik Davranışları Ölçeği'nde 0.69 ile 0.84, Okul İşbirliği Kültürü Ölçeği'nde 0.65 ile 0.86, Özyeterlik Ölçeği'nde 0.61 ile 0.77 ve Kolektif Öğretmen Yeterliği Ölçeği'nde 0.59 ile 0.80 arasında değişmektedir. Modelin toplam açıklanan varyansı 67.361'dir.

*Bulgular* : Araştırmada yapısal eşitlik modellemesi teknikleri kullanılarak, geliştirilen model LISREL 8.3 programı ile test edilmiştir. Sentaks (sözdizimi) SIMPLIS komut dilinde yazılmıştır. Tahmin prosedüründe Maksimum Olabilirlik Yaklaşımı kullanılmıştır. Yapısal eşitlik modellemesinden elde edilen uyum istatistikleri doğrultusunda, modelin veriler ile uyumlu olduğu söylenebilir ( $\chi^2=592.17$ ,  $df=415$ ,  $p=0.00$ ,  $CFI=.96$ ,  $NFI=.90$ ,  $RMR=.04$ ,  $RMSEA=.03$ ,  $GFI=.85$ ,  $AGFI=.81$ ). Modelin  $\chi^2/sd$  oranı 1.43'dür ve sınır olarak kabul edilen oran olan 3 ile karşılaştırıldığında oldukça iyi bir uyumun söz konusu olduğu söylenebilir.

Yapısal eşitlik modellemesinden elde edilen bulgulara göre, okul yöneticilerinin dönüşümcü liderlik davranışlarının, öğretmenlerin kolektif yeterlik inançları, öğretmenlerin özyeterlik inançları ve okuldaki işbirliği kültürü ile anlamlı bir ilişkisi bulunmaktadır. Öğretmenlerin özyeterlik inançları ve okuldaki işbirliği kültürünün de öğretmenlerin kolektif yeterlik inançları ile anlamlı bir ilişkisi olduğu saptanmıştır. Okul yöneticisinin dönüşümcü liderlik davranışları, kolektif öğretmen yeterliği inançlarındaki varyansın %35'ini, öğretmenlerin özyeterlik inançlarındaki varyansın % 49'unu, okuldaki işbirliği kültüründeki varyansın %58'ini açıklamaktadır. Öğretmenlerin özyeterlik inançları, kolektif öğretmen yeterliği inançlarındaki varyansın % 42'sini açıklarken, okuldaki işbirliği kültürü %18'ini açıklamaktadır. Ayrıca okul yöneticilerinin dönüşümcü liderlik davranışları, özyeterlik inançları ve işbirliği kültürü birlikte kolektif öğretmen yeterliğindeki varyansın %53'ünü açıklamaktadır.

*Sonuç ve Öneriler* : Çalışmanın sonucunda okul yöneticisinin dönüşümcü liderlik davranışlarının kolektif öğretmen yeterliği inancını oldukça güçlü bir biçimde yordadığı ve açıkladığı görülmüştür. Ayrıca öğretmenlerin özyeterlik inançlarının ve okuldaki işbirliği kültürünün kolektif öğretmen yeterliği inancının öncülü oldukları görüşü desteklenmiştir. Okul yöneticilerinin dönüşümcü liderlik davranışlarının, kolektif öğretmen yeterliği inancına doğrudan etkisinin, okulun işbirliği kültüründen yüksek, öğretmen özyeterliği inancına göre daha düşük olduğu görülmektedir. Ancak, okul yöneticilerinin dönüşümcü liderlik davranışlarının doğrudan ve öğretmen özyeterliği inancı ile okulun işbirliği kültürü aracılığıyla dolaylı etkisi bir araya geldiğinde, ilişkinin daha da güçlendiği görülmektedir. Böylece okuldaki öğretmenlerin kolektif yeterlik inancını güçlendirmek isteyen okul yöneticilerine okulda kolektif yeterlik inancını onaylama, des-

tekleme veya model olma gibi davranışlarda bulunmaları önerilebilir. Bunun yanı sıra, bu araştırmanın sonuçlarına dayalı olarak, okul yöneticisinin öğretmenler arasında etkileşim ve bilgi paylaşımı olabilmesi için olanaklar sağlanması, bu girişimleri desteklemek, öğretmenlerin kendi yeterliklerine olan inancını kararlara katılmaya yöreklendirip, sorumluluklar vererek, bunların sonuçlarına ilişkin olumlu geri bildirimler vererek yükseltme yollarıyla öğretmenlerin kolektif yeterlik inancını daha da güçlendirilmesinin mümkün olduğu söylenebilir.

**Anahtar sözcükler:** Dönüşümcü liderlik, kolektif yeterlik, özyeterlik, işbirliği kültürü

## 2005 Social Studies Curriculum's Effects on Students' Critical Thinking Skills

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### Abstract

*Problem Statement.* Although critical thinking didn't become a popular research topic in Turkey until the 1980s, it has played an important role for thousands of years in other countries. Similarly, the importance given to the critical way of thinking in the field of education does not have a long history in Turkey; only in 2005 were primary education curricula changed as part of a bigger change in the general education program. The new Social Studies curriculum was organized to put more emphasis on critical thinking and to implement this method of education in classrooms. However, one question is very important: Although the new curriculum is theoretically different from the older one, is it practically useful?

*Purpose of Study.* In this research, the effects of the new Social Studies curriculum on students' critical thinking skills will be analyzed. The main aim of the study is to define students' critical thinking skills in 1998, and see how the changes in curriculum have affected students' skills.

*Methods.* This article is based on descriptive research combined with a scanning technique. The research was carried out at various primary schools in Ankara's city center. Twenty primary schools were chosen randomly. The research was conducted twice over a two-year period on 612 students, 432 of which were public school students; the rest were private school students. The methods were first implemented on 4<sup>th</sup> grade students in the last month of the academic year (the last year of the 1998 Social Studies curriculum). The second part of the methods were implemented on the same students (then 5<sup>th</sup> grade students) in the last month of the academic year (the first year of the 2005 Social Studies curriculum).

*Findings and Results.* Analysis, evaluation, inference, interpretation, explanation and self-regulation scales were used to analyze changes in students' critical thinking skills. At the end of this process, it was seen that

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there is a positive change in students' critical thinking skills with the help of the 2005 Social Studies curriculum.

*Conclusions and Recommendations.* As mentioned before, the question was whether this new curriculum would be effective on students' critical thinking abilities. At the end of the study, it is understood that the new Social Studies curriculum is not only a theoretical idea; in practice, it improves students' critical thinking skills. However, it is crucial to point out that, in the process of implementing the curriculum, the teacher's ability is a very important factor. As teachers have a very important role in implementing this new curriculum, they should carefully follow the activities in order to develop critical thinking skills in their students.

*Keywords.* Critical thinking, primary school, social studies, curriculum.

Education shapes the future of people, societies and countries; people are dependent on education to develop not only economically but also culturally. Education's aim is to shape humans into innovative, futuristic, developed and motivated societies. Individuals shaped with this aim will love their country, respect cultural values, be conscious of their responsibilities, know and defend their rights, be able to think critically and declare their thoughts freely. Unfortunately, the question of whether existing educational systems can create these kinds of individuals has not yet been answered.

One of the most important educational reforms after the implementation of the new eight years' compulsory and continuous curriculum is the revision of all curricula. The Social Studies curriculum in primary schools' 4<sup>th</sup> and 5<sup>th</sup> grades were included in this revision process. The 1998 Social Studies curriculum was based on a behaviorist approach. In that curriculum, the teacher was the center of the class; he was actively involved in undertaking the process of transferring knowledge with an authoritative attitude. Students were passive, taking the information without questioning or criticizing. The new 2005 Social Studies curriculum was created based on the idea that "the former system was not a useful and fruitful model." In the new, constructivist system, teachers are seen as important guides. With this change in approach, students become active participants and the center of their classes.

The 2005 Social Studies curriculum gives importance to information, student expectations and experiences. The curriculum aims to support and develop students' abilities in solving problems, as well as to improve their skills in making right decisions, although giving importance to critical thinking is an important element for all new systems.

### **Critical Thinking**

The concept of critical thinking can be traced back to Socrates, who created the teaching method of questioning. Today, his method is accepted as the most important critical thinking method (Socratic questioning). According to Beck et al. (1992, p. 3), Plato, one of the students of Socrates, believed that "thinking is either a dialogue in the soul involving mental words (which he referred to as 'forms') or a

spiritual activity of examining or recollecting forms and discriminating their natures and interrelations." In keeping with his predecessors, Aristotle thought that critical thinking included not only abstract, but also logical and moral reasoning.

Certainly, human beings have the skill of critical thinking and have used it since the first day of their existence. Critical thinking has played an important role for thousands of years in other countries but it didn't become a popular research topic in Turkey until the 1980s. Different researchers have defined critical thinking from different point of views; while some of them focused on skills, some of them gave importance to tendencies. While some of them brought the world-view or the state into the foreground, some of them laid the emphasis on discussions and evidence.

According to Norris and Ennis (1989, p. 18), critical thinking is a logical and reflective thinking process focused on making decisions. According to Sternberg (1999, p. 46), critical thinking is the strategies and spiritual processes used by people in finding solutions to problems. According to a study prepared for the National Council for Excellence in Critical Thinking Instruction by Scriven and Paul (1997, p. 1), it is an intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. According to Brouwer (1996, p. 196) critical thinking is a process guiding people in making observation, experimentation, inference or communication by conceptualizing, applying, analyzing, and synthesizing.

The American Philosophy Association performed research to clear the confusion caused by the different definitions of critical thinking. The Association undertook the responsibility of this systematic research with its Committee on Pre-College Philosophy, carrying it out in 1987 under the presidency of important author and philosopher Peter A. Facione. For this research, the association chose 46 experienced professional researchers in the areas of education, evaluation and the theory of critical thinking (52% philosophy professionals, 22% education professionals, 6% social sciences professionals, 6% physics professionals). These professional colleagues from America and Canada were invited to join the so-called "Delphi Project."

Researchers on the Delphi Project Panel developed a most systematic approach to define critical thinking. This Delphi model conceptualized the meaning of critical thinking. This new concept, contained in the Delphi Report and announced by the American Philosophy Association in 1990, included this definition of critical thinking:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in one's

personal and civic life. While not synonymous with good thinking, critical thinking is a pervasive and self-rectifying human phenomenon (Facione, 1990, p. 2).

According to Erwin (2001), this definition was approved by the National Postsecondary Educational Cooperative (NPEC). This event included the participation of 500 businessmen, policy makers and academicians (Williams, 2002, p.1-2). According to Facione (1996, p. 130), the definition of critical thinking determined by the researchers on the Delphi Project Panel clarified the confusions about critical thinking in United States' educational and political institutions. This definition is also used in the report, "United States Department of Education's Education Goals."

### *Critical Thinking Skills*

Which abilities or dimensions constitute the basis of critical thinking? There are many different comments and beliefs stated by researchers on this question. The critical thinking skills stated by Nash (1994, p. 214) include depending on a proof or reference; questioning historical themes or concepts; making generalizations, evaluations, classifications, or comparisons; differentiating related and unrelated data; explaining different points of view; determining cause-result relationships or reliability of a source; differentiating facts and ideas; distinguishing stereotyped concepts; making hypotheses; defining implicit hypotheses; exploding notions at discussions; defining and using historical proofs; solving unclear or dilogical statements; and differentiating right or wrong ways of reasoning. According to Slattery (1990, p. 333), critical thinking skills include questioning, understanding and solving problems, researching proofs, analyzing hypotheses, avoiding emotional reasoning and making generalizations, taking different interpretations into consideration, and being tolerant of ambiguities.

When the research on this issue over the last 30 years is examined, it can be seen that some very important critical thinking theorists such as Watson and Glaser, McPeck, Siegel, Brookfield, Kurfiss, and Boostrom see critical thinking as more than a specific set of cognitive skills. According to them, critical thinking is a combination of skills, knowledge and attitudes. The theorists mention that critical thinking combines an understanding of making s and generalizations with the skills of carefully considering the logic and accuracy of evidence.

There are many different viewpoints about which abilities or dimensions constitute the basis of critical thinking. The Delphi Project, under the directorship of Facione, made a comprehensive study of this question. According to this research these skills are interpretation, analysis, evaluation, inference, explanation and self-regulation (Facione, 1990, p. 4). Cognitive skills and sub-skills included in this definition of critical thinking are presented in Table 1.

**Table 1***Critical Thinking Skills Mentioned in the Delphi Project*

Skills	Sub-Skills
Interpretation	Categorization
	Decoding Significance
	Clarifying Meaning
Analysis	Examining Ideas
	Identifying-Detecting Arguments
	Analyzing Arguments
Evaluation	Assessing Claims
	Assessing Arguments
Inference	Querying Evidence
	Conjecturing Alternatives
	Drawing Conclusions
Explanation	Stating Results
	Justifying Procedures
	Presenting Arguments
Self-Regulation	Self-examination
	Self-correction

The fact that critical thinking and its skills are defined by a consensus is very important not only for curricula but also for the application and evaluation of them. The 2005 Social Studies curriculum gives more importance to critical thinking when compared to the Social Studies curriculum in 1998. Although this importance is given on a theoretical basis, it is possible for teachers to use the ideas in their classes. The literature, by authors such as Elliott (1996); Abegglen, O'Neill and Conger (1997); Morin (1989); Oermann (1997); Whiteside (1997); Lipman and Dietrick (1997); Lenburg (1997); Walsh (1997); Daly (1998); Schell (1998); Sellappah et al. (1998); Fowler (1998); and Billings and Halstead (1998) offers various strategies to enhance critical thinking abilities. These authors support the usage of questioning, small group activities, role playing, debates, case studies, preparing journals, simulations, jigsaws, problem solving and writing assignments (Simpson & Courtney, 2002, p. 16).

According to Yang (2002, p.4), some educational strategies support the development of critical thinking. These strategies include class education techniques (Arons, 1979), collaborative learning techniques (Cooper, 1995), conference-style learning (Underwood & Wald, 1995), case studies (McDade, 1995) and research-based approaches (King, 1995).

Teachers have very important roles in the process of developing students' critical thinking skills. The teachers' own capacities for critical thinking, their levels of conformity to the new system and their ability to apply new techniques are some of



the important factors that can affect students' development process. This research aims to analyze the effect of the new Social Studies curriculum on critical thinking.

### Method

This study used a descriptive research based on a scanning technique. the scanning model is a research technique that aims to describe a continuing situation or a situation in the past as it was. In this technique, the subject, person or object is defined as it was or as it is, in its context. (Karasar, 1999, p. 77).

#### Research Group

The research was carried out at various primary schools in Ankara's city center. Twenty primary schools were chosen randomly, and the research was conducted twice over a two-year period on 612 students. 432 of the students were public school students while the rest were private school students. The methods were first implemented on 4<sup>th</sup> grade students in the last month of the academic year (the last year of the 1998 Social Studies curriculum). The second part of the methods were implemented on the same students (who were then 5<sup>th</sup> grade students), again in the last month of the academic year (the first year of the 2005 Social Studies curriculum).

**Table 2**

#### *Distribution of the Sample*

	Student Sex			School Type		
	Female Students	Male Students	Total	Public Primary School Students	Private Primary School Students	Total
f	302	310	612	432	180	612
%	49,3	50,7	100,0	70,6	29,4	100,0

According to Table 2, male and female students in the study were almost equal. Public school students made up 71% of the sample.

#### *Data Collection Tools*

In this research, critical thinking scales were used. While preparing the research, researchers gave importance to critical thinking skills as defined by the experts of the Delphi Project (analysis, evaluation, inference, interpretation, explanation and self-regulation). In developing the data collection tools for the validity and reliability of the true/false tests, expert advice, test-retest methods, double string correlation and Pearson moment multiplication correlation styles were used. In multiple choice tests, item difficulty rates, dotted double string correlation, and the Kuder-Richardson 20 (KR<sub>20</sub>) formula were used. In the Likert scale factor analysis and Cronbach Alpha were used. The critical thinking scales consist of three sub-scales of right/ wrong tests, two sub-scales of multiple choice tests and one sub-scale of the Likert scale made up of 56 questions. It was determined that the critical thinking scales were statistically valid and reliable and could be applied on students of the fourth and fifth grades.

### *Collection and Analysis of Data*

The first data was collected in June 1998 (the 1998 Social Studies curriculum's last application year). The second data was collected one year later, during the first year of the 2005 Social Studies curriculum. 612 students from private and public primary schools were chosen randomly and used in the process of collecting data. These students were at the same school in the fourth and fifth grades.

During the process of analyzing the collected data, t-tests were performed to get samplings to use to understand the differences in the two curricula (1998-2005).

## **Findings**

### *The Difference between Critical Thinking-Analysis Skills and the Applied Social Studies Curriculum*

Paired sample t-tests were used to understand the differences between critical thinking-analysis skills (examining ideas, identifying-detecting arguments, and analyzing arguments) and the applied social studies curriculum. The results are listed in Table 3.

**Table 3**

*T-Test Results Showing Differences between Critical Thinking-Analysis Skills and the Applied Social Studies Curriculum*

Critical Thinking Skill	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Analysis	1998 Social Studies C.	612	6,4134	1,3062	611	3,494	,001*
	2005 Social Studies C.	612	6,6814	1,3189			

\* p<0.05

Table 3 shows that there is a significant difference in students' critical thinking-analysis skills in favor of the 2005 Social Studies curriculum [ $t_{(611)}= 3,494$ ;  $p<.05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-analysis skills was 6,41, under the new curriculum this average raised to 6,68. This difference between the two averages is statistically very important. Namely, the 2005 Social Studies curriculum has an important positive effect on students' critical thinking-analysis skills.

***The Difference between Students' Critical Thinking-Evaluation Skills and the Applied Social Studies Curriculum***

Paired sample t-tests were used to understand the difference between critical thinking-evaluation skills (assessing claims, assessing arguments) and the applied Social Studies curriculum. The results are listed in Table 4.

**Table 4**

*T-Test Results Showing the Difference between Critical Thinking-Evaluation Skills and the Applied Social Studies Curriculum*

Critical Thinking Skill	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Evaluation	1998 Social Studies C.	612	6,2827	2,1030	611	5,851	,000*
	2005 Social Studies C.	612	6,9330	1,8256			

\*  $p < 0.05$

Table 4 shows that there is a significant difference in students' critical thinking-evaluation skills in favor of the 2005 Social Studies curriculum [ $t_{(611)} = 5,851$ ;  $p < .05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-evaluation skills was 6,28, under the new curriculum this average raised to 6,93. This difference between the two averages is statistically very important. Namely, the 2005 Social Studies curriculum has an important positive effect on students' critical thinking-evaluation skills.

***The Difference between Students' Critical Thinking-Inference Skills and the Applied Social Studies Curriculum***

Paired sample t-tests were used to discover the difference between critical thinking-inference skills (querying evidence, conjecturing alternatives, and drawing conclusions) and the applied Social Studies curriculum. The results are listed in Table 5.

**Table 5**

*T-Test Results Showing the Difference between Critical Thinking-Inference Skills and the Applied Social Studies Curriculum*

Critical Thinking Skill	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Inference	1998 Social Studies C.	612	5,4837	1,6665	611	9,894	,000*
	2005 Social Studies C.	612	6,3578	1,4590			

\*  $p < 0.05$

Table 5 shows that there is a significant difference in students' critical thinking-inference skills in favor of the 2005 Social Studies curriculum [ $t_{(611)} = 9,894$ ;  $p < .05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-inference skills was 5,48, under the new curriculum this average raised to 6,36. This difference between the two averages is statistically very important. Namely, the 2005 Social Studies curriculum has an important positive effect on students' critical thinking-inference skills.

*The Difference between Students' Critical Thinking-Interpretation Skills and the Applied Social Studies Curriculum*

Paired sample t-tests were used to discover the difference between critical thinking-inference skills (categorization, decoding significance, clarifying meaning) and the applied Social Studies curriculum. The results are listed in Table 6.

**Table 6**

*T-Test Results Showing the Difference Between Critical Thinking-Interpretation Skills and the Applied Social Studies Curriculum*

Critical Thinking Skills	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Interpretation	1998 Social Studies C.	612	5,9118	2,1158	611	4,451	,000*
	2005 Social Studies C.	612	6,4020	1,7121			

\* $p < 0.05$

Table 6 shows that there is a significant difference in students' critical thinking-interpretation skills in favor of the 2005 Social Studies curriculum [ $t_{(611)} = 4,451$ ;  $p < .05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-interpretation skills was 5,91, under the new curriculum this average raised to 6,40. This difference between the two averages is statistically very important. Namely, the 2005 Social Studies curriculum has an important positive effect on students' critical thinking-interpretation skills.

*The Difference between Students' Critical Thinking-Explanation Skills and the Applied Social Studies Curriculum*

Paired sample t-tests were used to discover the difference between critical thinking-inference skills (stating results, justifying procedures, presenting arguments) and the applied Social Studies curriculum. The results are listed in Table 7.

**Table V7**

*T-Test Results Showing the Difference between Critical Thinking-Explanation Skills and the Applied Social Studies Curriculum*

Critical Thinking Skill	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Explanation	1998 Social Studies C.	612	5,3529	2,3055	611	4,750	,000*
	2005 Social Studies C.	612	5,9265	1,8957			

\* p<0.05

Table 7 shows that there is a significant difference in students' critical thinking-explanation skills in favor of the 2005 Social Studies curriculum [ $t_{(611)} = 4,750$ ;  $p < .05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-explanation skills was 5,35, under the new curriculum this average raised to 5,93. This difference between the two averages is statistically very important. Namely, 2005 the Social Studies curriculum has an important positive effect on students' critical thinking-explanation skills.

***The Difference between Students' Critical Thinking-Self-Regulation Skills and the Applied Social Studies Curriculum***

Paired sample t-tests were used to discover the difference between critical thinking-inference skills (self-examination, self-correction) and the applied Social Studies curriculum. The results are listed in Table 8.

**Table VIII**

*T-Test Results Showing the Difference Between Critical Thinking-Self-Regulation Skills and the Applied Social Studies Curriculum*

Critical Thinking Skill	Applied Curriculum	N	$\bar{X}$	S	df	t	p
Self-Regulation	1998 Social Studies C.	612	16,0016	3,2564	611	5,077	,000*
	2005 Social Studies C.	612	16,9216	3,1680			

\* p<0.05

Table 8 shows that there is a significant difference in students' critical thinking-self-regulation in favor of the 2005 Social Studies curriculum [ $t_{(611)} = 5,077$ ;  $p < .05$ ]. While under the 1998 curriculum, the arithmetic average of students' critical thinking-self-regulation skills was 16,00, under the new curriculum this average raised to

16,92. This difference between the two averages is statistically very important. Namely, the 2005 Social Studies curriculum has an important positive effect on students' critical thinking-self-regulation skills.

### Conclusions and Recommendations

Analysis, evaluation, inference, interpretation, explanation and self-regulation scales were used to analyze the effects of the 2005 Social Studies curriculum on students' critical thinking skills. The results showed that the new system has an important positive effect. The rate of the values found at the end of the research shows the differences between the 1998 Social Studies curriculum and the 2005 Social Studies curriculum.

It is important to point out that teachers have very important roles in educational systems, so whether they carefully follow the system affects the process of improving students' skills. Another issue is that students grew a year during the research process (from the 4<sup>th</sup> grade to the 5<sup>th</sup> grade). However, this should not be seen as the cause of the difference in their skills. Although they grew a year older, they are still in the same cognitive continuum. Results of this research can be supported by making observations.

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## 2005 Sosyal Bilgiler Öğretim Programının Öğrencilerin Eleştirel Düşünme Becerilerine Etkisi

### (Özet)

*Problem Durumu:* Eleştirel düşünme Türkiye' de 1980' li yıllardan itibaren çalışılan bir konu olmasına rağmen dünyanın bazı ülkelerinde bin yılları bulan bir çalışma geçmişine sahiptir. Eğitimde eleştirel düşünmeye verilen önem de buna paralel bir durum göstermektedir. Eleştirel düşünme, öğrencilere ilköğretim çağından itibaren kazandırılması gereken bir beceri durumundadır. Bu gereklilik dünyada yaşanan son gelişmeler doğrultusunda içinde bulunduğumuz yüzyılda 20. yüzyıldan daha da fazla artmıştır. 21. yüzyılda düşünen, sorgulayan, alternatifler üreten, olaylara farklı açılardan yaklaşmasını bilen kısaca eleştirel düşünen bireylerin vatandaşların varlığı her ülke için olduğu gibi Türkiye için de önemlidir. Türkiye' de 2005 yılında gerçekleştirilen öğretim programlarındaki değişikliklerle ilköğretim programları değiştirilmiştir. Sosyal bilgiler öğretim programı da bu programlar arasındadır ve eleştirel düşünmeye teorik bazda da olsa diğer programlara göre en çok yer veren, önem veren program durumundadır. Aynı zamanda 1998 Sosyal Bilgiler Programı' nın eleştirel düşünmeye yeni programdan daha az önem verdiği de bu duruma ilave olarak belirtilebilir. Teorik olarak böyle bir farklılığa sahip olan 2005 Sosyal

Bilgiler Programı' nın uygulama bazında da öğrenciler üzerinde anlamlı bir farklılık oluşturup oluşturmadığı incelenmeye değer bir problem durumundadır. Çünkü son yıllarda eğitimde yapılan en önemli reform olarak adlandırılan program değişikliklerinin etkisinin program uygulamasının ilk yıllarından itibaren incelenmesi gerekmektedir.

*Araştırmanın Amacı:* Bu çalışmada Türkiye' de 2005 yılında uygulamaya konan sosyal bilgiler öğretim programının öğrencilerin eleştirel düşünme becerilerine etkisi ortaya konulmaya çalışılmıştır. Araştırmanın temel amacı 1998 Sosyal Bilgiler Programı sonucu elde edilen eleştirel düşünme becerilerinin 2005 Sosyal Bilgiler Programı sonucu nasıl bir durumda olduğunu belirlemektir. Böylece öğrencilerin eleştirel düşünme becerilerinin "uygulanan öğretim programı" değişkenine göre 2005 Sosyal Bilgiler Öğretim Programı lehine anlamlı bir farklılık oluşturup oluşturmadığı ortaya çıkarılmış olacaktır.

*Araştırmanın Yöntemi:* Bu araştırma, betimsel nitelikte bir araştırma olup, tarama modelleri esas alınarak gerçekleştirilmiştir. Araştırma Ankara il merkezinde bulunan ilköğretim okullarında yapılmıştır. Araştırmada random olarak seçilen 20 ilköğretim okulundan 432' si devlet okulu öğrencisi ve 180' i özel okul öğrencisi olmak üzere 612 öğrenciye ulaşılmıştır. Çalışma grubunu oluşturan 612 öğrenciye araştırmacı tarafından geliştirilen eleştirel düşünme ölçekleri bir yıl arayla iki defa uygulanmıştır. Ölçekler, Delphi Projesi' nde uzmanların konsensüsüyle belirlenen eleştirel düşünme beceri alanlarına (analiz, değerlendirme, çıkarım, yorumlama, açıklama ve öz düzenleme) göre geliştirilmiş, istatistiksel olarak geçerlik ve güvenilirlikleri sağlanmıştır. İlk uygulama ilköğretim dördüncü sınıfta bulunan öğrencilere öğretim yılının son ayında (1998 Sosyal Bilgiler Programı' nın son uygulama yılında) yapılırken ikinci uygulama ilköğretim beşinci sınıf öğrencisi olmuş aynı öğrencilere yine öğretim yılının son ayında (2005 Sosyal Bilgiler Programı' nın ilk uygulama yılında) yapılmıştır. Araştırmanın amacı doğrultusunda ilköğretim dördüncü ve beşinci sınıfta aynı okula devam eden öğrencilerin çalışmaya katılması uygun görülmüştür. Verilerin analizinde ise bu iki süreçte elde edilen verilerin birbirleriyle anlamlı bir farklılığa sahip olup olmadığını ortaya çıkarmak için ilişkili örneklem için t-testi yapılmıştır.

*Araştırmanın Bulguları:* Analiz, değerlendirme, çıkarım, yorumlama, açıklama ve öz düzenleme ölçekleri uygulanarak elde edilen verilerden 2005 yılında geliştirilen Sosyal Bilgiler Programı' nın öğrencilerin eleştirel düşünme becerilerinin tümünde becerileri geliştirici bir etki yaptığı görülmüştür. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin eleştirel düşünme-analiz becerilerinin aritmetik ortalaması "6,41" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-analiz becerilerinin aritmetik ortalaması "6,68" e yükselmiştir. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin eleştirel düşünme-değerlendirme becerilerinin aritmetik ortalaması "6,28" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-değerlendirme becerilerinin aritmetik ortalaması "6,93" e yükselmiştir. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin



eleştirel düşünme-çıkarm becerilerinin aritmetik ortalaması "5,48" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-çıkarm becerilerinin aritmetik ortalaması "6,36" ya yükselmiştir. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin eleştirel düşünme-yorumlama becerilerinin aritmetik ortalaması "5,91" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-yorumlama becerilerinin aritmetik ortalaması "6,40" a yükselmiştir. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin eleştirel düşünme-açıklama becerilerinin aritmetik ortalaması "5,35" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-açıklama becerilerinin aritmetik ortalaması "5,93" e yükselmiştir. 1998 Sosyal Bilgiler Öğretim Programı uygulanan öğrencilerin eleştirel düşünme-öz düzenleme becerilerinin aritmetik ortalaması "16,00" iken aynı öğrencilere 2005 Sosyal Bilgiler Öğretim Programı uygulandığında eleştirel düşünme-öz düzenleme becerilerinin aritmetik ortalaması "16,92" ye yükselmiştir. Yani öğrencilerin eleştirel düşünme becerilerinin tümü "uygulanan öğretim programı" değişkenine göre 2005 Sosyal Bilgiler Öğretim Programı lehine anlamlı bir farklılık oluşturduğu tespit edilmiştir.

*Araştırmanın Sonuçları ve Önerileri:* Araştırma sonucunda bütün eleştirel düşünme beceri alanlarında teorik olarak olduğu gibi pratikte de 2005 Sosyal Bilgiler Öğretim Programı' nın öğrencilerin eleştirel düşünme becerilerini arttırdığı anlaşılmıştır. Bu sonuca ulaşılmasında öğretmenlerin program gereklerini yerine getirmedeki başarıları önemlidir. Bu yüzden öğretmenlerin eleştirel düşünmeyi geliştirici etkinlikleri uygulamayı sürdürmeleri gereklidir. Uygulamaya konan bir öğretim programının sonuçları şüphesiz ki kısa vadede alınamaz. En azından program geliştirmede ortaya konan hedeflerin tamamına ulaşmak için uzun vade gereklidir. Bu yüzden öğretmenlere hizmet içi eğitim çalışmalarının sürdürülmesi büyük önem taşımaktadır.

**Anahtar Sözcükler:** Eleştirel düşünme, ilköğretim, sosyal bilgiler, öğretim programı

## Gender, Romantic Relationships, Internet Use, Perceived Social Support and Social Skills as the Predictors of Loneliness

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### Abstract

*Background/Problem Statement:* Loneliness is an unpleasant feeling accompanied with distress, anxiety and desperation. Several authors have expressed that the feeling of loneliness is heightened in adolescence. It poses a risk to psychological and physical health, which makes it an issue dealt with at length. Loneliness in adolescence is related to such variables as gender, depression, shyness, self-respect, social support, social anxiety, and social skills. The problem is whether loneliness is predicted by the variables thought to be related to loneliness.

*Purpose of the Study:* This study aims to identify if the university students' feelings of loneliness can be predicted significantly by the variables of gender, romantic relationships, internet use, social skills, and perceived social support from family and friends.

*Methods :* The study was conducted with 329 students between the ages of 18 and 23 studying at Uludag University. 61% were females and 39% were males (*Age*, 20.41). The data was collected using the Personal Information Form, UCLA Loneliness scale, Perceived Social Support Scale, and Social Skills Inventory respectively and analyzed with the regression technique.

*Findings and Results:* The regression analysis suggests that gender does not significantly predict loneliness scores, nor do the variables of romantic relationships and social support from family. Perceived social support from friends and social skills predict loneliness scores significantly with negative implications.

According to the findings, perceived social support from friends significantly predicts loneliness, but social support from family does not. Considering these results, relationships with friends are perceived as more important by Turkish adolescents than relationships with family among

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older adolescents. Another finding is that social skills predict loneliness negatively. Social skills explain almost one-third of loneliness, which is a very noteworthy rate. The importance of social skills training would be better appreciated in light of the fact that social skills play an essential role in establishing and maintaining relationships with friends. Two unexpected results of the study are that neither romantic relationships nor internet usage have a significant effect on loneliness.

*Recommendations:* The results of the study suggest that loneliness in adolescence is mitigated by perceived social support from friends and social skills, and social support from family is not adequate. These findings are noteworthy in terms of guidance services. Social skills training programs can help adolescents to have effective relationships with their friends and family members, which would alleviate their loneliness and enable them to benefit more from social support sources. Additionally, it would be appropriate to form social support groups for adolescents who feel lonely.

*Keywords:* Loneliness, social support, gender, social skills, romantic relationships, internet use

Loneliness is defined as the distressing psychological experience gone through when there are discrepancies between one's desired and one's actual relationships (Peplau & Perlman, 1984). Loneliness is an inescapable fact of life and one of the most painful experiences (Weis, 1973). It is an unpleasant feeling accompanied by distress, anxiety and desperation (Russell, Peplau & Cutrona, 1980). Seligman (1983) described loneliness to be one of the most poorly understood of all psychological phenomena. As one of the conceptual analyses of loneliness, Weis (1973) provided the definitions of social loneliness and emotional loneliness. In terms of social loneliness, the number of relationships a person has is not important; what matters is the ways in which that person enjoys and considers his relationships. Therefore, loneliness is what one perceives about himself and an inner experience (Peplau & Perlman, 1984). Emotional loneliness is caused when one suffers from anxiety and distress as a result of not being able to build close and intimate relationships with others (Weis, 1973).

Several authors have expressed that the feeling of loneliness is heightened in adolescence (Brennan, 1982; Larson, 1999; Weiss, 1973, Williams, 1983). There are various reasons for this. Adolescents desire to be alone because of the physical and emotional changes they undergo, but they also desire to be approved of and accepted by their parents and peers (Kulaksızoğlu, 2001). Adolescents feel lonely when they are not accepted by peers (Bilgiç, 2000; Cheng & Furnham, 2002), when their need for being loved is not met (Woodward & Frank, 1988), and when they have negative social experiences at school. In a meta-analysis study on adolescent loneliness, Mahon, Yarcheski, Yarcheski, Cannella and Hanks (2006) reported that the variables predicting loneliness felt by adolescents were gender, depression, shyness, self-respect, social support, social anxiety, and social skills respectively.

One of the significant variables related to loneliness is the lack of social skills (Deniz, Hamarta & Ari, 2005; Jones, Hobbs & Hockenbury, 1982; Riggio, 1986; Wittenberg & Reis, 1986). As people with poor social skills tend to not get emotionally close to others, they build poor relationships and feel dissatisfied with their social relationships (Franzoi & Davis, 1985). In many studies on adolescent loneliness, researchers have defined lonely adolescents as people who lack social skills and who are pessimistic in their relationships with others (Gerson & Perlman 1979; Jones, Freeman & Goswick, 1981). They are also introverted, passive and downhearted (Van Buskirk & Duke 1991), sidelined by their peers, and shy and bashful (Boivin, Hymel & Bukowski, 1995).

Studies have shown that another important variable related to loneliness is social support. Research has clearly demonstrated the relationships between the dearth of social support and loneliness and other psychological disorders (Cohen, 1988; Cornwel, 2003; Demir, 1990; Duru, 2008; Jones & Moore, 1987; Kozaklı, 2006; Mahon, Yarcheski & Yarcheski, 1994; Terzi, 2008; Yıldırım, 2004). Two of the important concepts which are used to explain social support are social network and social embeddedness. A social network consists of the people in one's life and one's relationships with them, and social embeddedness refers to a situation where one has close and healthy relationships with those who are important in his life (Barrera, 1986). People with a high level of social embeddedness are more inclined to be in social environments, and they feel more satisfied with their relationships (Lee & Robbins, 1998; Sorias, 1988). The social support sources an individual has reduces the risks of psychological and physical diseases diminishing the effects of experiences that cause stress (Pengilly & Dowd, 2000). People feel lonely when they are given no social support or when they perceive that they are not getting as much support as they need (Rook, 1984).

The relation between gender and loneliness is an issue that has been widely investigated. Some studies have not found a significant difference between genders in terms of loneliness (Berg & Peplau, 1982; Brage, Meredith & Woodward, 1993; Torntam, 1992), but others have reported that boys feel lonelier than girls (Davis & Franzoi, 1986; Schultz & Moore, 1986; Stokes & Levin, 1986). The few studies on the relationship between romance and loneliness have indicated that romantic relationships are important predictors of loneliness (Flora & Segrin, 2000; Goldenberg, 1981).

Internet use, which has increased rapidly in recent years, has engendered the studies on the relation between loneliness and internet use, but contradictory findings have been reported. While some studies have concluded that frequent use of the internet causes loneliness (Engelberg & Sjoberg, 2004; Moody, 2001), others have indicated that it reduces it (Matsuba, 2006; Morahan, Martin & Schumacher, 2003).

Reviewing the literature on this issue in Turkey, it can be observed that the number of studies on loneliness has increased recently. These are either studies investigating the relation between loneliness and such variables as age, gender, socioeconomic level, and social skills (Demir, 1990; Duru, 2008; Eren, 1994; Hamarta, 2000; Hamamcı & Duy, 2007; Terzi, 2008) or experimental ones dealing with the relation between loneliness and social skills training (Demir & Tezer, 1995, Duy, 2003, Hamamcı & Duy, 2005, Koçak, 2003). Though many studies have been carried out to investigate the relation between loneliness and several variables, none of them

has focused on the relation between loneliness and gender, romantic relationships, internet use, social support and social skills. For that reason, the present study will investigate these factors.

The aim of the study is to identify whether or not the university students' feelings of loneliness can be significantly predicted by the variables of gender, romantic relationships, internet use, social skills and social support from family and friends.

## Method

### *Sample*

The study was conducted with 329 students between the ages of 18 and 23 studying in different departments at Uludag University. 61% (200) of them were females and 39% (129) were males ( $M$  age = 20.41). The sample was comprised of randomly chosen students at the university.

### *Measures*

***Personal Information Form.*** This consists of questions about gender, age, romantic relationships (answered with "I have" or "I don't have") and internet use (answered with "less than 25%", "between 25% and 50%", and "50% and more").

***University of California Los Angeles Loneliness Scale (UCLA).*** The UCLA Loneliness Scale, which was developed to measure people's loneliness levels and revised by Russel, Peplau and Cutrona (1980), is composed of ten positive and ten reverse items. In terms of the original version of the scale, the reliability coefficient and coefficient of determination were found to be .91 and .94, respectively. It was adapted to Turkish by Demir (1990). In terms of the Turkish version, the internal consistency coefficient was found to be .96 and the reliability coefficient of the test-retest, which was administered after five weeks, was calculated as .94. For the sake of reliability, the relationship of the scale to similar ones was examined, and a correlation of .77 between it and the Beck Depression Inventory (Demir, 1990) was found. It was prepared as a 4 - point Likert-type scale. The lowest possible score was 20, and the highest was 80. Having a high score in the scale would suggest that an intense feeling of loneliness was being experienced.

***Perceived Social Support from Friends and Family Scale (PSSS).*** The Perceived Social Support from Friends and Family Scale, which was developed by Pradicano and Heller (1983), aims to measure the extent to which one perceives his needs are met by his family and friends. It was adapted to Turkish by Eskin (1992). It consists of 20 items which measure the perceived social support from friends, and another 20 items which measure the perceived social support from family. Both categories were combined. It includes three response options, which are "yes", "no" and "I don't know." The answers of "yes" and "no" are given +1 point; and "I don't know" is not given any points. The maximum points are 20, which shows a strong social support. The test-retest reliability coefficients of the form were found to be .80 and .90 in terms of the perceived social support from friends and family respectively. The internal consistency coefficients were calculated with the Cronbach alpha coefficient and found to be .76 and .85 with regard to the perceived social support from friends and family respectively.

**Social Skills Inventory (SSI).** This inventory, which assesses basic social skills that underlie social competence, was developed by Riggio (1989). It measures social skills in six domains and consists of 90 items. It assesses skills in these key areas: (1) emotional expressivity (2) emotional sensitivity (3) emotional control (4) social expressivity (5) social sensitivity, and (6) social control. Each scale consists of 15 items. People respond to items using a five-point Likert type scale, indicating the extent to which the description of the item applies to them. The reliability coefficient of the subscales of the original form varies between .81 and .96. The test-retest reliability coefficient is .94. For the validity of scale, its correlations with other scales were examined and the correlation between it and the Self-Regulation Questionnaire was calculated as .34 (Yüksel, 1998). The inventory was adapted to Turkish by Yüksel (1997). The reliability coefficients of the subscales of the Turkish version vary between .80 and .89, and the internal consistency coefficients vary between .56 and .82. The test-retest reliability coefficient was calculated as .92. For the validity of scale, .63 correlation was found between the Inventory and the UCLA Loneliness Scale.

#### **Procedure**

The procedures were performed during a two-month period in the spring term of 2006-2007. The questionnaires were distributed to the students by the researcher during class hours. The students were informed about the aim of the study in advance, and only volunteers were asked to participate. The procedures were completed in one class hour. The Pearson correlation coefficients of the scores were calculated and the multiple regression technique was applied to all variables. The data was analyzed using SPSS.

### **Results**

The results of the analyses done are presented in the table below together with explanations.

#### **Descriptive Analysis**

Table 1 shows the means and standard deviations regarding the loneliness, perceived social support from family, perceived social support from friends, and social skills scores of the participating students.

**Table 1**

*The Means and Standard Deviations of the Loneliness, Social Support and Social Skills Scales*

	M	SD	N
Loneliness	33.36	9.56	329
Per. Soc. Supp. from Fam.	17.73	2.45	329
Per. Soc. Supp. from Friends	17.37	3.15	329
Social Skills	287.67	26.51	329

As seen in Table 1, 33.36 is the mean score the students received from the loneliness scale. Considering the fact that the scores obtained from the scale ranged between 20 and 80, it could be claimed that the loneliness felt by the students was at

an average level. 17.73 and 17.37 are the mean scores regarding the perceived social support from family and friends respectively. The scores that can be obtained from the related scale range between 0 and 20. Thus, the perceived social support from their families and friends was strong. The mean social skills score was 287.67. 178 (54.1%) of the participants declared that they had romantic relationships and 151 (45.9%) stated that they did not. 249 (75%) students mentioned that they spent 25% of their time using the internet while 60 (18.2%) of them indicated that they spent 50% of their time going on the internet, and 20 (6.1%) declared that they spent more than 50% of their time using the internet.

#### *The Results of the Correlation Analysis*

The analyses results show that there are negative relations between loneliness and perceived social support from friends ( $r = -47.4$ ,  $p < .01$ ), perceived social support from family ( $r = -16.1$ ,  $p < .01$ ) and social skills ( $r = -35.7$ ,  $p < .01$ ). This means that loneliness decreases when perceived social support and social skills increase.

#### *The Results of the Multiple Regression Analysis*

Table 2 shows the results of the multiple regression analysis indicating whether or not the variables of gender, romantic relationships, social skills and perceived social support from family and friends predict loneliness.

**Table 2**

#### *Regression Analysis for Loneliness*

Dependent variable	R <sup>2</sup>	F	Independent variables	T
Loneliness	.325	15.30	Gender	-0.375
			Romantic Relationships	-1.258
			Perceived. Soc Supp. from Family	-0.254
			Perceived Soc Supp. from Friends	-8.052***
			Internet use (%25)	0.014
			Internet use (%50)	0.199
			Internet use (%50 and over)	1.079
			Social Skills Sum	-5.337***

\*\*\* $p < .001$

As seen in Table 2, gender does not significantly predict loneliness, nor do romantic relationships and perceived social support from family. The variables of social skills and perceived social support from family and friends predict the loneliness scores negatively ( $R = .565$ ,  $R = .325$ ,  $F = 15.30$ ,  $p < .001$ ). All of the independent variables subjected to regression analysis explain 33% of the total variance in the loneliness score. According to the standardized regression coefficient (B), the order of importance of the predictive variables on loneliness is perceived highest in social support from friends and social skills. In regard to the results of the t test about the significance of the regression coefficients, the variables of perceived

social support from friends and social skills both predict the loneliness scores significantly ( $p < .001$ ).

### Conclusions and Recommendations

This study investigated to what extent the loneliness of university students between the ages of 18 and 23 can be predicted by variables of gender, romantic relationships, internet use, social skills and perceived social support from family and friends. According to the findings, perceived social support from friends and social skills predict loneliness negatively; but gender, romantic relationships, internet use and perceived social support from family do not significantly predict the feelings of loneliness.

The fact that perceived social support from friends predicts loneliness negatively is partly supported by the results of some other studies. Riggio, Watring and Throckmorton (1992) reported that social support gives adolescents deeper satisfaction in life and helps them to not feel lonely. In a study done with university students, Duru (2008) found that social support and social embeddedness are negative predictors of loneliness, while Kafetsios (2002) indicated that social support is a significant predictor. Many studies on the relationships between social support and loneliness have found that social support has some positive effects on loneliness and psychological health (Perlman & Peplau, 1984; Cohen & Wilss, 1982; Rook, 1984; Yıldırım, 2004). What needs to be noted here is that social support received from family does not have a significant effect on loneliness while perceived social support from friends predicts loneliness significantly. In consideration of these results, it should be mentioned that relationships and rapport with friends are perceived to be more important by Turkish adolescents than relationships with family in late adolescence. When compared to the Western world, it is a fact that the relationships between adolescents and their families in Turkey and developing countries are stronger, and this continues even when adolescents become adults (Kağıtçıbaşı, 1996). This brings up the questions of whether adolescents think support from friends is more important than family support and whether the relationship between families and adolescents is changing.

Another finding of the study is that the variable of social skills predicts loneliness negatively, which is similar to the findings of many other studies reporting that there is a negative correlation between loneliness and social support (Demir, 1990; Deniz et al., 2005; DiTommaso, McNutly, Ross & Burges, 2003). According to the results of the study, social skills explain one-third variance of the loneliness scores, which is a highly important rate. In this way, the importance of social skills has been emphasized once more. In his comprehensive study on loneliness, Demir (1990) found that adolescents who think they lack some social skills feel lonelier than the ones who think they do not. The importance of social skills training would be better appreciated in light of the fact that this plays an essential role in establishing and maintaining relationships with friends, thus enhancing the social support and satisfaction taken from relationships. Furthermore, social skills help people receive more support from social support sources (friends, family, teachers). To summarize,



learning about social skills starting from childhood supports people psychologically throughout their lives.

One of the findings of the current study is that gender does not have a significant effect on loneliness. Although many studies on the relationship between gender and loneliness have found that males feel lonelier than females (Avery, 1982; Davis & Franzoi, 1986; Demir, 1990; Deniz et al., 2005 & Russell et al., 1980; Schultz & Moore, 1986; Stokes & Levin, 1986), others have reported that loneliness is not related to gender in any way (Berg & Peplau, 1982; Brage et al., 1993; Tornstam, 1992).

One of the unexpected results of the study is that romantic relationships do not have a significant effect on loneliness, which is similar to the findings of some other studies in the literature. There have not been many studies referring to a relationship between loneliness and romantic relationships (Deniz et al., 2005; Jones & Hebb, 2003), but Flora and Segrin (2000) reported that satisfaction taken from romantic relationships mitigates loneliness, and Goldenberg (1981) stated that romantic relationships are an important predictor of loneliness. Nonetheless, there needs to be more study findings on this issue. Another unexpected result of the study is that internet use does not have a significant effect on loneliness. There have been different findings on this issue in the literature. Moody (2001) reported that excessive internet use is related to intense emotional loneliness and social loneliness as well, and Matsuba (2006) expressed that frequent use of the internet mitigates loneliness.

The results of the study suggest that loneliness in adolescence is mitigated by perceived social support from friends and social skills, and social support from family is not adequate. These findings are very important in terms of guidance services. Social skills training programs can help adolescents to have effective relationships with their friends and family members, which would alleviate their loneliness and enable them to benefit more from social support sources. Additionally, it would be appropriate to form social support groups for adolescents who feel lonely.

#### *Limitations of the Study*

The study produced significant results, but the following could be mentioned in regard to the limitations: The study aimed to explain loneliness levels with all the variables of social support, social skills, gender, romantic relationships and internet use, but it was found that the ones that have effects on loneliness are social support and social skills. This result shows that there could be some other variables predicting loneliness. The finding that internet use does not have a significant effect on loneliness could be explained by the fact that the number of participants using the internet excessively was small. Thus, more reliable results about the relationship between loneliness and internet use could be obtained if studies were conducted with more people who use the internet excessively and an internet addiction scale was used. Another limitation of the study is that it was carried out in just one university and did not consider the socioeconomic levels of the participants. It would be appropriate to do future studies including more variables with larger and more heterogeneous study groups.

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### **Yalnızlığın Belirleyicileri Olarak:Cinsiyet, Duygusal İlişki, İnternet Kullanımı Algılanan Sosyal Destek ve Sosyal Beceri**

#### **(Özet)**

*Problem Durumu:* Yalnızlık hoş olmayan bir duygu olup üzüntü, sıkıntı, kaygı, çaresizlik gibi negatif duyguların eşlik ettiği bir durumdur. Bununla birlikte yalnızlık tüm psikolojik fenomenler arasında en az anlaşılabileni olarak tanımlanmıştır. Yalnızlıkla ilgili olarak yapılan kavramsal analizlerde sosyal yalnızlık ve duygusal yalnızlık tanımlamaları yapılmıştır. Sosyal yalnızlıkta bireyin yalnızlık duygusunu yaşamasında önemli olan bireyin kaç kişiyle birlikte olduğu değil, bu ilişkileri nasıl yaşayıp yorumladığıdır. Bu yüzden yalnızlık tamamen bireyin kendisi hakkında algısı olup içsel bir yaşantıdır. Duygusal yalnızlıkta ise başka insanlarla yakın ve içten ilişkiler kurulamaması sonucunda kaygı ve üzüntü yaşanmaktadır. Farklı yazarlar tarafından ergenlik döneminde yalnızlık duygusunun arttığı belirtilmektedir. Yalnız ergenler kendilerini üzgün, karamsar ve ümitsiz

hissetmektedir. Özetle yalnızlık, psikolojik ve bedensel sağlık için risk oluşturmaktadır. Bu nedenle üzerinde önemle durulan bir konu olmuştur. Yalnızlık birçok değişkenle ilgilidir. Yalnızlığın ilişkili olduğu önemli değişkenlerden biri sosyal beceri eksikliğidir. Sosyal becerileri gelişmemiş bireyler diğer insanlarla duygusal yakınlık kuramadıkları için yüzeysel ilişkiler kurarak, bunun sonucunda sosyal ilişkilerinde yetersizlik ve doyumsuzluk yaşamaktadırlar. Yapılan çalışmalarda yalnızlığın ilişkili olduğu diğer bir önemli değişkenin de sosyal destek olduğu görülmektedir. Araştırmalar sosyal destek yoksunluğu ile yalnızlık ve diğer psikolojik bozukluklar arasındaki ilişkileri açıkça ortaya koymaktadır.

Cinsiyet ve yalnızlık ilişkisi çok araştırılan konulardan biri olmuştur. Bazı çalışmalarda cinsiyet ve yalnızlık arasında önemli bir farklılık bulunamazken, bazı çalışmalarda erkeklerin kızlardan daha yalnız olduğu bulunmuştur. Duygusal birliktelik ve yalnızlık ilişkisini araştıran az sayıdaki çalışmada ise romantik ilişkinin yalnızlığın önemli bir belirleyicisi olduğunu belirtilmektedir. Son yıllarda internet kullanımının hızla artması da, yalnızlık ve internet kullanımı arasındaki ilişkilerin araştırılmasına yol açmış, ancak birbirinden farklı bulgular elde edilmiştir. Bazı çalışmalarda sık internet kullanımının yalnızlığa yol açtığını belirtilirken bazı çalışmalarda yoğun internet kullanımının yalnızlığı azalttığı belirtilmektedir. İlgili literatür incelendiğinde yalnızlık ve yukarıda bahsedilen değişkenlerin birlikte ele alındığı bir çalışmaya rastlanmamıştır. Tüm Bu nedenlerden dolayı, yalnızlıkla ilişkili olduğu düşünülen ve aşağıda sıralanan değişkenlerin yalnızlığı yordayıp yordamadığı bu araştırmanın problemi oluşturmaktadır.

*Araştırmanın Amacı:* Bu araştırmanın amacı üniversite öğrencilerinde cinsiyet, duygusal ilişki, internet kullanımı aileden ve arkadaşan algılanan sosyal destek ve sosyal beceri değişkenlerinin yalnızlığı anlamlı olarak yordayıp yordamadığını ortaya koymaktır.

*Araştırmanın Yöntemi:* Araştırma Uludağ Üniversitesinin çeşitli bölümlerinde öğrenim gören 18-23 yaş arası (yaş ortalaması, 20.41) 329 öğrenci üzerinde gerçekleştirilmiştir. Araştırmaya katılan öğrencilerin 200'ü (%61) kız, 129'u (%39) erkektir. Araştırmanın verileri sırası ile, araştırmacı tarafından geliştirilen Kişisel Bilgi Formu, Türk toplumuna uyarlaması Demir tarafından yapılan (1990) "UCLA" (University of California Los Angeles) Yalnızlık Ölçeği, Eskin (1992) tarafından uyarlanan Arkadaştan ve Aileden Algılanan Sosyal Destek Ölçeği ve Yüksel (1998) tarafından uyarlanan Sosyal Beceri Ölçeği ile toplanmıştır. Araştırmada ölçeklerden elde edilen puanların Pearson korelasyon katsayıları hesaplanmış, daha sonra ele alınan tüm değişkenlere çoklu regresyon analizi tekniği uygulanmıştır.

*Araştırmanın Bulguları:* Yapılan çoklu regresyon analizi sonucunda, regresyona giren tüm yordayıcı değişkenlerin (cinsiyet, romantik ilişki, aileden ve arkadaşan algılanan sosyal destek, internet kullanımı, sosyal beceri) yordanan değişken (yalnızlık) üzerindeki etkileri sırası ile tek tek ele alındığında cinsiyet değişkeninin yalnızlık puanını anlamlı olarak yordamadığı görülmüştür. Aynı şekilde romantik ilişki değişkeni ve aileden algılanan sosyal destek değişkeni de yalnızlık puanını anlamlı olarak yordamamaktadır. Diğer yordayıcı değişkenler olan arkadaşan algılanan

sosyal destek ve sosyal beceri değişkenleri ikisi birlikte yalnızlık puanını negatif yönde anlamlı olarak yordamaktadır. Regresyona giren bağımsız değişkenlerin hepsi birlikte yalnızlık puanındaki toplam varyansın % 33 ü'nü açıklamaktadır. Standardize edilmiş regresyon katsayısına göre (B), yordayıcı değişkenlerin yordanan değişken(yalnızlık) üzerindeki göreceli önem sırası arkadaşta algılanan sosyal destek ve sosyal beceridir. Regresyon katsayılarının anlamlılığına ilişkin t testi sonuçları incelendiğinde arkadaşta algılanan sosyal destek ve sosyal beceri değişkenlerinin her ikisinin de yalnızlık puanı üzerinde anlamlı yordayıcılar olduğu görülmüştür.

*Sonuç ve Öneriler:* Araştırma sonuçlarına göre, arkadaşta algılanan sosyal destek yalnızlığı anlamlı olarak yordarken, aileden alınan sosyal desteğin yalnızlık üzerinde anlamlı bir etkisi bulunamamıştır. Bu sonuçlara göre geç ergenlik döneminde, arkadaşlık ilişkilerinin Türk ergenler tarafından aile ilişkilerine göre daha önemli algılandığı söylenebilir. Araştırmanın diğer bulgusu sosyal beceri değişkeninin yalnızlık üzerinde negatif yönde anlamlı etkisinin olmasıdır. Sosyal beceri yalnızlığın neredeyse üçte birini açıklamaktadır. Bu oldukça önemli bir orandır. Sosyal becerinin arkadaşlık ilişkilerinin kurulması ve devam ettirilmesi, böylelikle arkadaşlık ilişkilerinden alınan psikolojik doyum ve sosyal desteğin artırılmasında önemli rol oynadığı düşünülmüşse sosyal beceri eğitimin önemi bir kez daha ortaya çıkmaktadır. Araştırmanın beklenilmeyen sonuçlarından birisi duygusal birlikteliğin yalnızlık üzerinde anlamlı bir etkisinin olmamasıdır. Yalnızlık ve duygusal birliktelik ilişkisini gösteren çok fazla çalışma olmamakla birlikte, romantik ilişkinin ve ilişkiden alınan doyumun yalnızlığı azalttığını gösteren araştırma sonuçları vardır. Beklenilmeyen bir diğer sonuç ise internet kullanımının yalnızlık üzerinde anlamlı bir etkisinin bulunamamasıdır. Bu konuda literatürde farklı araştırma sonuçları vardır. Bazı araştırmalar aşırı internet kullanımının yüksek düzeyde duygusal yalnızlıkla, düşük seviyede sosyal yalnızlıkla ilgili olduğunu belirtirken, bazı çalışmalar yoğun internet kullanımının yalnızlığı azalttığını belirtmektedirler.

Özet olarak bu araştırmanın sonuçları ergenlik döneminde yalnızlığın arkadaşta algılanan sosyal destek ve sosyal beceri ile azaldığını, aileden alınan sosyal desteğin yeterli olmadığını ortaya koymaktadır. Bu sonuçlar gelişimsel rehberlik açısından son derece önemlidir. Sosyal becerilerinin geliştirilmesi için sosyal beceri eğitimi programlarının artırılması ergenlerin, arkadaşları, aileleri ve çevreleriyle daha etkili ilişkiler kurmasını sağlayarak yalnızlığın azalmasına yardımcı olacaktır. Bunun yanı sıra, sosyal destek kaynaklarından da daha fazla yararlanmasını sağlayacaktır. Ayrıca kendilerini yalnız hisseden ergenler için sosyal destek grupları oluşturulması yerinde olacaktır.

*Anahtar Sözcükler:* Yalnızlık, sosyal destek, sosyal beceri, romantik ilişki, internet kullanımı, ergen.

## Insights to Ecocentric, Anthropocentric and Antipathetic Attitudes towards Environment in Diverse Cultures

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### Abstract

*Problem Statement:* For almost 30 years, scientists from around the world have committed themselves to the endeavor of raising people's consciousness of the environment. It is possible to find many empirical studies about this subject in the related sources. Most of the studies are devoted to global or general consciousness of the environment. The subject of environmentally friendly behaviour is what constitutes the contents of the questionnaires cited in recent studies. To name some of them, these behaviours include separation of garbage, water saving, reduction of garbage, energy saving and driving private cars or using public transportation. Despite a great deal of both general and specific researches into environmentally conscious behaviours, there are very few studies and questionnaires devoted to researching people's value judgements as well as the source of values that urge people to protect environment.

*Methods:* The universe of the study is the population in and around the city of Giessen in Germany and the city of Ankara in Turkey. The sampling group of the study is composed of 250 Turkish teachers and 150 German teachers. The study utilizes a questionnaire which was adapted into Turkish and involves ecocentric, anthropocentric and antipathetic attitudes towards the protection of the environment. An independent t-test was carried out to determine whether differences between Turkish and German teachers' ecocentric, anthropocentric, and antipathetic attitudes towards protection of the environment are significant. Cronbach's alpha reliability coefficients of the questionnaire for Turkish teachers and German teachers were calculated as .80 and .77, respectively.

*Findings and Results:* This analysis was carried out not only for two different groups, but also for men and women separately and was instrumental to understanding whether both intercultural and intersexual differences are significant in light of the obtained data. There appeared to

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be no meaningful difference between German and Turkish teachers in antipathetic attitudes towards the environment. Of the overall differences between the attitudes of the Turkish and German teachers, the most attention-grabbing is that the averages belonging to Turkish teachers are on a higher level in ecocentric and anthropocentric attitudes. When the intersexual diversity of the two nations is considered, there was no detection of significant differences according to the t-test results in the above-mentioned attitudes of male and female German teachers, while the attitudes of the Turkish teachers differ according to sex. These differences appeared between ecocentric attitudes and antipathetic attitudes towards the environment.

**Keywords:** Ecocentric, anthropocentric, environmental apathy, environmental attitudes

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The environmental problems and possible precautions to be taken against these risks, which have been at the top of the world agenda for almost 30 years, have prompted scientists to closely study this field. All these studies agree that the main actor in efforts to prevent environmental problems is the human, who is the main actor in creating these problems. This situation urges scientists studying in the field of environmental education to find answers to key questions. How can people become conscious of the environment? What does environmental consciousness mean? How can people adopt environmentally friendly behaviours? What kind of a relationship is there between attitudes towards environmental knowledge and the environment itself, and environmentally conscious behaviours? Do human beings have a sense of ethics about the environment they live in? What kinds of dilemmas exist in this sense of ethics?

For almost 30 years, scientists from around the world have committed themselves to the endeavor of raising people's consciousness of the environment. It is possible to find many empirical studies in the related sources. Most of the studies are devoted to global or general consciousness of the environment (Amelang, Tepe, Vagt & Wendt, 1977; Dunlap & van Liere, 1978; Dunlap, Gallup & Gallup, 1993; Lounsbury & Tornatzky, 1977; Maloney & Ward, 1973; Thompson & Barton, 1994; Weigel & Weigel, 1978).

The subject of environmentally friendly behaviour is what constitutes the contents of the questionnaires cited in recent studies. To name some of them, these behaviours include separation of garbage, water saving, reduction of garbage, energy saving and driving private cars or using public transportation (Erten, 2000a, 2000b, 2002a, 2002b, 2003; Bamberg, 1994, 1996; Bamberg & Schmidt, 2003; Mielke, 1985; Schahn, 1996, Schahn & Holzer, 1990a, 1990b). Despite a great deal of both general and specific researches into environmentally conscious behaviours, there are very few studies and questionnaires devoted to researching people's value judgements as

well as the source of values that urge people to protect the environment. Most studies fail to offer a certain distinction as to whether those environmentally friendly behaviours are demonstrated in favor of the environment or for the benefit of people. A study in Ankara, for example, shows that 82% of families warn their children “frequently” about energy saving at home (Erten, 2002b). What could be the reason for this behaviour? Do the families act this way to protect the environment or to save money because of the economic crisis experienced in Turkey for the last few years? More studies are needed in such matters to obtain better knowledge. A number of academic sources dwell on such situations with research into environment consciousness (Axelrod, 1994; Schrenk, 1994; Seligman, 1989; Seligman, Syme & Gilchrist, 1994; Stokols, 1990; Siegrist, 1996).

There are few studies that offer insights into people’s value judgements and motives (Dunlap & van Liere, 1978; Kortenkamp & Moore, 2001; Siegrist, 1996; Stern, Dietz & Kalof, 1993; Thompson & Barton, 1994). The ecocentric and anthropocentric attitudes designate ethical concepts that humans have about the nature (Kortenkamp & Moore, 2001). Efforts to search and find out the mentality (motives) behind the protection of the environment and a person’s consciousness of the environment constitute the focal point of research of environment psychology. There are differences between the ecocentric and anthropocentric approaches. Thompson and Barton (1994) developed an attitude scale to measure these concepts.

Dunlap and van Liere (1978) put forward the differences between the value judgements of the ecocentric and anthropocentric standards of judgement. What is understood from the concepts of ecocentricity and anthropocentricity? If a person views the world itself as a stand-alone value, believes that it has to be protected without first safeguarding his self interest and acts accordingly, it means that the person has an ecocentric point of view. People of this type may see plants and animals as having equal value with humans. In contrast, people adopting an anthropocentric point of view would want to protect the environment because they see it as indispensable in raising the quality of life and sustaining human life. They believe that the environment must be protected since it is for the benefit of humanity and that protection of the environment is tantamount to protection of humanity. They would argue that environmental pollution (air, soil and water pollution, etc.) must be prevented as it poses a serious threat to our health. Natural resources should be consumed reasonably so that we will not have to live with energy shortages and have a lower quality of life in the future. Anthropocentric attitudes are based on pragmatic philosophy.

In a questionnaire they used in 1994, Thompson and Barton added antipathetic attitudes towards the environment as a third dimension. This dimension is used to measure the reasons for protection of the environment as well as the individual’s value judgements about environmental degradation. Are some people negatively affected by recent efforts to preserve the environment, laws enacted, education initiatives and large coverage of environmental problems by visual and printed media? This question is addressed in light of antipathetic attitudes towards the environment. A person with either an ecocentric attitude or an anthropocentric

attitude could be conscious of protecting the environment under all circumstances. Dawes (1980) posits that most environmental issues could be interpreted with reference to social dilemmas. The differences arise from concepts behind the behaviours (Thompson & Barton, 1994). Are the ecocentric, anthropocentric and antipathetic attitudes towards the environment an indicator of the difference between eastern and western cultures? The argument section of this paper will seek an answer to that question. This study is important in determining what motivations are more apparent in attitudes towards the environment of teachers from different countries with diverse cultures. Since teachers could affect many students' attitudes towards the environment, they are chosen as the participants for this study. The most important reasons for including Turkish and German teachers in the study are listed as follows: 1. The fact that the researcher could carry out the research more easily in Germany than in any other western countries, and 2. The fact that these two countries have differences in environmental consciousness (Erten, 2000a).

## Method

### *Sample*

The universe of the study is the population in and around the city of Giessen in Germany and the city of Ankara in Turkey in the fall 2000 term. The sampling group of the study is composed of 250 Turkish teachers and 150 German teachers. The teachers who participated in the study were picked from among those working in the primary and elementary schools, and high school teachers who teach particularly in the fields of biology and chemistry, since it is they who address environmental issues predominantly in their courses. Teachers who work in similar places and fields were selected for the study from both countries. 69.4% of the Turkish teachers are women and 30.6% are men. Of these, 50% are teachers working in primary schools, 13.3% are branch teachers working in elementary schools at second level, and 36.7% work as biology or chemistry teachers in high schools. 33.6% of the German teachers are women and 66.4% are men. Of these, 72.9% work as biology teachers, and 27.1% work as chemistry teachers. 45.8% of the teachers in question work as first and second level teachers at primary schools whereas 54.2% serve as teachers in high schools. The variation in the percentages of female and male teachers was not purposeful, but an outcome of the distribution of teachers in the branches and schools surveyed in the study.

### *Data Gathering Instruments*

The study utilizes a questionnaire which was adapted into Turkish and involves ecocentric, anthropocentric and antipathetic attitudes towards the protection of environment. The questionnaire was first developed by Thompson and Barton (1994) in the United States of America. Then in 1996 it was adapted into German by Siegrist. The researcher is the first to adapt it into Turkish (Erten, 2007). The questionnaire was translated from German to Turkish and vice versa to avoid a discrepancy in the content. The process of translation was carried out by two people with advanced knowledge of the Turkish and German languages. In addition, the original text in

English was translated and checked by a person who has a good knowledge of both English and Turkish. The questionnaire was referred to the related experts after being examined for lingual considerations by linguists. It is a valid questionnaire in terms of measure, construction and scope (see Erten, 2007).

The questionnaire involves proposals of twelve ecocentric, eight anthropocentric and seven antipathetic attitudes. The matters which are specific to the Turkish adaptation of the questionnaire have been omitted because of cultural differences. The questionnaire is a seven-point scale ranging from "strongly disagree" (1) to "strongly agree" (7). The questionnaire is present in attachment in the form of a table.

The quantitative data gathered was analyzed with an SPSS program. Mean, standard deviation, kurtosis and skewness values were used as descriptive statistics throughout the study. The Mann-Whitney U test was used to figure out whether differences between Turkish and German teachers' ecocentric, anthropocentric, and antipathetic attitudes towards protection of the environment are meaningful.

The result of the questionnaire's reliability analysis was carried out according to Turkish and German samples. Cronbach's alpha reliability coefficients of the questionnaire for Turkish teachers and German teachers were calculated as .80 and .77, respectively. The Cronbach  $\alpha$  value of ecocentric attitudes of the scale which was adapted by Siegrist is at  $\alpha = .82$ . The Cronbach  $\alpha$  value of anthropocentric attitudes is at  $\alpha = .72$ . The Cronbach value of antipathetic attitudes towards the protection of the environment is at  $\alpha = .74$ .

### *Procedure*

This study was conducted involving teachers who practice teaching in schools in Ankara, the capital of Turkey. The Ministry of National Education was asked for official permission for implementation of the phases of the study. After being granted the required official permission, the researcher chose 23 schools which represented every socio-economic level with a view to Ankara's socio-economic characteristics. With that choice, the researcher aimed at ensuring full representation of the target population and preempting claims that economic differences could ultimately have an influence on the choices of the teachers who teach at schools. All the schools involved in the study are state-supported schools. The researcher himself visited the schools, met and discussed with the teachers and asked them to take the questionnaire, noting that this is an intercultural study. Some of the teachers stated that they had no time for the questionnaire at the time, so the questionnaires were given to them and recollected on the scheduled day. The full completion of the questionnaires took 15 days. 280 teachers were contacted but 30 of them failed to hand in the questionnaire, because either they were in bad health, or they were charged with other tasks and therefore were not available or simply did not take it.

The second phase of the study took place with the German teachers by researchers in 2000. The German city of Giessen and its neighbourhood was determined as the study area. Before the study was initiated in Germany, the Ministry of Education of this specific region was informed and asked for official permission as a prerequisite for the

start of the study. These permission papers were considered acceptable by the directory boards of the relevant schools as well as the families' union. The study was carried out in 13 schools with the help of assistants who speak German. There were not many problems in deciding which schools to choose, as the area did not have as great a socio-economic level gap as Ankara, nor as high a population.

### Findings and Results

Table 1 shows the descriptive statistical results that vary depending on differences of sex and culture. Skewness and kurtosis values are both within acceptable limits for all three attitudes. Looking at the averages of the German and Turkish teachers, one will see that the attitudes have differences which make sense, since they have different cultural values regarding the environment.

When the teachers give the answers to all questions in the attitude scales, the maximum points they can obtain are 84 (12 questions) for the ecocentric attitude, 56 (8 questions) for the anthropocentric attitude and 49 (7 questions) for the antipathetic attitude towards the environment. If a teacher responds to all the questions as "undecided", he/she will get 42 points for the ecocentric attitude, 23 for the anthropocentric attitude and 24 for the antipathetic attitude towards the environment. Therefore, if it is taken into consideration that both male and female teachers' average points are higher than these points (except in the antipathetic dimension), it can be said that those with positive attitudes overwhelm the negative ones.

Mann-Whitney U tests were implemented as procedural statistics analysis. This analysis was carried out not only for the two different cultural groups, but also for men and women separately and was instrumental to understanding whether both intercultural and intersexual differences are meaningful in light of the obtained data. It was concluded from the results of the Mann-Whitney U tests that there are striking differences among ecocentric, anthropocentric and antipathetic attitudes of German and Turkish teachers. The sensibility rate for the difference of ecocentric attitudes is  $z=-7.117, p<.000$ ; the sensibility rate for anthropocentric attitudes is  $z=-7.715, p<.000$ ; and finally, the sensibility rate for antipathetic attitudes towards the environment was calculated to be  $z=-2.807, p<.005$ .

There appeared to be no meaningful difference between German and Turkish teachers in antipathetic attitudes towards the environment. Of the overall differences between the attitudes of the Turkish and German teachers, the most attention-grabbing is that the averages belonging to Turkish teachers are on a higher level in ecocentric and anthropocentric attitudes. When the intersexual diversity of the two nations was considered, there was no detection of significant differences according to Mann-Whitney U test results in the above-mentioned attitudes of German teachers, while the attitudes of the Turkish teachers differed according to sex. These differences appeared between ecocentric attitudes ( $z=-1.928, p<.05$ ) and antipathetic attitudes towards environment ( $z=-3.274, p<.001$ ). The differences between nations and sexes can be seen in Table 1. When these results are examined, it is obvious that

the highest-rating attitudes are the ecocentric and anthropocentric attitudes, regardless of the comparison being on the point of general differences or on intersexual differences. The ecocentric attitudes of both Turkish and German female teachers are higher than those of male ones. The researchers in this field show that women are more sensitive than men on environmental protection (Erten, 2000a; Kuckartz, 1998). German male instructors tend to adopt anthropocentric attitudes more often compared to female instructors. If we take a general look at the attitudes of teachers of each nation, the German teachers define their ecocentric attitude as "I'm hesitant", while the Turkish ones define it as "I agree". An interesting finding was observed in Turkish teachers' attitudes in the research. It is normally expected that the more ecocentric attitudes an individual develops, the less anthropocentric he/she gets. However, both attitudes were simultaneously rated high in Turkish teachers.

**Table 1***Descriptive Statistical Results According to Gender and Nation*

Attitude	Nation	Gender	N	Min.	Max.	Average	Standard Distribution	Skewness	Kurtosis
Ecocentric Attitude	Turkish Teachers	Female	125	51	84	75.65	6.19	-0.82	0.59
		Male	54	52	84	73.26	7.61		
	German Teachers	Female	36	49	84	68.78	8.90	-0.73	0.39
		Male	67	45	82	67.30	8.14		
Anthropo-centric Attitude	Turkish Teachers	Female	125	21	56	44.50	7.80	-0.99	0.68
		Male	54	20	55	43.11	8.08		
	German Teachers	Female	36	18	51	36.22	8.12	-.612	.335
		Male	67	21	52	37.30	6.31		
Antipathetic Attitude towards Environment	Turkish Teachers	Female	125	7	49	15.43	9.85	1.43	1.28
		Male	54	7	48	20.50	11.54		
	German Teachers	Female	36	8	30	16.25	5.28	.625	-.007
		Male	67	7	36	18.09	8.43		

As can be seen in Table 2, Turkish and German teachers' ecocentric attitudes are rather high. Upon comparison, German teachers' attitudes were found to be a bit lower than their Turkish colleagues. Nevertheless, the researchers had expected to find higher ecocentric attitudes in the Germans because other researchers (De Haan et al., 1997) show that Germany is one of the most environmentally conscious societies in the world. The possible reason for this could be the frequent appearance of environmental issues in the media in Turkey recently.

**Table 2***General Averages of Turkish and German Teachers*

Attitudes	Nation	Subjects	Mean	Standard Deviation
Ecocentric	Turkish	179	74.9	6.7
	German	103	67.6	8.3
Anthropocentric	Turkish	179	44.0	7.8
	German	103	36.9	6.9
Environmental Antipathy	Turkish	179	16.9	10.6
	German	103	17.4	6.0

Antipathetic attitudes towards the environment are higher in both German and Turkish male teachers. When the two countries results are looked into, it can be seen that Germans adopt antipathetic attitudes towards the environment slightly more than Turks. The reason for this may be that environmental problems have been occupying the German agenda for many years.

**Correlation Results**

Correlations of the ecocentric, anthropocentric and antipathetic attitudes with each other confirm the previous results. The differences between sexes are given in Table 3 and Table 4. According to the data, a person having dominant ecocentric attitudes tends to have lower antipathetic attitudes towards the environment. There is a meaningful relationship based on sex in each of the three attitudes. It was observed that the rise of ecocentric attitudes in Turkish instructors is on equal footing with the rise in anthropocentric attitudes. While the similar rise of the two attitudes is not observed in western societies, it is the case with the Turkish teachers here.

**Table 3***The Relationship between Turkish Teachers' Attitudes and Gender*

	2.	3.	4.
1. Ecocentric Attitudes	.30**	-.28**	.15*
2. Anthropocentric Attitudes		.17*	.07
3. Antipathetic Attitudes towards Environment			-.20**
4. Sex			

N=179, Women 1, Men 0 coded, \*p<.05, \*\* p<.001

**Table 4***The Relationship between German Teachers' Attitudes and Gender*

	2.	3.	4.
1. Ecocentric Attitudes	.23*	-.31**	-.06
2. Anthropocentric Attitudes		.18	.06
3. Antipathetic Attitude towards Environment			.14
4. Sex			

N=103, Women 1, Men 0 coded, \*  $p < .05$ , \*\*  $p < .001$

In view of the t-test results of the means, a significant difference based on sex could not be found in German instructors in either attitude. The correlation coefficient between ecocentric attitudes and anthropocentric attitudes in German teachers are rated lower than those in Turkish teachers. A reverse correlation was observed between the ecocentric attitudes and antipathetic attitudes towards environment protection in the German teachers and the Turkish ones alike. This indicates that the more the individual is prone to ecocentric attitudes, the less he/she is prone to antipathetic attitudes towards the protection of the environment.

### **Discussion**

There is little research and insufficient data dating back to past times on ecocentric and anthropocentric attitudes. The differences between these two concepts were first included in the sphere of social science researches by Dunlap and van Liere (1978). Thompson and Barton (1994) argued that materialists represent the anthropocentric view holders; while abstractionists stand for ecocentrism. A person with an anthropocentric view has a sense of ethical factor regarding nature, because harming or preserving it will come back as a harm or benefit to him/her.

The anthropocentric view advocates upholding human beings as creatures higher than nature. For example, according to this doctrine, destroying the rain forests cannot be justified ethically as they contain potential cures to many diseases. For a person with an ecocentric view, protecting the rain forests means protecting the biological diversity. This point of view stresses the need to establish empathy with nature instead of exploiting it for the sake of human interests. The average of Turkish teachers' ecocentric attitudes is higher than the average of German teachers'. While German teachers chose the option 'I am hesitant' as their response to anthropocentric attitude questions, Turkish teachers agreed with the anthropocentric view. It can be said that the data does not reveal the way of thinking underlying protection efforts of Turkish teachers. The results point to the fact that German teachers are less anthropocentric than Turkish ones.

Turkish teachers' average anthropocentric attitude scores are higher than those of German teachers, which may be the result of the belief in Turkish society's cultural structure that humans are created superior to other living things. Based on this belief,



humans are the most excellent of the created beings, and everything is created for them. According to this belief, humans should take advantage of things they need. This feature of Turkish society was the way western societies behaved until a short time ago. Because of this, the natural resources of the world have come to the point of exhaustion until recently. To stop this, intense environmental protection studies have started and the ecocentric way of thinking has been developed by way of education and studies on this issue. Based on the ecocentric way of thinking, protection of the environment happens through behaviors that are suitable to benefit analysis. People who have this way of thinking protect the environment as long as they observe benefits to themselves and the observation of the benefits and environmental protection has a direct ratio.

German teachers agreed with ecocentric attitude proposals, while they were hesitant with anthropocentric attitude proposals. It is possible to explain this result with the following argument. One of the most important differences between Turkish culture and German culture is the education systems. Germany has shown a great degree of development in the last 20 to 25 years, especially in the area of environmental education, by including this subject in its education system. Based on the investigations of some scientists (de Haan et al., 1997; Kuckarts, 1998) environmental awareness in Germany is fairly high compared to that in other societies of the world. This result naturally causes German teachers to think more ecocentrically than Turkish teachers.

Because Germany is an industrialized country, people who live in Germany have been uncomfortable with the environmental problems such as pollution, acid rain, noise pollution, and nuclear waste for a long time. This negative situation has caused environmental awareness studies to progress in a rapid way. Because studies have shown that "individuals' perception of environmental problems as a risk and as a threat, motivates environmentally friendly behavior" (Martens & Rost, 1998).

Similar to Turkish teachers, German teachers provided an inverse correlation between the ecocentric attitudes and negative attitudes towards environmental protection. This shows that the more a person has an ecocentric attitude, the less he/she has negative attitudes towards environmental protection. The similarity of negative attitudes of German and Turkish teachers may be the result of the intense environmental agenda for the last 30 years in Germany, the laws that went into effect about these issues and the frequent demonstrations. It is possible that some people have become uncomfortable with the regulations because of their negatively effected benefits. Information obtained from short interviews with Turkish teachers may explain the negative attitudes of Turkish teachers as people who live in Turkey view the economic and terrorist problems as ranking higher than the environmental problems.

It has been planned that such studies will be done with university students and a country that has different cultural values than Turkey.

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## Farklı Kültürlerde Çevre Merkezli, İnsan Merkezli ve Çevreye Karşı Olan İticilik Tutum Anlayışları

### (Özet)

*Problem Durumu:* Yaklaşık 30 yıldan beri dünyanın birçok yerinde birçok bilim adamı insanların çevre bilinçlerini geliştirmek için büyük çaba sarf etmektedirler. Bununla ilgili kaynaklarda birçok deneysel çalışma bulmak mümkündür. Bu araştırmaların büyük çoğunluğu küresel sorunlara ya da genel çevre bilincine yöneliktir. Son yıllarda yapılan araştırmalarda kullanılan anketlerin içerikleri çevre dostu davranışlara yöneliktir. Bunlara örnek olarak; çöpleri ayırma davranışı, su tasarrufu, çöplerin azaltılması, enerji tasarrufu davranışları ile özel otomobili veya toplu taşıma araçlarını kullanım davranışları verilebilir. Çevreye yararlı davranışların araştırılmasında özgül birçok araştırma bulmak mümkündür. Bu araştırmalarda, insanların kişisel değer yargılarını ve çevre dostu davranışlarının kaynaklarını ortaya koyan çalışmalar ve bunun için geliştirilmiş anketler çok ta yaygın değildir. Birçok araştırmada, ortaya çıkan çevre dostu davranışların, çevrenin yararı için mi yoksa davranışı gösteren kişilerin çıkarları için mi gösterildiği çok belli değildir. Örneğin, Araştırmacının Ankara'daki bir başka araştırmasında, ailelerin % 82'sinin evde çocuklarını enerji tasarrufu konusunda "sıkça" uyardıkları ortaya çıkmıştır. Bu davranışın arkasında yatan sebep nedir? Ailelerdeki bu davranışların nedeni çevreyi mi korumak? yoksa son yıllarda Türkiye'de görülmekte olan ekonomik krizden dolayı para tasarrufu mu yapmaktır? Bu gibi çalışmalara ağırlık verilmesi gerçek bilgilerin elde edilmesinde gereklidir. Çevre merkezli ve insan merkezli yaklaşımlar insanoğlunun doğaya karşı taşıdığı etik anlayışlarını, çevrenin korunmasındaki ve bir insanın çevre bilincinin arkasında yatan anlayışları araştırıp bulmak çevre psikolojisinin ve çevre eğitimcilerinin araştırma merkezini oluşturmaktadır.

*Araştırmanın Amacı:* Çevre merkezli (Ekosentrik), insan merkezli (Antroposentrik) ve çevrenin korunmasına karşı insanlarda olan iticilik tutumlarının iki farklı kültürdeki durumlarını tespit etmek ve buna uygun öneriler geliştirmektir.

*Yöntem:* Araştırmanın evrenini, Almanya'da Giessen şehri ve çevresi ile Türkiye'de Ankara şehri oluşturmaktadır. Araştırmanın örneklemini 250 Türk ve 150 Alman öğretmen oluşturmaktadır. Araştırmada daha önceden Türkçeye uyarlaması yapılan Ekosentrik, Antroposentrik ve çevrenin korunmasına yönelik antipati tutumlarını içeren anket kullanılmıştır. Söz konusu anket ilk defa araştırmacı tarafında Türkçeye uyarlanmış. Ankette 12 tane Ekosentrik, 8 tane Antroposentrik ve 7 tane de antipatik tutum önermeleri yer almaktadır. Anket Likert tipinde 7 aralıklı bir ölçeklidir. Cevaplar "Kesinlikle katılmıyorum" (1) ile "kesinlikle katılıyorum" (7) arasında değişebilmektedir. Tanımlayıcı istatistik olarak ortalama, standart sapma, basıklık ve çarpıklık değerlerine bakılmıştır. Türk ve Alman öğretmenlerin çevre merkezli, insan merkezli ve çevrenin korunmasına yönelik iticilik tutumlarının arasındaki farkın anlamlı olup olmadığını anlamak için ise bağımsız t-testi yapılmıştır.

Ölçeğin Türkiye ve Almanya örnekleme göre yapılan güvenilirlik analiz sonuçları; Türk öğretmenlerinde kullanılan anketin Cronbach  $\alpha$  değeri,  $\alpha = .80$ , Alman öğretmenlerinde ise  $\alpha = .77$  olarak bulunmuştur. Siegrist'in uyarılama çalışmasını yaptığı ölçeğin Ekosentrik tutumlarının Cronbach  $\alpha$  değeri,  $\alpha = .82$ , Antroposentrik tutumların ise  $\alpha = .72$  ve çevrenin korunmasına yönelik antipatik tutumların Cronbach  $\alpha$  değeri de  $\alpha = .74$ 'dür.

*Bulgular:* Alman ve Türk öğretmenlerin ortalamalarına bakıldığında tutumlar arasında anlamlı farkların olduğu görülmektedir. İstatistik analizleri olarak Mann-whitney U testi analizleri yapılmıştır. Bu analizleri iki farklı grup için yapıldığı gibi gruplar içerisinde bayan ve erkekler için de ayrı yapılarak hem kültürler arasındaki farkların hem de cinsiyetler arasındaki farkların anlamlı olup olmadığına bakılmıştır. Mann-whitney U testi sonuçlarından Alman ve Türk öğretmenlerin çevre merkezli ve insan merkezli tutumları arasında anlamlı farklar olduğu ortaya çıkmıştır. Çevre merkezli tutumlar arasındaki farkın anlamlılığı  $z = -7.117$ ,  $p < .000$ 'dir. İnsan merkezli tutumlar arasındaki farkın anlamlılık derecesi ise  $z = -7.715$ ,  $p < .000$ 'dir. Çevreye karşı iticilik tutumlarında ise  $z = -2.807$   $p < .005$ 'dir. Alman ve Türk öğretmenlerin tutumları arasındaki bu farklarda dikkati çeken çevre merkezli ve insan merkezli tutumlarda ortalamaların Türk öğretmenlerde daha yüksek oluşudur. İki ulusun cinsiyetler arası farklarına bakıldığında ise Alman öğretmenlerin söz konusu tutumları arasında Mann-whitney U testi sonuçlarına göre anlamlı farklar bulunmaz iken Türk öğretmenlerin cinsiyetlere bağlı olarak tutumları arasında anlamlı farklar bulunmuştur. Bu farklar çevre merkezli tutum ( $z = -1.928$ ,  $p < .05$ ) ile çevreye karşı olan iticilik tutumlarında ( $z = -3.279$   $p < .001$ ) ortaya çıkmıştır. Bu sonuçlar incelendiğinde ister genel anlamdaki farklarda olsun ister cinsiyetler arasındaki farklarda olsun en yüksek tutumlar çevre merkezli ve insan merkezli tutumlardır. Türk ve Alman bayan öğretmenlerin çevre merkezli tutumları erkek meslektaşlarından daha yüksektir. Bu konudaki araştırmalar, bayanların çevrenin korunması konularında erkeklere göre daha duyarlı olduklarını göstermektedir. Alman öğretmenlerin erkekleri bayanlara göre daha insan merkezli tutumlara sahiptirler. Genel anlamda iki ulusun öğretmenlerinin tutumlarına bakacak olursak Alman öğretmenler insan merkezli tutumlarını "kararsızım" olarak değerlendirirken Türk öğretmenler "katılıyorum" şeklinde değerlendirmişlerdir. Araştırmada ilginç bir bulgu da Türk öğretmenlerdeki tutumlarda ortaya çıkmıştır. Bir insan ne kadar çevre merkezli tutuma sahip olursa insan merkezli tutumlarının da o derece az olması beklenir. Fakat Türk öğretmenlerinde her ikisi de yüksek çıkmıştır. Bunun sebebi kültürel farklılık olarak açıklanabilir

*Tartışma:* Türk öğretmenlerin insan merkezli tutumlarının ortalaması Alman öğretmenlerin aynı konudaki tutumlarının ortalamasından daha yüksek olması, Türk toplumunun bu konudaki kültür yapısının temelinde insanın diğer canlılardan daha üstün yaratıldığı düşüncesinin bulunması olabilir. Buna göre, insan yaratılanların en üstün olanıdır ve her şey onun için yaratılmıştır ve insan ihtiyaç duyduğu şeylerden yararlanmalıdır.

Alman öğretmenler çevre merkezli tutum önermelerine katılırken insan merkezli tutum önermelerinde kararsız kalmışlardır. Bu sonucu da şu şekilde açıklamak mümkündür. Türk toplumu ile Alman toplumu arasındaki en önemli farklardan biri de eğitim sistemindeki farklılıktır. Almanya'nın son 20-25 yılda özellikle çevre eğitimi alanında büyük gelişmeler göstermesi, eğitim sistemi içerisinde bu konuyu almasıyla olmuştur. Ayrıca Almanya'nın sanayi ülkesi olması nedeniyle, Almanya'da yaşayanlar, çevre kirliliğinden, asit yağmurlarından, gürültü kirliliğinden, nükleer atık sorunları gibi birçok çevre sorunundan uzun süre rahatsız olmuştur. Bu olumsuz durum çevre bilinci çalışmalarının hızlı bir şekilde gelişmesine neden olmuştur. Çünkü araştırmalar "çevre sorunlarının birey tarafından risk olarak algılanması ve tehdit olarak görülmesi çevreye yararlı davranışları motive etmekte" olduğunu göstermektedir.

Alman öğretmenlerde de Türk öğretmenlerde olduğu gibi çevre merkezli tutumlar ile çevrenin korunmasına yönelik itici tutumları arasında ters yönde korelasyon ortaya çıkmıştır. Bu da, bir kişinin ne kadar çevre merkezli tutuma sahipse o kişinin çevre sorunlarının çözümüne karşı o derece de az itici olduğunu gösterir. Alman öğretmenler ile Türkler öğretmenlerin çevre konularına karşı olan iticiliklerinin benzer olması, Almanya'da yaklaşık son 30 yıldır yoğun bir şekilde çevre konularının gündemden düşmemesi ve bu konuda çokça yasaların yürürlüğe girmesi ve çok sık gösterilerin olması olabilir. Ayrıca yapılan düzenlemelerden bazıları çıkarları gereği rahatsız olmuş olabilir. Türk öğretmenlerinde görülen iticilik ise Türk öğretmenleriyle yapılan kısa görüşmelerden elde edilen bilgiler doğrultusunda şu şekilde açıklanabilir. Türkiye'de yaşayan insanların sorunlarının ilk sıralarında, çevre sorunlarından ziyade ekonomik ve terör sorunlarının bulunması olabilir. Gelecekte bu tür çalışmaların üniversite öğrencileriyle ve Türkiye dışındaki farklı kültürel yapıya sahip bir ülkeyle yapılması planlanmaktadır.

**Anahtar Sözcükler:** Ekosentrik, antroposentrik, çevre antipatisi (çevreye duyulan iticilik) ve çevre tutumları

### Appendix

Questions	Ecocentric Environment Attitudes
1.	One of the worst results of the permanent increased population is continuous occupation of natural areas.
2.	On holidays, I spent a lot of my time enjoying nature.
3.	I sorrow when I see forests ceasing to exist (cutting, fires, etc.).
4.	At times, if I want to be happy, I feel that I have to spend my time in nature.
5.	At times, if I feel unhappy, I find consolation in nature.
6.	I sorrow when I see how much the natural environment is spoiled.
7.	Nature alone is a valuable being.
8.	I get rid of stress when I spend time in nature.
9.	One of the most important reasons to protect nature is to protect nature for its own sake.
10.	Humans are not more valuable than other beings in nature.
11.	Protection of animals is at least as important as health of humans.
12.	Nature must be protected notwithstanding the limitation of human needs.
	<b>Anthropocentric Environment Attitudes</b>
13.	One of the most important reasons to protect nature is to lengthen the life of the human being.
14.	One of the most important aims of recycling is saving money.
15.	Nature is important because of its benefits to human health and happiness.
16.	We have to protect natural resources to live at ease.
17.	One of the most important reasons to protect the nature is to guarantee our comfortable life.
18.	Persistently processing soil to get crops is necessary for our comfortable life.
19.	The worst side of cutting forests is destroying the valuable natural resources.
20.	When I think that I use nature intensively, the thing that most concerns me is the spoiling of necessary fundamental materials to survive.
	<b>Antipathetic Attitudes towards Environment</b>
21.	Claims about dangers coming from the environment, such as destroyed forests and the depleting ozone layer, are overblown.
22.	It seems to me that most of the environmentalists are pessimistic and some of them are paranoid.
23.	I do not believe that natural resources have been depleted as seriously as is being declared.
24.	It is difficult for me to tackle environment problems.
25.	I do not worry about environment problems.
26.	I am against governmental activities to protect natural life and natural resources against environmental pollution.
27.	Superfluous value is placed on nature.

The questionnaire is a seven-point scale ranging from “strongly disagree” (1) to “strongly agree” (7).

## The Effects of Differences in the Configurations of Knowledge Maps (k-map)

İzzet Görgeç\*

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### Abstract

*Problem Statement:* In this study, the effects of a knowledge map (k-map) are enhanced by combining Gestalt's similarity and proximity principles with different link structures on the levels of knowledge acquisition and recall, and thus presented on a map with those of typical knowledge maps. A K-map is a means of schematically displaying verbal knowledge and relationships among the pieces of this knowledge.

*Purpose:* The purpose of this study is to investigate the effects of k-maps with structural differences on the levels of knowledge acquisition and recall. In this way, it demonstrates why one graphical display may be more effective than another.

*Methods:* In the present study, pre- and post-test experimental design is used with a control group. The participants are primary school eighth graders. There were 31 students in the experimental group and 19 students in the control group. For the study, a text titled "Maslow'un İhtiyaçlar Hiyerarşisi" was selected. A test consisting of 31 multiple-choice type questions was used to measure the students' levels of acquisition and recall. The reliability coefficient of the test was found to be 0.95.

*Findings and Results:* In the study, it was found that there is no significant difference between the acquisition level of the experimental group using the enhanced knowledge map and that of the control group using the typical knowledge map. However, the students in the experimental group recalled more information than those in the control group.

*Recommendations:* While designing k-maps, the use of similarity and proximity principles of Gestalt, together with different link structures for different types of knowledge may increase the level of recall. Considering the importance of long-term recall at schools, it is advisable to draw on the findings of the present study while designing teacher-made maps.

*Keywords:* Knowledge map, learning strategy, graphical displays, Gestalt principles.

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The purpose of this study is to investigate the effects of k-maps having structural differences. For this purpose, a comparison is made between the effects of a k-map enhanced by using similarity and proximity principles together with different link structures on acquisition and recall levels of the knowledge presented on the map and those of a typical k-map. So doing, it is aimed to find an answer to the question of whether studying the knowledge on different maps leads to differences in the levels of acquisition and recall.

There are different techniques used by different individuals to acquire new knowledge (i.e., note taking, summarizing, topic outlining, rehearsal). A term more comprehensive than technique is strategy. According to Weinstein and Mayer (1986), learning strategies are student behaviours and thoughts aimed to influence the coding activities of students during the learning process. Learning strategies enable students to feel more motivated and helps newly-acquired knowledge remain long-lasting (Erden & Akman, 1995). One of the strategies used in the learning process is organizational strategy. Organizational strategy means determining the main and supportive ideas and establishing connections between them in such a way as to facilitate coding and recall (Weinstein & Mayer, 1986). The students using this strategy can successfully summarize a page-long text with a simple figure or table, and thus, can learn and recall better (Berkowitz, 1986; Mc Gagg & Dansereau, 1991; Scevak, Moore & Kirby, 1993; Amer, 1994; Duban, 2006; Tok & Beyazit, 2007; Şen & Aykutlu, 2008). One organizational strategy technique is the graphical display of knowledge. There are various types of graphical displays, such as graphical organizers, concept maps, knowledge maps, and semantic networks. In this present study, knowledge maps are investigated as one type of graphical display.

By its broadest definition, the K-map is a means of illustrating verbal knowledge (Jones, Pierce, & Hunter, 1989). The knowledge map technique was developed by a group from Texas Christian University (Mc Gagg & Dansereau, 1991). Dansereau et al. developed the k-map as an alternative to the traditional way of presenting a written text (Dees, Dansereau, Peel, Boatler, & Knight, 1991). The K-map is a means of schematically displaying both important verbal knowledge in a text and the relationships among the pieces of knowledge. Additionally, the K-map is one technique used to translate a text into two-dimensionally constructed maps to represent knowledge more accurately (O'Donnell, 1994). In a k-map, knowledge presented in a text is presented as node-link-node assemblies (Wiegmann, Dansereau, Mc Gagg, Rewey, & Pitre, 1992). Further, in a k-map the basic concept related to the main idea of a text, and the sub-concepts related to the main concept; other important information (features, definitions, types, samples) concerning all these concepts are written within geometrical figures of different shapes and sizes which are called "nodes". Inside the nodes, words, pictures, formulas, and other signs can also be placed (Lambiotte & Dansereau, 1992).

Another aspect of a k-map is the links showing the relationships among nodes. Links are the arrows drawn among nodes to show the connections among the pieces

of knowledge within the nodes. For a better indication of the relations among the pieces of knowledge in the nodes, some words or abbreviated labels are written on each link. Abbreviations are written on the link to show the type and direction of the relationship (Rewey, Dansereau, Skaggs, Hall, & Pitre, 1989; Mc Cagg & Dansereau, 1991; Lambiotte & Dansereau, 1992; Wiegmann et al., 1992). In this way, students can easily and holistically recognize at a glance what type of relationship exists among the main concept, sub-concepts and other important knowledge.

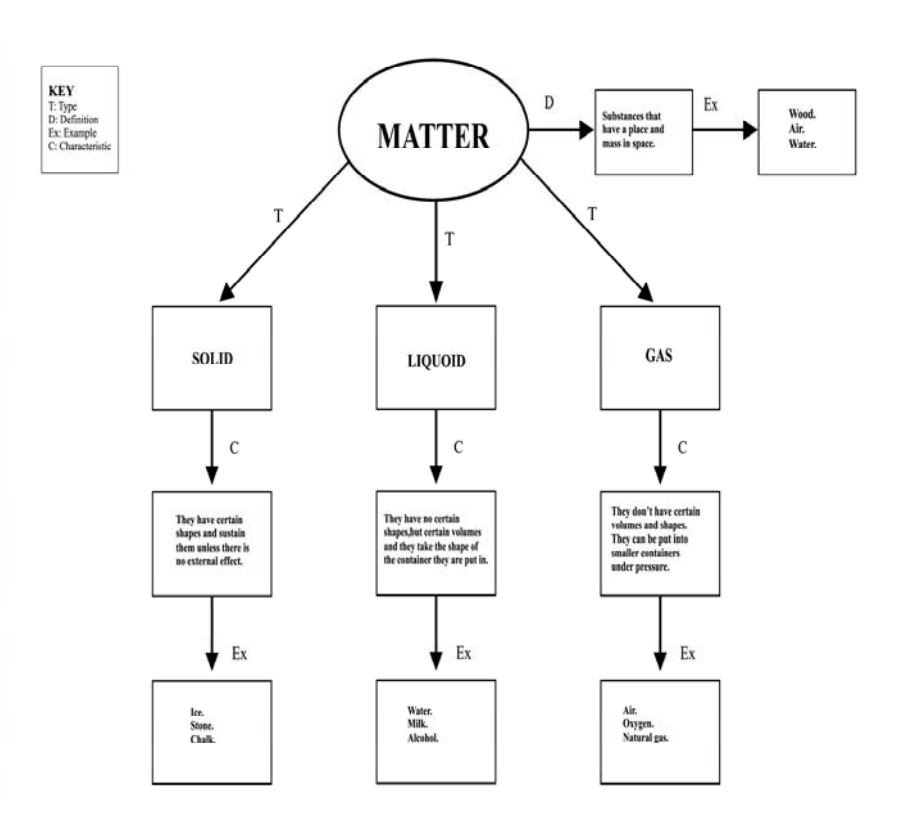


Figure 1. A Sample k-map

In recent years, the interest in graphical displays has increased. In a meta-analysis study, a significant relation was revealed between the use of node-link diagrams for educational purposes and educational research conducted in this field for the last 20 years. The number of articles written on k-maps, concept-maps, and node-link maps has considerably increased since 1985 (Nesbit & Olusola, 2006). The studies conducted on k-maps usually focus on the comparison of them with traditional texts and other learning strategies (text organization, Berkowitz, 1986; scripted cooperation

and knowledge maps, Rewey et al., 1989; map, out line, lists, Lambiotte & Dansereau, 1992; traditional text, Hall, Dansereau, & Skaggs, 1992; text, O'Donnell, 1993; underlining, Amer, 1994; list, Bahr & Dansereau, 2005 ).

K-maps are spatial tools consisting of various geometrical shapes in which information is written, and the relations between these shapes are shown through link structures. Hence, students with different spatial aptitudes may draw on these maps at varying levels. Wiegmann et al., (1992), stated that the degree of making use of k-maps is directly associated with the spatial aptitude of students.

Besides student-generated forms of the k-maps encountered in the field of education, expert-generated ones are also used as a support material for students. These maps provide knowledge in a coherent and organized way by using Gestalt principles and clearly designated relationships. In previous studies investigating the use of k-map techniques, it was found that expert-generated maps have positive effects on the acquisition and recall of knowledge (Mc Cagg & Dansereau, 1991).

#### ***Structural Characteristics of Knowledge Maps***

*Spatial configurations.* In recent studies, emphasis has been placed on the effects of both the use of Gestalt principles and the differences in map characteristics on acquisition and recall levels of the knowledge ( Lambiotte, Dansereau, Cross, & Reynolds, 1989; whole-map, stacked map, Gestalt map, web-map, and link embellishment, Wiegmann et al., 1992; vertically or horizontally k-map, O'Donnell, 1994; colour enhancement map, Hall & Sidio-Hall, 1994; Gestalt-enhanced map, standard map, text, Wallace, West, Ware, & Dansereau, 1998; O' Donnell, Dansereau, & Hall, 2002). In the present study, first, the k-map used in the experimental group was enhanced by using similarity and proximity principles. Similarity and proximity are just two of Gestalt principles. "The organism has the tendency to perceive the objects by grouping them according to the proximity to each other" (Senemoğlu, 1989, p.248). "Marks close to each other will tend to be grouped together" (Kosslyn, 1989, p.195). "Similarity is important for the perception of visual stimuli. Similar marks will tend to be grouped together" (Kosslyn, 1989, p.195). Items similar to each other in terms of their shape, color, tissue etc. tend to be grouped together (Senemoğlu, 1989). One important contribution of the use of colors is their aid in grouping the items together. (Shah & Hoeffner, 2002). Some researchers argue that k-maps organized in compliance with the processing characteristics of the perceptual system (configurations that use gestalt organizational principles of symmetry, proximity, and good continuation) should be more effective than maps that do not incorporate these principles (Wiegmann et al., 1992). According to O'Donnell et al., active processing strategies such as summarizing, note taking, and designing maps in line with Gestalt principles enhance the learning from the maps. The knowledge presented through well-structured maps designed according to Gestalt principles is recalled more efficiently than knowledge presented in less well-structured maps. The structured format of a map may alleviate the burden of encoding the knowledge. In one study, Wallace et al. compared three presentation formats: (1) text, (2) enhanced map, and (3) un-

enhanced map. The findings of the study revealed that enhanced maps have stronger effects on recall levels when compared to the others.

Vekiri (2002) stated that the effectiveness of graphical displays depends on their visuo-spatial characteristics. When graphical displays are designed in compliance with Gestalt organizational principles (connectedness, spatial proximity, etc.) and when they present vital knowledge in the form of visual chunks, they can turn into more automatically functioning perception tools and can be computationally more effective. As a result of this, cognitive load decreases.

According to Fleming (1987), similar stimuli can be grouped both in perception and mind. When objects, incidents, and opinions are connected with each other, organized and conceptualized, they can generate a similarity effect. Stimuli and elements viewed close to each other with regards to time and place tend to be classified together in perception and mind. This principle is labeled “proximity in perception and contiguity in mind”.

*The links.* The k-map used in the experimental group was not only enhanced by using the principles of similarity and proximity, but also by forming link structures in different styles. Basically, links consist of a line connecting two nodes. Other properties of the links are as follows: arrow heads to indicate the direction of the relationship (for example; main concept, sub-concepts), and abbreviations or words to label the relationships among the pieces of knowledge (for example; Example is abbreviated as Ex and L stands for Leads to) (Wiegmann et al., 1992). Different links are used to classify relationship types. There are three types of links (Mc Cagg & Dansereau, 1991; Wiegmann et al., 1992; Wallace et al., 1998; O'Donnell et al., 2002): (1) Dynamic links: Using thick and double arrow heads to indicate a dynamic relationship (for example; cause-effect and primary-secondary). (2) Static links: Using static links to show structural relationships among the pieces of information (for example; characteristic and definition) (3) Elaborative links: Using arrows consisting of dotted lines to show elaborative links expanding the knowledge (comment, sample, etc.). Wiegmann et al. concluded that maps embellished with links are more effective for students with high verbal capacity. Studies examining the link system of k-maps suggest that the relation-determination method of k-maps affect both the development of the map and the processing procedure (Mc Cagg & Dansereau, 1991). In the present study, as explained above, the links in the k-map used in the experimental group are structured differently. In the control group, however, all of the links are in the form of static links (straight line). In figures 2 and 3, the enhanced k-map and typical k-map are presented, respectively.

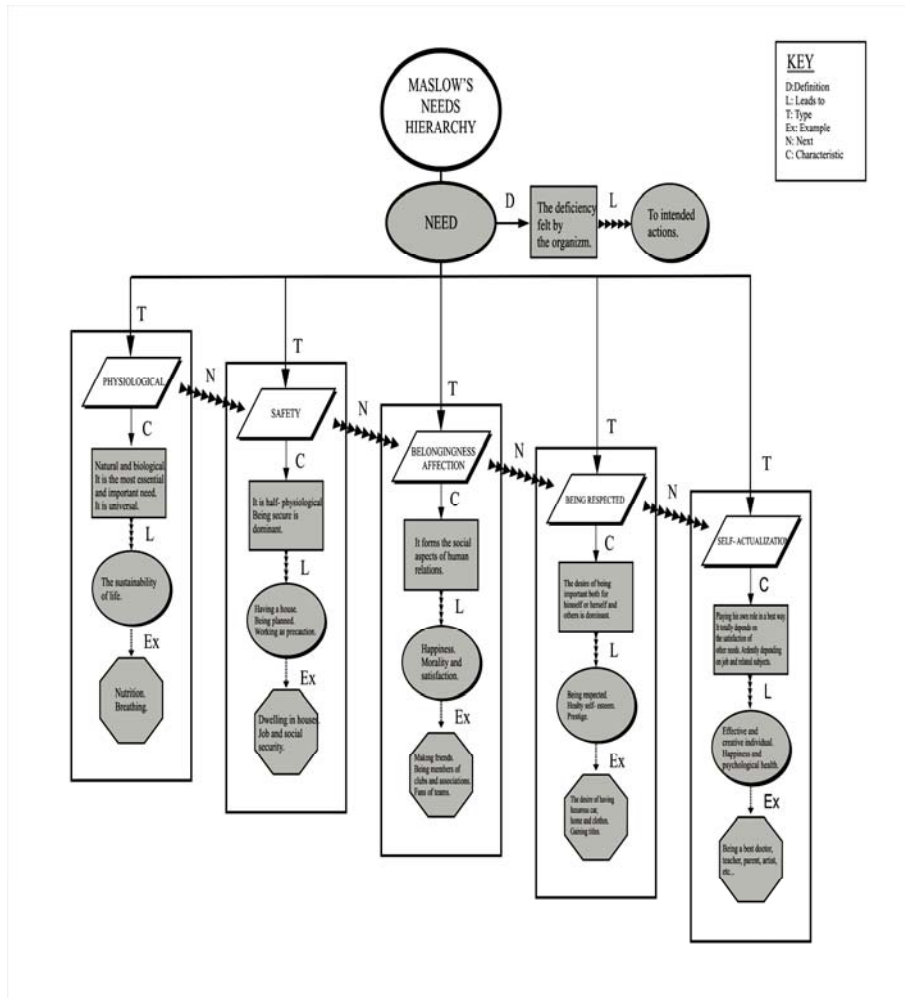


Figure 2. Enhanced k-map

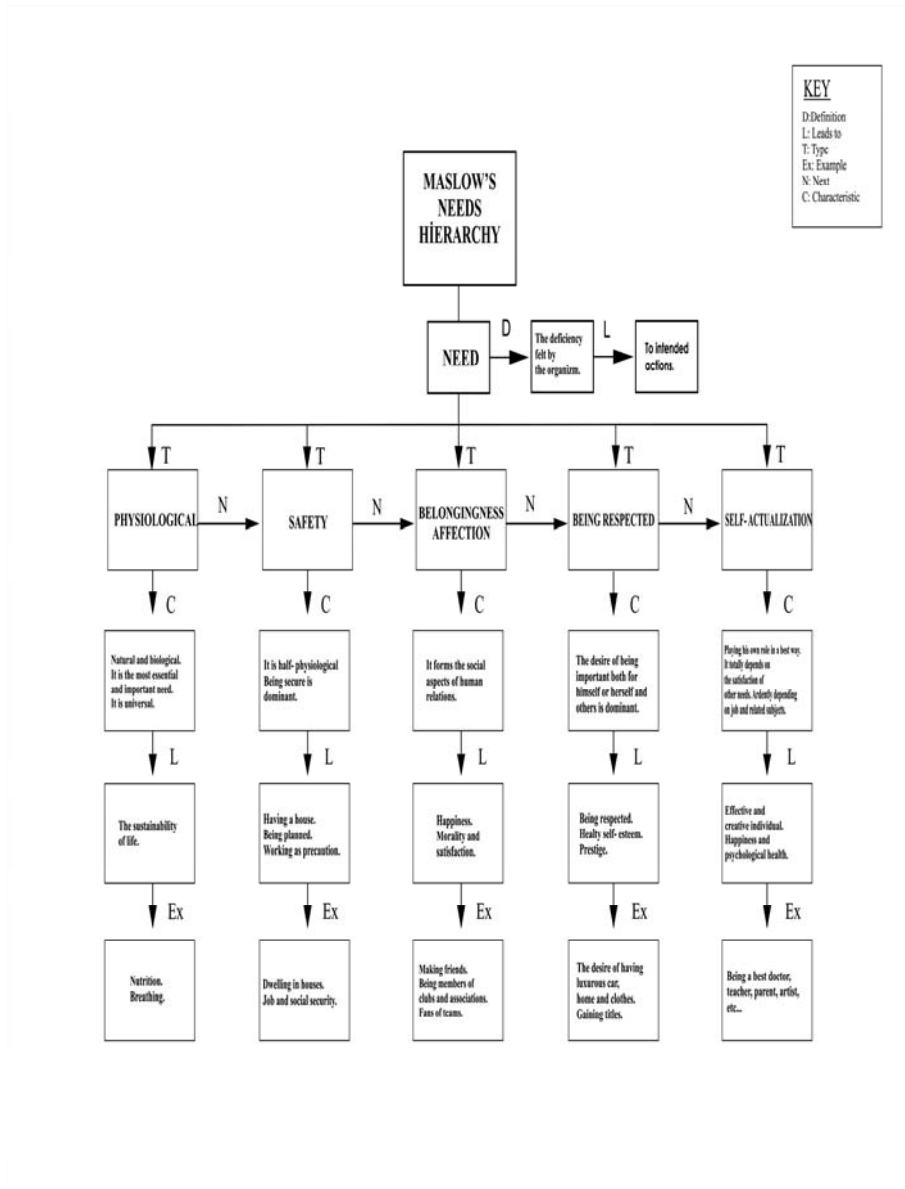


Figure 3. Typical k-map

As can be understood from the research findings and explanations reviewed above, the k-maps organized in line with the processing of perceptual systems (e.g. principles of similarity and proximity) are more effective than the k-maps not organized in line with these principles. The two hypotheses of the study are as follows:

1- The experimental students studying a k-map enhanced by means of similarity and proximity principles and different link structures have higher acquisition levels of the presented information than the control students studying a typical k-map.

2- The experimental students studying a k-map enhanced by means of similarity and proximity principles and different link structures have higher recall levels of the presented information in the k-map than the control students studying a typical k-map.

There is paucity in research investigating the structural features of k-maps that make them educationally more effective. The present study makes a great contribution to the limited research findings concerning the presentation and structure of k-maps, more specifically, this study discusses how an effective k-map should be formed. If the hypotheses are justified in the present study, we can base the different performances of the k-maps on the structural differences generated by the use of different link structures together with the principles of similarity and proximity.

## Method

### *Participants*

The study was carried out among Turkish primary school eighth graders in Muğla, Turkey. For the study, according to the results of a pre-test and spatial relations test, two classes with no significant differences between them were selected. One of the classes was randomly assigned to the experimental group and the other to the control group. Although there were 43 students in the experimental group and 42 students in the control group, as some of the students were absent from time to time, all the applications and measurements were performed with the constant participation of 31 students from the experimental group and 19 students from the control group. 17 of the participants in the experimental group were female and 14 of them were male. In the control group, on the other hand, there were 10 female and 9 male students. Average age of the students is about 15. The school is located among a majority of the homes of middle class families.

### *Study Materials*

In order to construct k-maps in this study, a text written in Turkish and entitled "Maslow'un İhtiyaçlar Hiyerarşisi" (Şahin, 1983) was selected. The principle criterion in the selection of the text was that it must be novel and interesting to the students. To decide whether the text was appropriate for the level of the students, the expert opinions of psychology teachers and Turkish language teachers were sought. The text is an expository one reflecting the hierarchic structures. This text was also selected for the richness of the link structures; k-maps allow their use in various fields such as knowledge management (Çınar, 2002); statistics, biology, and psychology (Mc Gagg & Dansereau, 1991). The above-mentioned text was converted into two different types of k-maps by the author. The knowledge was presented with 150 words in each of the k-maps. In the experimental group, a k-map was developed by using

similarity and proximity principles and link structures with different characteristics. A typical one was used in the control.

#### *Characteristics of the K-map Used in the Experimental Group*

**Spatial configuration.** In the study, the text converted into a k-map is mainly hierarchic in structure, thus the k-map was established in a spatial configuration reflecting the hierarchic features. In this context, Sönmez (2001) suggests that the title and the sub-titles of a text should be both meaningful and related to each other as well as hierarchically sequenced. The main concept in the text was placed in the center at the top of the k-map. Then, sub-concepts were gradually placed in a stair format under the main concept. This placement goes on until the end of the page by placing vital knowledge under the related sub-concepts. In the study, the similarity principle was applied to the map through geometrical shapes and writing color. Moreover, according to the characteristics of the pieces of knowledge and the relationship among them, different link structures were used.

**Similarity.** Each type of knowledge was written inside different geometrical shapes. The same type of knowledge was represented by the same geometrical shape. For instance, the main concept inside a circle, sub-concepts inside parallel lines, definitions and characteristics inside a rectangle, cause-effect relationships inside an ellipse, and samples inside an octagon. Moreover, same types of knowledge were written in the same color. For instance, the main concept and sub-concepts were written with red capital letters on a white surface. Characteristics were written in red, samples in black and cause-effect relations in purple. Yellow was used for surface characteristics, samples, and cause-effect relations because this increases the readability of the writings.

**Proximity.** To show that each sub-title in the map has a unity in itself, geometrical shapes including sub-titles and vital knowledge related to them were placed next to each other or one under the other. Then, they were all enclosed in a node. In this way, it was possible to group and perceive the elements close to each other together.

**Links.** Thick arrowheads were used to show "primary-secondary" relationships among dynamic pieces of knowledge. Moreover, to show the hierarchy among the sub-titles, the arrows put among the nodes were placed in a stair formation from top towards them bottom. As the samples were elaborative knowledge, they were represented with arrows of dotted lines. On the other hand, other knowledge (definitions, characteristics etc.), was shown with arrows of static straight lines. On each arrow, an abbreviated label indicating what kind of relation it represents was placed (i.e., Definition: D; Example: Ex).

#### *K-map Used in the Control Group*

In the control group, a typical k-map was used (Wiegmann et al., 1992; Wallace et al., 1998). In this map and in all the nodes the same geometrical shape was used. All the links were in the same structure (static).



### *Testing Materials*

To measure the students' acquisition and recall levels of the knowledge presented in the k-maps, a test was used consisting of 31 multiple-choice questions written in Turkish and designed by the author. Opinions of the psychology teachers and academicians with expertise in the field of assessment and evaluation were sought to prove the suitability of the multiple-choice questions for the purposes of the study. First, for the piloting purpose, a test consisting of 38 multiple-choice questions based on the knowledge presented in the map was administered to a group of 57 people who would not be involved in the study and were instructed regarding the topic in the text.

The items having a discrimination index above 0.44 and a difficulty index between 0.27 and 0.84 were included in the test. If the test was a teacher generated one, a discrimination index above 0.40 is acceptable (Seker & Gençdoğan, 2006). The seven items below this threshold level were eliminated from the test and the resultant test consisted of 31 items. The KR-20 reliability coefficient of the test was found to be 0.95. This multiple-choice test was administered to both the experimental students and control students ten days before starting the study to evaluate their prior-knowledge levels, one day after the application was completed to test their acquisition levels, and 15 days after the application was completed to test their recall levels. For each true answer, 1 point was given and for every false answer, 0 point was given. The questions had four choices, with 31 as the highest score obtainable.

### *Individual Difference Testing Material*

**Space relations aptitude test.** To test and equalize the groups with regards to their differences before the experiment, two tests were used: a space relations aptitude test and "pre-test" measuring existing knowledge about the text. The extent to which the participants might benefit from k-maps varied depending on their spatial aptitudes (Wiegmann et al., 1992). Hence, visual-spatial aptitude levels of the students of both experimental and control groups were tested via a "space relations" test before the experiment. For this purpose, *A Form of Different Aptitude Battery*, developed by Bennet, Seashore, and Wesman in 1947, was used to evaluate some basic aptitudes of the students from 8-12 grades. A 40-item space relations sub-test of this test, adapted to Turkish by Remzi Öncül, was then administered to the participants. In the space relations test, students were required to find the folded form of an unfolded geometrical shape out of five choices; the maximum attainable score was 100. Test scores were then converted into T standard scores. "Space relations aptitude test measures visual perception strength and designing ability for newly emerging images as a result of changes taking place in different objects" (Özgüven, 2004, p.248). Vural (1972) conducted the reliability and validity works of space relations tests among 9<sup>th</sup> graders. The reliability coefficient of the test calculated with KR-21 was found to be 0.94 for the students from a middle socio-economic level. The correlation of the test with general academic average points was found to be 0.29. For the pre-

sent study, the descriptive statistics and independent t-test results concerning the Space Relations aptitude test scores are presented in Table 1.

**Table 1**

*The Descriptive Statistics and Independent t-test Results Concerning the Space Relations Aptitude Test Scores of the Experimental and Control Groups*

Map Group	N	X	SD	DF	t	p
Enhanced Map (Experimental Group)	31	50.0	9.95			
				48	-.081	.986
Typical Map (Control Group)	19	49.94	9.92			

P\* < 0.05

As a result of the analysis of the scores obtained from the test, the mean of the experimental group was found to be (M=50.0) and the mean of the control group was found to be (M=49.94). Independent-sample t tests were used to determine whether there is a significant difference between the means. According to these results, it can be claimed that there was no significant difference ( $t = -.081$ ,  $p < .05$ ) between the space relations aptitudes of the groups before the experiment.

*Pre-test.* In the study, whether there were differences between the control group and experimental group concerning their prior knowledge about what will be presented in the k-maps was tested. For this purpose, the above-mentioned test of multiple-choice questions was administered to the participants as a pre-test. Descriptive statistics and independent t-test results concerning the pre-test scores belonging to the experimental and control groups are presented in Table 2.

**Table 2**

*The Descriptive Statistics and Independent t-test Results Concerning the Pre-Test Scores of the Experimental and Control Groups*

Map Group	N	X	SD	DF	t	p
Enhanced Map (Experimental Group)	31	13.29	3.34			
				48	.799	.428
Typical Map (Control Group)	19	14.10	3.74			

$P^* < 0.05$

As a result of the analysis of the pre-test scores, the mean of the experimental group was found to be ( $M=13.29$ ) and the mean of the control group was found to be ( $M=14.10$ ). Independent- sample t tests were used to find significant differences among the obtained means. The results of the test revealed that there is no significant difference ( $t = 0.799$ ,  $p < .05$ ) between the prior-knowledge levels of the groups.

#### **Procedure**

Both of the groups were informed about k-maps, how they are used, etc. for 20 minutes immediately before their k-maps were given to them. The members of the experimental group were then given k-maps enhanced with similarity and proximity principles and link structures with different characteristics, and the members of the control group were given a typical k-map to study. All the participants studied their maps for 25 minutes, then the k-maps were collected from the students. Throughout the experiment, the students did not read any text about "Maslow'un İhtiyaçlar Hiyerarşisi" they just studied it on the maps. One day after the experiment, the acquisition level test (post-test) was administered to both of the groups. The same test was administered to both of the groups 15 days after the first application to evaluate their recall levels.

#### **Data Analysis**

Means and standard deviations of the scores of the tests used in the study were calculated. The T-test was used to analyze whether there is a significant difference between the mean scores of the groups. The SPSS 10.0 program was used in the analysis of the data.

## Results

### *The Findings Regarding Acquisition Level*

Our first hypothesis in this study is “The students studying a k-map enhanced with similarity and proximity principles and link structures with different characteristics will have higher achievement levels in the acquisition of the knowledge presented in the k-map than those studying a typical k-map”. To test this hypothesis, means and standard deviations of the acquisition scores of both groups were calculated. Subsequently, to test the significance of the differences observed between the acquisition levels of the groups, independent-sample t tests were used. In table III, the results of descriptive statistics and t tests are given.

**Table 3**

*Descriptive Statistics and t- test Results Obtained for Acquisition Levels of the Experimental and Control Groups*

Map group	N	M	SD	DF	t	p
Enhanced map (Experimental group)	31	19.48	5.26			
				48	-0.302	.246
Typical map (Control group)	19	19.05	4.20			

P\* < 0.05

As can be seen in table III, there is no significant difference ( $t = -0.302$ ,  $p < .05$ ) between the acquisition level of the students studying the enhanced k-map and that of those studying the typical k-map. Therefore, it can be claimed that differences in map structures do not lead to significant differences in students' acquisition levels. In the present study, the acquisition level of the students using the enhanced k-map was not found to be significantly higher than that of the students using the typical k-map, so the first hypothesis was not supported.

### *The Findings Regarding Recall Level*

Our second hypothesis in this study is “Recall level of the students studying a k-map enhanced with similarity and proximity principles and different link configurations is higher than that of the students studying a typical k-map”. To test this hypothesis, means and standard deviations of the recall scores of both groups obtained 15 days after the first application were calculated. To test the significance of the differences observed between the recall levels of the groups, independent-samples t tests were used. In table 4, the results of the descriptive statistics and t test are given.

**Table 4**

*Descriptive Statistics and t- test Results Obtained for Recall Levels of the Experimental and Control Groups*

Map group	N	M	SD	DF	t	p
Enhanced map (Experimental group)	31	16.70	7.01			
				48	-2.406	.020*
Typical map (Control group)	19	11.78	7.02			

P\* < 0.05

As can be seen in table 4, there is a significant difference ( $t = -2.406$ ,  $p < .05$ ) between the recall level of the students studying the enhanced map and that of those studying the typical one. Therefore, it can be claimed that differences in map structure lead to significant differences in recall levels favoring the students in the experimental group. In our study, the students studying the enhanced k-map recall more knowledge ( $M=16.70$ ) than the students studying the typical k-map ( $M=11.78$ ). This finding supports our second hypothesis.

### Discussion

In our study, both the students studying the enhanced k-map ( $M=19.48$ ) and the students studying the typical k-map ( $M=19.05$ ) have obtained similar acquisition levels according to their acquisition level test scores. The structural differences in the k-maps have not led to differences in the acquisition levels. So, our first hypothesis is not supported. This finding can be interpreted as follows: as the number of the words in the study material is small (150 words), no differences occurred in the acquisition levels of the students. Moreover, link types of different characteristics along with the display of nodes with different geometrical shapes in the enhanced k-map used in the experimental group may have increased the load of working memory. It can be argued that because of these reasons, no significant difference was found between the acquisitions levels of the experimental and control groups according to the results of the acquisition level test conducted one day after the experiment.

In our research, the students who studied the enhanced k-map ( $M=16.70$ ) had higher levels of recall than those studying the typical k-map ( $M=11.78$ ). This finding supports our second hypothesis, and can be interpreted as follows: Above-mentioned enhancements in k-maps have led to increases in the recall levels of the

students in the experimental group due to the provision of clues that help them both store and retrieve the knowledge in their long-term memories. Wallace et al. (1998) states that spatial arrangement of the knowledge provides an effective reminding clue for later recall of the related knowledge. In the present study, enhancement of the k-map used in the experimental group by using the principles of similarity and proximity and different link structures allows for storage of the knowledge in the long-term memory through different ways and with various clues. This variety was observed in the enhanced k-map, and helps store knowledge in the long-term memory, thus leading to variety in the ways of retrieving the knowledge later. Therefore, the experimental group of students was able to remember the correct answers to the multiple-choice questions better than the control group of students.

The use of similarity and proximity principles and different link structures enhanced the structure of the k-map. This positively affected the processes of knowledge encoding and accordingly increased recall levels of the knowledge. Wiegmann et al. (1992) stated that the gestalt-map facilitates recall besides encoding. In the present study, the similarity principle is fulfilled by using writing colors and geometrical shapes; by placing the nodes close to each other, the proximity principle is fulfilled with different link structures, and the knowledge organization property of the k-map is enhanced. These enhancements increased the recall level by affecting the process of information encoding.

A good graphical display can improve one's ability to read the knowledge and think of it in a changeable way (Jones et al., 1989). Both of the k-maps used in the present study can be read from left to right or from top to bottom. When the map is read from top to bottom, all the knowledge related to the sub-titles of the main topic can be seen in unity, and when it is read from left to right, similar types of knowledge (characteristics, samples etc.) under each sub-title can be seen comparatively. Different from the typical k-map, the enhanced k-map generates a similarity by displaying same types of knowledge belonging to each sub-title from left to right and in the same type of shape and color (for example, all the characteristics are given in a rectangular shape and in red, all the examples are in an octagon and in black); thus, comparison among the pieces of knowledge is facilitated. For the k-map to be effective, it should be constructed in such a way that the reader can compare the relationships among the pieces of knowledge, particularly, in such a way that he can directly compare them (Hall et al., 1992).

From top to bottom sequence, on the other hand, the knowledge belonging to each sub-title is grouped close together, and unity is established by placing it in a single node. Pieces of knowledge are connected with different arrows depending on the relationships among themselves (for example, dynamic relationships with thick arrows and elaborative relationships with dotted arrows). In this way, it can be argued that the effects of facilitating recall are generated by positively affecting encoding of both the knowledge and the relationships among the pieces of knowledge.

### Conclusion and Recommendations

This study investigated whether the structural differences in k-maps lead to significant differences in acquisition and recall levels; subsequently, findings revealed that structural differences in k-maps did not result in differences in acquisition levels. However, the recall levels of the students using the enhanced k-map were found to be significantly higher than students using the typical k-map. Structural differences in the enhanced k-map positively affected the recall level of the knowledge. This positive effect of the enhanced k-map is based on structural characteristics formed via the use of similarity and proximity principles, together with different link structures. Therefore, it can be argued that recall levels can be increased by using similarity and proximity principles, two of the perceptual organizational principles and different link structures for different types of knowledge presented in k-maps, Considering the importance of long-term recall at schools, it is advisable to draw on the findings of the present study when designing teacher-made maps. As k-maps lessen the need for memorization, the use of enhanced k-maps when teaching subjects from social science fields may allow students to retain the information longer. Students with outstanding visual-spatial aptitude can facilitate the recall of pages long information by forming and using enhanced k-maps.

A similar study can be carried out by increasing the amount of information in the map. Future studies may compare the effects of k-maps developed in different spatial structures either by using other Gestalt principles or different link structures. Additional studies can be conducted on different types of texts.

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## Bilgi Haritalarındaki Yapısal Farklılıkların Etkileri

### (Özet)

*Problem Durumu* : Bir metindeki bilgilerin öğrenilmesinde kullanılan tekniklerinden biri de bilgi haritalarıdır. Bilgi haritası bir metindeki önemli sözel bilgilerin ve bu bilgiler arasındaki ilişkilerin şematik olarak gösterilme biçimidir. Bilgi haritasında, metnin ana düşüncesi ile ilgili temel kavram, temel kavramla ilgili alt kavramlar, bunlarla ilgili önemli bilgiler (özellikler, tanımlar, türler, örnekler) özetlenerek, "çerçeve" adı verilen değişik geometrik biçim ve boyuttaki şekiller içine yazılır. Bilgi haritalarının diğer boyutu ise, çerçeveler arasındaki ilişkiyi gösteren bağlardır. Yapılan araştırmalarda bilgi haritasında gerek Gestalt ilkelerinin kullanımının gerekse harita özelliklerindeki farklılıkların bilgiyi öğrenme ve hatırlama sürecine etkileri üzerinde durulmuştur. Araştırmacılar, algısal sistemin işleme özellikleri ile uyumlu ve

benzer biçimde düzenlenmiş bilgi haritalarının (örneğin; Gestalt ilkelerini - simetri, yakınlık ve süreklilik kullanan) bu ilkeleri içermeyen haritalardan daha etkili olması gerektiğini öne sürmüşlerdir. Bu çalışmada hem gestalt örgütlenme ilkelerinden benzerlik ve yakınlığı uygulayarak hem de farklı bağ yapılarını kullanarak zenginleştirilen bilgi haritasının, kontrol grubunda kullanılan tipik bilgi haritasından haritadaki bilgiyi öğrenme ve hatırlama düzeyi üzerinde daha çok etkili olacağı düşünülmüştür.

*Araştırmanın Amacı* : Bu çalışmanın amacı, yapısal farklılıkları olan bilgi haritalarının bilgiyi öğrenme ve hatırlama düzeyi üzerine etkililiğini incelemektir. Böylece, hem harita yapılarındaki farklılıkların etkilerine ilişkin nispeten sınırlı olan araştırmalara katkıda bulunmak istenmiş hem de etkili bir grafiksel gösterimin nasıl oluşturulacağı (ya da bir grafiksel gösterimin bir diğerinden niçin daha etkili olabileceği) açıklanmaya çalışılmıştır.

*Araştırmanın Yöntemi* : Araştırmada kontrol gruplu ön-test son-test deney deseni kullanılmıştır. Araştırma için ilköğretim 8.sınıflar arasından, ön-test ve uzay ilişkileri testi sonuçlarına göre aralarında anlamlı farklılık olmayan iki sınıf seçilmiştir. Araştırmaya deney grubunda 31, kontrol grubundan 19 öğrenci katılmıştır. Araştırmada bilgi haritası oluşturulmak üzere "Maslow'un ihtiyaçlar Hiyerarşisi" başlıklı psikoloji ile ilgili bir metin seçilmiştir. Metin araştırmacı tarafından iki farklı türde bilgi haritasına dönüştürülmüştür. Deney grubunun bilgi haritası, benzerlik ve yakınlık ilkeleri ile farklı özellikte bağ yapıları kullanılarak geliştirilmiştir. Kontrol grubunun bilgi haritası ise tipik bilgi haritası yapısındadır. Benzerlik için, aynı tür bilgiler aynı geometrik şeklin içine yazılmıştır. Ayrıca, aynı tür bilgiler aynı yazı rengi ile yazılmıştır. Haritadaki her alt başlığın kendi içinde bir bütünlük oluşturduğunu göstermek için de alt başlıklar ve onlarla ilgili önemli bilgileri içeren geometrik şekiller, alt alta ve birbirine yakın yerleştirildikten sonra tek bir çerçeve içine alınarak yakınlık sağlanmıştır. Deney grubunda kullanılan bilgi haritasında bağ yapıları şöyle oluşturulmuştur: Bilgiler arasında dinamik bir ilişkiyi gösteren "öncelik-sonralık" ilişkisi, kalın çift ok başları ile gösterilmiştir. Ayrıca, alt başlıklar arasındaki hiyerarşiyi göstermek için çerçeveler arasında çizilen oklar sayfaya yukarıdan aşağıya doğru merdiven biçiminde yerleştirilmiştir. Örnekler, çıkarımsal bilgiler olduğu için kesik, kesik çizgilerden oluşan oklarla gösterilmiştir. Diğer bilgiler (tanım, özellik vb) ise, durağan düz çizgili oklarla gösterilmiştir. Her bir okun üzerine ne tür bir ilişkiyi gösterdiğini belirten kısaltılmış etiketler (örneğin; Tanım: Ta) yazılmıştır. Kontrol grubunda ise tipik bir bilgi haritası kullanılmıştır. Bu haritada tüm çerçevelerde aynı geometrik şekil kullanılmıştır. Tüm bağlar aynı yapıda (durağan) kullanılmıştır.

Öğrencilerin bilgi haritasında sunulan bilgileri öğrenme ve hatırlama düzeylerini ölçmek için araştırmacı tarafından geliştirilen 31 soruluk çoktan seçmeli test kullanılmıştır. Testin (KR-20) güvenilirlik katsayısı 0,95 olarak belirlenmiştir. Araştırma öncesinde öğrencilerinin görsel-uzamsal yetenek düzeyleri "uzay ilişkileri" testi ile ölçülmüştür. Bu amaçla 8-12. sınıflardaki öğrenciler-

rin temel bazı yeteneklerini ölçmek amacıyla geliştirilmiş olan farklı yetenek testi A formunun Türkçeye uyarlanan 40 maddelik “uzay ilişkileri alt testi uygulanmıştır. Araştırmada şu işlemler yapılmıştır: Bilgi haritaları dağıtılmadan önce her iki gruba da bilgi haritası ile ilgili 20 dakika açıklama yapılmıştır. Ardından deney grubu öğrencileri zenginleştirilmiş bilgi haritasını, kontrol grubu öğrencileri, tipik bilgi haritasını 25 dakika süreyle çalışmışlardır. Bu işlemden bir gün sonra her iki gruba da öğrenme düzeyi testi (son test) uygulanmıştır. Bu testten 15 gün sonra gruplara aynı test hatırlama düzeylerini ölçmek amacıyla tekrar uygulanmıştır. Araştırmada test sonuçlarının analizi t-testi ile yapılmıştır.

*Araştırmanın Bulguları :* Araştırma sonuçları, zenginleştirilmiş bilgi haritasından çalışan deney grubu öğrenciler ile tipik bilgi haritasından çalışan kontrol grubu öğrencilerinin bilgi haritasındaki bilgileri öğrenme düzeyleri arasında anlamlı bir fark olmadığını göstermektedir. Ancak, araştırmamızda, zenginleştirilmiş bilgi haritasından çalışan deney grubu öğrencileri tipik bilgi haritasından çalışan kontrol grubu öğrencilerden daha fazla bilgiyi hatırlamışlardır.

*Araştırmanın Sonuç ve Önerileri :* Araştırmamızda, yazı rengi ve geometrik şekillerle benzerliğin, öğeleri birbirine yakın yerleştirip tek bir çerçeve içine alarak yakınlığın ve farklı bağ yapılarının kullanılması ile bilgi haritasının bilgiyi örgütleyici özelliğini zenginleştirmiştir. Bu zenginleştirme bilgiyi kodlama sürecini etkileyerek hatırlama düzeyini artırmıştır. Bilgi haritaları yapılırken, algısal örgütleme ilkelerinden benzerlik ve yakınlık ile farklı bilgi türleri için farklı bağ yapılarını kullanmak, bilgiyi hatırlama düzeyini artırılabilir. Okullarda bilginin uzun süreli hatırlanmasının önemi düşünüldüğünde öğretmen yapımı haritalar oluşturulurken araştırmamızın bu bulgusundan yararlanılabilir. Yeni araştırmalarda gerek diğer gestalt ilkelerini gerekse bağ yapılarını kullanarak, farklı uzamsal yapıda geliştirilen bilgi haritalarının etkisi karşılaştırılabilir.

*Anahtar Sözcükler:* Bilgi haritası, öğrenme stratejileri, Gestalt ilkeleri, grafiksel gösterimler.

## The Comparison of the Educational Philosophies of Turkish Primary School Superintendents and Teachers

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### Abstract

*Problem Statement:* Awareness of the prevailing educational philosophies of teachers and superintendents may contribute to making correct decisions and policies regarding innovations and arrangements in educational systems. One reason for the failure of the arrangements and innovations in the educational system is the failure to consider the educational philosophies of the teachers and superintendents who implement the new arrangements into practice.

*Purpose of the Study:* This study aims to determine and compare the prevailing educational philosophies of primary school teachers and superintendents.

*Method:* Descriptive method was used in this study. "The Educational Philosophy Orientations Scale" with 53 items and 5 sub-scales was developed by the researcher to determine the educational philosophies of the primary school teachers and superintendents. This self-administrated scale was conducted on 312 teachers and 53 primary school superintendents working in the Malatya province.

*Findings and Results:* Research showed that educational philosophies of the teachers and superintendents are different in terms of perennialist, essentialist, and pragmatic views. Teachers tend to adopt the views relevant to these philosophies more than superintendents. No significant difference was observed between the teachers' views on educational philosophies according to the variables of gender, seniority, and type of school they graduated. However, a significant difference was found between teachers' views of pragmatist educational philosophy according to the teaching subject variable. Also, though no significant difference was observed between the superintendents' views on educational philosophies according to the variables of gender, teaching subject, and type of school they graduated,

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there was a significant difference found between superintendents' views of existentialist educational philosophy according to the seniority variable.

*Conclusion and Recommendations:* The findings indicated that the educational philosophy most adopted by primary school teachers and superintendents is perennialism, with existentialism adopted the least. However, the objectives of the Turkish Educational System which are specified in the Basic Law on Education No 1739 which was put into force in 1973 can not be realized by teachers and superintendents who hold a perennialist educational philosophy. The realization of the objectives specified in cited Law requires possessing a progressivist and pragmatic educational philosophy.

*Keywords:* Educational philosophy, primary school teachers, primary school superintendents, the educational philosophy orientations scale

In a developing country like Turkey, expectations from the educational system increase daily, and this system is thought to be the place and where solutions to almost all social problems can be found. Both the reasons and the solutions for Turkey's social problems including inflation, traffic accidents, child abuse, drug addiction, unemployment, terrorism, etc. are associated with "education". Though "education" is of an inevitable nature for a society, it cannot be an answer to all problems. If education is to be a solution for all problems, then the characteristics of such an education should be thoroughly considered.

Together with educational economics, educational psychology, and educational sociology, educational philosophy is an influential criterion in developing curricula (Sönmez, 2008). The answer to the question "What kind of education a society should be offered with these curricula?" is directly related to the educational philosophy that society either embraces or highly implements. In countries like Turkey, the adopted educational philosophy may not be consistent with the objectives of education deemed necessary. Today, people discuss the nature of the educational philosophy which is actually adopted and the ideal educational philosophy which should be adopted by 19.935.277 students, 57.837 schools, and 734.597 teachers in the Turkish education system (Ministry of National Education [MoNE], 2008).

The indicator of teaching behaviors a teacher is to exhibit is the educational philosophy she adopts, whether or not she is aware of it. Research indicates that teachers' beliefs correlate with observed classroom practice and that attitudes about teaching and learning shape one's educational philosophy and guide professional action (Gajda, 2001). A teacher's educational philosophy determines his beliefs about educational objectives, the manner of teacher-student communication, the types of instructional methods and materials, and what priorities should be given in education. According to Sergiovanni and Starratt (1983), an educational philosophy includes "the assumptions, theories, and beliefs one holds for key aspects of effective teaching, such as the purpose of schooling, perceptions about students, what knowledge is of most worth, and the value of certain teaching techniques and pedagogical principles" (p. 304). The educational philosophy a teacher has adopted is based on certain principles, with some degree of consistency between these principles. What matters here is the adoption of principles consistent with the educational objectives of the teachers and superinten-

dents. Glickman, Gordon, and Gordon (1998) argue that what is needed is a basis of sound/valid principles. The complete set of these principles which are not frequently cited is called a "platform". They emphasize that just as a political party has a party platform on which it bases its decisions and actions and according to which it takes action and makes preferences, those in charge of supervising must in a similar way have a platform to conduct their activities.

The quality and dimensions of the relationship between education and philosophy are determined by the process of education and philosophy. Education is a phenomenon which in general terms covers all the activities towards an individual's behaviors and the processes determining them. Philosophy, on the other hand, means producing conceptions. The determinants of people's actions are believed to be their thoughts. Basic variables which determine one's thoughts are concepts. With his ability to think, man actually thinks with a language, i.e. with the words and concepts of the language. "Conception" above all is an element/division of "symbol(s)" or "sign(s)" in the system, and thus one of the components of the linguistic domain of existence. It is also a means of thinking; from where the concepts derive is one of the objective realities in our environment. Conceptions are mental abstractions about objective reality. Thus the nature of a person's thoughts and actions are in line with which or what kind of conceptions he/she has. Philosophical thought systems (philosophies) are the collection of systematic conceptions. During any phases of education (objectives, content, teaching-learning procedure, and assessment) we think and decide with certain conceptions. The type and quality of the conceptions in our thinking process determine our decisions and actions regarding these phases. For example, the instruction where theory and practice co-exist also has an impact on class behaviors and events with its dimensions going beyond education in class. The relationship teachers will have with their students depends on their conceptions about human nature (Guttek, 1997, p. 1). Thus, the decisions and actions of the people related to education are determined by their conceptions. Philosophy is the domain where these conceptions are produced.

Philosophies like idealism and realism date back to ancient times, while others, including pragmatism and existentialism, however, are more recent. Based on these more general philosophies, some schools of thoughts like essentialism, perennialism, progressivism etc. have evolved specifically in the field of education. To comprehend some of the major philosophies and their effects in education, there is a need to briefly define them.

#### ***Pragmatism and Education***

Pragmatism is usually regarded as an American philosophy, and is associated with English empiricism, which is based on the conviction that we can know anything we can experience through our senses. For a pragmatist, experiment is the source of knowledge. The root of this approach goes back to the Greek philosopher Heraclitus who preceded Socrates. Major representatives of this philosophy are Charles Sanders, C. S. Peirce, William James, and John Dewey. Their views differ, however, from each other both in terms of method and their conclusions (Tozlu, 2003, p. 48).

Pragmatists agree with realists in that the material world exists in itself and is not a product of man's mind, yet they refuse to accept the world's continuance and independence from the man. The essence of reality is change, thus pragmatism is by nature humanistic. Humanity is the criterion for everything, such that many pragmatists do not accept the belief that humans are spiritual beings (Alkan, 1983, p. 38).

According to Dewey, one of the leading adherents of Pragmatism, the relationship between life and education resembles that between organism and environment. To Dewey, the human organism is a living natural being which is made up of psychological reactions and drives; every organism lives in an environment which includes elements both ensuring and threatening its survival (Chambliss, 1996, p. 499-505). In this respect, we can list the major components of Dewey's educational philosophy as follows (Guttek, 1997, p. 100): (1) A living and learning organism is a biological and sociological phenomenon which has the effect or energy to survive, (2) one who learns to live in both a natural and social environment, (3) the learning individual who acts in his/her own peculiar manner is always in a relation with his/her environment, (4) while the individual seeks to meet his/her needs within his relationship to the environment, he/she faces some problems and (5) the individual actually learns the process of solving his/her problems, which takes place in the environment.

#### *Existentialism and Education*

The fundamental thought marking existentialism is that the uniqueness and freedom of the individual have priority over the society or human communities, and all human beings bear the responsibility to exist and define themselves. Existentialist philosophy dwells on the constant problems of life, particularly the issues including inevitability of death, joy of love, grief, the reality of choice, freedom, and the (un)productivity of personal relations, rather than seeking after the available problems of traditional philosophy (Büyükdüvenci, 1987). Van Cleve Morris (quoted in Guttek, 1997, p. 134) defines existentialist education by drawing the following framework: "Education is supposed to provide the learner with an intensive level of awareness". In an education with such a framework, the individuals must be expected to make choices in a free and creative way, therefore putting free will and individualism into the center (Gajda, 2001). Again, such a level of awareness will in turn have implications on how an individual wants to live and what kind of an individual he/she aims to be. To Morris, the most proper education for human beings is the one which provides both men and women with an "Existentialist Awareness," suggesting that they are unique subjects in the world. Existentialist education should start in the first years of higher education and continue until the end of it. The aim of such an education should be making the individuals aware of themselves. In the light of the knowledge offered in such an education which centers on subjectivity and individualism, the individuals should be encouraged to make choices between good and evil or right and wrong (Guttek, 1997, p. 134).

Hardcastle-Stanford and Parkay (2000) argue that a curriculum grounded in existentialism creates a flexible and responsive classroom environment where the students are encouraged to think about and explore the meaning of their lives. Most critical learning is limited with neither a field of knowledge nor any curricula, but the best

learning is based on the knowledge a learner chooses and interprets himself. In an Existentialist learning process, a learner explains/evaluates like an "actor" the subjects which he associates with himself, embraces, and interprets in line with his own goals (Gutok, 1997, p. 137). An Existentialist instructor, though being able to apply various instructional methods, should not allow an uncertain learner-teacher relationship in any of these methods. According to Griffis (1998), the existentialist teacher is not a "traditional" teacher; he/she respects and lifts up individuality and will guide his/her students to release their creativity.

### *Progressivism*

Adopting in essence the Pragmatist principle that "the essence of reality is change," Progressivism embraces the understanding that "education is in a continuous progress". According to Progressivism, the essence of education does not mean adaptation to the society and external world or certain static standards of good, truth, and beauty, but a constant rearrangement of experiences. In Dewey's words "thus we obtain the technical definition of education." This means rebuilding or reorganizing the experience which develops the ability to lead one's life, which in turn follows and adds up to the meaning of life. Growing up through rebuilding the experiences is the underlying objective and nature of education (Alkan, 1983, p. 28; Armstrong, Henson & Savage, 1981, p. 217; Gutok, 1997, p. 315; Erden & Sapling 1998, p. 100).

According to Progressivism, education should be appropriate and efficient (active) in terms of a child's interest. John Dewey believed that curriculum content should be derived from the students' personal interests and developmental needs (Gajda, 2001). Success in life depends on the degree to which experiences can be reduced to the level of special problems. Therefore, learning should be through problem solving projects rather than internalizing the content. Education, which means the rational rebuilding of experiences, is equivalent to civilized life. Therefore, an individual's education should not be the preparation for life, but the life itself. Schools should attach more importance to cooperation than to competition. Education and democracy should give rise to each other. Therefore, the schools should be administered according to democratic principles.

### *Perennialism*

Perennialism sets off from the idea that human beings are constant and unchangeable. In line with this structure and lack of change, education, too, is unchangeable. At least, in essence, unchangeable components are in the majority. In fact, the aim of education is to comply with unchangeable and universal facts. Perennialism attaches great importance to intellectual-rational education as against progressivism. Since the mind is the superior feature of a human being, he/she should use that ability to develop his/her intuitional nature in line with deliberately determined objectives. The roots of perennialism began with Plato, Aristotle, and Thomas Aquinas, with the belief that education should be the same for everyone and that man is a rational being (Knight, 1989). It attempts to assimilate certain traces of humanist education within its texture. The adaptation problem is defined as adaptation to an unchangeable universal reality. Education never means to simulate life, but it



must intend to have a nature of preparation for it (Topses, 1982; Erden & Sapling, 1998, p. 129; Armstrong et al., 1981, p. 216).

The perennialist philosophy also advocates that in classroom environments, opportunities which can improve students' mind and willpower should be offered rather than an ideal life itself. For the procedure, in which a deductive way of reasoning is highly used, such methods as Socratic discussion, excursion, and observation are recommended. In evaluating the students' achievement, it is essential to ask questions testing students' ability to reason and judge the unchangeable realities of the universe. In perennialist curriculum, the only authority in the classroom is the teacher (Sönmez, 2002, p. 66-70).

### *Essentialism*

According to this school of thought, the human being is a social and cultural creature. He is not equipped with any knowledge at birth. Induction is the only method of obtaining knowledge. Knowledge and technique constantly accrues in society, and those who adhere to an essentialist philosophy assert there is one essential body of academic knowledge that teachers are obligated to convey to their students in a systematic fashion (Gajda, 2001, p. 25). Therefore, school is a means of learning rather than a means of reform. In this context, the objectives of education must be to ensure the socialization of the individual, to provide him with dominant cultural values, to prevent change and clashes, to protect cultural heritage, to ensure his adaptation to society, and to raise knowledgeable and talented people (Alkan, 1983, p. 36).

Since subjects and lessons are important in instructional procedure, the teacher rather than the students is the center of the classroom, for teacher is the representative of the cultural heritage. He is equipped with correct and consistent knowledge. As for the assessment, the students should be asked to memorize whatever the teacher has done and told and whatever is written in the book. Like the perennialist philosophy, essentialist education also suggests that knowledge be put into the center of instructional processes. Yet, essentialism differs from perennialism in that it stresses core knowledge and skills as opposed to a set of external truths (Gajda, 2001).

### *The Aim of the Study*

If an educational system is to achieve its objectives, especially at the level of primary education, the place to achieve this is the classroom. The most important factor deciding the efficacy of the classroom is the teacher. A variety of variables including those social, psychological, economic, and educational, etc. can affect the behaviors of a teacher in the classroom. Another factor affecting teacher behaviors, yet mostly ignored in the curriculum during teacher training, is the educational philosophy the teachers embrace. Whether they are aware of it or not, each teacher has a certain educational philosophy which can be described in terms of behavior – this is the very assumption of this study. In this respect, this study investigates the educational philosophies of primary school teachers and superintendents. Knowledge about the educational philosophy of the teachers and superintendents helps provide input regarding the type of educational philosophy that should be provided during in-service trainings and pre-service teacher training programs.

This study aims to answer the following questions: (1) Is there a significant difference between the educational philosophies of primary school teachers and super-

intendents? (2) Do teachers' opinions about educational philosophies differ according to some variables including (a) gender, (b) professional seniority, (c) teaching subject, and (d) type of school they graduated? (3) Do the primary school superintendents' opinions about educational philosophies differ according to variables including (a) gender, (b) professional seniority, (c) teaching subject, and (d) type of school they graduated? This study is restricted to certain educational philosophies, including existentialism, essentialism, pragmatism, perennialism, and progressivism.

## Method

### Population

The teacher population of this study comprises 3317 teachers. They work in 64 primary schools located within the Municipality of the province of Malatya, a medium-sized city in the eastern part of Turkey. Primary school superintendent population is comprised of 55 primary school superintendents working under the Office of Inspection Board in the National Education Directorate of the Province of Malatya.

### Sample

The population sampling was random in accordance with the aim and scope of the study. Thus, 400 teachers working in 12 primary schools selected randomly were reached and only 312 of them who completed the measurement instruments adequately were taken into consideration. Since the whole superintendent population is accessible they were all involved in the study. Out of 55 primary school superintendents, 53 with acceptable measurement instruments were considered eligible for evaluation. Table 1 shows the socio-demographic characteristics of participant teachers and primary school superintendents.

### Data Analysis

In analyzing the data obtained via measurement instrument, a paired sample t-test was used to find the difference, if any, between total scores obtained by the teachers and superintendents from the sub-scales in the philosophical tendency scale. To find whether the participants' opinions differ in terms of gender and type of graduation variables, an independent sample t-test was used. In the case of not homogeneous variances as a result of the Levene test, t-test was replaced by Mann Whitney U. Furthermore, an ANOVA test was used to find whether their views regarding educational philosophies differ in terms of seniority and subject variables. In case of not homogeneous variances as a result of the Levene test, ANOVA was replaced by the Kruskal Wallis test (Özdamar, 1999; Hopkins, Glass, & Hopkins, 1987). To detect the

**Table 1.**

*Socio-demographic Characteristics of Teachers and Primary School Superintendents*

Variables		Teachers		Superintendents		Total	
		N	%	N	%	N	%
Gender	Male	199	63.8	45	84.9	244	66.8
	Female	113	36.2	8	15.1	121	33.2

Type Of Duty		312	85.5	53	14.5	365	100
Seniority (year)	1-5	61	19.6	-	-	61	16.7
	6-10	74	23.7	-	-	74	20.3
	11-15	65	20.8	8	15.1	73	20.0
	16-20	48	15.4	13	24.5	61	16.7
	21-25	17	5.4	5	9.4	22	6.0
	26 and over	47	15.1	27	50.9	74	20.3
Subject	Social Studies	254	81.4	49	92.5	303	83.0
	Scientific Studies	30	9.6	4	7.5	34	9.3
	Vocational-Tech.	28	9.0	-	-	28	7.7
Type Of Graduation	Associate degree	95	30.4	3	5.7	98	26.8
	Undergraduate	217	69.6	50	94.3	267	73.2

differences found between the groups, LSD test was used. Moreover, descriptive statistics are obtained regarding independent variables and obtained scores.

#### *Instrument*

Various resources about education philosophy (Alkan, 1983; Aydın, Ünal, Balcı, Koçak, & Burgaz, 1991; Büyükdüvenci, 1987; Gutek, 1997; Parkay & Hardcastle-Stanford, 1996; Sönmez, 2002; Tozlu, 2003; Yıldırım, 1987), book chapters related to educational philosophy (Glickman et al., 1998; Jon and Bondi, 1989; Armstrong et al., 1981) and some educational philosophy scales (Jersin, 1972; Jon and Bondi, 1989; Gajda, 2001; Griffis, 1998) were researched for statements therein regarding objectives, instructional methods, materials, teacher-students relations, instructional environment, and evaluation components of idealist, realist, pragmatic, existentialist, perennialist, and essentialist educational philosophies. Subsequently, three instructors in the department of educational sciences, all with graduate degrees in philosophy and currently teaching Introduction to Philosophy and Educational Philosophy, were asked whether these statements reflect the views of relevant philosophies. Based on the views and suggestions by these instructors, a trial scale was developed with 104 trial items (18 items about idealism, 20 items about realism, 18 items about pragmatism, 20 items about existentialism, 12 items about perennialism, and 15 items about essentialism). This scale with 104 trial items was administered to a total of 342 people, 185 teachers and 157 primary school superintendents, in 17 cities other than Malatya. Then, the data obtained from the administration of the draft scale were tested for their applicability for factor analysis. As obtained, Kaiser-Meyer-Olkin (KMO) sample appropriateness value was found .70; this value is bigger than the minimum .60 value suggested by Pallat (2001), and the result of the Bartlett test (Bartlett's Test of Sphericity: 10804,968; sd:5671;  $p < .000$ ) was significant—the data were concluded to be applicable for factor analysis. After 44 trial items with factor loadings lower than .30 were discarded as a result of factor analysis, a repeated factor analysis resulted in 53 trial items whose Kaiser-Meyer-Olkin (KMO) sample appro-

priateness value was calculated as .86, and Bartlett test result was found as  $\chi^2(6457,626; sd:2145; p<.000)$ .

Basic components factor analysis (coupled with Varimax Rotation) resulted in distribution of 53 items in the scale into five factors. Based on the interpretational analysis of the items in the 1st factor, this factor was named as a perennialism sub-scale. Example items for perennialism are "Student is a store receiving the information offered to him" and "Schools are for increasing the students' knowledge." The maximum possible score from the perennialism sub-scale is 85, while the minimum possible score is 17. Based on the interpretational analysis of the items in the 2<sup>nd</sup> factor, this factor was named as a pragmatism sub-scale. Example items for pragmatism are "In school an understanding of education which considers all students' needs and interests and takes him as a whole should be adopted and applied." and "Education should discover students' individual differences and emphasize improving these differences". The maximum possible score from the pragmatism sub-scale is 45, while the minimum possible score is 9. Based on the interpretational analysis of the items in the 3<sup>rd</sup> factor, this factor was labeled as a progressivism sub-scale. Example items for progressivism are "The principal goal of education is to improve people's ability to comprehend the environment." and "The goal of education is to have the individual become open to continuous change". The maximum possible score from the progressivism sub-scale is 55, while the minimum possible score is 11. Based on the interpretational analysis of the items in the 4th factor, this factor was named as essentialism sub-scale. Example items for essentialism are "The primary responsibility of the schools is to get the students to comprehend the moral truths," and "Curriculum should be based on unchanging moral values." The maximum possible score from the essentialism sub-scale is 45, while the minimum possible score is 9. Based on the interpretational analysis of the items in the 5th factor, this factor was named as existentialism sub-scale. Example items for existentialism are "The student should select what knowledge to learn and he should decide what to do with this knowledge," and "Education should able the students to be aware of the institutions, powers, and trends which restrict their freedom." The maximum possible score from the existentialism sub-scale is 35, while the minimum possible score is 7.

As for the reliability of the scale, the alpha values of the items in different sub-scales were estimated respectively as follows: .85 for 17 items in perennialism sub-scale; .77 for 9 items in pragmatism sub-scale, .79 for 11 items in progressivism sub-scale, .81 for 9 items in essentialism, .62 for 7 items in existentialism sub-scale. These values indicate that the sub-scales of the scale reveal adequate values in terms of internal consistency.

### Findings and Comments

1. "Is there a significant difference between the educational philosophies of primary school teachers and superintendents?"

Analysis revealed that the mean scores regarding the teachers' and superintendents' views about educational philosophies are a maximum for the perennialism sub-scale (Teachers  $\bar{x}$  =60.54; Superintendents  $\bar{x}$  =52.73), while scores are at a minimum for the existentialism sub-scale (Teachers  $\bar{x}$  = 27.65; Superintendents  $\bar{x}$  =28.18).

The common belief that the Turkish National Education System is traditionally perennialist seems to be in agreement with this finding.

The results of the Mann-Whitney U test revealed that there was a significant difference between teacher and superintendent views in the perennialism sub-scale ( $p < .000$ ), which shows that teachers hold perennialist educational philosophy more than superintendents do. A significant difference was also observed between teachers' and superintendents' views about essentialism (Teachers  $\bar{x} = 34.66$ ; Superintendents  $\bar{x} = 30.75$ ) as a result of the t-test ( $t = 4.045$ ;  $p < .05$ ). The mean scores show that teachers hold essentialist educational values more than superintendents. Teachers' and superintendents' views about pragmatism (Teachers  $\bar{x} = 39.88$ ; Superintendents  $\bar{x} = 38.43$ ) also differed significantly according to the t-test ( $t = 2.245$ ,  $p < .05$ ), which indicates that teachers possess a pragmatist educational philosophy more than superintendents. No significant difference was observed between the teachers' and superintendents' views about progressivist and existentialist educational philosophies.

2. "Do teachers' opinions about educational philosophies differ according to some variables including: (a) gender, (b) seniority, (c) teaching subject, (d) type of school they graduated?"

2.a) Analysis revealed that the educational philosophy with the highest mean scores for both male and female teachers (Male  $\bar{x} = 59.78$ ; Female  $\bar{x} = 61.88$ ) was perennialism. The educational philosophy with the lowest mean scores, however, for both male and female (Male  $\bar{x} = 27.52$ ; Female  $\bar{x} = 27.89$ ) was existentialism. The t-test analysis revealed that the views of male and female teachers regarding any of their educational philosophies did not differ significantly.

2.b) ANOVA analysis showed that teachers' views about perennialist, pragmatist, progressivist, essentialist, and existentialist educational philosophies did not differ significantly according to seniority ( $p > .05$ ).

2.c) The Kurskal Wallis test results showed that the views of the teachers with regard to perennialist, pragmatist, essentialist, and existentialist educational philosophies did not differ significantly in terms of subject field variable ( $p > .05$ ). The views of the teachers regarding progressivist educational philosophy differed significantly, however, in terms of subject field variable ( $p < .05$ ). To find our source of the difference, subject fields were compared in pairs using the Mann-Whitney U test, which revealed that the views of Social Studies teachers regarding progressivism differed significantly from those of Science teachers in favor of the former group of teachers ( $p < .05$ ). It was also found that the progressivist views of the Science teachers differed significantly from views of vocational and technical teachers in favor of the latter ( $p < .05$ ).

2.d) Test results showed that the teachers' views of educational philosophies did not differ significantly according to school of graduation. As it is known, the teachers who are still in service had a different type of higher education in the past. While until 1989 one was eligible for primary school teaching after graduation from a two-year of education, after 1989 these schools were transformed into educational faculties and the duration of training increased to 4 years. Some of the teachers working in primary schools have these two-year associate degrees. The fact that no significant difference

was found between teachers' educational philosophies according to type of school of graduation can be explained with the fact that both the two-year associate programs, which served until 1989, and the succeeding four-year educational faculties may most probably employ the same curriculum and a similar understanding.

3. "Do the primary school superintendents' opinions about educational philosophies differ according to some variables including; (a) gender, (b) seniority, (c) teaching subject, (d) type of school they graduated?"

3.a) The mean scores regarding the superintendents' educational philosophies were as follows: in perennialism sub-scale  $\bar{x}=53,06$  for male and  $\bar{x}=50,87$  for female; in pragmatism sub-scale  $\bar{x}=38,53$  for male and  $\bar{x}=37,87$  for female; in progressivism sub-scale  $\bar{x}=47,86$  for male and  $\bar{x}=49,12$  for female; in essentialism sub-scale  $\bar{x}=30,77$  for male and  $\bar{x}=30,62$  for female; and in existentialism sub-scale  $\bar{x}=28,24$  for male and  $\bar{x}=27,87$  for female. As a result of the applied t-test and Mann-Whitney U test, results showed that the superintendents' views about educational philosophies did not differ significantly according to the gender variable.

3.b) Analysis also showed that superintendents' views about educational philosophies did not differ significantly in terms of seniority variable in perennialist, pragmatist, progressivist, and essentialist educational philosophies sub-scales. Superintendents' views regarding existentialist educational philosophy, however, differed significantly in terms of seniority variables ( $F=3.340$ ;  $p=.027$ ). LSD test revealed that the difference was between the groups with seniority for 16-20 years and 26 years and over. The superintendents with a seniority for 16-20 years hold the existentialist educational philosophy ( $\bar{x}=30,76$ ) more than those with 26 years and longer seniority ( $\bar{x}=26,77$ ).

3.c) Although the scale included three options in regard to subject fields of superintendents, no one tested from the vocational-technical subjects. Therefore, the analysis concerning whether the views of the superintendents about educational philosophies differed in terms of their subject fields had to be conducted with two fields (social studies and science teaching). The t-test analysis showed that the views of the superintendents regarding educational philosophies did not differ significantly according to subject field variable.

3.d) The t-test analysis showed that the views of the superintendents about educational philosophies did not differ significantly according to the type of school they graduated. Half of the participating superintendents (50%) stated that they had 26 years or more seniority. Those with the least seniority had been working for 11-15 years. Indeed, given the historical development of education in our country, most of the superintendents who are currently working probably started their career as graduates from high schools or associate programs and then gained their university degrees through arrangements and practices as part of in-service training. The fact that superintendents' views about educational philosophies did not differ significantly in terms of the type of school they graduated can be interpreted as the result all undergoing similar training procedures.

### Conclusions and Recommendations

Societies should have a certain educational philosophy, which is realizing the goals of their educational system. Education in nature urges this. These goals inherently suggest specific educational philosophies. For example, goals requiring a pragmatic educational philosophy cannot be realized with an understanding of perennialist educational philosophy.

This study revealed that teachers hold perennialist, essentialist, and pragmatic educational philosophies significantly more than superintendents. The views of the teachers about educational philosophies did not significantly differ regarding gender, seniority, or type of school graduated. A significant difference was observed between teachers' views regarding progressivist educational philosophy in terms of subject field variable. It was also observed that Social Studies teachers held views regarding progressivist educational philosophy more than Science teachers, and Science teachers, in turn, held views regarding progressivist educational philosophy more than those from vocational-technical studies.

No significant difference was observed among the superintendents' views about educational philosophies in terms of gender, subject, and school of graduation variables. There was however, a significant difference between the superintendents' views about existentialist educational philosophy in terms of seniority variables. The views of the superintendents with seniority for 16-20 years differed significantly from those with 26 years and longer. The superintendents with a seniority for 16-20 years hold the existentialist educational philosophy more than those with 26 years and over.

The educational philosophy held the most by the teachers and superintendents in Malatya is perennialism. However, the objectives of the Turkish Educational System specified in Basic Law on Education No:1739 and put into force in 1973 cannot be realized by teachers and superintendents who hold a perennialist educational philosophy. The realization of the objectives specified in the cited Law requires employing a combination of progressivist and pragmatic educational philosophies.

The educational philosophy that the teachers and the superintendents hold the least is existentialist. According to existentialist educational philosophy, the aim of education should be to free all people by providing them with an intensive level of awareness. Education should enable the individuals to direct themselves in their actions. The goal in education should be to promote students' beliefs in their uniqueness and worth. It should be ensured that the individuals become aware of the forces which restrict their freedom and learn the knowledge they choose and interpret for themselves. The fact that teachers and superintendents hold the existentialist philosophy less than the others is consistent with the findings that they possess perennialist philosophical views.

Based on the findings of this study the following suggestions can be made:

1. Similar researches should be conducted, especially using methods of triangulation, to determine in a clearer way the dominant educational philosophy of the Turkish education system held by the actors at all stages, whether instructional or administrative, particularly the teachers.

2. While the specified objectives of the Turkish educational system are based on a pragmatic educational philosophy, the teachers and superintendents as the immediate actors in this system have a rather perennialist philosophy as revealed by this study, which creates a controversy. This controversy points to the fact that teachers and superintendents are unaware of the vital consistency between the teaching objectives and the underlying educational philosophies. This unawareness, however, can not be assumed to lead to a hidden curriculum which operates implicitly in line with legal curricula, but rather an "opposite curricula" as coined by Sönmez (2008), who defines it as the one "developed to train people to defend exactly the opposite of the objectives of legal curriculum." Therefore, the teachers and superintendents should be provided, through in-service trainings, first with some awareness about the educational philosophy they actually have, and next certain perspectives as required by the educational philosophy currently adopted in the Turkish Education System.

3. Teacher training programs at universities should include courses and activities designed to provide the students with the educational philosophy the Turkish Education System is based upon.

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## Türk İlköğretim Müfettişleri ve Öğretmenlerinin Eğitim Felsefelerinin Karşılaştırılması

### (Özet)

*Problem Durumu* : Bir toplumun eğitiminin nasıl olması gerektiğine ilişkin cevabı o toplumun benimsemiş olduğu ya da baskın olarak uygulanmakta olan eğitim felsefesi verir. Türkiye gibi ülkelerde benimsenen eğitim felsefeleri ile eğitimin gerçekleştirilmesi istenen hedefler arasında tutarlılık olmayabilir. Bugün Türkiye eğitim sistemini oluşturan yaklaşık 18 milyon öğrenci, 60 bin okul ve 630 bin öğretmenin ne tür bir eğitim felsefesini benimseyerek hareket ettiği ve ne tür bir eğitim felsefesi benimseyerek hareket etmesi gerektiği tartışılmalıdır.

Farkında olsun ya da olmasın bir öğretmenin sergileyeceği/göstereceği öğretmenlik davranışlarının belirleyicisi onun benimsemiş olduğu eğitim fel-

sefesidir. Öğretmenin benimsemiş olduğu eğitim felsefesi belirli ilkeler üzerine oturur. Bu ilkeler arasında bir tutarlılık söz konusu olabilir. Burada önemli olan eğitim amaçlarıyla tutarlı ilkelerin öğretmen ve müfettişler tarafından benimsenmiş olmasıdır.

İlköğretim aşamasında bir eğitim sisteminin, amaçlarına ulaşabilmesi için üretilmesi gerekenin üretim yeri sınıflardır. Sınıfın etkililiğini belirleyen en önemli etken ise öğretmendir. Bir sınıfta bulunan öğretmenin davranışlarını sosyal, psikolojik, ekonomik, eğitsel vb bir çok değişken etkileyebilir. Öğretmen davranışlarına etki eden, ancak çoğu zaman dikkate alınmayan, öğretmen eğitimi esnasında programlarımızda üzerinde durulmayan, bir diğer önemli faktörde öğretmenlerin benimsemiş oldukları eğitim felsefeleridir.

*Araştırmanın Amacı* : İlköğretim okullarında görev yapmakta olan öğretmenlerin ve ilköğretim müfettişlerinin benimsemiş oldukları başat eğitim felsefelerinin neler olduğunun belirlenmesi ve karşılaştırılmasıdır. Bu amaç doğrultusunda şu sorulara yanıt aranmıştır: (1) Öğretmenler ile ilköğretim müfettişlerinin benimsemiş oldukları eğitim felsefeleri arasında anlamlı bir farklılık var mıdır? (2) Eğitim felsefelerine ilişkin öğretmen görüşleri; a) cinsiyet, b) mesleki kıdem, c) öğretmenlik branşı ve d) mezun olunan okul türü değişkenlerine göre farklılık göstermekte midir? (3) Eğitim felsefelerine ilişkin ilköğretim müfettişi görüşleri; a) cinsiyet, b) mesleki kıdem, c) öğretmenlik branşı, d) mezun olunan okul türü değişkenlerine göre farklılık göstermekte midir?

*Araştırmanın Yöntemi* : Araştırma tarama modelindedir. Araştırmanın öğretmen evrenini Malatya şehir merkezinde yer alan 64 ilköğretim okulunda çalışmakta olan 3317 öğretmen, örneklemini ise bu okullar arasından kura ile belirlenen 12 ilköğretim okulundaki 312 öğretmen oluşturmuştur. İlköğretim müfettişi evrenini Malatya Milli Eğitim Müdürlüğü Teftiş Kurulu Başkanlığı Bünyesinde çalışmakta olan 55 ilköğretim müfettişi oluşturmuş, ilköğretim müfettişlerinin tamamı araştırma kapsamına alınmıştır. Öğretmen ve müfettişlerin benimsemiş oldukları eğitim felsefeleri'nin ne olduğunu belirlemek amacıyla araştırmacı tarafından geliştirilen, 53 maddeden ve beş alt boyuttan (daimici, pragmatizm, ilerlemeci, esasici ve varoluşçu eğitim felsefeleri boyutları) oluşan "Eğitim Felsefesi Yönelimi Ölçeği" kullanılmıştır. Araştırmada yer verilen eğitim felsefesi görüşlerinin varoluşçuluk, esasicilik, pragmatizm, daimicilik, ve ilerlemecilik olması araştırmanın sınırlılığıdır.

*Araştırmanın Bulguları* : Araştırmada elde edilen verilerin analizi sonucunda öğretmen ve müfettişlerin benimsemiş oldukları eğitim felsefelerinin daimici, esasici, pragmatik eğitim felsefeleri alanlarında farklı olduğu gözlenmiştir. Öğretmenler bu felsefelere ilişkin görüşleri, müfettişlerden daha fazla benimsemektedirler.

Öğretmenlerin eğitim felsefelerine ilişkin görüşleri cinsiyet, kıdem ve mezun olunan okul değişkenleri açısından anlamlı bir farklılık göstermemiştir. Branş değişkeni açısından ilerlemeci eğitim felsefesine ilişkin öğretmen görüşleri arasında anlamlı bir farklılık gözlenmiştir. Sosyal bilimler branşında olan öğretmenlerin ilerlemeci eğitim felsefesine ilişkin görüşleri fen bilimleri branşında olan öğretmenlerden daha fazla benimsedikleri, fen bilimleri branşında olan öğretmenlerin ise ilerlemeci eğitim felsefesine ilişkin

görüşleri mesleki ve teknik branş da olan öğretmenlerden daha fazla benimsedikleri gözlenmiştir.

Müfettişlerin eğitim felsefelerine ilişkin görüşleri cinsiyet, branş, mezun olunan okul değişkenleri açısından anlamlı bir farklılık göstermemiştir. Mesleki kıdem değişkeni açısından var oluşçu eğitim felsefesine ilişkin müfettiş görüşleri arasında anlamlı bir farklılık gözlenmiştir. Mesleki kıdemi 16-20 yıl olan müfettişlerin var oluşçu eğitim felsefesine ilişkin görüşleri, mesleki kıdemi 26 yıl ve üzeri olan müfettişlerin görüşlerinden anlamlı düzeyde farklı bulunmuştur. Mesleki kıdemi 16 -20 yıl olan müfettişlerin var oluşçu eğitim felsefesine ilişkin görüşleri mesleki kıdemi 26 yıl ve üzeri olan müfettişlerden daha fazla benimsedikleri bulgulanmıştır.

*Araştırmanın Sonuçları ve Önerileri* : İlköğretim okullarında çalışan öğretmen ve müfettişlerinin en fazla benimsediği eğitim felsefesinin daimicilik, en az benimsedikleri eğitim felsefesinin ise var oluşçuluk felsefesi olduğu gözlemlenmiştir. 1973 tarih ve 1739 sayılı Millî Eğitim Temel Kanununun da yer alan Türk Eğitim Sisteminin Amaçlarının daimici bir eğitim felsefesini benimseyen öğretmen ve müfettişlerle gerçekleştirilmesi olası değildir. Bu kanun da belirtilen amaçların gerçekleştirilmesi gerçekte ilerlemeci ve pragmatik bir eğitim felsefesinin benimsenmesini öngörmektedir.

Öğretmen ve müfettişlerin en az benimsedikleri eğitim felsefesi ise var oluşçuluktur. Var oluşçu eğitim felsefesine göre eğitimin amacı bireyde yoğun bir bilinç/farkına varma düzeyi gerçekleştirerek insanları özgürleştirmek olmalıdır. Eğitim, insanları eylemlerinde kendi kendilerini yönlendirebilecekleri bir düzeye getirmelidir. İnsanın kendi tekliğine ve değerliliğine olan inancı artırıcı bir eğitim hedeflenmelidir. Bireyin özgürlüğünü sınırlayan güçlerin farkına vardırılması, kendi seçeceği ve anlamlandıracağı bilgileri öğrenmesi sağlanmalıdır. Okulda yarışmaya ve rekabete yer verilmemelidir. Var oluşçu bir eğitim felsefesinin bu nitelikleri açısından öğretmen ve müfettişlerin var oluşçu eğitim felsefesini diğerlerine göre daha az benimsemeleri daimici eğitim felsefesinin benimsenmesiyle tutarlılık göstermektedir.

Elde edilen bulgulardan hareketle bazı öneriler sunulmuştur. Öncelikle öğretmen ve müfettişlerin benimsediği eğitim felsefelerinin belirlenmesine yönelik farklı araştırma tekniklerinin kullanıldığı çalışmalar yapılmalıdır. Hizmetiçi eğitimler sayesinde öğretmen ve müfettişlerin benimsedikleri eğitim felsefeleri konusunda bir farkındalık yaratılmalı ve ülkenin eğitim sisteminin dayandığı eğitim felsefesi kazandırılmalıdır.

**Anahtar Sözcükler:** Eğitim felsefesi, ilköğretim öğretmenleri, ilköğretim müfettişleri, eğitim felsefesi yönelimi ölçeği

## The Adaptation of the Reader Self-Perception Scale to the 4<sup>th</sup> and 5<sup>th</sup> Grade Turkish Students

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### Abstract

*Problem statement:* The affective dimension of reading instruction like *self-efficacy* has been highly studied, and a need for the assessment of this dimension has emerged in recent years. After some effort, the Reader Self-Perception Scale (RSPS) was developed to meet this need.

*Purpose of the Study:* The purpose of this study is to adapt the RSPS into Turkish to make it available to the researchers and teachers in Turkey.

*Methods:* The original RSPS consists of one general item and thirty-two subsequent items that embody the four scales: Progress, Observational Comparison, Social Feedback and Physiological States. To adapt the 33-item RSPS, the scale was translated into Turkish under the supervision of some scholars from the field of education. Later, a validity and reliability study analysis was carried out. The quantitative data were collected from 629 4<sup>th</sup> and 5<sup>th</sup> graders enrolled in five primary schools in Burdur, Denizli and İzmir by using the RSPS and the Attitude Scale towards Reading. For the data analysis, the factor structure of the Turkish form of the RSPS, the *Cronbach's Alpha* coefficients of the scale and the subscales, test-retest and concurrent validity correlations were measured.

*Findings and Results:* The analyses of the collected data indicated some findings. *First*, the factor analysis revealed the need for excluding two items from the original scale. *Second*, the exploratory factor analysis, using the principal component analysis and varimax rotation, and the confirmatory factor analysis were conducted. Five independent factors, explaining 51.98% of total variance, with the eigenvalue over 1.00 have been found. The result of the confirmatory factor analysis also confirmed the five-factor model. *Third*, the *Cronbach's Alpha* values of the scale and the subscales proved the high reliability for the adapted scale. *Fourth*, the item-total correlations of the scale acceptably ranged between .37 and .68.

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Finally, the test-retest validity and the concurrent validity with the Attitude Scale displayed significant correlations.

*Conclusions and Recommendations:* Findings suggest that the adapted RSPS is a valid and reliable instrument for researchers and teachers in collecting descriptive data from students. Since the RSPS was tested with only the 4<sup>th</sup> and 5<sup>th</sup> grade students, additional studies are required to adapt the scale to other grades and to examine the changes in the 4<sup>th</sup> and 5<sup>th</sup> grade students' self-perception levels regarding the reading process.

**Keywords:** Reading, self-perception, validity, reliability

As reading is considered to be a fundamental skill on which formal schooling is based, early experiences in literacy count for later success in complicated tasks (Özbay, 2006; Snow, Burns & Griffin, 1998). Thus, children suffering from failure in reading are unlikely to flourish in school or even in life. Alexander and Jetton (2000) pinpoint that reading comprehension instruction is critical especially for Grade 4 and beyond, when students need to read a wide variety of materials and texts for knowledge and literary experiences. Thus, reading comprehension achievement in these grades requires special attention for the good of future learning processes.

The perception of learning, not only as a cognitive but also an affective and social process, has been underscored by the recognition of the social cognition model introduced by Bandura (1977, 1982, 1986, & 1993). According to the model, as well as being influenced by biological and environmental phenomena, individuals develop self-perceptions about their feelings, thoughts and behaviors. In other words, not only do individuals interact with the social environment, but they also regulate and manage these feelings, thoughts and behaviors by relying on their self-perceptions. This conception of Bandura's perceives the learner as a constructor and regulator of knowledge in addition to his or her passive role as a product of the environment and a consumer of knowledge. This conception relates deep with self-efficacy beliefs about performance, as a person with high self-efficacy believes that he or she is capable of attaining certain goals (Ormrod, 2006). Thus, *perceived self-efficacy*, learners' own judgments and beliefs on their performance and ability, which influence the performances in specific future tasks, has a lot to do with learning processes (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Chapman & Tunmer, 2003; Grolnick & Slowiaczek, 1994; Schunk, 1989, 1991; Tunmer & Chapman, 2002).

As self-efficacy deals with judgments on specific cases of a field, it distinguishes itself from self-concept, which is a general term (Linnenbrink & Pintrich, 2003). It is essential to consider more specific cases and details when it comes to self-efficacy. Therefore, a student might have self-efficacy beliefs for some activities and low beliefs for some other activities of reading. Also, another student's self-efficacy beliefs might be high for mathematics and low for the arts. Students with a high belief of self-efficacy approach the assigned tasks saying, "I can do this"; however, those with low self-efficacy try to avoid certain tasks, thinking, "I can do this, but not that one" (Linnenbrink & Pintrich, 2003). Consequently, these negative thoughts or feelings might result in weak performances and make students avoid taking risks that can help their development. On the other hand, students with high self-efficacy

beliefs try harder and are more persistent (Schunk, 2003). This effort and persistence are the main elements that contribute to students' achievement and development.

Literacy instruction is a very complicated and socially-situated process (Alvermann & Guthrie, 1993). Research has shown that students with positive attitudes towards reading read, or tend to read, a lot and extensively (Henk & Melnick, 1995). Henk and Melnick underpin the direct relationship between reading behavior (or habit) and attitude. That is, self-efficacy beliefs of individuals constructed on the feedback from themselves and their environment help to shape their judgments and beliefs. These self-efficacy beliefs play a significant role in the increase of academic achievement and reading performance.

The importance of self-efficacy beliefs in reading instruction requires the measurement of these beliefs. Likewise, the difficulty of measuring self-efficacy perceptions and beliefs necessitates reliable measurement tools. Owing to this requirement, some efforts to develop scales (for example, Boersma, Chapman, & MacGuire, 1979; Mitman & Lash, 1988) emerged in the literature. A similar effort was the Reader Self-Perception Scale (RSPS), developed by Henk and Melnick (1995) and based upon the self-efficacy theories of Bandura. When Bandura's (1977, 1982, 1986, 1993) self-efficacy model is considered, it is essential that readers' present and past performances (1), observational comparisons (2), social feedback (3) readers think they receive, and physiological states (4) be paid attention to as four important factors (Henk & Melnick, 1992, 1993, & 1995). That is to say, readers, when asked to judge their reading, think in the boundaries of these four factors that contribute to their judgments and beliefs. Henk and Melnick (1995) emphasize that these four factors are interrelated, which complies with Bandura's theoretical implications.

The early studies of developing the RSPS (Henk & Melnick, 1992, 1993) gave rise to the redefinition of *performance*, one of the four factors. Thus, Henk and Melnick (1995) decided to narrow the concept of performance into *progress* in the final form of the scale and came up with a 33-item scale and four subscales. They state that these four subscales construct the self-perception of readers and that the scale could be applied to individual readers as well as groups in order to retrieve their self-perceptions and determine the readers with reading difficulties. The RSPS focuses on intermediate level readers on purpose because children do not think about their academic performances and do not attribute their achievement to ability but to luck or effort before Grade 4 (Blumenfeld, Pintrich, Meece, & Wessels, 1982; Nicholls, 1978, 1979).

The only researcher to attempt to use the RSPS in Turkish education settings was Tercanlıoğlu (2001), who measured the pre-service EFL (English as a Foreign Language) teachers' feelings about themselves as readers in both Turkish and English. That is, the instrument was used with a different age group of readers after some modifications. The results with that group showed acceptable reliability levels for the subscales ranging between .74 and .80.

A great deal of research and investment is made on literacy instruction in many countries of the world, depending on the cultural, traditional and educational priorities of the countries (Kern, 2000). The recent educational movement in Turkey,

based on an understanding of individual differences, calls for measurement tools which will help researchers and teachers know about individual students better. That is why new tools should be introduced to the education settings in Turkey. Therefore, this study aims at filling in a gap by adapting the Reader Self-Perception Scale (Henk & Melnick, 1995) into Turkish and making it available to the researchers and teachers in Turkey.

Not only could the adaptation of the RSPS into Turkish culture provide Turkish language instruction research with a gap-filling tool that measures self-perception in reading, but also it could enable classroom teachers and teachers of Turkish language to discover the issues that influence the success of their students in reading. The importance of Grade 4 as a starting phase for more complicated knowledge and literary practices makes it more crucial to enrich the educational settings with a variety of measurement tools. The adaptation of the RSPS will also empower the researchers in Turkey to carry out well-designed research in reading instruction.

## Methods

### *Participants*

The participants of this study were 629 students enrolled in the 2007 spring term of 4th and 5th grades of five primary schools in Burdur, Denizli and İzmir. These provinces were chosen due to the diversity of their populations. Burdur is a small province and Denizli is of medium size in terms of their populations, while İzmir is a highly populated one. In this study, 96 students were from Burdur, 203 from Denizli and 330 from İzmir. Participants, 316 females and 313 males, varied in their residence areas. 203 of them attended schools in a city center, 220 in a small town, and 206 in small municipalities and a village. The different residential areas were chosen to comply with the methodology in the development of the original scale. Of the participants, 303 were 4th graders and 326 were 5th graders, and their ages ranged from 9 to 12 at the time of the study. The original form of the RSPS was developed for 4th, 5th and 6th graders. The reason why this study was confined to 4th and 5th graders was the need to consider the first and second phases of primary education separately. Therefore, the 6th grade was excluded from the study, as it is considered to be in the second phase of primary education in Turkey.

### *Data Collection Tools*

**Reader self-perception scale.** The original Reader Self-Perception Scale developed by Henk and Melnick (1995) consists of 33 items. The first item is for general preparation and categorized under no subscale. The 32 items of the scale are categorized under four subscales: Progress (an extremely broad, inclusive category that includes past success, necessary effort, task difficulty, task persistence, need for assistance, and patterns of progress), Observational Comparison (how one's performance compares with peers), Social Feedback (direct or indirect cues derived from teachers, classmates and family) and Physiological States (bodily feedback in the form of relative comfort/discomfort, calmness/nervousness, etc.). The scale

items are responded to and scored using a 5-point Likert system: 5=Strongly Agree (SA), 4=Agree (A), 3=Undecided (U), 2=Disagree (D) and 1=Strongly Disagree (SD). Higher scores were related with higher levels of reader self-perception. The original RSPS was administered to 1479 students from urban, suburban and rural school districts to perform the final analysis of the scale. The internal consistency reliability *Cronbach's Alpha* values for the four subscales were .84 for Progress, .82 for Observational Comparison, .81 for Social Feedback and .84 for Physiological States. The validity and reliability of the RSPS were confirmed on two different samples (Melnick & Henk, 1997). Firstly, the RSPS was administered to 2,733 students from 4th, 5th and 6th grades. The range of the alpha coefficient was observed to change from .81 to .84. Secondly, two different groups of graduate students (63 graduate students) enrolled in a graduate reading specialist program acted as expert reviewers for the content validation stage of the RSPS. Thirty students reviewed the items using the forced choice method, and the other 33 students reviewed items using a latent category judgmental review procedure. According to the results, all items were placed in the anticipated a priori categories.

***Attitude scale towards reading.*** The attitude scale towards reading developed by Susar-Kırmızı (2006) consists of 32 items and six subscales. The first 50-item form of the scale was administered to 381 students enrolled in 4<sup>th</sup> and 5<sup>th</sup> grades of the schools in İzmir, and the findings were analyzed for validity and reliability. Due to poor factor loading, 18 items were eliminated. The *Cronbach's Alpha* reliability value of the scale was found to be .83. It was reported that item-total correlations ranged from .40 to .81. In addition, the result of the analysis showed that the scale had six factors, accounting for 53.44% of the common variance. Higher scores were related with higher levels of positive attitudes towards reading.

#### ***Data Analysis***

In terms of the construct validity of the RSPS for exploratory factor analysis, the SPSS 15-program was used. Firstly, in order to test whether or not the data obtained were compatible with the factor analysis, the results of KMO (Kaiser- Meyer-Olkin) and Barlett Sphericity tests were analyzed. Secondly, the principle component analysis with varimax was used to understand a number of factors. In addition, as suggested in the literature (Büyüköztürk, 2007), the criteria for common factor variance were decided to be .30 minimum in a single factor. For item selection, a minimum difference value of .10, the difference between each item's high factor loading in one factor and high factor loading in other factors, was also accepted.

The program LISREL was used in order to confirm the construct of the scale with factor analysis. A confirmatory factor analysis (CFA) was conducted to validate the hypothesized relationship between the constructs. The measurement and structural models were evaluated with the following fit indexes (Byrne, 1989): Chi-square, the Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), Relative Fit Index (RFI), and the Standardized (RMR).



### *Translation of the RSPS into Turkish*

The RSPS was translated into Turkish after the necessary permission was granted by the researchers who originally developed the scale. The translated scale was checked by six scholars in the field of education who had good command of English in order to ensure accuracy and appropriate expressions in Turkish. After that, the scale was translated back into English by a scholar from an English Language Teaching department and later double-checked by two scholars. The final form of the translated scale was approved after a pilot study with 38 students from 4<sup>th</sup> and 5<sup>th</sup> grades was conducted to avoid any possible misunderstandings with the students.

## **Results**

### *Findings Related to the Validity Studies of the RSPS*

#### *Construct Validity*

**Exploratory factor analysis of the RSPS.** The Kaiser-Meyer-Olkin index of adequate sampling was .92 for the sample. This result indicated that the data represented a homogeneous collection of variables that were suitable for the factor analysis. It was understood that this was an excellent value, as it was suggested in literature that the KMO value should be greater than .60 in order to continue the factor analysis of the value found (Büyüköztürk, 2007). Barlett's test of sphericity was significant for the sample, [ $\chi^2 = 7105, 352, df = 496, p < .000$ ], which indicated that the set of correlations in the correlation matrix was significantly different from zero and suitable for factor analysis (Duru & Balkıs, 2007). The RSPS consisted of 1 general item (item 1) and 32 subsequent items that represent the four scales. Item 1 was discarded from the analysis because this item was only used to prepare the children to think about their reading ability (see Henk & Melnick, 1995).

The principal components factor analysis with varimax was used to understand a number of factors. Firstly, the original scale developed by the researchers consists of four factors. For this reason, the data were analyzed for four-factor solutions, but items loaded on unrelated factors. A variety of criteria was used to determine the number of common factors to retain: the eigenvalue greater than 1 criterion, the scree test, the amount of common variance explained, and the conceptual interpretability of the factor structure. The result of the analysis showed that the scale had five factors, accounting for 50.09% of the common variance. In addition, when the factor loading matrix was examined, one item (item 5) with low factor loading and one item (item 14) not loaded on the corresponding factor were excluded from the scale. After removing these items, the factor analysis was repeated, and this second analysis also revealed that the RSPS had a five-factor construct. Although the original RSPS had four factors, the result of the factor analysis showed that the RSPS had five factors in our sample. Item 12, item 31 and item 33 were loaded on Factor V. These items were related to social feedback taken from family, labeled as Social Feedback from Family. The five factors with eigenvalues greater than 1 explained about 51.98% of the total variance. Factor I (eigenvalue =8.667, 28.67% variance) was labeled as Progress. Items from Physiological States loaded on Factor II

(eigenvalue = 2.919, 9.73 % variance). Items from Social Feedback from Friends and Teacher loaded on Factor III (eigenvalue = 1.661, 5.53% variance). Items from Observational Comparison loaded on Factor IV (eigenvalue = 1.323, 4.28% variance) and items from Social Feedback from Family loaded on Factor V (eigenvalue = 1.090, 3.63% variance). As a result, as can be seen in Table 1 with the original item numbers, the scale consisting of 30 items and five factors was obtained. The range of factor loadings was observed to change from .41 to .77.

**Table 1**

*The means, standard deviations and item-total correlations and Rotated Factor Loads Related to Items of the RSPS (N=629)*

Items	M	SD	Item-Total Correlations	Factor Loading				
				I	II	III	IV	V
<b>Total <math>\alpha=.91</math></b>								
<b>1st Factor: Progress (<math>\alpha=.80</math>)</b>								
Item 10	4.22	1.12	.36	.41	.19	.28	.05	-.27
Item 13	4.29	.09	.53	.48	.26	.16	.22	.10
Item 15	4.26	1.19	.31	.52	-.01	.08	.19	-.16
Item 18	4.51	.09	.40	.57	.18	.08	.04	.02
Item 19	4.47	.09	.48	.67	.01	.11	.17	.20
Item 23	4.46	.08	.48	.60	.26	.14	-.08	.09
Item 24	4.41	.09	.46	.64	.25	.03	-.01	.17
Item 27	4.48	.09	.49	.66	.19	.02	.06	.23
Item 28	4.44	.08	.52	.62	.30	.02	.13	.13
<b>2nd Factor: Physiological States (<math>\alpha=.83</math>)</b>								
Item 8	4.51	.08	.50	.20	.66	.22	.05	-.04
Item 16	4.55	.08	.46	.08	.77	.04	.13	.05
Item 21	4.34	.09	.49	.21	.61	.04	.13	.05
Item 25	4.43	.09	.47	.27	.65	.03	.10	.03
Item 26	4.37	.09	.46	.32	.54	.03	-.02	.26
Item 29	4.36	.09	.50	.21	.62	.07	.13	.18
Item 32	4.56	.08	.46	.08	.70	.08	.05	.25
<b>3rd Factor: Social Feedback from Friends and Teacher (<math>\alpha=.85</math>)</b>								
Item 2	3.60	.09	.49	.07	.11	.76	.09	.08
Item 3	3.71	1.00	.51	.08	.07	.76	.17	.12
Item 7	3.43	1.07	.55	.08	.20	.69	.25	.01
Item 9	3.61	1.02	.53	.12	.17	.56	.29	.09
Item 17	3.53	1.06	.53	.13	-.01	.73	.18	.28
Item 30	3.46	.09	.56	.14	.08	.55	.34	.27
<b>4th Factor: Observational Comparison (<math>\alpha=.79</math>)</b>								
Item 4	3.31	1.11	.47	.05	.04	.35	.64	.08
Item 6	3.75	1.03	.50	.24	.09	.31	.58	-.05
Item 11	3.65	1.05	.50	.31	.10	.24	.57	-.08
Item 20	3.33	1.04	.46	.04	.05	.24	.74	.10
Item 22	3.46	1.06	.51	.06	.26	.05	.70	.30
<b>5th Factor: Social Feedback from Family (<math>\alpha=.74</math>)</b>								
Item 12	4.05	1.04	.56	.21	.18	.38	.17	.52
Item 31	4.04	1.05	.57	.25	.16	.33	.14	.66
Item 33	4.12	1.04	.46	.13	.24	.25	.07	.60

*Confirmatory factor analysis of the RSPS.* A confirmatory factor analysis (CFA) was conducted to validate the hypothesized relationship between the constructs (factors reported in the previous original study and obtained in the exploratory factor analysis for this study). It is important to note that, to the best of researchers' knowledge, this research was the first study to utilize CFA in order to assess the RSPS. The appropriateness of four- and five-factor models representing the self-perceptions scope was evaluated through confirmatory factor analyses using LISREL (Jöreskog & Sörbom, 1993) for structural equation modeling. Structural equation modeling has no single test that best describes the strength of a particular model. The measurement and structural fit models were evaluated with the following fit indexes (Byrne, 1989): Chi-square, the Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI), Relative Fit Index (RFI), and the Standardized (RMR). GFI, CFI, IFI, NFI, and RFI fit indexes range from 0 to 1, with values of .90 or higher indicating an adequate fit, with a value greater than 0.95 as a very good model fit. For the standardized RMR and RMSEA, values below .05 indicate a good fit (Bentler, 1990; Browne & Cudeck, 1993), and values between .08 and .10 represent a mediocre fit (Siu & Shek, 2005). The following commonly used criteria were utilized in evaluating the adequacy of the models: RMSEA < .08 (Browne & Cudeck, 1993), Standardized RMR < .05, GFI ≥ .90, CFI ≥ .90, IFI ≥ .90, NFI ≥ .90, and RFI ≥ .90, (Bentler, 1990; Browne & Cudeck, 1993) and  $\chi^2/df < 5$  (Marsh & Hocevar, 1985). As can be seen in Table 2, the fit indexes in this study indicated that the model provided a good fit to the data for the five-factor model, with the exception of a low GFI value. A path diagram of five-factor model is presented in Figure 1. On the other hand, the results of the confirmatory factor analysis did not support four-factor models.

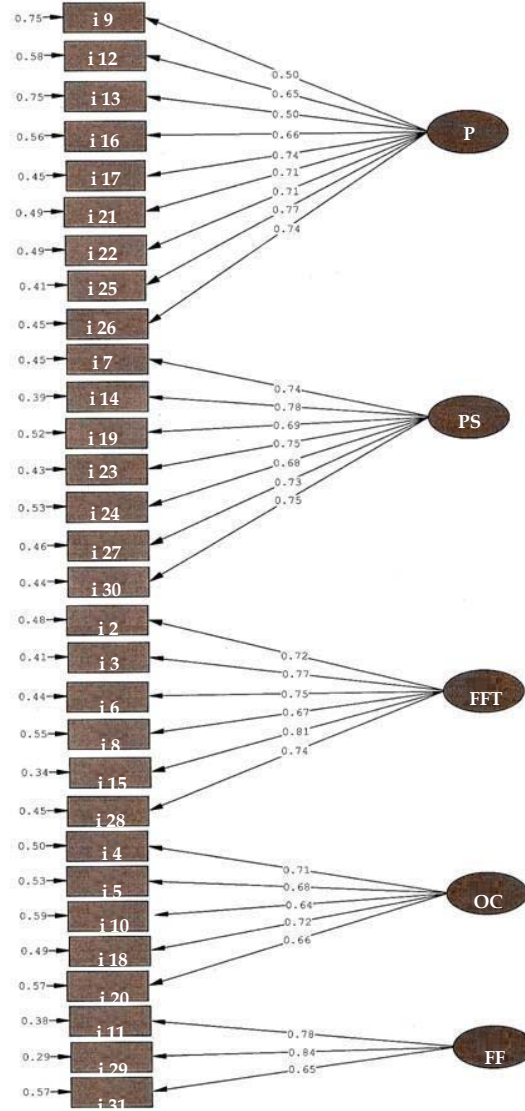


Figure 1. The result of confirmatory factor analysis for the standardized solution of five-factor model (P=Progress, PS=Physiological States, FFT=Social Feedback from Friends and Teacher, OC=Observational Comparison, FF=Social Feedback from Family)

**Table 2*****The Fits of Four- and Five-Factor Models of the RSPS***

Models	$\chi^2$	$\chi^2/sd$	RMS EA	NFI	CFI	IFI	SR MR	GFI	RFI
Model 1 (Four Factor)	2226.48	5.20	0.08	0.94	0.95	0.95	0.06	0.81	0.93
Model 2 (Five Factor)	1815.89	4.59	0.07	0.95	0.96	0.96	0.05	0.84	0.94

***Concurrent Validity***

Factorial validity is just one of many methods offered to assess an instrument's validity. Another method is the assessment of validity using an instrument's concurrence with other instrument(s) that have valid and reliable properties. To provide support for concurrent validity, correlations were examined by using the Attitude Scale towards Reading (Susar-Kırmızı, 2006). The results showed that the total scale score of the RSPS correlated significantly with the measurements of the Attitude Scale ( $r = .65$ ,  $p < .01$ ) with Turkish students. There was a positive relationship between all the subscales of the RSPS and attitudes towards reading. The range of correlations was observed to change from .41 to .68. Attitudes towards reading correlated positively with Progress, Physiological States, Social Feedback from Friends and Teacher, Observational Comparison and Social Feedback from Family subscales (.47, .68, .41, .42 and .47, respectively). All of the correlations with reader self-perceptions and attitudes towards reading measurements were meaningful ( $p < .01$ ) and in the expected direction, indicating that the increased perceptions of the self were related to higher levels of attitudes toward reading.

**Findings Related to the Reliability Studies of the RSPS*****Internal and Test-Retest Reliability***

The reliability coefficient of the scale was calculated by employing *Cronbach's Alpha* and test-retest methods. Internal reliability estimates were calculated for the total scale and five subscales. The results confirmed that the RSPS had high internal and test-retest reliability. The internal consistency coefficient of the scale was found to be .91. The Progress, Physiological States, Social Feedback from Friends and Teacher, Observational Comparison and Social Feedback from Family subscales demonstrated high internal consistency (.80, .83, .85, .79 and .74, respectively). The internal consistency coefficient of the total scale and the subscales were similar to the previously reported value (see Henk & Melnick, 1995). In addition, the result of the analysis showed that the subscales significantly correlated with each other, and the correlations among the five subscales were positive and statistically significant ( $p < .01$ ).

Once informed consent had been obtained from students who volunteered to participate in the study, the students were administered a packet of surveys during a

class period. For the re-test procedure, 110 voluntary students were retested at the end of two weeks after initially completing the questionnaire. Students were assigned a special symbol to match their first and second surveys. The test-retest reliabilities for the Progress, Physiological States, Social Feedback from Friends and Teacher, Observational Comparison and Social Feedback from Family were .65, .66, .66, .55, and .64, respectively. For the whole scale, the value obtained was .65 ( $N = 110$ ). As a result, the RSPS demonstrated good internal reliability and adequate test stability over a two-week period.

#### *Descriptive Statistics and Group Differences*

The means, standard deviations and item-total correlations for the RSPS were presented in Table 1. The means and standard deviations for the subscales were as follows: Progress ( $M = 43.67$ ,  $SD = 5.9$ ), Physiological States ( $M = 31.15$ ,  $SD = 4.4$ ), Social Feedback from Friends and Teacher ( $M = 21.36$ ,  $SD = 4.6$ ), Observational Comparison ( $M = 17.51$ ,  $SD = 3.8$ ), Social Feedback from Family ( $M = 12.22$ ,  $SD = 2.54$ ) and Total Self-Perception ( $M = 109.62$ ,  $SD = 14.03$ ). As can be seen, the range of item-total correlations was observed as changing from .37 to .68.

To determine the group differences among male and female students with respect to levels of Progress, Physiological States, Social Feedback from Friends and Teacher, Observational Comparison and Social Feedback from Family, we conducted a one-way ANOVA test. This revealed significant group differences between female and male students in terms of Observational Comparison [ $F(1, 627) = 4.292$ ,  $p < .05$ , for female  $M = 17.8$ ,  $SD = 3.8$ , for male  $M = 17.1$ ,  $SD = 3.8$ ], Physiological States [ $F(1, 627) = 30.563$ ,  $p < .001$ , for female  $M = 32.1$ ,  $SD = 3.8$ , for male  $M = 30.1$ ,  $SD = 4.7$ ], Social Feedback from Family [ $F(1, 627) = 7.390$ ,  $p < .01$ , for female  $M = 12.5$ ,  $SD = 2.4$ , for male  $M = 11.9$ ,  $SD = 2.6$ ] and Total Self-Perception [ $F(1, 627) = 10.877$ ,  $p < .001$ , for female  $M = 111.4$ ,  $SD = 13.2$ , for male  $M = 107.7$ ,  $SD = 14.6$ ]. On the other hand, the analysis of variance confirmed that Progress and Social Feedback from Friends and Teacher did not significantly differ according to students' genders. Results showed that female students had higher levels of Observational Comparison, Physiological States, Social Feedback from Family and total Self-Perception than did male students.

### **Conclusions and Recommendations**

The aim of this study is to test the validity and reliability of the Reader Self-Perception Scale with Turkish 4<sup>th</sup> and 5<sup>th</sup> graders. The results of the analyses provide psychometric support for the scale to be used in Turkey with five dimensions. The results also show that the scale has a high internal consistency value and acceptable test-retest reliability. The internal consistency analysis results of the adapted scale are similar to those of the original scale. The concurrent validity analysis results of the RSPS revealed a positive relationship with the Attitude Scale towards Reading, as expected.

An exploratory factor analysis and a confirmatory factor analysis were applied to the scale to analyze the factor construct. Findings from exploratory and confirmatory factor analyses provide psychometric support for a five-dimensional scale in Turkish

culture, which is different from the original form of the scale. In the literature, it is advised that factor loads should not be under .30 (Büyüköztürk, 2007). Considering this criterion, item 5 was eliminated from the scale, as it had a factor load under .30. In addition, item 14 was also eliminated, as it was observed to be loaded on Factor I, differently from the original scale. The analysis indicates that the Social Feedback dimension of the original scale is perceived as two dimensions in our country: Social Feedback from Friends and Teacher and Social Feedback from Family. This means, in Turkey, feedback from the friends and teacher is perceived differently than feedback from the family. In other words, students in our country pay attention to whom they receive feedback from, which is not the case with the original scale.

The concurrent validity of the RSPS was calculated with the Attitude Scale towards Reading (Susar-Kırmızı, 2006). Both scales were administered to all the participants to reach a correlation coefficient of .65 ( $p < .01$ ). This considerable positive correlation indicates that there is a significant relationship between self-perceptions of readers and their attitudes towards reading. That is, the self-perceptions of the readers relate positively with other affective dimensions of reading. This finding is congruent with what Henk and Melnick (1992) found in their first effort to develop the RSPS.

In order to test the reliability of the scale, the *Cronbach's Alpha* ( $\alpha$ ) value and item-total correlations were calculated, and the test-retest method was used. The analysis shows that the RSPS has an internal consistency at .91 and the reliability coefficients for the subscales are acceptable: .80 for Progress, .83 for Physiological States, .85 for Social Feedback from Friends and Teacher, .79 for Observational Comparison and .74 for Social Feedback from Family. These coefficients are similar to those of the original scale. This result displays the similarity and consistency in responding to the items. For the test-retest reliability, the scale was administered to a fraction of the participants again after two weeks, and the Pearson Correlation Coefficient was found to be  $r = .65$ , significant at  $p < .01$  ( $n = 110$ ). This result proves that the scale shows test stability over time. The group differences between the female and male students in the study displayed a high general self-perception level in favor of female students. This finding corroborates the results of many studies in the literature (Lynch, 2002). The finding that female students at 4<sup>th</sup> and 5<sup>th</sup> grades have higher self-perception as readers than the male students should be taken into consideration by the teachers.

In conclusion, the Reader Self-Perception Scale, developed by Henk and Melnick (1995) and adapted to Turkish, could be used by both researchers and teachers for collecting descriptive data and observing the development of students at schools. The present study makes a useful and necessary contribution to the measurement of the 4<sup>th</sup> and 5<sup>th</sup> grade students' self-perception levels regarding the reading process.

#### *Limitations of the Study*

The present results should be interpreted in light of their limitations. First, in this study, both the analyses of the CFA (Confirmatory Factor Analysis) and EFA (Exploratory Factor Analysis) were used for the construct validity of the RSPS on the same sample. This point seems to be an important limitation. For this reason, future studies may use different samples for both analyses. Second, the sample included the

students from five schools in Burdur, Denizli and İzmir. Thus, further research is needed to assess the results in different schools' and regions' samples.

#### *Implications for Practice*

As suggested in the literature (Alexander and Jetton, 2000) Grade 4 is critically important in students' schooling and reading instruction. It is also a very significant age for children in general, when they develop sound theories and perceptions of their own learning (Blumenfeld, Pintrich, Meece, & Wessels, 1982; Nicholls, 1978, 1979). Thus, research findings prove that measurement tools like the RSPS are crucial for students at 4<sup>th</sup> grade and beyond. Teachers could benefit from this instrument in order to determine each student's strengths and weaknesses regarding the reading process and could take the necessary precautions for the ones with negative perceptions, knowing that they can avoid taking risks in certain reading tasks.

#### *Implications for Further Studies*

In this study, the RSPS was tested with only the 4<sup>th</sup> and 5<sup>th</sup> grade students. Additional studies are required in order to adapt the scale to other grades of primary and secondary education. Furthermore, longitudinal studies can be conducted to inspect the changes in the 4<sup>th</sup> and 5<sup>th</sup> grade students' self-perception levels regarding the reading process. In this study, students' self-perception levels were assessed by using the self-report instruments, but these instruments might not reflect internal experiences of students in the reading process. Thus, the qualitative research, such as in-depth interviews, may be helpful in better understanding students' self-perceptions.

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## Okur Öz-Algılama Ölçeği'nin İlköğretim 4. ve 5. Sınıf Öğrencileri için Türkçeye Uyarlanması

### (Özet)

*Problem Durumu* : Okuma kişilerin gelecekteki akademik başarılarına etki eden bir beceri olduğu için özenli bir ilgiyi gerektirmektedir. Okuduğunu anlama konusunda yeterli eğitimi almamış olan öğrencilerin ilerideki yaşamlarında başarılı olmaları zor görünmektedir. Bu yüzden, okuma öğretimi çok önemli bir süreç olarak algılanmalıdır.

Öğrenmenin sadece bilişsel değil aynı zamanda duyuşsal ve sosyal bir süreç olarak algılanması Bandura'nın sosyal biliş modelinin benimsenmesiyle güç kazanmıştır. Bu modele göre bireyler sadece çevrelerinden etkilenip, çevrelerini etkilemekte kalmaz; aynı zamanda öz farkındalıkları ölçüsünde duygu, düşünce ve davranışlarını düzenleyebilir ve bunları yönetebilirler. Öğrencinin bilgiyi işleyen ve kendini düzenleyebilen aktif bir aktör olarak kavramsallaştırılması, onun kendi performansına ilişkin öz yeterlik inançlarıyla doğrudan ilişkilidir. Bu nedenle, *algılanan öz-yeterlik*, yani kişinin kendi öğrenme performansı ve yeteneğine ilişkin yargıları ve inançları, öğrenme sürecine etki eden bir gerçeklik olarak görülmektedir. Araştırmalar okumaya karşı olumlu tutuma sahip olan öğrencilerin daha çok ve daha yoğun okuduklarını ve okumaya daha eğilimli olduklarını göstermektedir. Öğrencinin öz-yeterlik inançlarının okuma eğitimindeki önemi, bu inançların ölçülmesini, öz-yeterlik algı ve inançlarının ölçülmesinin zorluğu ise güvenilir ölçüm araçlarına olan gereksinimi artırmıştır. Bunun sonucunda, bazı ölçek geliştirme çabaları ortaya çıkmıştır. Bunlardan biri de Henk ve Melnick tarafından geliştirilen Okur Öz-algılama Ölçeği'dir ve ölçek Bandura'nın öz-yeterlikle ilgili kuramsal açıklamaları üzerine temellendirilmiştir. Bandura'nın öz-yeterlik modeli dikkate alındığında, okuma etkinliği ile ilgili olarak öğrencilerin geçmiş ve şimdiki performanslarının, gözleme dayalı karşılaştırmalarının, aldıklarını düşündükleri sosyal dönütün ve fizyolojik durumların dört önemli faktör olarak dikkate alınması gerekliliği ortaya çıkmaktadır. Yani okurlar kendi okumalarıyla ilgili yargıya varırken, okuma ile ilgili öz-yeterlik inançlarını ve yargılarını besleyen bu dört faktör temelinde düşünürler. Henk ve Melnick bu dört alt-ölçeğin birlikte, öğrencinin okumaya ilişkin öz-algılamasını oluşturduğuna dikkat çekmektedir. Onlara göre ölçek, öğrencilerin okumaya ilişkin öz-algılarının belirlenmesi amacıyla hem bireysel hem de gruba uygulanabileceği gibi, okuma açısından riskte olan öğrencilerin belirlenmesinde de kullanılabilir.

*Araştırmanın Amacı* : Ülkemizde de son yıllarda ivme kazanan bireysel farklılıkları anlamaya yönelik eğitim anlayışı; hem araştırma hem de öğretmenlerin öğrencileri tanımalarına yardımcı olacak ölçme araçlarına yönelik gereksinimi artırmıştır. Ülkemizde okur öz-algılarını değerlendiren bir ölçme aracının olmaması alan yazınında bir boşluk oluşturmaktadır. Yapılan araştırmalar ilköğretim 4. sınıf ve sonrasındaki öğrencilerin karmaşık metinlerle karşılaştıklarını ve bu yaşlardan itibaren kendi öğrenmeleri konusunda kuramlar ve algılar geliştirdiklerini göstermiştir. Bununla birlikte,

öğrencilerin okumaya yönelik öz-algılamalarının güdülenmeleri açısından önemli olduğu dikkate alındığında, 4. ve 5. sınıf öğrencilerinin okuma etkinliğine ilişkin öz-algılama düzeylerini belirleyebilecek ölçme araçlarına gereksinim duyulacağı açıktır. Dolayısıyla bu araştırmanın amacı, ülkemiz alan yazınındaki konu ile ilgili boşluğun doldurulmasına katkı sağlamak, Okur Öz-Algılama Ölçeği'ni 4. ve 5. sınıf öğrencileri için Türkçeye uyarlayarak geçerlik ve güvenilirlik çalışmasını yapmaktır.

*Araştırmanın Yöntemi* : Araştırmada, geçerlik çalışmaları kapsamında açıklayıcı, doğrulayıcı faktör analizi ve ölçüt bağıntılı geçerlik; güvenilirlik kapsamında ise iç tutarlık ve test-tekrar test analizleri yapılmıştır. Araştırmaya Burdur (96 öğrenci), Denizli (203 öğrenci) ve İzmir (330 öğrenci) illerinde yer alan 5 ilköğretim okulunun 4. ve 5. sınıflarından toplam 629 öğrenci katılmıştır. Bu öğrencilerden 203'ü il merkezi, 220'si ilçe merkezi, 206'sı ise belde ve köy okullarında öğrenim görmektedirler. Bu yerleşim yeri çeşitliliği, ölçeğin İngilizce özgün halinin geliştirmesinde dikkate alınan yerleşim yeri çeşitliliğinden kaynaklanmaktadır. Toplam katılımcı öğrencilerin 316'sı kız, 313'ü ise erkektir ve 303'ü 4. sınıf ve 326'sı 5. sınıf öğrencisidir. Katılımcı öğrencilerin yaşları 9 ila 12 arasındadır.

*Araştırmanın Bulguları* : Okur Öz-Algılama Ölçeği'nin uyarlaması 629 katılımcıdan elde edilen veriler ışığında yapılmıştır. Faktör analizi yapılmadan önce maddeler arasında kısmi korelasyonların ve korelasyon matrisinin faktör analizi için uygun olup olmadığı Kaiser-Meyer-Olkin (KMO) katsayısı ve Barlett testi ile incelenmiştir. Birinci madde hazırlık maddesi olduğu için özgün çalışmaya benzer şekilde analizlere alınmamış, kalan 32 madde üzerinden analizler yapılmıştır. Yapılan analizlerde, 32 maddenin faktör analizi için Keiser Meyer Olkin değerinin .92 olduğu görülmüştür. Benzer şekilde 32 maddenin Barlett testi sonucu, [ $\chi^2= 7105.352$ ,  $df=496$ ,  $p <.000$ ] olarak bulunmuştur.

Ölçeğin yapı geçerliğini ve faktör yapısını incelemek amacıyla açıklayıcı (Exploratory) faktör analizi, faktörleştirme tekniği olarak da temel bileşenler analizi seçilmiş, Kaiser normalleştirilmesine göre özdeğeri (eigenvalue) 1'in üzerinde olan faktörler ölçüt alınmıştır. Ek olarak, doğrulayıcı faktör analizi yapılmış ölçeğin dört ve beş faktörlü yapıları test edilmiştir. Analizler ölçeğin beş boyutlu modelinin ülkemizde kullanılması için psikometrik destek sağlamıştır. Faktör analizleri ölçeğin 31 madde ve beş boyuttan oluştuğunu doğrulamıştır. Analizler sonucunda, Henk ve Melnick tarafından geliştirilen ölçekte yer alan 5. madde zayıf faktör yüküne bağlı olarak, 14. madde ise Türkçe adaptasyonunda orijinalinden farklı olarak Faktör 1'e yüklendiği için ölçekten çıkarılmışlardır. Sonuçlar ayrıca, ölçeğin oldukça yüksek sayılabilecek bir iç tutarlık ve kabul edilebilir test-tekrar test güvenilirlik katsayısına sahip olduğunu göstermektedir. Ölçeğin iç tutarlılığı ile ilgili analiz sonuçları, ölçeğin orijinal iç tutarlık çalışmalarına benzer sonuçlar vermiştir. Okur Öz-Algılama Ölçeği'nin ölçüt bağıntılı geçerliği ile ilgili analiz sonuçları beklenen yönde, Okumaya Yönelik Tutum Ölçeği ile pozitif yönde ilişkili olduğunu göstermiştir. Bunlardan başka, grup farklılıklarını anlamak için yapılan veri analizi sonucunda, 4. ve 5. sınıf kız öğ-

rencilerinin genel anlamda erkeklere göre daha yüksek öz-algılama düzeyine sahip oldukları bulunmuştur.

*Araştırmanın Sonuçları ve Önerileri* : Bu çalışmayla Türkçeye uyarlanan Okur Öz-Algılama Ölçeği ile ilgili araştırma sonuçları araştırmanın sınırlılıkları göz önüne alınarak değerlendirilmelidir. Bu ölçek gerek araştırmacılar gerekse sınıf öğretmenleri ve Türkçe öğretmenleri tarafından bilimsel veri toplama ve öğrencilerin gelişimini gözleme amaçlarıyla kullanılabilir. Öğretmenler bu ölçeği kullanarak okuma becerisi için kritik bir dönemde bulunan öğrencilerinin okumaya ilişkin öz algılarını anlayabilirler. Ayrıca olumsuz algılama sahibi öğrencilerin okumaktan kaçınacaklarını bilerek ve cinsiyet faktörünü dikkate alarak gerekli önlemleri geç olmadan alabilirler.

**Anahtar Sözcükler:** Okuma, öz-algılama, geçerlik, güvenilirlik

## Pre-service English Teachers' Views of Teacher and Student Responsibilities in the Foreign Language Classroom

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### Abstract

*Problem Statement:* Research in learner autonomy suggests that the concept of autonomous learning is perceived differently in different cultural and educational contexts. Therefore, before making any attempt to promote learner autonomy in a particular educational environment, it is important to investigate how ready students and their teachers appear to be to take on the autonomous learning conditions. A number of studies on learners' and teachers' readiness for learner autonomy were conducted in different language learning contexts. However, in the world in general, and in Turkey in particular, there is a need for the studies conducted on future language teachers' readiness for learner autonomy.

*Purpose of the Study:* Aiming to bridge the gap in the literature, the purpose of this study was to explore Turkish pre-service English teachers' perceptions, attitudes, and opinions related to learner autonomy. It was hoped that such a study would provide guidance for English teacher education programs in terms of training future teachers of English in a better way to promote learner autonomy in their classes.

*Methods:* The participants were 179 pre-service English teachers from the English Language Teaching Department of a public university in Turkey. A mixed-method path was followed by combining quantitative and qualitative research techniques. Quantitative data was analyzed by using descriptive statistics and Kolmogorov-Smirnov test for two independent samples. Qualitative data was analyzed by using the techniques of recording, transcribing, coding, and categorizing.

*Results:* Results of the study indicated that the participants have the notion of a shared responsibility for making progress during lessons, stimulating interest and identifying weaknesses in English, making students work harder, and evaluating learning and the course; they give more

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responsibility to the teacher in deciding the course objectives, deciding what to learn next, choosing activities and materials, and deciding how long to spend on each activity. They also give more responsibility to students for outside class learning activities.

*Conclusions and Recommendations:* Results of this study revealed that future English language teachers in Turkey are ready to promote learner autonomy in their classes by sharing some responsibilities of the language learning process with their students. However, in terms of better preparing those future teachers to create more effective autonomous learning environments, there still seem to be some weak points in the English teacher education curricula that need to be addressed by teacher trainers.

**Keywords:** learner autonomy, teacher training, foreign language education, pre-service teachers, teacher and student responsibilities

Major innovations in language teaching theory and methodology over the last 30 years have changed the roles of teachers and learners in the language classroom. Communicative language teaching and learner-centeredness are among those major innovations. They both share the idea that the learner should stand at the center of the teaching and learning process. With the development of these approaches, teachers have become less likely to dominate classroom events in contrast to traditional classrooms, and learners have started to be more involved in classroom actions (Benson & Voller, 1997; Benson, 2001).

The basic ideas of autonomy are in harmony with major innovations in language teaching theory and methodology developed over the last three or four decades. The development of discourse analysis, pragmatics, sociolinguistics, and functional approaches to grammar has supported a shift towards more communicative approaches in language teaching. The idea that language learning should be a process of learning how to communicate also launched the notion of learner-centeredness, which puts the learner rather than the teacher at the center of the process of teaching and learning. Benson (2001, p. 17) states that “communicative teaching, learner-centeredness and autonomy share a focus on the learner as the key agent in the learning process, and several prominent researchers in the field of communicative language teaching and learner-centered practice have incorporated the idea of autonomy into their work.”

The notion of ‘learner autonomy’ in language learning is generally referred to as the capacity to take control over, or responsibility for, one’s own learning; that control or responsibility may take a variety of forms in relation to different levels of the learning process (Benson, 2001). Answering the question ‘Why is autonomy desirable?’, Crabbe (1993) talks about a combination of the following three arguments: the ideological, the psychological, and the economic. The ideological argument is that the individual has the right to be free to exercise his or her own choices, and this right should be applied to learning just as it is applied to other areas of life. The psychological argument is that people learn better when they take control of their own learning because learning is more meaningful and more permanent

when the individual is in charge. Having more control in the learning process may also increase motivation, and a motivated learner is often a successful learner. And at last, the economic argument is that individuals must be able to provide for their own learning needs because society does not have enough resources to provide the level of personal instruction needed by all its members in every area of learning. Crabbe concludes by stating that the psychological argument is the most appealing of the three arguments because it is pedagogical rather than political.

Characteristics of autonomous learners stated in the literature indicate the importance and desirability of fostering learner autonomy in language teaching. Long lists related to these characteristics have been suggested by many researchers (Dickinson, 1993; Cotterall, 1995; Littlewood, 1996; Breen & Mann, 1997; Sheerin, 1997; Chan, 2001). We can summarize the common characteristics as follows:

Autonomous learners:

- ✓ set learning goals
- ✓ identify and develop learning strategies to achieve those goals
- ✓ develop study plans
- ✓ reflect on their own learning
- ✓ can work cooperatively
- ✓ select relevant resources and support
- ✓ are aware of the nature of learning
- ✓ assess their own progress

Considering the definition and importance of learner autonomy, and the characteristics of autonomous learners, one may claim that every teacher should start to foster learner autonomy as soon as possible. However, although everything seems perfect in theory, there might be some challenges in practice. Literature suggests that the concept of learner autonomy is perceived differently in different cultural contexts. That is, the culture and educational context of students and teachers affect the realization of learner autonomy (Gremmo & Riley, 1995; Littlewood, 1999; Holliday, 2003).

As the perception of autonomy changes according to different cultural conditions, before making any attempt to promote learner autonomy, we should investigate students' and teachers' readiness for learner autonomy. That is, we should shed light on how ready students and their teachers appear to be to take on the autonomous learning conditions and opportunities (Chan, 2003). Benson and Voller (1997, p. 93) state that "both learners and teachers need to know who they are, what they can expect from each other and what their respective attitudes are towards the institutional and social context of learning if autonomous learning is to work." Such an understanding of learners' and teachers' readiness for learner autonomy could provide guidance for curriculum development, material revision and adaptation, classroom practice, and teacher training (Little, 1995; Ho & Crookall, 1995; Scharle & Szabo, 2000; Chan, 2003; Koçak, 2003).

A number of studies on learners' and teachers' readiness for learner autonomy were conducted in different language learning contexts in the world (Cotterall, 1995; Cotterall, 1999; Chan, 2001; Spratt, Humphreys & Chan, 2002; Chan, Spratt & Humphreys, 2002;



Chan, 2003). In Turkey, Koçak (2003) conducted a study on university level English learners' perceptions related to learner autonomy. However, in the world in general, and in Turkey in particular, there is a need for the studies conducted on future language teachers' readiness for learner autonomy. Aiming to bridge that gap in the literature, this study focuses on future English teachers' perceptions related to learner autonomy. It is crucial to know the needs, views, and expectations of student teachers in any teacher education program (İşikoğlu, Ivrendi & Şahin, 2007; Sağ, 2008). Future language teachers' positive attitudes towards learner autonomy are important because we cannot expect them to foster learner autonomy in their future classrooms if they do not perceive autonomy as an important aspect of language learning. Thus, the purpose of this study was to explore Turkish pre-service English teachers' perceptions of autonomous learning. In order to reach that aim, future English teachers' attitudes and opinions related to teacher and learner responsibilities were investigated in this study. In other words, by investigating pre-service teachers' perceptions of teacher and learner responsibilities in the language classroom, the study aimed at understanding their views of learner autonomy as future teachers of English. In addition, the study also specifically focused on the differences between freshman and senior pre-service teachers' perceptions related to learner autonomy as future English teachers. Investigating those differences, it was hoped to gain information about whether the teacher training program provided for them would make any difference in their perceptions of learner autonomy as future teachers. The reason for choosing especially the first and fourth year students of an English teacher training program was that the first year students are future teachers who did not take any formal education about how to teach a language, whereas fourth year students can be viewed as future teachers who were educated on how to teach English. It was hoped that the information gained through this study would provide guidance for teacher training programs.

## Method

### *Participants*

The participants of this study were 179 pre-service English language teachers from the English Language Teaching Department of a public university in Turkey. Ninety of the participants were studying in their first year in the program whereas 89 of the participants were studying in their fourth year. English language teacher education programs in Turkey provide learners with a four-year curriculum. The first year of the program focuses on students sharpening their English language skills and grammar knowledge. First year students take reading, listening, speaking, writing, and grammar courses. The first year of the program provides no courses related to teaching English as a foreign language. Starting from the second year of the program, students take methodology courses which specifically focus on how to teach English.

### *Research Instruments*

This study followed a mixed-method path by combining quantitative and qualitative data collection and analysis methods. Mixed-method was preferred in order to have an in-depth understanding of the data collected. The data for the study came from the following two sources: a structured questionnaire and follow-up interviews based on the

data collected through the questionnaire. The questionnaire used in the study was adapted from Chan, Spratt and Humphreys (2002), who developed the original questionnaire to investigate language learners' readiness for learner autonomy in Hong Kong. The adapted questionnaire consisted of 13 items which asked participants to report on their perceptions of teacher and student responsibilities in the language learning process. Benson (2001) defines learner autonomy as the capacity to take control over, or responsibility for, one's own learning. According to Holec (1985), responsibility operates in five main areas that are vital to the practice of learner autonomy. These areas are: (a) defining objectives; (b) defining contents; (c) defining materials and techniques; (d) defining the place/time and pace of learning; and, (e) evaluating what has been learned. Items in the questionnaire focus on those five main areas, and ask pre-service teachers to put themselves into in-service teacher shoes and report how much responsibility they give to themselves, as teachers, and their students for certain aspects of language learning on a scale ranging from 1 (not at all) to 5 (completely).

In order to ensure the validity of the adapted questionnaire for Turkish context, the first draft of the questionnaire was given to ten experts who work as professors and associate professors in teacher education programs in Turkey. These experts were requested to evaluate the questionnaire in terms of content validity, face validity, and clarity of the items. Taking their evaluations and suggestions into consideration, the first draft of the questionnaire was revised and necessary changes were made. After the revision procedure was completed, the questionnaire was piloted to a group of 60 first and fourth year pre-service English teachers to foresee the possible problems that may occur in the administration process. The data collected through the pilot study was also used for testing the internal reliability of the instrument. *Cronbach's alpha* coefficient was calculated and found to be .89, which indicates a high internal consistency.

In order to support the quantitative data with the qualitative data, follow up interview sessions were conducted after the data analysis sessions for the questionnaires were completed. Interviews were conducted with 50 volunteer participants. During the sessions, each interviewee was reminded of his/her answers referring to the questionnaire he/she answered, and then he/she was asked for the reasons of giving those answers.

#### ***Data Collection and Analysis***

The questionnaire data was collected in pre-service teachers' classroom settings. Interview data was collected in a quiet room during pre-arranged time slots. Before administering the questionnaire and conducting interviews, the participants were informed about the purpose of the study and they were guaranteed that the results of the study would not affect their grades.

As for the data analysis purposes, descriptive statistics (frequencies and percentages) were first calculated. In addition to descriptive statistics, Kolmogorov-Smirnov two-independent-samples test was applied to each question in order to see whether there is a significant relationship between the participants' year of study in the program and their answers to each question. In other words, by applying Kolmogorov-Smirnov test, it was aimed to investigate whether being a first or fourth year student in the teacher education program affected the answers given to each question. As for the

qualitative data, all the interview sessions were tape recorded, and then the recordings were transcribed. Transcriptions were read, re-read, and categorized in order to support and better understand the data coming from the questionnaire.

## Results and Discussion

### *First Year Pre-service Teachers' Perceptions of Responsibility*

In the questionnaire, participants were asked how much responsibility they give to themselves, as teachers, and their students for certain aspects of language teaching. Table 1 presents the percentages of answers related to each question. To aid interpretation, the 'not at all' and 'a little' categories, and 'mainly' and 'completely' categories have been combined in the table. As the table indicates, a great majority of the students reported that as teachers they have 'mainly / completely' responsibility for eleven out of thirteen items (Items 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12). The percentage for the 'mainly/completely' category of these items are all above 50%, which means that a majority of the students think that the teacher has great responsibility

**Table 1**

*First Year Participants' Perceptions of Teacher and Student Responsibilities - % of Respondents*

When you teach English, whose responsibility should it be to:	teacher responsibilities			student responsibilities		
	1/2	3	4/5	1/2	3	4/5
1. Make sure students make progress during lessons	-	6.7	<b>93.3</b>	8	31	<b>61</b>
2. Make sure students make progress outside of class	14.8	<b>50</b>	35.2	2.3	7.9	<b>89.8</b>
3. Stimulate students' interest in learning English	-	2.2	<b>97.8</b>	14.8	33	<b>52.2</b>
4. Identify students' weaknesses in English	-	5.6	<b>94.4</b>	15.9	40.9	<b>43.2</b>
5. Make students work harder	2.2	19.1	<b>78.7</b>	4.5	28.4	<b>67.1</b>
6. Decide the objectives of the course	3.4	9	<b>87.6</b>	29.5	<b>37.5</b>	33
7. Decide what students should learn next in the course	1.1	3.4	<b>95.5</b>	<b>42</b>	30.7	27.3
8. Choose what activities to use to learn English in the course	1.1	6.8	<b>92.1</b>	34.1	<b>38.6</b>	27.3
9. Decide how long to spend on each activity	-	6.7	<b>93.3</b>	<b>40.5</b>	39.3	20.2
10. Choose what materials to use to learn English in the course	1.1	4.5	<b>94.4</b>	<b>39.8</b>	36.3	23.9
11. Evaluate learning	1.1	4.5	<b>94.4</b>	25	29.5	<b>45.5</b>
12. Evaluate the course	1.1	7.9	<b>91</b>	28.4	33	<b>38.6</b>
13. Decide what students learn outside of class	36	<b>37.1</b>	26.9	9.1	14.8	<b>76.1</b>

N = 90; 1 = not at all, 2 = a little, 3 = some, 4 = mainly, 5 = completely

for these items. The only items that participants did not take 'mainly/completely' responsibility as teachers are item 2 (making sure students make progress outside of class) and item 13 (deciding what to learn outside of class). This means that, putting themselves into the teacher's shoes, participants take great responsibility for all the in-class activities and procedures, but they do not think that they have great responsibility for outside class activities. However, when we look at the participants' perceptions of student responsibilities for the items in the questionnaire, we see that we should be talking about a notion of shared responsibility for six of eleven items for which the participants gave themselves, as teachers, 'mainly/completely' responsibility. In other words, for items 1, 3, 4, 5, 11 and 12, most of the participants reported that although the teacher has 'mainly/completely' responsibility, the student has 'mainly/completely' responsibility, too. For example, for making students work harder (item 5), 78.7% of the respondents reported 'mainly/completely' responsibility for themselves as teachers; similarly, for the same item, 67.1% of the respondents reported 'mainly/completely' responsibility for their students. This means that the participants have the notion of shared responsibility for this item, and the same argument can be made for other five items (1, 3, 4, 11, and 12).

Interviews supported the idea that for these six items respondents generally think of shared responsibility. For example, for item 11 (evaluating learning), one participant stated the following:

*It (evaluation) is the teacher's responsibility because he must see whether the students learned something or not. However, the student must make his own evaluation as well. She/he can think 'Today I went to school, what did I learn?' or 'Did it work? Will I use it, or not?' I think they (students) should do this by using their own evaluation.*

On the other hand, for items 6, 7, 8, 9 and 10 respondents gave high responsibility to teachers, but not to students. For example, for item 7 (deciding what to learn next), 95.5% of the respondents stated that it is 'mainly/completely' the teacher's responsibility to decide what to learn next in the English lesson, and for the same item, 42% (the highest percentage) of the respondents stated that students have 'not at all/a little' responsibility for deciding what to learn next. Interviews revealed that the reason for respondents taking more responsibility for these items as teachers is that all of these items involve methodological and technical aspects of learning, and students cannot operate well in these methodological aspects. In the following example, the participant was asked why he gives more responsibility to himself, as a teacher, in item 7 (deciding what to learn next), the following is his answer:

*Because, as teachers, we have more knowledge than they have. We were educated for this. We can decide what they learn better at that age. It is harder for them to decide what is good or what is bad.*

Finally, items 2 and 13 are both related to outside class learning. Majority of the participants think that students have 'mainly/completely' responsibility for these items. When they were asked for their reasons in the interviews, they generally

stated that it is not possible for teachers to control what is going on outside the classroom.

To summarize, results presented in Table 1 can be clustered into three main categories. First of all, first year pre-service English teachers think that students and teachers share the responsibility for the situations which are not completely related to methodological or technical aspects of learning such as stimulating students' interest in learning English. Secondly, they think that teachers have more responsibility than students for the situations which involve methodological or technical decisions such as choosing what materials to use in the course. Third, they think that students have more responsibility than teachers for the situations related to outside class learning activities.

#### *Fourth Year Pre-service Teachers' Perceptions of Responsibility*

Table 2 presents the results for the fourth year pre-service teachers' perceptions of teacher and student responsibilities in the language learning process. For items 1, 3, 4, 5, 11 and 12, a majority of the respondents stated that both themselves, as teachers, and their learners have high responsibility. For example, for item 12 (evaluating the course), 86.9% of the participants said that it is 'mainly/completely' their own responsibility to evaluate the course they are teaching; and, for the same item, 66.7% of the respondents said that it is 'mainly/completely' their students' responsibility to evaluate the course. Then we can say that they have the notion of shared responsibility for evaluating the course. In the interviews, participants stated that the teacher and students complement each other in course evaluation and that is the reason why they have the notion of shared responsibility for these items.

For items 6, 7, 8, 9 and 10, respondents reported that they give more responsibility to themselves as teachers than they give to their students. For example, for item 6 (deciding the objectives of the English lesson), 89.3% of the respondents stated that it is 'mainly/completely' the teacher's responsibility to decide the objectives of the English lesson. For the same item, 45.4% (the highest percentage) of the respondents stated that students have 'some' responsibility for deciding the objectives.

**Table 2**

*Fourth Year Participants' Perceptions of Teacher and Student Responsibilities - % of Respondents*

When you teach English, whose responsibility should it be to:	teacher responsibilities			student responsibilities		
	1/2	3	4/5	1/2	3	4/5
1. Make sure students make progress during lessons	-	13.1	<b>86.9</b>	4.8	27.3	<b>67.9</b>
2. Make sure students make progress outside of class	15.5	<b>45.2</b>	39.3	1.2	10.7	<b>88.1</b>
3. Stimulate students' interest in learning English	1.1	6	<b>92.9</b>	8.3	41.7	<b>50</b>
4. Identify students' weaknesses in English	2.4	8.3	<b>89.3</b>	8.3	32.2	<b>59.5</b>
5. Make students work harder	4.8	26.2	<b>69</b>	7.2	19	<b>73.8</b>
6. Decide the objectives of the course	-	10.7	<b>89.3</b>	27.3	<b>45.4</b>	27.3
7. Decide what students should learn next in the course	-	3.6	<b>96.4</b>	29.7	<b>41.7</b>	28.6
8. Choose what activities to use to learn English in the course	-	10.7	<b>89.3</b>	26.2	<b>40.5</b>	33.3
9. Decide how long to spend on each activity	2.4	11.9	<b>85.7</b>	33.3	<b>35.8</b>	30.9
10. Choose what materials to use to learn English in the course	1.2	9.5	<b>89.3</b>	31	<b>44</b>	25
11. Evaluate learning	-	3.6	<b>96.4</b>	16.6	27.4	<b>56</b>
12. Evaluate the course	-	13.1	<b>86.9</b>	6	27.3	<b>66.7</b>
13. Decide what students learn outside of class	19.1	<b>52.4</b>	29.5	3.6	11.9	<b>84.5</b>

N = 89; 1 = not at all, 2 = a little, 3 = some, 4 = mainly, 5 = completely

All the items that participants took more responsibility to themselves, as teachers, are again related to the methodological aspect of learning such as deciding the objectives or choosing activities and materials. The interviews revealed that the participants generally think that these aspects of learning require professional knowledge, and that is the reason why teachers should be more responsible for these aspects of learning. The following is an answer when given the question, "Why did you take more responsibility to yourself in item 6 (deciding the objectives), item 8 (choosing activities), and item 10 (choosing materials)?"

*Because they are more technical subjects. For example, when I first came to the university I was wondering how the teachers teach something. But I saw that everything has its own technique. How we introduce, how we prepare students to the topic, how we arrange activities ... These are all the things that a teacher knows. I think here the teacher has greater responsibility. The student cannot define objectives, or choose activities because he always thinks individually.*

When we look at the items that the participants gave greater responsibility to students, we see that the fourth year pre-service English teachers think that students have more responsibility for making sure that they make progress outside of class, and for deciding what to learn outside of class. When they were asked for their rea-

sons during the interviews, they said that as teachers they cannot give enough time and equal interest to all students outside the classroom. They cannot control what they are doing; therefore, students have greater responsibility in outside class activities. Following is an example:

(Outside the classroom) *They should be responsible for their own learning because we cannot be with all of them. It is too difficult for us to control what they are doing outside the classroom. We have more than one student. They should be aware of this, and they should study to improve themselves.*

To summarize, as it was in the first year pre-service teachers' answers, fourth year pre-service teachers' answers to the questionnaire can also be clustered into three categories. First, students and teachers share the responsibility for some aspects of learning such as identifying weaknesses in English. Second, teachers have more responsibility than students for the aspects of learning which require methodological knowledge such as deciding on how long to spend on each activity. Third, students have more responsibility than teachers for outside class learning.

#### ***Comparison of the First and Fourth Year Pre-service Teachers' Perceptions of Responsibility***

Comparison of the results presented in Table 1 and Table 2 shows that the fourth year pre-service teachers reported shared responsibility for all the items that the first year pre-service teachers reported shared responsibility (1, 3, 4, 5, 11, and 12). Moreover, there is consistency between first and fourth year pre-service teachers' answers in terms of taking more responsibility as teachers. Items 6, 7, 8, 9, and 10 were reported by both first year and fourth year pre-service teachers as the items that they have more responsibility as teachers. This consistency does not change for the items for which the participants gave more responsibility to students than the teacher (2 and 13).

Supporting this consistency, results of the Kolmogorov-Smirnov two-independent-samples tests applied to each item in the questionnaire indicated that, except for only one question, there is no significant relationship between the participants' year in the teacher education program and their perceptions of teacher and student responsibilities in the language learning process. In other words, Kolmogorov-Smirnov test results revealed that being a first or fourth year student in the English teacher education program did not make any difference in terms of answers given to the questions in the questionnaire, except for the student responsibility part of one question. Table 3 presents the Kolmogorov-Smirnov test statistics and *p* values for each question in the questionnaire. As the table indicates, the only significant difference between first and fourth year pre-service teachers' perceptions of responsibilities was in the student responsibilities part of item 12 (evaluating the course). For this item, as Tables 1 and 2 show, as compared to 66.7% of the fourth year participants, only 38.6% of the first year participants said that it is 'mainly/completely' the student's responsibility. For all the other items, Kolmogorov-Smirnov tests indicated non-significant differences.

To conclude, results of the study indicated that there are no differences between first and fourth year pre-service English teachers' perceptions of teacher and student responsibilities in the language learning process. This is important because first year

pre-service teachers participated in this study had not taken any methodology courses about how to teach English, whereas fourth year pre-service teachers had already taken numerous methodology courses and were about to graduate and start working as English teachers in the Turkish public school system. Although all the participants reported that they are ready to share some responsibilities with their students, in ideal conditions we would expect to find fourth year pre-service teachers to be more ready to share their responsibilities than the first year pre-service teachers because they should have been taught that promoting learner autonomy involves training students to share even the methodological and technical responsibilities with them. However, results of this study indicated that the teacher training program provided to these pre-service teachers did not make any difference in their perceptions of teacher and student responsibilities in language learning.

**Table 3**

*Comparison of First and Fourth Year Pre-service Teachers' Perceptions of Student and Teacher Responsibilities*

Question	Teacher Responsibilities		Student Responsibilities	
	Kolm. - Smir.	<i>p</i>	Kolm. - Smir.	<i>P</i>
1	0,711	0,692 > 0,05	0,454	0,986 > 0,05
2	0,266	1,00 > 0,05	0,110	1,00 > 0,05
3	0,397	0,997 > 0,05	0,500	0,964 > 0,05
4	0,359	1,00 > 0,05	1,071	0,201 > 0,05
5	0,631	0,820 > 0,05	0,443	0,989 > 0,05
6	0,737	0,649 > 0,05	0,365	0,999 > 0,05
7	0,936	0,344 > 0,05	0,805	0,536 > 0,05
8	0,287	1,00 > 0,05	0,518	0,951 > 0,05
9	0,496	0,966 > 0,05	0,705	0,703 > 0,05
10	0,883	0,416 > 0,05	0,720	0,678 > 0,05
11	0,642	0,804 > 0,05	0,688	0,731 > 0,05
12	0,263	1,00 > 0,05	1,838	0,002 < 0,05
13	0,521	0,949 > 0,05	0,550	0,923 > 0,05

### Conclusions and Recommendations

The purpose of this study was to explore Turkish pre-service English teachers' perceptions related to learner autonomy. More specifically, in order to better understand their ideas and attitudes about learner autonomy, this study focused on pre-service English teachers' opinions regarding teacher and student responsibilities in the language learning process. Of the first and fourth year students from an English



teacher education program of a Turkish public university, 179 participated in the study. First and fourth year students were specifically selected for this study in order to investigate the effects of the teacher education program in terms of perceptions related to learner autonomy.

Results of the study indicated that both the first year and the fourth year pre-service teachers reported that they have the notion of shared responsibility for making progress during lessons, stimulating interest and identifying weaknesses in English, making students work harder, and evaluating learning and the course; they give more responsibility to the teacher in deciding the course objectives, deciding what to learn next, choosing activities and materials, and deciding how long to spend on each activity. They give more responsibility to students for outside class learning activities. Based on these results, we can conclude that future English teachers in Turkey are ready to promote learner autonomy in their classes by sharing some of their responsibilities with their students. However, they are still reluctant to share some responsibilities which involve technical and methodological decisions. Teacher education programs in Turkey should help future English teachers to understand that the ultimate realization of learner autonomy involves gradually increasing the degree of learner autonomy by training language learners to share highest levels of responsibilities with the teacher (Nunan, 1995).

Results of the study also indicated that there are not any big differences between first and fourth year pre-service English teachers' perceptions related to learner autonomy. Aspects of learning which participants give more responsibility to teachers, aspects which they give more responsibility to students, and aspects which they have the notion of shared responsibility are almost the same for the first and fourth year participants of the study. Statistical analysis of the data supports this as well. Then, we can conclude that the English teacher education program provided to these participants was not effective enough to change their opinions, attitudes, and perceptions about learner autonomy. Especially the similarity in the cases which both parties give greater responsibility to teachers is important. All these cases are about the methodological aspect of learning such as defining objectives, deciding on material and activities, deciding what to learn, and deciding how long to spend for specific activities. If the results had indicated that the fourth year students had the notion of shared responsibility for these methodological aspects, then we would have been able to say that the teacher education program they received had changed their views. However, as there is not such a difference, we can conclude that learning how to teach English did not change those future English teachers' perceptions of teacher and student responsibilities. The main reason for this might be that the participants of the study did not experience autonomy themselves in their teacher education program. As Kumaravadivelu (2001, p.548) indicates, "Autonomous learners deserve autonomous teachers." That is, if we want the future teachers to promote learner autonomy in their own classrooms, we should help them experience autonomy and become more autonomous in their own teacher education process. In addition, teacher educators can design specific courses which focus on promoting learner autonomy in the language classroom. With the help of such courses, pre-service teachers might become more aware of the benefits of autonomous learning.

In this study, the data was collected from pre-service teachers only. A further study can be designed to collect data from both pre-service teachers and teacher educators. By comparing the data collected from the trainees and the trainers, it might be possible to better understand the gaps between what teacher trainers want to teach related to learner autonomy and what the trainees take. Implications of such a study might be quite beneficial to language teacher training programs. In addition, a further study can be carried out to investigate the differences related to perception of learner autonomy between the English teachers currently working in the Turkish education system and the English teacher candidates in the teacher education programs. In this way, we might be able to see what job experience changes in the teachers' perceptions of learner autonomy. Furthermore, if the results indicate such a need, in-service teacher training programs can be provided to the teachers in the system.

Learner autonomy is a crucial aspect of language learning. Results of this study revealed that future English language teachers in Turkey are ready to promote learner autonomy in their classes by sharing some responsibilities of the language learning process with their students. However, in terms of better preparing those future teachers to create more effective autonomous learning environments, there still seem to be some weak points in the English teacher education curricula that need to be addressed by teacher trainers.

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## İngilizce Öğretmen Adaylarının Yabancı Dil Sınıfındaki Öğrenci ve Öğretmen Sorumlulukları İle İlgili Görüşleri

### (Özet)

*Problem Durumu* : Yabancı dil eğitiminde son otuz yılda gittikçe daha fazla popüler hale gelen öğrenci merkezli eğitim ve iletişimsel öğrenme metodları, yabancı dil sınıfındaki öğrenci ve öğretmen rollerinin de değişmesine neden olmuştur. Günümüz yabancı dil eğitim sınıflarındaki ideal öğrenme öğretme ortamı hem öğrencilerin dil öğrenim sürecinde daha aktif roller almasını hem de öğretmenlerin geleneksel yabancı dil sınıflarındakinden daha az baskın olmalarını tavsiye etmektedir. Öğrencilerin dil öğrenme sürecinde daha aktif ve daha sorumlu davranmalarının öğrenmeyi olumlu yönde etkileyeceği savına dayanan otonom öğrenme kavramı tam da bu aşamada ortaya çıkarak son dönemdeki yabancı dil öğrenme öğretme ortamlarını önemli bir ölçüde etkilemiştir. Fakat, otonom öğrenme ile ilgili yapılan teorik ve uygulamalı çalışmalar farklı kültür ve eğitim öğretim ortamlarında bu kavramın farklı algılandığını işaret etmektedir. Bu sebeple, herhangi bir eğitim öğretim ortamında otonom öğrenmeyi teşvik edici aktivitelerin uygulanmaya başlanmasından önce bu ortamdaki öğrenci ve öğretmenlerin otonom öğrenmeye hazır bulunuşluk düzeylerini araştırmak önemlidir. Bu tür çalışmalar farklı ülkelerdeki farklı eğitim öğretim ortamlarındaki öğrenci ve öğretmenlerle yapılmıştır. Diğer taraftan, gerek dünyada gerekse Türkiye’de geleceğin öğretmen adaylarının otonom öğrenmeyle ilgili tutum ve algılarını araştıran çalışmalara ihtiyaç vardır. Öğretmen adaylarıyla yapılacak bu tür çalışmalardan elde edilecek bulgular öğretmen eğitimi programlarına yansıtılarak geleceğin yabancı dil sınıflarının otonom öğrenme açısından daha etkili ve başarılı olması sağlanabilir.

*Amaç* : Literatürdeki yukarıda bahsettiğimiz boşluğu doldurmak niyetiyle yola çıkmış olan bu çalışmanın amacı İngilizce öğretmen adaylarının otonom öğrenme ile ilgili tutum, görüş ve algılarını belirlemektir. Bu amaca ulaşmak için öğretmen adaylarının dil öğrenme sürecindeki öğretmen ve öğrenci sorumlulukları ile ilgili fikirleri araştırılmıştır. Bu ana amaca bağlı olarak irdelenen bir diğer amaç da öğretmen adaylarına verilen eğitimin otonom öğrenme ile ilgili tutum ve görüşleri ne ölçüde değiştirdiğini saptamaktır. Böyle bir saptamanın İngilizce öğretmen eğitimi programlarının geliştirilmesine yönelik faydalı bulgular sağlayacağı umut edilmiştir.

*Yöntemi* : Bu çalışmanın katılımcıları Türkiye’deki bir devlet üniversitesinin İngiliz Dili Eğitimi Anabilim Dalı’nda eğitimlerini sürdürmekte olan 179 İngilizce öğretmen adaydır. Bu 179 katılımcının 90 tanesi birinci sınıf, 89 tanesi ise dördüncü sınıf öğrencileri arasından seçilmiştir. Çalışmada birinci ve dördüncü sınıf öğrencilerini kullanmanın amacı öğretmen adaylarına verilen öğretmen eğitiminin otonom öğrenme ile ilgili tutum, görüş ve alguları ne derecede etkilediğini saptayabilmektir. Birinci sınıftaki İngilizce öğretmen adayları İngilizce eğitimi ile ilgili herhangi bir formal eğitim almamışken, dördüncü sınıftakiler aynı konuda gerekli eğitimi almış ve kısa bir süre içerisinde Türk eğitim sisteminde yerlerini alacak olan öğretmen adayları olarak kabul edilebilirler.

Çalışmada hem nitel hem de nicel araştırma yöntemleri bir arada kullanılmıştır. Nitel verilerin toplanmasında kullanılan anket araştırmacı tarafından benzer amaçlı bir çalışmada kullanılan bir anketin Türkiye'deki eğitim öğretim ortamına adapte edilmesiyle elde edilmiştir. Bu anketin Türkiye'de kullanıldığı ortam açısından geçerlilik ve güvenilirliği, uzman görüşü alınması ve Cronbach's alpha katsayısının belirlenmesi yollarıyla test edilmiştir. Anket ayrıca 60 kişiden oluşan ve ana çalışmadaki gruba benzeyen başka bir grupta ön uygulamadan geçirilmiştir. Araştırmada elde edilen nicel veriler ise mülakat yöntemi kullanılarak toplanmıştır. Mülakatlar anketlerin uygulanıp veri analizlerinin tamamlanmasından sonra 50 öğrenci ile yapılmış, mülakat sırasında öğrencilere anketteki sorulara verdikleri cevaplar hatırlatılmış ve bu cevapları ne düşünerek verdikleri sorulmuştur. Bu yöntemle, sadece anket kullanarak elde edilme imkanı olmayan kapsamlı bilgilerin toplanması amaçlanmıştır.

Anket yoluyla toplanan verilerin analizinde hem sıklık ve yüzde gibi betimsel istatistikler, hem de Kolmogorov-Smirnov iki bağımsız örneklem testi kullanılmıştır. Kolmogorov-Smirnov testi birinci ve dördüncü sınıflarda eğitimlerini sürdüren öğretmen adaylarının ankete verdikleri cevaplar arasında anlamlı bir fark olup olmadığını saptamak amacıyla kullanılmıştır. Mülakat yoluyla toplanan verilerin analizi için ise ses kaydı yapılan mülakatlar daha sonra dinlenerek kağıda geçirilmiş ve anket sorularına uygun olarak kategorilere ayrılmıştır.

*Bulgular ve Sonuçlar* : Araştırmanın sonuçlarına göre İngilizce öğretmen adayları, İngilizce dersi sırasında öğrenmenin başarılı bir biçimde gerçekleşmesi, İngilizce'ye olan ilginin artırılması, öğrencilerin İngilizce'deki eksik yönlerinin saptanması, öğrencilerin etkili bir biçimde ders çalışmalarının sağlanması, ve dersin ve öğrenmenin değerlendirilmesi alanlarında öğrenci ve öğretmenlerin sorumlulukları paylaşmaları gerektiğini düşünmektedirler. Diğer taraftan, ders amaçlarının belirlenmesi, öğrenilecek konulara karar verilmesi, aktivitelerin ve materyallerin seçilmesi, ve aktivitelere ayrılacak sürelerin belirlenmesi gibi konularda İngilizce öğretmen adayları, öğretmenin öğrenciden daha fazla sorumluluğu olması gerektiğini düşünmektedirler. Öğrencilerin öğretmenlerden daha fazla sorumluluk alması gereken alanlar ise ders dışında gerçekleştirilen İngilizce öğrenme etkinlikleri olarak öğretmen adayları tarafından belirtilmiştir. Ayrıca, birinci ve dördüncü sınıftaki İngilizce öğretmen adaylarının verdikleri cevapların karşılaştırılması sonucunda herhangi bir anlamlı fark bulunamamıştır.

*Öneriler* : Her ne kadar çalışmanın sonuçlarına göre İngilizce öğretmen adayları dil öğreniminin bazı alanlarındaki sorumluluklarını gelecekteki öğrencileriyle paylaşmaya hazır görünseler de, halen paylaşmaktan uzak durdukları sorumlulukların da olduğu anlaşılmıştır. Otonom öğrenme en ideal boyutunda düşünüldüğünde, öğrencilerin öğretmenler tarafından dil öğreniminin her alanında daha fazla sorumluluk almak üzere eğitilmesi anlamına gelmektedir. Bu açıdan bakıldığında, İngilizce öğretmeni yetiştiren programlar otonom öğrenmeye daha fazla önem vermeli, öğretmen adaylarının otonom öğrenme ile ilgili tutum, görüş ve algılarını olumlu bir yönde geliştirmek için daha fazla gayret göstermelidirler.

*Anahtar Kelimeler*: otonom öğrenme, öğretmen eğitimi, yabancı diller eğitimi, öğretmen adayları, öğrenci ve öğretmen sorumlulukları

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13	<input type="checkbox"/>	The article is preceded by English Structured Abstract of not more than 400 words and not less than 300 using five required headings: <i>Problem Statement, Purpose of Study, Methods, Findings and Results, and Conclusions and Recommendations</i> . (These headings may need some adaptation in the case of discussion papers: <i>Background, Purpose of Study, Sources of Evidence, Main Argument, and Conclusions</i> ). More information available from ( <a href="http://www.tandf.co.uk/journals/authors/reereabstracts.asp">http://www.tandf.co.uk/journals/authors/reereabstracts.asp</a> ) Yapılandırılmış İngilizce öz 300-400 sözcük uzunluğunda olup, aday makalenin başında yer almakta ve <i>Problem Durumu, Araştırmanın Amacı, Araştırmanın Yöntemi, Araştırmanın Bulguları, Araştırmanın Sonuçları ve Önerileri</i> başlıklarını içermektedir. Bu başlıklar tartışma yazıları için: <i>Çalışmanın Temeli,</i>

		<i>Çalışmanın Amacı, Kanıt Kaynakları, Ana Tartışma ve Sonuçlar</i> şeklinde olabilir. Daha fazla bilgi için <a href="http://www.tandf.co.uk/journals/authors/rereabstracts.asp">http://www.tandf.co.uk/journals/authors/rereabstracts.asp</a> adresine başvurunuz.
14	<input type="checkbox"/>	Following the structured abstract in English four to six keywords are included.  Yapılandırılmış İngilizce özden sonra 4-6 anahtar sözcüğe yer verilmiştir.
15	<input type="checkbox"/>	An extended (750-1000 words) Turkish structured abstract is placed following the "References" section using five required headings: <i>Problem Statement, Purpose of Study, Methods, Findings and Results, and Conclusions and Recommendations</i> . (These headings may need some adaptation in the case of discussion papers: <i>Background, Purpose of Study, Sources of Evidence, Main Argument, and Conclusions</i> ). More information available from <a href="http://www.tandf.co.uk/journals/authors/rereabstracts.asp">http://www.tandf.co.uk/journals/authors/rereabstracts.asp</a>  Kaynakça'dan sonra 750-1000 sözcükten oluşan Türkçe yapılandırılmış öze yer verilmiştir. Türkçe yapılandırılmış öz <i>Problem Durumu, Araştırmanın Amacı, Araştırmanın Yöntemi, Araştırmanın Bulguları, Araştırmanın Sonuçları ve Önerileri</i> başlıklarını içermektedir. Bu başlıklar tartışma yazıları için: <i>Çalışmanın Temeli, Çalışmanın Amacı, Kanıt Kaynakları, Ana Tartışma ve Sonuçlar</i> şeklinde olabilir. Daha fazla bilgi için; <a href="http://www.tandf.co.uk/journals/authors/rereabstracts.asp">http://www.tandf.co.uk/journals/authors/rereabstracts.asp</a>
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17	<input type="checkbox"/>	References are not cited in the structured abstracts in English and in Turkish.  İngilizce abstract ve Türkçe öz içerisinde atıfta bulunulmamıştır.
18	<input type="checkbox"/>	The format of headings, tables, figures, citations, references, and other details follow the APA style as described in the Publication Manual of the American Psychological Association, 5th edition, available from <a href="http://www.apa.org">http://www.apa.org</a>  Aday makalenin başlıkları, tabloları, şekilleri, atıfları, kaynakçası ve diğer özellikleri tamamen APA beşinci baskıda belirtildiği şekildedir.
19	<input type="checkbox"/>	All illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.  Aday makalenin şekilleri ve tabloları metin içerisinde bulunmaları gereken uygun yerlere yerleştirilmiştir. Makale sonunda sunulmamıştır.
20	<input type="checkbox"/>	Citations in the text of the document include the author's surname, the year of publication, and, when there is a specific quote from a source used, a page number where the quote is located in the text. Example: Nothing seemed so certain as the results of the early studies (Tatt, 2001, p. 445). It was precisely this level of apparent certainty, however, which led to a number of subsequent challenges to the techniques used to process the data (Jones & Wayne, 2002, p. 879). There were a number of fairly obvious flaws in the data: consistencies and regularities that seemed most irregular, upon close scrutiny (Aarns, 2003; West, 2003, p. 457). With studies by two authors, always include both author names: (Anderson & Bjorn, 2003) As Anderson and Bjorn (2003) illustrated in their recent study As recently as 2003, a prominent study (Anderson & Bjorn) illustrated When a study has 3, 4, or 5 authors, include the names of all the authors the first time the work is cited: (Anderson, Myers, Wilkes, & Matthews, 2003) For all subsequent citations of this work, use "et al.": (Anderson et al., 2003) When a work has 6 or more authors, use et al.: (Bell et al., 2003) For unsigned works, include the title, enclosed in parentheses. Put quotation marks for short work titles, and italicize the titles of reports, books, and other significant works: ("Recent Developments," 2004) (Dictionary of Tetrathalocigistic Diseases, 2004)  Metin içindeki atıfları üstte verilen örneklere uygundur.

21	<input type="checkbox"/>	<p>Three levels of headings are used: Level 1, Level 3 and Level 4. The headings are formatted as follows:  Centered Uppercase and Lowercase Heading (Level 1)  <i>Flush Left, Italicized, Uppercase and Lowercase Side Heading</i> (Level 3)  <i>Indented, italicized, lowercase paragraph heading ending with a period. Start writing after the period</i> (Level 4).</p> <p>Aday makale içerisinde üç farklı düzey başlık kullanılmıştır. Düzey 1, Düzey 2, Düzey 3. Başlıklar bu düzeylere uygun olarak aşağıdaki şekilde biçimlendirilmiştir:  Ortalı ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık (Düzey 1)  <i>Tam Sola Dayalı, İtalik ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık</i> (Düzey 3)  <i>İçeriden, itatik, tamamı küçük harflerle yazılmış ve nokta ile biten başlık.</i> Noktadan sonra normal metin yazımına devam edilmeli (Düzey 4).</p>
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23	<input type="checkbox"/>	<p>Order of the main parts in the manuscript is as follows:  Main title in English (max. 12 words)  Structured abstract (min. 300- max.400 words length)  Keywords (in English, min. four-max. six)  Main text  References  Main Title in Turkish (max. 12 words)  Extended structured abstract (min.750-max.1000 words length in Turkish)  Keywords (in Turkish, min. four-max. six)</p> <p>Aday makaleyi oluşturan ana ögeler aşağıdaki düzendedir:  İngilizce Ana Başlık (En fazla 12 sözcük)  Yapılandırılmış İngilizce Abstract (En az 300, en fazla 400 sözcük)  Anahtar Sözcükler (İngilizce, en az dört, en fazla altı)  Ana Metin  Kaynakça  Türkçe Ana Başlık (En fazla 12 sözcük)  Yapılandırılmış Türkçe Öz (En az 750, en fazla 1000 sözcük)  Anahtar Sözcükler (Türkçe, en az dört, en fazla altı)</p>
24	<input type="checkbox"/>	<p>The manuscript and this checklist form are submitted electronically to <a href="mailto:ejer.editor@gmail.com">ejer.editor@gmail.com</a>.  Aday makale ve bu kontrol çizelgesi elektronik olarak <a href="mailto:ejer.editor@gmail.com">ejer.editor@gmail.com</a> adresine gönderilmiştir.</p>

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