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Developing a Scale for Constructivist Learning Environment Management Skills[*]

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Abstract

Problem Statement: The success of creating a constructivist learning environment is directly related to teachers' management abilities and therefore scales that evaluate those skills are essential to the process. Given the importance of this subject, the development of scales that address all aspects of the constructivist learning environment should be an assessment priority.

Purpose of the Study: The purpose of this study is to develop a scale that will determine elementary and high school teachers' management skills within the constructivist learning environment.

Methods: The study was conducted on three different study groups composed of teachers working in elementary and high schools located in the city center of Şanlıurfa, Turkey. The groups were determined by the random sampling method. A draft scale composed of 47 items was compiled for use in this study. Exploratory factor analysis (EFA) was applied to evaluate the factor structure of the scale. Item analysis was used to evaluate the consistency of each item within the entire scale and the distinctive quality of each item. Confirmatory factor analysis (CFA) was applied to assess whether the factors obtained as a result of EFA were confirmed or not. The reliability of the scale was calculated by Cronbach's alpha coefficient for internal consistency and test-retest methods.

Findings and Results: As a result of EFA, a six-factored structure composed of 33 items, which have factor load values of .49 and above was finalized. Item analysis affirmed that each item was consistent with the entire scale and the distinctive powers of the items were at an acceptable level. CFA

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[*] Although the concept of constructivist learning environment management is also used to mean constructivist learning environment leadership, in this study, only the term constructivist learning environment management will be used. Therefore, the scale could also be named as the Scale for Constructivist Learning Environment Leadership Skills (SCLELS).

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indicated that the fit indexes had values significantly above acceptable values, which confirmed the 6-factored structure. The scale's internal consistency coefficient, which was .95, indicated high reliability.

Conclusions and Recommendations: The study results showed that this scale was an appropriate instrument to evaluate teachers' management skills within the constructivist learning environment in elementary and high schools in Turkey. A version of this scale for students can be developed to collect more detailed information about the constructivist learning environment management skills of teachers.

Keywords: Constructivism, constructivist leadership, constructivist learning environment, learning environment management, scale development

Constructivism is a contemporary theoretical approach that has recently influenced educational systems world-wide. The constructivist approach to learning was first introduced to education in England in 1989 (Pon, 2001) and became especially popular in the 2000s (Şişman, 2010). Constructivism in education is now implemented in more than 30 countries (Güneş, 2007) including the U.S., New Zealand (Matthews, 2000; Yaşar, 2005), Taiwan (Aldridge, Fraser, Taylor, & Chen, 2000; Pon, 2001), Spain, Canada (Matthews, 2000) and Turkey.

Constructivism is a learning approach that encourages the learner to construct knowledge (Brooks & Brooks, 1999; Fosnot, 2005; Henson, 2003; Koç & Demirel, 2004; Özden, 2005; Perkins, 1999). In other words, it is an educational approach that centers on the learner so that information is given meaning and structure through the establishment of a relationship between past experiences and the new information (Asan & Güneş, 2000; Şaşan, 2002; Şimşek, 2004; Tynjälä, 1999; Vermette & Foote, 2001). The constructivist approach to education has been related to teaching, cognition and information, as well as the learning process (Matthews, 2000). This is why the task of teachers who implement this approach is to create an environment and opportunities that encourage students to create meaning and construct knowledge (Brooks & Brooks, 1999, 1999a; von Glasersfeld, 1995, 2005).

A constructivist learning environment is very different from the classroom environment where traditional teaching methods are implemented (DeVries & Zan, 2005; Kaya & Tüfekçi, 2008; Yıldırım, 2009). The concept of a "learning environment" is widely used instead of the word "classroom" since the learning activity is realized both in and out of the classroom. Students' skills on a variety of levels are developed and honed within this educational environment (Güneş, 2007). Active, rather than passive, learning methods are at the core of the constructivist learning environment (Açıkgöz, 2003; Loyens & Gijbels, 2008; Yaşar, 1998). Active learning requires that students take on more responsibility for their own learning process (Saban, 2000; Schunk, 2008; Shapiro, 2002; Yager, 1991). However, teachers still need to actively manage this environment (DeVries & Zan, 2005). It is widely accepted that the

quality of education depends largely on the quality of classroom management (Başar, 1999). In a constructivist learning environment, the role of the teacher is to support students' learning process by organizing student-oriented activities (Brandon & All, 2010; Brooks & Brooks, 1999a; Yıldırım & Dönmez, 2008). It can be said that the success of such implementations in this environment is directly linked to teachers' management skills and determining the level of these skills requires development of appropriate scales.

There have been some studies regarding the development of a scale for measuring the constructivist learning environment. To assess the constructivist learning environment, Taylor and Fraser (1991) developed the Constructivist Learning Environment Survey (CLES). It consists of four dimensions: negotiation, prior knowledge, autonomy, and student centeredness. Studies have also been conducted to redevelop and update this scale (e.g., Aldridge et al., 2000; Taylor, Fraser, & Fisher, 1997). The updated version of this scale, which was prepared by Aldridge et al. (2000), was adapted into Turkish culture by Bukova-Güzel and Alkan (2005). Tenenbaum, Naidu, Jegede, and Austin (2001) devised another constructivist learning environment scale. This scale has seven dimensions: arguments, discussions, debates; conceptual conflicts and dilemmas; sharing ideas with others; materials and resources targeted toward solutions; motivation toward reflections and concept investigation; meeting students' needs; making meaning, and real-life examples. This scale was similarly adapted into Turkish culture, by Fer and Cırık (2006). Arkün and Aşkar (2010) developed yet another scale that aims to assess the constructivist learning environment through the opinions of university students. This scale has six dimensions: student centered, encouraging the student to think, cooperation, life-related, combination of teaching and assessment, and different points of view. Different scale development studies have also been conducted regarding the constructivist learning approach. For example, Karadağ (2007) developed a scale titled, "teacher efficiency in constructivist learning" by ascertaining the opinions of students of education faculty. This scale consisted of four dimensions: students, planning the instruction, the instruction process, and assessment and evaluation.

According to the literature, the developed scales are generally related to the constructivist learning approach or constructivist learning environment. These scales have been developed primarily to determine to what extent the constructivist learning approach is applied within the learning environment or the suitability of the specific learning environment to a constructivist learning approach (e.g., Aldridge et al., 2000; Arkün & Aşkar, 2010; Balım, Kesercioğlu, Evrekli, & İnel, 2009; Karadağ, 2007; Kaya, 2008; Taylor & Fraser, 1991; Tenenbaum et al., 2001). However, the present author has not encountered a scale for "teachers' constructivist learning environment management skills" that involves classroom management phases based on teachers' opinions. According to Başar (1999), learning environment or classroom management includes physical structure, plan-curriculum, time management, relationship management, and behavioral management. Management of the constructivist learning environment is also composed of many dimensions (Güneş, 2007; Yıldırım & Dönmez, 2008), so a need has emerged to develop a scale that covers

these dimensions. This is why the developing of "the Scale for Constructivist Learning Environment Management Skills (SCLEMS)" offers a useful contribution to the field. The purpose of this study is to develop a scale that can be used to determine the constructivist learning environment management skills of elementary and high school teachers.

Method

The current study aimed to develop a " Scale for Constructivist Learning Environment Management Skills (SCLEMS).

Research Sample

The study was conducted on three different study groups. EFA was applied on the first group. This group consisted of 316 teachers who were chosen by a random sampling method among teachers working in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 186 (59%) were male and 130 (41%) were female. The number of participants working in elementary schools was 212 (67%) while 104 (33%) worked in high schools.

CFA was applied on the second study group. This group consisted of 317 teachers chosen by a random sampling method among teachers working in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 167 (53%) were male and 150 (47%) were female. The number of participants working in elementary schools was 209 (66%) while 108 (34%) worked in high schools.

The third study group was selected for a reliability analysis of the test-retest. This group consisted of 50 teachers who worked in an elementary school located in the city center of Şanlıurfa during the 2010-2011 academic year. Of these teachers 26 (52%) were male and 24 (48%) were female. The final version of the scale was applied on this study group twice at a four-week interval.

Research Instrument and Procedure

The following procedures were performed in order to develop the draft scale: *(i)* Studies and scales concerning the constructivist learning environment were examined (Aldridge et al., 2000; Aydın, 2007; Brooks & Brooks, 1999; Fosnot, 2005a; Güneş, 2007; Karadağ & Korkmaz, 2007; Kaya, 2008; Lambert, et al., 2002; Özden, 2005; Tenenbaum et al., 2001; Yıldırım, 2009; Yıldırım & Dönmez, 2008). *(ii)* Interviews were conducted with three teachers and two education supervisors regarding teachers' management skills within the constructivist learning environment. *(iii)* Then a draft scale was developed with 44 items, which was consistent with a 5-point Likert type (Never, Rarely, Sometimes, Mostly, Always). Constructivist learning environment management processes were taken into account while determining the items in the draft scale. These processes consisted of such activities as organizing the learning environment, teaching and learning, communication and interaction, time usage, assessment (Güneş, 2007; Yıldırım & Dönmez, 2008), and improving skills (Güneş, 2007; Yıldırım, 2009). *(iv)* One expert from the Turkish Language and Literature Department and one expert from the statistics field were asked their opinions on the conformity of items for the draft scale in terms of language and expression. The opinions of an education supervisor, four experts from the educational administration and supervision field, and the opinions

of two lecturers from the educational programs field were consulted for the content validity of the items (Tavşancıl, 2010). Expert opinions revealed that three items in the draft scale were appropriate for measuring two different skills each. The number of items then rose to 47 as these three items were rewritten as six separate items. *(v)* The content validity ratio (CVR) of each item was analyzed using Lawshe's technique based on the expert opinions. In the analysis, it was found that all the items in the draft scale fulfilled the .99 minimum standard of the CVR values (Lawshe, 1975). Accordingly, all the items were included in the draft scale form.

Data Analysis

The data were analyzed using SPSS and LISREL. *(i)* EFA was applied in order to evaluate the structural validity and factor structure of the scale. The consistency of the data with EFA was determined by using Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. Principal Component Analysis was performed for EFA using the Varimax rotation technique. In determining the factor number, the criterion was a minimum Eigen value of 1.00 and in choosing the items, the criterion was a minimum factor load of .32 (Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Tabachnick & Fidel, 2007). *(ii)* Item analysis was conducted for the first study group data. Initially, corrected item total correlations were examined in order to evaluate the consistency of each item with the entire scale. Then, the distinctive power of the items was examined by the independent samples *t*-test. For this equation, an item analysis technique based on the upper-lower 27% group averages difference was used (Büyüköztürk, 2003; Tavşancıl, 2010). Data was first checked to see whether it met *t*-test requirements and was found to meet them. *(iii)* CFA was used to assess whether the factors obtained as a result of EFA were confirmed or not. The criteria for assessing the conformity of the model defined are as follows (Bayram, 2010; Çokluk et al., 2010; Kline, 2005; Tabachnick & Fidel, 2007): the ratio of Chi-Square value to Degree of Freedom (χ^2/df) should be below 2, the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) should be below .05, Adjusted Goodness of Fit Index (AGFI) should be above .85, and the Comparative Fit Index (CFI) and Non-Normed Fit Index (NNFI) should be above .90. *(iv)* The scale's reliability was calculated by Cronbach's alpha coefficient for internal consistency and test-retest reliability methods (Altunışık, Coşkun, Bayraktaroğlu, &Yıldırım, 2005; Büyüköztürk, 2003; Tavşancıl, 2010).

Results

Validity of the SCLEMS

EFA results. The KMO value was found to be .93 and the result of the Bartlett's test of sphericity was significant (χ^2=4349.14; df=528; *p*<.001). Accordingly, it was concluded that the data were perfectly sufficient to apply EFA (Tavşancıl, 2010). The anti-image correlation matrix was examined in order to evaluate whether there were variables with a spoiling effect on EFA. All the variables were believed to contribute to the total solution as the diagonal values in this matrix were between .83 and .96 (Altunışık et al., 2005). In EFA, it was evident that 47 items were divided into nine factors and the difference between the factor load values that 14 items obtained in two different factors analysis was below .01. After excluding the aforementioned items, EFA was conducted again on the remaining items (Büyüköztürk, 2003).

Accordingly, a six-factored structure consisting of 33 items was finalized. The items matching the factors were given names after examining their contents. The factors were given the following names: communication and interaction (CI), relation establishment (RE), skills development (SD), time usage and assessment (TUA), learning and teaching (LT) and learning environment organization (LEO). The factor analysis results of the SCLEMS are presented in Table 1.

Table 1

Factor Analysis Results of The SCLEMS

Factor name	Scale item no	Item no	Weight Values after Rotation					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
CI	1	I–22	**.72**	.10	.12	.09	.16	.17
	2	I–23	**.68**	.14	.09	.16	.23	.06
	3	I–18	**.67**	.11	.26	.21	-.05	.12
	4	I–17	**.65**	.03	.28	.18	.20	.04
	5	I–21	**.65**	.25	.16	.11	.15	.02
	6	I–19	**.56**	.27	.30	.17	.09	.00
	7	I–24	**.54**	.28	.00	.18	.24	.24
	8	I–16	**.53**	.25	.31	.12	-.03	.18
RE	9	I–33	.13	**.69**	.19	.06	.21	.06
	10	I–32	.17	**.65**	.18	.21	.03	.24
	11	I–34	.23	**.62**	.06	.13	.15	.13
	12	I–36	.20	**.59**	.19	.25	.33	.07
	13	I–35	.28	**.53**	.16	.21	.28	.02
SD	14	I–9	.16	.22	**.71**	.11	.22	.05
	15	I–10	.15	.19	**.66**	.20	.07	.15
	16	I–11	.30	.18	**.65**	.16	-.01	.10
	17	I–8	.27	.14	**.63**	.23	.14	.10
	18	I–7	.29	-.07	**.51**	.30	.20	.25
TUA	19	I–28	.26	.04	.25	**.68**	.18	-.07
	20	I–26	.24	.18	.15	**.60**	.30	.06
	21	I–27	.23	.23	.26	**.60**	.26	-.06
	22	I–30	.07	.26	.16	**.55**	.16	.33
	23	I–31	.25	.35	.14	**.53**	-.00	.24
	24	I–29	.35	.23	.13	**.49**	.23	.14
LT	25	I–44	.21	.02	.04	.11	**.65**	.07
	26	I–46	.01	.28	.22	.22	**.63**	.13
	27	I–45	.20	.29	.19	.17	**.59**	.01

Table 1 continuee...

Factor name	Scale item no	Item no	Weight Values after Rotation					
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
	28	I–47	.10	.35	.18	.30	**.58**	.19
	29	I–43	.28	.25	-.00	.18	**.51**	.31
LEO	30	I–5	.13	.18	-.00	.16	-.08	**.71**
	31	I–3	.10	.08	.31	-.12	.27	**.64**
	32	I–4	.14	.18	.07	.31	.16	**.59**
	33	I–2	.13	-.05	.33	-.14	.24	**.50**
Eigenvalue			11.30	1.86	1.56	1.34	1.15	1.07
% of Variance			34.23	5.65	4.74	4.05	3.50	3.25
Cronbach's	Alpha	.86	.79	.81	.82	.79	.65	

Cumulative explained variance: 55.40 %
Cumulative reliability coefficient of the scale Cronbach Alpha: .94

CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Upon examination Table 1 shows that factor Eigenvalues were 1.07 and above and the items had factor load values between .49 and .72. It was found that the SCLEMS explained 55.40% of the total variance and this value was acceptable (Altunışık et al., 2005; Büyüköztürk, 2003; Tavşancıl, 2010). The first factor explains 34.23% of the total variance of the scale; the second factor explains 5.65%; the third factor explains 4.74%; the fourth factor explains 4.05%; the fifth factor explains 3.50%; and the sixth factor explains 3.25%. Table 2 gives the factor correlation coefficients with each other and with the total score.

Table 2

Correlation Coefficients Among the SCLEMS Factors

Factor	SCLEMS	CI	RE	SD	TUA	LT
CI	.83**	-				
RE	.80**	.57**	-			
SD	.79**	.62**	.52**	-		
TUA	.85**	.64**	.65**	.62**	-	
LT	.78**	.54**	.63**	.51**	.64**	-
LEO	.66**	.42**	.43**	.47**	.42**	.45**

**p<.01; CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

As can be seen in Table 2, there is a significant relationship among the factors, and between the factors and the total score. There is a relationship at an average level between the total score and the LEO factor; and there is a high significant relationship between the total score and other factors. It is also evident that the SCLEMS factors have an average relationship with each other (Büyüköztürk, 2003). The fact that this relationship is not at a very high level shows that the scale is convenient for a multiple-factored structure (Kline, 2005).

Item analysis. An item analysis was conducted based on the corrected item total correlation and difference of the lower-upper 27% group means. The results of the analysis are given in Table 3. When Table 3 is examined, it is seen that the corrected item total correlation coefficients varied between .33 and .64 and these coefficients were high above the minimum .25 criterion. These coefficients show that each item is consistent with the entire scale and this result provides evidence for the structural validity of the scale (Tavşancıl, 2010). In the item analysis based on the difference of lower-upper 27% group means, *t* values are significant ($p<.001$). Accordingly, it is understood that all the items distinguish teachers according to their constructivist learning environment management skills (Büyüköztürk, 2003; Tavşancıl, 2010).

Table 3

Corrected Item-Total Correlations and t Values for the Difference of Lower-Upper 27% of the Items

Item no	t (n=86)	r (n=316)	Item no	r (n=316)	t (n=86)	Item no	t (n=86)	r (n=316)
2	6.81***	.33	18	.56	12.22***	31	14.66***	.58
3	8.36***	.43	19	.58	13.11***	32	12.29***	.56
4	8.95***	.50	21	.56	11.58***	33	10.79***	.51
5	6.78***	.36	22	.57	13.73***	34	10.33***	.52
7	11.16***	.56	23	.57	12.89***	35	12.76***	.59
8	11.74***	.60	24	.56	12.15***	36	15.62***	.60
9	10.90***	.57	26	.59	12.94***	43	11.66***	.57
10	10.72***	.54	27	.61	12.58***	44	8.29***	.41
11	11.49***	.55	28	.54	11.13***	45	11.82***	.56
16	13.11***	.56	29	.62	13.86***	46	11.04***	.54
17	10.75***	.58	30	.55	10.32***	47	13.81***	.64

*** $p<.001$

CFA results. The model for the six-factored structure, which was determined by EFA, was tested with CFA. As a result of CFA, conformity indexes were found to be $\chi^2=707.45$ (df=480, $p<.001$), χ^2/df=1.47, RMSEA=.039, SRMR=.042, AGFI=.86, CFI=.95, NNFI=.94. These values are well above the acceptable values, showing that the six-factored structure of the scale is confirmed. Then, *t* values for the factors' status that explains each item were examined and it was seen that these values were significant ($p<.01$). Standardized analysis coefficients for factor-item relations calculated with CFA are presented in Figure 1. Upon examining Figure 1, it was concluded that the coefficients for the factors' direct effect on the items varied between .50 and .78; and the variance coefficients, which could not be explained, varied between.39 and .75. The observed factor-item relationships were found to be significant ($p<.01$).
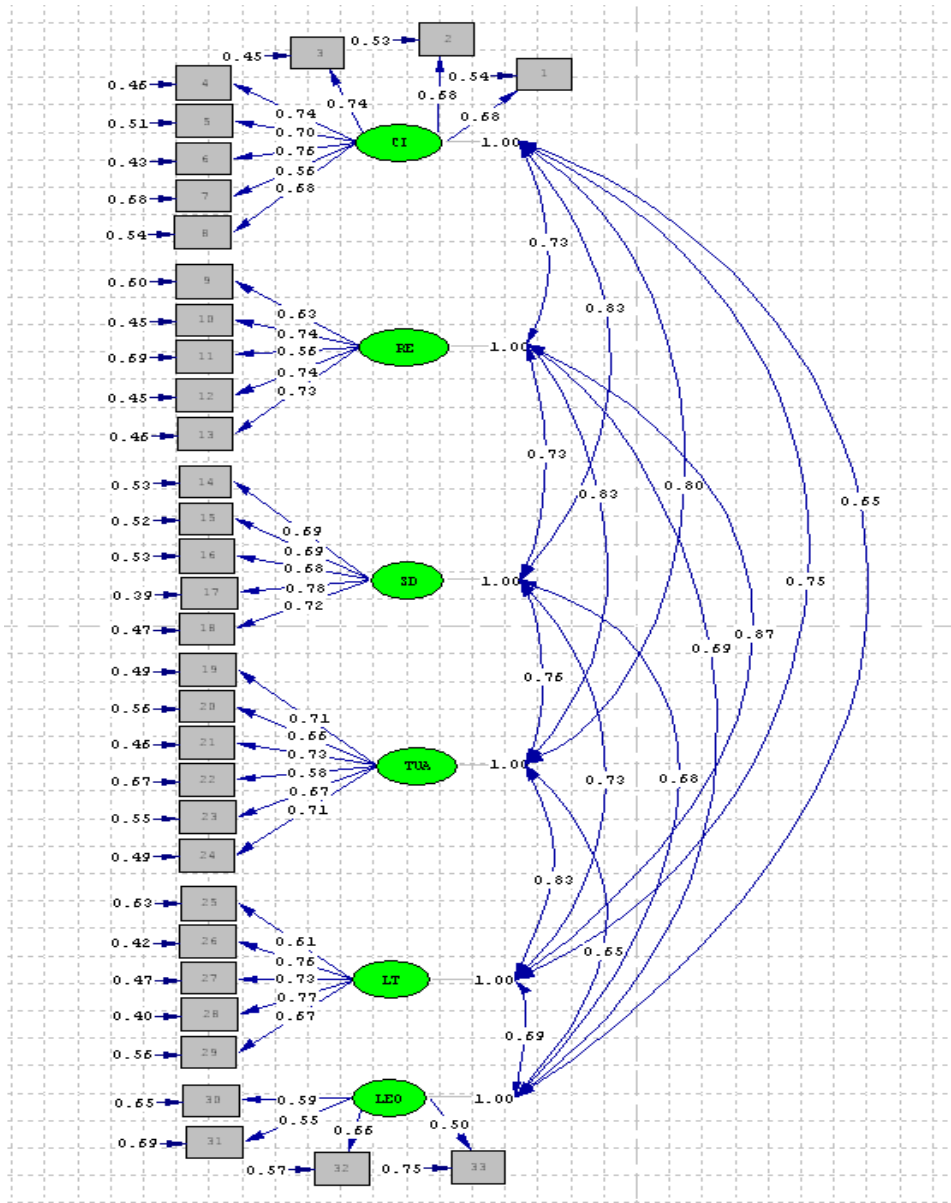
CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Figure 1. *CFA Results for SCLEMS*

Reliability of the SCLEMS

The reliability of the SCLEMS was calculated by Cronbach's alpha coefficient for internal consistency and test-retest reliability methods. Results concerning the reliability of the SCLEMS are presented in Table 4. When the results in Table 4 are examined, it is evident that the factors' internal consistency coefficients obtained values between .67 and .88 and the internal consistency coefficient for the entire scale was .95. These coefficients show that the scale has a high internal consistency. It was found that the factors' test-retest reliability coefficients obtained values between .71 and .79; and the test-retest reliability coefficient for the entire scale was .93. These coefficients show that with this scale, consistent time-dependent measurements at a reliable level can be performed.

Table 4

Internal Consistency and Test-Retest Reliability Coefficients of the SCLEMS

Factor	Cronbach's Alpha Coefficient (n=317)	Test-retest Reliability (n=50)
CI	.88	.76
RE	.81	.74
SD	.84	.79
TUA	.84	.72
LT	.83	.77
LEO	.67	.71
Total	.95	.93

CI: communication and interaction, RE: relation establishment, SD: skills development, TUA: time usage and assessment, LT: learning and teaching, LEO: learning environment organization

Discussion and Conclusion

In the present study, analyses were made for the reliability and validity of the SCLEMS, which was developed in order to evaluate the constructivist learning environment management skills of elementary and high school teachers. In the calculation, the CVR values for the scale items were found to be above .99, showing that the content validity of the SCLEMS was very good. The KMO value was found to be .93; the result of the Bartlett's test for sphericity was significant and the anti-image correlation matrix diagonal values were above .83, showing that these data were sufficient to conduct EFA (Altunışık et al., 2005). As a result of the Varimax rotation in EFA, a six-factored structure that explains 55.40% of the total variance, whose item factor loads are .49 and above, and whose Eigen values are 1.07 and above, was obtained. The Varimax rotation produced values that were high above

the minimum criterion, which supports the content validity of the scale. In the literature, although no scale studies directly similar to this scale were found, there are many scale studies concerning the constructivist learning environment that have similar results to those of this study. Furthermore, these scales are seen to have a multiple-factored structure (Aldrige et al., 2000; Arkün & Aşkar, 2010; Kaya, 2009; Taylor & Fraser, 1991; Tenenbaum et al., 2001). For example, the scales developed by Taylor and Fraser (1991), Arkün and Aşkar (2010) had four factors; and the scale developed by Tenenbaum et al. (2001) had seven factors. These scale studies support the current scale structure used in the present study. As the items in the SCLEMS were created by taking classroom management processes into account, the number of factors and factor names are not entirely consistent with the other scales. The relationship coefficients among the SCLEMS factors were found to be between .42 and .65 and these values are not very high, which supports the multiple-factored structure of this scale (Kline, 2005). In the item analysis, the corrected item-total correlation coefficients were found to be .33 and above; and result of the independent samples *t*-test based on the difference of lower-upper 27% group means was found to be significant for all the items, which illustrates that the distinctive power and structural validity of the SCLEMS are very good (Tavşancıl, 2010). It was revealed that the conformity indexes obtained as a result of CFA were good; and the factor-item relationships, which were observed, were significant. These results confirm the six-factored structure of the scale obtained by EFA.

As a result of Cronbach's alpha coefficient analysis for internal consistency, the reliability coefficient for the entire scale was found to be .95; and the reliability coefficients of the factors were found to be .67 and above. As a result of the test-retest reliability analysis, it was determined that the reliability coefficient for the entire scale was .93; and the factor reliability coefficients were .71 and above. The reliability results of the scale showed that the scale had a high level of internal consistency and consistent time-dependent measurements at a reliable level can be performed with this scale (Tavşancıl, 2010).

Validity and reliability results showed that the SCLEMS was a convenient assessment instrument in terms of validity and reliability. It is thought that this scale is convenient for measuring the constructivist learning environment management skills of elementary and high school teachers in Turkey. A version of the SCLEMS for students may be developed to collect more detailed information about the constructivist learning environment management skills of teachers.

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Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeğinin Geliştirilmesi[***]

Atıf:

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Özet

Problem Durumu: Son yıllarda sıkça tartışılan yaklaşımlardan biri yapılandırmacılıktır. Bu yaklaşımı uygulayan öğretmenlerin temel görevi, öğrenenlerin bilgiyi anlamlandırmasına ve yapılandırmasına teşvik edecek ortam ve olanaklar sağlamaktır. Yapılandırmacı öğrenme ortamları, geleneksel yöntemlerin uygulandığı sınıf ortamlarından oldukça farklıdır. Yapılandırmacı öğrenme ortamlarında öğrencilerin daha fazla sorumluluk almaları ve aktif olmaları gerekmektedir. Öğretmenlerin ise bu ortamın yönetimi konusunda aktif olmaları beklenmektedir. Yapılandırmacı öğrenme ortamındaki uygulamaların başarıya ulaşmasının, öğretmenlerin bu ortamı yönetme becerileriyle doğrudan ilişkilidir. Öğretmenlerin bu ortamı yönetme becerilerinin ne düzeyde olduğunun belirlenebilmesi ise sözü edilen becerileri belirlemede kullanılabilecek ölçme araçlarının geliştirilmesini gerektirmektedir. Yapılandırmacı öğrenme ortamı ile ilgili bazı ölçek geliştirme çalışmaları yapılmıştır. Fakat alanyazında öğretmenlerin görüşlerine dayalı, öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerine yönelik ve sınıf yönetimi süreçlerini kapsayan herhangi bir ölçeğe rastlanmamıştır. Bu nedenle, böyle bir ölçek geliştirme çalışmasına ihtiyaç duyulmuştur.

[***] "Yapılandırmacı öğrenme ortamını yönetme" kavramı, yapılandırmacı öğrenme ortamı liderliği anlamında da kullanılmaktadır. Bu çalışmada, yapılandırmacı öğrenme ortamını yönetme kavramı tercih edilmiştir. Dolayısıyla, Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeği (YÖOYB), Yapılandırmacı Öğrenme Ortamı Liderliği Becerileri Ölçeği (YÖOLBÖ) şeklinde de adlandırılabilir.

Araştırmanın Amacı: Bu araştırmanın amacı, ilköğretim okullarında ve liselerde görev yapan öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerinin ne düzeyde olduğunu belirlemeye yönelik bir ölçek geliştirmektir.

Araştırmanın Yöntemi: Araştırma, Şanlıurfa il merkezindeki ilköğretim okullarında ve liselerde görev yapan ve tesadüfi örnekleme yöntemiyle belirlenen öğretmenlerden oluşan üç farklı çalışma grubu üzerinde gerçekleştirilmiştir. Birinci çalışma grubu, 316 öğretmenden; ikinci çalışma grubu 317 öğretmenden, üçüncü çalışma grubu ise bir ilköğretim okulunun 50 öğretmeninden oluşmuştur. Alanyazın incelemesinden ve kapsam geçerliğine yönelik uzman görüşleri alındıktan sonra 47 maddelik taslak bir ölçek oluşturulmuştur. Ölçeğin yapı geçerliğini ve faktör yapısını belirlemek için birinci çalışma grubu verileri üzerinde Açımlayıcı Faktör Analizi (AFA) uygulanmıştır. Verilerin AFA'ya uygunluğu Kaiser-Meyer-Olkin (KMO) ve Bartlett küresellik testleriyle belirlenmiştir. Faktör sayısının belirlenmesinde ölçüt olarak, Eigen değerinin minimum 1.00 olması ve maddelerin seçiminde ise madde faktör yüklerinin minimum. 32 olması temel alınmıştır. AFA'dan sonra madde analizi yapılmıştır. Her bir maddenin ölçeğin bütünü ile tutarlığını belirlemek için düzeltilmiş madde toplam korelasyonları incelenmiştir. Maddelerin ayırt edicilik gücü ise ilişkisiz örneklemler için t testi ile belirlenmiştir. AFA'da elde edilen faktörlerin doğrulanıp doğrulanmadığına ilişkin değerlendirmenin yapılabilmesi için ikinci çalışma grubu verileri üzerinde Doğrulayıcı Faktör Analizi (DFA) yapılmıştır. DFA'da tanımlanan modelin uyumunu değerlendirmede; χ^2 değerinin serbestlik derecesine oranının ikiden küçük, RMSEA ve SRMR değerlerinin .05'ten küçük, AGFI değerinin .85'ten büyük, CFI ve NNFI değerlerinin .90'ten büyük olması ölçüt olarak kabul edilmiştir. Ölçeğin güvenirliğini belirlemek için ikinci çalışma grubu verileri üzerinde Cronbach alfa katsayısı ve üçüncü çalışma grubu verileri üzerinde ise test-tekrar test güvenirliği katsayısı hesaplanmıştır.

Araştırmanın Bulguları: AFA sonucunda, KMO değeri .93 bulunmuş ve Bartlett küresellik testinin sonucu (χ^2=4349.14; sd=528; *p*<.001) anlamlı çıkmıştır. Bu sonuçlar, verilerin AFA yapmak için mükemmel düzeyde yeterli olduğunu göstermiştir. Madde faktör yükleri .49 ve üzerinde değerler alan 33 maddeden oluşan ve faktör öz değerleri 1.07 ve üzerindeki değerlere sahip altı faktörlü bir yapı ortaya çıkmıştır. Faktörlere; iletişim ve etkileşim (İE), bağlantı kurma (BK), becerileri geliştirme (BG), süre kullanımı ve değerlendirme (SKD), öğrenme ve öğretme (ÖÖ), öğrenme ortamının düzenlenmesi (ÖOD) şeklinde isimler verilmiştir. Yapılandırmacı Öğrenme Ortamını Yönetme Becerileri Ölçeği (YÖOYBÖ)'nin toplam varyansın %55.40'ını açıkladığı ve bu değerin kabul edilebilir düzeyde olduğu anlaşılmıştır. Birinci faktör ölçeğe ilişkin toplam varyansın % 34.23'ünü, ikinci faktör %5.65'ini, üçüncü faktör %4.74'ünü, dördüncü faktör %4.05'ini, beşinci faktör %3.50'sını ve altıncı faktör %3.25'ini açıklamaktadır. Korelasyon analizinde, hem faktörler arasında hem de faktörler ile toplam puan arasında anlamlı bir ilişkinin olduğu saptanmıştır. Hesaplanan düzeltilmiş-madde toplam korelasyon katsayıları .33 ve üzerinde bulunmuştur. Bu katsayılar, her bir maddenin ölçeğin bütünüyle tutarlı olduğunu göstermektedir. Alt-üst %27 grup ortalamaları farkına dayalı madde analizinde ise t değerleri anlamlı (*p*<.001) bulunmuştur. Bu sonuç, tüm maddelerin öğretmenleri

yapılandırmacı öğrenme ortamını yönetme becerileri açısından ayırt ettiğinin bir göstergesi olarak kabul edilmiştir. Altı faktörlü yapıya ait model DFA ile test edilmiştir. DFA ile hesaplanan uyum indeksleri şöyledir: $\chi^2/sd=1.47$, RMSEA=.039, SRMR=.042, AGFI=.86, CFI=.95, NNFI=.94. Uyum indekslerinin kabul edilebilir değerlerin oldukça üzerinde olması, ölçeğin altı faktörlü yapısının doğrulandığını göstermiştir. Ayrıca DFA ile hesaplanan faktör-madde ilişkilerine ait standardize edilmiş çözümleme katsayıları incelenmiştir. Faktörlerin maddeler üzerindeki doğrudan etki katsayıları .50 ve üzerinde, açıklanamayan varyans katsayılarının ise .75' ve altında olduğu belirlenmiştir. Gözlenen tüm faktör-madde ilişkileri anlamlı (*p*<.01) bulunmuştur. Ölçeğin Cronbach alpha güvenirlik katsayıları, faktörler bazında .67 ve üzerinde, ölçeğin toplamına yönelik ise .95 bulunmuştur. Bu katsayılar, ölçeğin iç tutarlığının yüksek olduğunu göstermektedir. Test-tekrar test güvenirlik analizinde ise faktörlere yönelik güvenirlik katsayılarının .71 ve üzerinde olduğu, ölçeğin toplamı için .93 olduğu saptanmıştır. Bu katsayılar, ölçek üzerinde zamana bağlı olarak iyi derecede kararlı ölçümlerin yapılabileceğine işaret etmektedir.

Araştırmanın Sonuçları ve Öneriler: Geçerlik ve güvenirlik sonuçları, YÖOYBÖ'nün geçerlik ve güvenirlik açısından uygun bir ölçme aracı olduğunu göstermiştir. Bu ölçeğin Türkiye'deki ilköğretim okullarında ve liselerde görev yapan öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerini ölçmeye uygun olduğu düşünülmektedir. Öğretmenlerin yapılandırmacı öğrenme ortamını yönetme becerilerine yönelik daha ayrıntılı veri toplamak için YÖOYBÖ'nün öğrenci formları geliştirilebilir.

Anahtar Sözcükler: Yapılandırmacılık, yapılandırmacı liderlik, yapılandırmacı öğrenme ortamı, öğrenme ortamını yönetme, ölçek geliştirme

APPENDIX

The Scale for Constructivist Learning Environment Management Skills (SCLEMS)

[The Scale for Constructivist Learning Environment Leadership Skills (SCLELS)]

Factor name	Items
Communication and interaction	I take student opinions into account.
	I encourage the students to take the floor, to speak and to discuss to express their
	I encourage the students to be enterprising.
	I encourage the students to give decisions independently.
	I encourage the students to communicate both with me and each other.
	I support the development of the feeling of responsibility in students.
	I include the students in rule making and decision making process.
	I support the development of self-discipline skills in students.

Relation establishment	I give feedback to the students.
	I give students the opportunity to establish a relation between what they learn and the facts and concepts in nature.
	I ask open-ended questions which provoke thinking in the students.
	I guide the students to give a meaning to what they learn.
	I stimulate the prior knowledge and previous experiences of students in order to facilitate the construction of knowledge.
Skills development	I support the development of question asking, the questioning and research skills
	I support the development of high level thinking skills (e.g., critical thinking, creative thinking etc.) of students.
	I support the development of the problem solving skills of students.
	I support the development of information access and the usage skills of students.
	I support the development of purpose determination and the realization skills of
Time usage and assessment	I give the students the necessary time for answering the questions.
	I give the students enough time in learning activities.
	I encourage students to use the time efficiently and effectively.
	I use different assessment techniques to evaluate the students.
	I take the learning process of the student into consideration, rather than the results in the assessment.
	I encourage the students to make self-assessments.
Learning and teaching	I conduct the lesson by focusing on principal concepts.
	I use various teaching methods and techniques which are consistent with the lesson's purpose.
	I devise some activities in the lesson to attract student attention and to increase
	I devise learning activities for the active learning of the students.
	I center learning around students' interests and needs.
Learning environment organization	I present real life problems or unsolved incidents to the students.
	I make learning possible outside of the school as well as in it.
	I use various real materials and primary sources for supporting the participation
	I prepare an order of seating which facilitates the communication and interaction among the students.

Preservice Teachers' Intercultural Competence: A Comparative Study of Teachers in Switzerland and Turkey

Soner POLAT∗

Tania OGAY BARKA**

Abstract

Problem Statement: Every society consists of individuals different in terms of physical, psychological, and sociocultural characteristics. Differentiation in today's societies has increased due to globalization, intensified immigration, advancements in communication technologies, and the recent increase in value of subcultures within the dominant culture. Consequently, human communities that maintain different characteristics together have brought about the concept of multicultural societies. Within these societies, teachers play the principle role in maintaining the multicultural environment and managing its processes. Since teachers' successful implementation of these tasks depends on their level of intercultural competence, today's teachers should develop their intercultural competence.

Purpose of Study: The present study aims to determine the intercultural competence levels of preservice teachers from Switzerland and Turkey.

Methods: A descriptive survey model was used as the chief research approach. The study sample comprised 185 preservice teachers, 84 of whom were from Switzerland and 101 of whom were from Turkey. Data were collected by means of the Multicultural Personality Questionnaire and a personal information form.

Findings and Results: The intercultural competence levels of preservice teachers from Switzerland and Turkey were found to be middling. Preservice teachers perceived themselves to be the most competent in the dimension of 'cultural empathy,' which was followed by 'open-mindedness,' 'social initiative,' 'flexibility,' and 'emotional stability,'

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respectively. The variable of preservice teachers' university showed significant difference regarding the self-perception of intercultural competence. By culture, results revealed that preservice teachers from Switzerland had higher intercultural competence than those from Turkey, though such competence did not show significant differences according to gender and department.

Conclusions and Recommendations: The variable of nationality significant differed in preservice teachers' perceptions of intercultural competence. In Switzerland, whose preservice teachers' perceptions of such competence were higher, teacher training curricula include courses on multiculturalism and intercultural education, while in Turkey such courses are not offered even as electives. Understanding multiculturalism necessitates the renewal of preservice and in-service teacher training programs. Teacher training should align with international standards and topics, and include a systematic approach to promote intercultural competence.

Keywords: Intercultural competence, preservice teachers, intercultural education, multiculturalism

This study aims to compare the intercultural competence of preservice teachers from two countries whose national cultures, experiences with multiculturalism, and teacher training programs differ significantly.

For societies, one of the greatest challenges in the process of civilization is coming to terms with how their lifestyles, traditions, behaviors, and ideas culturally differ from those of other societies. In research, social scientists have studied distinctive cultural differences and sought to account for these differences within the systematic thinking of their fields. According to social scientists, cultural differences result from the idea of national spirit or ethos (e.g., the German spirit, American ethos), physical environment and living conditions (e.g., Eskimo culture, African culture, Mediterranean culture), social organization (e.g., urban culture, kinship system culture), religious beliefs, and economic relations, among others.

As a result, multicultural societies emerge (Çüçen, 2005). A multicultural society comprises two or more cultural categories within social structure categories of gender, nationality, social class, religion/sect, language, and sexual orientation, among other exceptional features (Banks & Banks, 2007; Parekh, 2000). In multicultural societies, complex, similar, and different cultural understandings based on cultural complexity are common. These cultural understandings are shaped by various factors such as age, gender, nationality, ethnicity, socioeconomic status, religious identity, sexual behavior, education, and history (Clark, 2003). Globalization, technology, and the rapid development of communication in the late 20th and early 21st century, as well as large migrations caused by economic and sociological reasons, have resulted in the formation of multicultural societies through the sustained interaction of similar but sometimes very different cultures (Kostova, 2009).

Switzerland, or more formally the Swiss Confederation, occupies a land area of over 41,000 thousand km2, a population of 7.4 million, and a population density of 182 people per square kilometer (Federal Statistical Office, 2010). The country is a federation with 24 cantons that, as prescribed by federal constitutional law, has been governed by direct democracy since 1848. The country has four official languages—French, German, Italian, and Romansh—all of which are equally recognized (Federal Constitution of the Swiss Confederation, Articles 1–4, 1999). All Swiss citizens must learn an official language of Switzerland other than their mother tongue; hence nearly all Swiss citizens are bilingual, at least. The country admits immigrants from nearly every country in the world. These immigrants also use their own mother tongues in their daily lives. Foreigners living in the country and temporary worker foreigners comprise 22% of the overall population. Although Switzerland does not have an official religion, the majority of the population is Christian (Catholic 44%, Protestant 35.2%). Muslims (4.3%) and Orthodox Christians (1.8%) are typically immigrants. The remaining percentage includes atheists and followers of various other religions (Federal Statistical Office, 2010).

Turkey is situated as a bridge between Asia, Europe, and Africa. It has an area of 783,562 km2, a population of over 73 million, and a population density of 93 people per square kilometer (Turkish Statistical Institute, 2011). The country has been governed by representative democracy since its establishment in 1923. Turkey, or formally the Republic of Turkey, is a unitary country with 81 cities. The only official language is Turkish (Constitution of the Turkish Republic, 1982), though many languages are also spoken in daily life, including Abkhazian, Albanian, Arabic, Armenian, Azerbaijani, Bosnian, Circassian, Georgian, Kurdish, Laz, Romaic, Syriac, and Zazaki. Though many Turkish citizens are ethnically Turkish, Armenians, Greeks, and Jewish people are recognized minorities. Albanians, Arabs, Assyrians, Azerbaijanis, Bosnians, Chaldeans, Circassians, Georgians, Kurds, Laz people, and Zazas also live in Turkey but are not recognized minorities (Önder, 2006; Şener, 2004). Since Turkey is secular, it does not have an official religion, though many Turkish citizens are Muslim. Most of these Muslims are Sunni Hanafi, while Alawites form the second largest Muslim subset. Atheists, Christians, and Jews constitute very little of the population (Kayabaş & Kütküt, 2011; Önder, 2006; Şener, 2004). Given the above diversity within their national borders, it is clear that both Switzerland and Turkey are multicultural countries.

As a result of recent development in democracy, assimilation policies that try to standardize social differences have tended to give way to policies that recognize and support cultural diversity (Banting et al., 2006). Examples of policies that recognize cultural diversity are clear in the educational policies of multiculturalist and intercultural education. Multicultural politics support a positive attitude toward cultural diversity with the belief that many groups with different characteristics can coexist (Arends–Toth & van de Vijver, 2002). In the last quarter of the 20th century, countries from Western Europe have therefore begun to take intercultural education into consideration in order to increase the general awareness and acceptance of different cultures in their societies (Leeman, 2003). This understanding has also

affected teacher training programs. Switzerland is among these countries that have accepted multiculturalism in their societies.

Turkey also began to make reforms while adapting as member of the European Union. In 2005, primary education programs were renewed that reflected an understanding of multiculturalism and intercultural education. Though Turkey is still implementing reforms in line with multiculturalism and intercultural education, both aspects have recently gained importance. These policy reforms have also inspired different expectations from teachers and shifted the roles they must play. It is necessary to develop the multicultural competence of practitioners in order to put these reforms into practice.

Geert Hofstede (1980) developed a theoretical model using factor analysis to examine the results of a worldwide survey of employee values at IBM in the 1960s and 1970s. The model was one of the first to produce quantifiable results to explain observed differences among cultures. Along which cultural values, Hofstede's theory proposed four dimensions that could be analyzed: individualism–collectivism, uncertainty avoidance, power distance (i.e., strength of social hierarchy), and masculinity–femininity (i.e., task orientation versus person-orientation). According to Hofstede's (1984) classification, Switzerland and Turkey report the following points for each dimension: individualism–collectivism (Switzerland 68, Turkey 37), uncertainty avoidance (Switzerland 58, Turkey 85), power distance (Switzerland 34, Turkey 66), and masculinity–femininity (Switzerland 70, Turkey 45). As can be seen, there is a significant difference between these points in the Swiss and Turkish cases. Every country has its own cultural characteristics, which influence their educational systems.

Individuals develop within cultures in which no individual acts independently of his or her culture (Kağıtçıbaşı, 2000). Culture can be defined as either a whole encompassing a group's survival and compatibility program (Banks & Banks, 2007) or, according to Kafesoğlu (1984), a society's spiritual values that shape its philosophy and the technology that emerges in the world as the reflection of these spiritual powers (cited in Arslanoğlu, 2000). As emphasized in these definitions, each society has a different culture. However, within a given society, individuals develop different cultures within their own groups on the basis of previous experiences, geographical region, economic activities, and socioeconomic status. From a multiculturalist perspective, the effectiveness of individuals in another culture depends on their interest in other cultures, sensitivity to cultural differences, and ability to reshape their behaviors to show respect to and for people from other cultures (Bhawuk & Brislin, 1992).

The role of intercultural relations is considerably high both in global and local terms. Human mobility at the global and local levels facilitates, if not makes inevitable, interpersonal communication (Kealey, 1989). In a world where boundaries are diminishing, conditions requiring human groups to live together are expected. Consequently, recognizing different countries' cultures to actualize mutual understanding and harmony has become increasingly important. In this respect, understanding and tolerating people from different cultures, as well as

acknowledging others' differences, are significant for intercultural acceptance (Unutkan, 2007). People need to respect and tolerate differences and adopt a "multiperspective philosophy strategy" by considering other individuals' perspectives apart from their own in order for different cultures to exist together in harmony (Fritz, Möllenberg, & Chen, 2002).

Differences sometimes lead to problems in interpersonal relationships and communication (Loosemore & Al Muslmani, 1999). The lack of recognition arising from cultural differences in societies results in prejudice toward other cultural groups and their members (Dong, Day, & Collaço, 2008). Countries have to maintain harmony for individuals with different characteristics regarding a multitude of issues, including nationality, religion, ethnicity, culture, education, age, gender, experience, values, and perceptions (McMahan et al., 1998). People must possess intercultural competence to cope with intercultural problems, (Dong et al., 2008) and be trained regarding intercultural awareness and competence to be competent in intercultural communication (Chen & Starosta, 1996; Leeman, 2003; Loosemore & Al Muslmani, 1999). Therefore, the educational system should help individuals to adapt to the world with increasing cultural variety, to live in harmony with other members of the society, and to recognize and tolerate other cultures (Cırık, 2008). The educational approach whereby such information and skills are acquired is called 'intercultural education' (Leeman, 2003).

Intercultural education is the reflection of educational policies and school practices through meeting the different educational expectations of the society in order to reduce prejudice, identity conflict, and power disputes in societies where ethnic, linguistic, religious, and sexual differences exist (Banks, 1999; Banks, 2009). Intercultural education assures a mixed-school approach based on an educational approach of democratic values in order to promote multiculturalism (Bennett, 2003). According to Fase (1994), the chief aim of intercultural education is to teach students to live together in a society with cultural variety (Leeman, 2003). Intercultural education is based on cooperative learning and dialog (Batelaan & van Hoof, 1996). Teachers have the principal role in the maintenance of this environment and its processes. Teachers' successful implementation of these tasks depends on their level of intercultural competence.

Spindler and Spindler (1993) state that the individual experiences and sociocultural status of teachers determine their teaching behaviors. Candidate teachers who receive courses on multiculturalism might develop an understanding of basic concepts that can influence their attitudes in the future, which would in turn affect students' academic performance (Delpit, 1996; Howard & del Rosario, 2000). An analysis of the High Pedagogical School Fribourg (Switzerland) Teacher Education Program has revealed that some of program's courses are directly related to multiculturalism and intercultural education (Diversité et pluralité, education interculturelle), while supplementary related content is implicitly promoted in other courses. At the Faculty of Education at Kocaeli University (Turkey), teacher education program does not offer courses directly related to multiculturalism and intercultural education, but the content related to multiculturalism and intercultural

education is implicitly promoted in other courses. It is considered that this difference in teacher education programs might differentiate the cultural competence levels of teachers in two different countries.

Societies with different cultures need multicultural education practices in order to assist individual development and equip these individuals with multi-perspective ways of thinking. In order for multicultural education to succeed, teachers are expected to be skilled in creating a welcoming atmosphere, instructing topics of student differences, raising students' potentials to the maximum, and forming a democratic environment for students with different languages, religions, ethnicities, and socioeconomic statuses (Bennett, 2003). For this reason, today's teachers should develop their intercultural competence.

The key role in intercultural education belongs to the teacher, who will implement the educational program, evaluate learning, and both choose and use appropriate methods, techniques, and learning tools. Hence, it is essential for teachers to be equipped with intercultural competence. Studies of both university students (Sultana, 1994) and preservice teachers (Neuharth–Pritchett, Reiff, & Pearson, 2001) have demonstrated that information regarding the outcomes of multicultural education is unsatisfactory.

In multicultural societies, a certain level of intercultural competence is essential for effective communication among individuals. Currently, since even the farthest distances have become nearer and intertwined, individuals from each society and culture encounter situations in which they communicate with each other. As the relationships among societies increase, effective mutual communication becomes more important. A natural consequence of this is that individuals' intercultural competence must be raised in order for mutual communication to be maintained effectively (Altundağ, 2007).

Intercultural competence refers to the craft of forming intercultural links, internal as well as external, to a society and evaluating each link on the basis of one another, be it on behalf of the individual or others. This type of competence also incorporates the ability to acknowledge that perspectives vary between cultures within the scope of critical and rational interpretations (Byram, 2000).

Intercultural competence constitutes several interactive dimensions. Byram (2000) posits that attitude, knowledge, interpretation, and the abilities to relate, explore, and communicate skills in addition to a critical awareness of culture or political education constitute intercultural competence. Somewhat similarly, the present study views intercultural competence as an ability to deal with people from different cultures in a respectful way, view and perceive cultural distinctions, and acknowledge them and react accordingly, both in spoken and behavioral terms. This type of competence also encompasses awareness, maintenance, and the advancement of one's local cultural values (Luka, 2009). As such, in this study, intercultural competence comprises five dimensions: cultural empathy, open-mindedness, social initiative, emotional stability, and flexibility (van der Zee & van Oudenhoven, 2000; van Oudenhoven & van der Zee, 2002; van der Zee, Zaal, & Piekstra, 2003).

Cultural empathy is related to the recognition of the behaviors, ideas, and emotions of individuals from different cultural histories (van der Zee & van Oudenhoven, 2000; Leone, et al., 2005). Ruben (1976) defined cultural empathy as "the capacity to clearly project an interest in others, as well as to obtain and to reflect a reasonably complete and accurate sense of another's thoughts, feelings, and/or experiences". Cultural empathy can be defined as 'reading' other cultures (van der Zee, Zaal, & Piekstra, 2003). The ability of cultural empathy means one's competence reflecting his understanding of the emotional states of people in the target culture, therefore the psychological barriers of the target culture can be decreased. The ability of cultural empathy is important for coping with cultural problems adequately, effectively and satisfactorily. Cultural empathy does not mean to cast aside one's native culture, but a rational understanding and acceptance of the cultural differences shown in the target culture (Zhu, 2011). In order for individuals to work effectively with people from other cultures, they need to understand these cultures in the right way. Individuals who have high degrees of cultural empathy can understand and differentiate behaviors, ideas, and emotions of other groups, while individuals with low cultural empathy have difficulty identifying behaviors, ideas, and emotions of groups with different cultural histories (van der Zee & van Oudenhoven, 2000; van der Zee, Zaal, & Piekstra, 2003; van Oudenhoven & van der Zee, 2002).

Open-mindedness refers to people's lack of prejudice and openness to communication when they encounter people outside of their own cultural group. Like cultural empathy, open-mindedness is considered significant to understanding other cultures' values and rules and coping with them (Leone, et al., 2005). Being open-minded helps individuals be curious about others and open-minded people are willing to listen others. Also open-minded people have interest in cultural differences (Callen, 2008). Open-mindedness is of great importance for encountering new values of target culture (Williams, 2009). Individuals with high levels of open-mindedness act without prejudice toward other groups and are open to new opinions, whereas individuals with low open-mindedness act with prejudice toward other individuals and groups (van Oudenhoven & van der Zee, 2002; van der Zee, Zaal, & Piekstra, 2003).

Social initiative signifies an individual's effective handling of social situations and tendency to initiate social interaction. Individuals with these skills are expected to communicate with and befriend individuals from other cultures easily (Leone, et al., 2005). Social initiative is significant for intercultural competence, because intercultural competence is supported by social initiative (Bisballe, 2006). Individuals with high social initiative tend to be active in taking responsibility and are extroverted when it comes to other cultures, while individuals with low social initiative tend to be less responsible and prefer to stay in the background (van Oudenhoven & van der Zee, 2002; Leone, et al., 2005).

Emotional stability refers to an individual's state of preserving his or her emotional dignity and calmness during conflicts and other situations made stressful due to cultural differences(van der Zee & van Oudenhoven, 2000; van Oudenhoven

& van der Zee, 2002). In other words, emotional stability is a person's ability to cope with negative emotions and anxiety (Costa & McCrae, 1992).When working in and/or with another culture, it is important to cope with emotional and psychological situations (van der Zee & van Oudenhoven, 2000; van Oudenhoven & van der Zee, 2002; Leone, et al., 2005). Various factors (e.g., political system, operations, lack of meaning and resources, setbacks) may prevent individuals from working in and/or with other cultures similar to how they work in their own cultures. When the lives of individuals in other cultures do not occur as in their own culture, the situation may lead to tension, aggression, anxiety, social isolation, economic problems, and personal conflicts. Individuals who can preserve their emotional stability in such cases tend to stay calm and collected in stressful situations (van Oudenhoven & van der Zee, 2002; van der Zee, Zaal, & Piekstra, 2003), and they are capable of withstanding delays in satisfaction of needs, coping with an acceptable amount of frustration. Also they can make long term plans and revise his/her expectations in terms of demands of the situations (Aleem, 2005). However, individuals who cannot preserve their emotional balance may exhibit severe emotional reactions toward stress (van Oudenhoven & van der Zee, 2002; van der Zee, Zaal, & Piekstra, 2003).

Flexibility is defined as the willingness to value and move across different cultural and social peer groups and environments (Carter, 2010). Flexibility refers to a person's ability to adapt to new and unknown situations. When working in and/or with another culture, the individual should be able to change his or her strategy since behaviors may not always work in the new environment (van der Zee & van Oudenhoven, 2000; Leone, et al., 2005). Flexibility is regarded as an important ability for individuals' successful adaptation (Yamazaki & Kayes, 2004). Individuals with high flexibility can cope with new and unknown situations and adapt to unexpected situations in other cultures. By contrast, individuals who are not flexible enough can perceive new and different situations to be dangerous; since they tend to choose familiar and trustworthy behaviors, they have difficulty adapting to unexpected situations (van Oudenhoven & van der Zee, 2002; van der Zee, Zaal, & Piekstra, 2003).

Method

Research Design

The present study is a comparative descriptive study that aims to determine the intercultural competence of preservice teachers from Switzerland and Turkey. A descriptive survey model was used as this study's main research approach.

Research Sample

The study population comprised students (N = 780 students) from the High Pedagogical School Fribourg (n = 300 students) in Fribourg canton of Switzerland and primary and preschool education department students (n = 480) from Kocaeli University's Faculty of Education in Turkey.xxx

The High Pedagogical School Fribourg, at which periods of study last 3 years, includes two departments: PS1 and PS2. Students who will be teaching preschool (preschool grades 1–3) and the first stage of the primary school (grades 1–2) attend PS1, while preservice teachers to teach stages 2 and 3 (grades 3–6) attend PS2. The School of Pedagogy gives instruction in two languages: French and German. The study population included preservice teachers from the French section only. Each year, approximately 100 students enroll in this school in order to receive education in French. The total number of students studying in this school in French is 300. There are seven departments in Kocaeli University's Faculty of Education, at which periods of study last 4 years. Only students from preschool and primary education departments were included in this study. The number of students studying preschool education is 160, while the number of students studying primary education is 320.

Purposive sampling was used to choose the sample of the study, because the development of intercultural competence is acquired by at the end of the educational process and for this reason, students in their final year at each school were included in the sample. In the PS1 and PS2 departments of the High Pedagogical School Fribourg, 84 preservice teachers were studying in their final year, while 101 preservice teachers were studying at the primary school and preschool education departments of Kocaeli University's Faculty of Education. In sum, the study sample included 185 teacher candidates.

Research Instruments and Procedures

Questionnaire (MPQ) (van der Zee & van Oudenhoven, 2000; van der Zee, et al., 2003; van Oudenhoven & van der Zee, 2002) was used as a data collection instrument. The MPQ comprises five dimensions: cultural empathy, open-mindedness, social initiative, emotional stability, and flexibility. The original instrument contains 91 items: 20 items regarding emotional stability, 17 items regarding social stability, and 18 items each regarding flexibility, cultural empathy, and open-mindedness. However, many researchers, including the instrument developers, have eliminated some items in order to use them for measurement in different studies. The adaptation of the instrument into Turkish was performed by Polat (2009).

For factor analysis, the items found to be in dimensions different from those of the original instrument were excluded. Thus, 33 items of the questionnaire were used, 11 of which measure cultural empathy, while six measure social initiative, seven measure emotional stability, five measure open-mindedness, and four measure flexibility. The overall alpha reliability coefficient of the intercultural personality scale was found to be 0.82; the reliability coefficients of the dimensions were calculated to be 0.87 for cultural empathy, 0.73 for social initiative, 0.65 for emotional stability, 0.66 for open-mindedness, and 0.67 for flexibility.

The data collection instruments were prepared in two versions: French and Turkish. During the preparation of the French form, native speakers of French (i.e., Erasmus students at Kocaeli University studying intensive Turkish at the time of the

study) were consulted and asked to translate the instrument from English to French. In addition, both the original English and French versions were sent to University of Fribourg's Educational Sciences Department, where its appropriateness to Swiss French was ensured. The compatibly of the two data collection instruments were confirmed by a French instructor working at Kocaeli University, and the data collection instruments were finalized. The Likert-type scale ranged from 1 to 5, where 1 = definitely disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = definitely agree.

Data were collected via the Internet. The students at the High Pedagogical School Fribourg and Kocaeli University's Faculty of Education were each sent an email requesting that they complete the form provided by a link to the database within the specified period. In sum, 84 students from the High Pedagogical School Fribourg and 101 students from Kocaeli University's Faculty of Education submitted completed forms, thus data collected from 185 students were processed.

Data Analysis

In order to identify the preservice teachers' intercultural competence, the arithmetic means were calculated. Meanwhile, in order to determine whether intercultural competence and its dimensions varied according to the variables of nationality, gender, and department, a t test was carried out. When interpreting the arithmetic means, the interval 1.00–1.79 was evaluated to be 'very low,' 1.80–2.59 to be 'low,' 2.60–3.39 to be 'middling,' 3.40-4.19 to be 'high,' and 4.20–5.00 to be 'very high.'

Results

The arithmetic mean and t test results related to perception of intercultural competence and its dimensions by preservice teachers from Switzerland and Turkey are provided in Table 1. The preservice teachers from Turkey and Switzerland perceived their intercultural awareness to be middling (M = 3.59). The dimension in which preservice teachers perceived themselves to be most effective cultural empathy, followed by open-mindedness (M = 3.62), social initiative (M = 3.55), flexibility, (M = 3.36) and emotional stability (M = 2.98).

Table 1

Preservice Teachers' Self-Perception of Intercultural Competence.

Intercultural competence and dimensions	N	M	SD
Cultural empathy	185	4.07	.34
Open-mindedness	185	3.62	.56
Social initiative	185	3.55	.62
Flexibility	185	3.36	.67
Emotional stability	185	2.98	.52
Intercultural competence	185	3.59	.29

As shown in Table 2, a significant difference was observed in the perceptions of intercultural competence according to country (t = -4,547, p < 0.01). The intercultural

competence levels of preservice teachers from Switzerland (M = 3.69) were higher than those of preservice teachers from Turkey (M=3.50).

Table 2

The Intercultural Awareness Perception Levels of Preservice Teachers From Switzerland and Turkey.

Intercultural competence and dimensions	Country variable	N	M	SD	t	p
Cultural empathy	Kocaeli University	101	3.91	.18	-8.003	.00
	High Pedagogical School Fribourg	84	4.25	.38		
Emotional stability	Kocaeli University	101	2.99	.50	.129	.90
	High Pedagogical School Fribourg	84	2.98	.55		
Flexibility	Kocaeli University	101	3.36	.57	.111	.91
	High Pedagogical School Fribourg	84	3.35	.77		
Open-mindedness	Kocaeli University	101	3.58	.47	-1.051	.29
	High Pedagogical School Fribourg	84	3.67	.65		
Social initiative	Kocaeli University	101	3.39	.57	-3.951	.00
	High Pedagogical School Fribourg	84	3.74	.63		
Intercultural competence	Kocaeli University	101	3.50	.24	-4.547	.00
	High Pedagogical School Fribourg	84	3.69	.32		

In order to test whether the variable of university made a difference in perceptions of the dimensions of intercultural competence, a t test was conducted. According to t test results, the university made a significant difference in the dimensions of cultural empathy (t = -8.003, p < 0.01) and social initiative (t = -3.951, p < 0.01); while it did not yield a significant difference in the dimensions of emotional stability (t = .129, p > 0.05), flexibility (t = 0.111, p > 0.05) and open-mindedness (t = -1.051, p > 0.05). In the dimension of cultural empathy, preservice teachers from Switzerland (M = 4.25) had higher perceptions than those from Turkey (M = 3.91). A similar situation was clear regarding the dimension of social initiative, since these levels of preservice teachers from Switzerland (M = 3.74) were higher than those from Turkey (M = 3.39).

Table 3

The Preservice Teachers' Perception of Intercultural Competence According to Gender.

Intercultural competence and dimensions	Gender	N	M	SD	t	p
Cultural empathy	Male	32	4.05	.28	-.368	.71
	Female	151	4.07	.35		
Emotional stability	Male	32	3.18	.51	2.457	.02
	Female	151	2.94	.52		
Flexibility	Male	32	3.45	.67	.610	.54
	Female	151	3.35	.67		
Open-mindedness	Male	32	3.62	.58	.008	.99
	Female	151	3.62	.56		
Social initiative	Male	32	4.05	.62	-.566	.57
	Female	151	4.07	.62		
Intercultural competence	Male	32	3.62	.31	.719	.47
	Female	151	3.58	.29		

The variable of gender did not show any significant difference in the cultural competence of preservice teachers (t = 0.729, p > 0.05). However, in the dimension of emotional stability, gender created a significant difference (t = 2.457, p < 0.05); the emotional stability perceptions of men preservice teachers (M = 3.18) were found to be higher than those of women preservice teachers (M = 2.94).

Table 4

The Preservice Teachers' Intercultural Competence Levels According to Department.

Intercultural competence and dimensions	Department	N	M	SD	t	p
Cultural empathy	Pre-school education	35	3.94	.21	.791	.43
	Primary education	68	3.91	.19		
Emotional stability	Pre-school education	35	2.83	.46	-2.376	.02
	Primary education	68	3.07	.49		
Flexibility	Pre-school education	35	3.36	.56	.048	.96
	Primary education	68	3.35	.59		
Open-mindedness	Pre-school education	35	3.53	.50	-.649	.52
	Primary education	68	3.60	.48		
Social initiative	Pre-school education	35	3.42	.54	.306	.76
	Primary education	68	3.38	.59		
Intercultural competence	Pre-school education	35	3.48	.26	-.802	.42
	Primary education	68	3.52	.25		

The variable of department also did not reveal any significant difference concerning perceptions of intercultural competence (t = -0.802, p > 0.05). However,

the perceptions of emotional stability of preservice teachers studying in the primary education department (M = 3.07) were found to be significantly higher than those of preschool education students (M = 2.83) (t = 2.376, p < 0.05).

Discussion and Conclusion

According to Cogan and Pederson (2001), the 21st-century teacher should possess a perspective of multiculturalism and its competencies. Teachers with this philosophy should be tolerate and be flexible with different lifestyles, respect other citizens' rights, and display a strong position against discrimination (Spiecker & Steutel, 2001).

The intercultural competence of preservice teachers from Turkey and Switzerland were found to be middling. Preservice teachers perceived themselves to be the most competent in the cultural empathy dimension of intercultural competence, which was followed by open-mindedness, social initiative, flexibility, and emotional stability, respectively. As clear from these results, teacher training programs should be investigated in terms of intercultural education. Teacher training should align with international standards and topics, and cultural differences should be considered in a systematic approach. Thus, prospective teachers will enable the learning of intercultural differences, as well as related details (Lappan & Le, 2002).

The variable of nationality created a significant difference in preservice teachers' perception levels of intercultural competence. It was found that preservice teachers from Switzerland had higher intercultural competence than those from Turkey. The variable of university revealed a significant difference in the dimensions of cultural empathy and social initiative, though it did not create a significant difference in the dimensions of emotional stability, flexibility, and open-mindedness. As for cultural empathy, preservice teachers from Switzerland had higher levels of perception than those from Turkey, and similarly, the social initiative of preservice teachers from Switzerland was found to be higher than those from Turkey. This difference may stem from the different styles of government, social structures, and/or intercultural environments in which preservice teachers live, as well as the teacher education programs of the two countries.

In analysis, it was observed that Switzerland's High Pedagogical School Fribourg Teacher Education Program offers courses directly related to multiculturalism and intercultural education (Diversité et pluralité, education interculturelle), as well as offers related content in other courses within the scope of its hidden curriculum. Kocaeli University's Faculty of Education teacher training program, by contrast, does not offer any courses directly related to multiculturalism and intercultural education, though related content is covered in education courses in its hidden curriculum. Also, the curricula in Turkey do not sufficiently emphasize intercultural education (Cırık, 2008). As Arslan (2009) reported, the Turkish education system does not place importance on cultural differences, and its curricula and textbooks do not reflect a philosophy of intercultural education. The fact that such a philosophy has not developed in Turkey's education system might explain why intercultural competence levels of preservice teachers from Switzerland are higher.

Understanding multiculturalism necessitates the renewal of preservice and in-service teacher training programs (Cogan & Morris, 2001). Theorists of

multiculturalism recommend that variety be the primary theme for preservice teachers and course with primary multicultural content be offered as compulsory courses instead of as electives (Nieto, 2000; Villegas & Lucas, 2002; Zeichner, 1993). In the teacher training curricula of Switzerland, there are courses on multiculturalism and intercultural education, while in Turkey no such courses are provided—even as electives. However, given the importance of multicultural education, its effects on teacher training programs are increasing. By comparison, for the majority of US education faculties, multicultural education courses have become compulsory (Larke & Larke, 2009).

Though gender did not reveal any significant difference in terms of perceptions of intercultural competence, gender did exhibit a significant difference regarding the dimension of emotional stability. Moreover, men preservice teachers were found to be more competent than women preservice teachers regarding the dimension of emotional stability.

Though the department of preservice teachers also did not show any significant difference in terms of the perception of intercultural competence, preservice teachers in primary education departments were found to be more competent in the dimension of emotional stability compared to preschool education students.

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Öğretmen Adaylarının Kültürlerarası Yeterlik Düzeyleri: İsviçre ve Türkiye Uluslarında Karşılaştırmalı Bir Çalışma

Atıf:

Özet

Problem Durumu: Çok kültürlü toplum; cinsiyet, ırk, sosyal sınıf, din/mezhep, dil, cinsel yönelim ve diğer istisna özelliklere dayalı toplumsal yapı kategorilerinden iki veya daha fazla kültürel kategoriyi içinde barındıran toplumlardır. Çok kültürlü toplumlarda kültürel çeşitliliğe dayalı karmaşık, benzer ve farklı kültürel anlayışlar yaygındır. Bu kültürel anlayışlar; yaş, cinsiyet, ırk, etnik özellikler, sosyo-ekonomik sınıf, dinsel kimlik, seksüel davranışlar, eğitim, tarih gibi pek çok faktörlerle şekillenmektedir.

Bireylerin bir başka kültürde etkili olabilmesi; diğer kültürlerle ilgilenmesine, kültürel farklılıkları fark edebilecek kadar duyarlı olmasına ve sonrasında da davranışlarını diğer kültürlerden insanlara saygı gösterecek biçimde yeniden biçimlendirmesine bağlıdır. İnsanların farklılıklara hoşgörü ve saygı gösterip, farklı kültürlerin uyum içerisinde yaşayabilmesi için bireylerin kendi bakış açılarının yanı sıra başka bireylerin de bakış açısını göz önünde bulundurması gereken "çok bakışlı anlayış stratejisini" benimsemesi gerekmektedir.

Bireylerin kültürlerarası iletişimde yeterli olabilmeleri için bireylerin kültürlerarası farkındalık, kültürlerarası duyarlılık ve kültürlerarası yeterlilik konularında eğitim almaları gerekmektedir. Bu bilgi ve becerilerin kazandırıldığı eğitim yaklaşımı ise kültürlerarası eğitim olarak isimlendirilmektedir. Kültürlerarası eğitim; etnik, ırksal, dil, din, cinsiyet vb kültürel özelliklere bağlı farklılıkların olduğu toplumlarda; önyargı, kimlik çatışması, güç çekişmelerini azaltmak için, toplumun farklı beklentilerine cevap veren eğitim politikası yada kültürel çoğulculuğu teşvik etmek için demokratik değerlere dayalı eğitim-öğretim yaklaşımı ya da eğitim eşitliğini sağlamayı taahhüt eden karma okul anlayışı olarak tanımlanmaktadır. Kültürlerarası eğitimde başarılı olmak için öğretmenlerin sınıf ortamında olumlu iklim yaratabilme; dil, din, etnik köken, sosyo-ekonomik düzey gibi farklılıklara sahip öğrenciler için demokratik ortam oluşturabilme ve öğrenci farklılıklarına yönelik eğitim verme ve öğrencilerin potansiyellerini en üst düzeye çıkartabilme konularında becerikli olması beklenmektedir. Bu nedenle günümüz öğretmenlerinin kültürlerarası yeterliklerinin geliştirilmesi gerekmektedir.

Van der Zee & Van Oudenhoven'e göre kültürlerarası yeterlik kültürel empati, açıklık, sosyal girişim, duygusal denge ve esneklik olmak üzere beş boyuttan oluşmaktadır. Kültürel empati, farklı kültür geçmişinden gelen bireylerin davranış, düşünce ve duygularını tanıma olarak nitelendirilmektedir. Açıklık, bireylerin kendi kültürel grupları dışındaki insanlarla karşılaştıklarında önyargısız ve iletişime açık olmasıdır. Sosyal girişkenlik, bireylerin sosyal durumlara etkin bir şekilde yaklaşmasını ve girişimde bulunma eğilimlerini ifade etmektedir. Duygusal denge, kültürel farklılıklara bağlı olarak gelişen çatışmalarda ve stresli durumlarda bireylerin duygusal dinginliğini korumasını, sakin kalabilme derecesidir. Esneklik ise, bireylerin yeni ve bilinmeyen durumlara alışabilme yeteneğini ifade etmektedir.

Araştırmanın Amacı: Ülkelerin bireysel, toplumsal, kültürel ve ekonomik ihtiyaçlarına dayalı olarak öğretmen yetiştirme sistemleri değişebilmektedir. Bu araştırmanın amacı, öğretmen yetiştirme programları farklı iki ülke olan İsviçreli ve Türkiyeli öğretmen adaylarının kültürlerarası yeterlik düzeylerini saptamaktır.

Araştırmanın Yöntemi: Tarama modelinde karşılaştırmalı betimsel bir araştırmanın verileri toplamak için çok kültürlü kişilik ölçeği ve kişisel bilgi formu kullanılmıştır. Fribourg Pedagoji Yüksek Okulu ve Kocaeli Üniversitesi Eğitim Fakültesi öğrencilerine toplu elektronik mektup gönderilerek belirtilen süre içerisinde veri tabanı bağlantısındaki (linkindeki) verileri doldurmaları istenmiştir. Fribourg Pedagoji Yüksek Okulundan 84 öğrenci, Kocaeli Üniversitesi Eğitim Fakültesinden ise 101 öğrenci ölçekleri doldurarak göndermiştir. Toplam 185 öğrencinin ürettiği veri üzerinde işlem yapılmıştır.

Araştırmanın Bulguları: Araştırmanın Bulguları: Türkiyeli ve İsviçreli öğretmen adayları genel olarak kültürlerarası yeterliklerini orta düzeyde algılamaktadırlar (M=3.59). Öğretmen adaylarının kültürel yeterliliğin alt boyutlarından kendilerini en yetkin gördükleri boyut kültürel empati (M =4.07) iken, bu boyutu sıra ile açıklık(M =3.62), sosyal girişkenlik (M=3.55), esneklik (M=3.36) ve duygusal denge (M=2.98), izlemektedir. İsviçreli öğretmen adaylarının kültürlerarası yeterlilik algı düzeyleri (M=3.69), Türkiyeli öğretmen adaylarının kültürlerarası yeterlilik algı düzeylerine (M=3.50) göre daha yüksektir (t= -4.547, p<.01).

Öğretmen adaylarının öğrenim gördükleri üniversite değişkeni, kültürel yeterliliğin alt boyutlarından kültürel empati (t= -8.003, p<.01) ve sosyal girişkenlik (t= -3.951, p<.01) boyutlarında anlamlı farklılaşma yaratırken; duygusal denge (t= 0.129, p>.05), esneklik (t=0.111, p>.05) ve açıklık (t= -1.051, p>.05) boyutlarında anlamlı farklılaşma yaratmamıştır. Kültürlerarası yeterliliğin kültürel empati boyutunda İsviçreli öğretmen adayları (M=4.25), Türkiyeli öğretmen adaylarına (M=3.91), göre daha yüksek algı düzeyine sahiptirler. Benzer durum kültürlerarası yeterliliğin sosyal girişkenlik boyutunda da söz konusudur. İsviçreli öğretmen adaylarının (M=3.74), Türkiyeli öğretmen adaylarına (M=3.39) göre sosyal girişkenlik düzeyleri daha yüksektir.

Cinsiyet değişkeni öğretmen adaylarının kültürlerarası yeterlik algılarından anlamlı farklılaşma yaratmamıştır (t= 0.729, p>.05). Bay öğretmen adaylarının kültürlerarası yeterliliğin duygusal denge boyutuna ilişkin algı düzeyleri (M=3.18), bayan öğretmen adaylarının algı düzeylerine (M=2.94) göre daha yüksektir(t= 2.457, p<.05). Öğretmen adaylarının öğrenim gördükleri bölüm değişkeni kültürlerarası yeterlik algısında anlamlı farklılaşma yaratmamıştır (t= -0.802, p>.05). Ancak sınıf

öğretmenliği bölümünde öğrenim gören öğretmen adaylarının kültürlerarası yeterliliğin duygusal denge boyutuna ilişkin algı düzeyleri (M=3.07), okul öncesi eğitim öğretmenliği bölümünde öğrenim gören öğretmen adaylarının algı düzeylerine (M =2.83) göre anlamlı şekilde daha yüksektir (t= 2.376, p<.05).

Araştırmanın Sonuçları ve Önerileri: Araştırma sonucunda İsviçreli ve Türkiyeli öğretmen adaylarının kültürlerarası yeterlik düzeylerinin orta düzeyde olduğu bulunmuştur. Öğretmen adaylarının kültürel yeterliliğin alt boyutlarından kendilerini en yetkin gördükleri boyut kültürel empati iken, bu boyutu sıra ile açıklık, sosyal girişkenlik, esneklik ve duygusal dengenin izlediği görülmüştür. Öğretmen adaylarının öğrenim gördükleri üniversite değişkeni öğretmen adaylarının kültürlerarası yeterliklerine ilişkin algı düzeylerinde anlamlı farklılaşma yaratmıştır. İsviçreli öğretmen adaylarının kültürlerarası yeterlilik algı düzeyleri, Türkiyeli öğretmen adaylarının kültürlerarası yeterlilik algı düzeylerine göre daha yüksek olduğu saptanmıştır. Cinsiyet ve öğrenim görülen bölüm değişkeni öğretmen adaylarının kültürlerarası yeterlik algılarında anlamlı farklılaşma yaratmamıştır.

Görüldüğü üzere her ülkedeki öğretmen yetiştirme programlarının kültürlerarası eğitim açısından sorgulanması gerekmektedir. Öğretmen eğitiminin uluslararası düzeyde standartlara bağlanması ve sistematik bir yaklaşımla kültürel farklılıkları içeren konulara yer verilmesi gerekmektedir. Böylece geleceğin öğretmenlerinin yeterliklerinde kültürlerarası farklılıkların bilgisi yanında; bu konulara ilişkin detayların öğrenilmesini de sağlayacaktır. Yapılan incelemelerde İsviçre Fribourg eğitim Yüksekokulu öğretmen yetiştirme programında çok kültürcülük ve kültürlerarası eğitimle doğrudan ilgili dersler (Diversité et pluralité, education interculturelle) olduğu gibi diğer öğretim derslerinde de örtük program yaklaşımı ile içeriğin sunulduğu görülmüştür. Türkiye'deki Eğitim Fakültesi öğretmen yetiştirme programlarında ise çok kültürcülük ve kültürlerarası eğitimle ilgili doğrudan bir dersin bulunmadığı ancak öğretim dersleri içerisinde örtük program yaklaşımı ile içeriğin yayıldığı saptanmıştır. Çok kültürlülük anlayışı, hizmet öncesi ve hizmet içi öğretmen yetiştirme eğitim programlarının yenilenmesi gerekliliğini ortaya koymaktadır Çok kültürlülük kuramcıları, öğretmen adayları için çeşitliliğin programın ana konusu olmasını, seçmeli değil zorunlu olmasını, diğer derslerle birlikte verilmesini önermektedirler. İsviçre öğretmen yetiştirme programlarında çok kültürlülük ve kültürlerarası eğitimle ilgili zorunlu dersler bulunurken Türkiye öğretmen yetiştirme programlarında lisans düzeyinde henüz seçmeli ders bile bulunmamaktadır. Türkiye'deki öğretmen yetiştirme programlarında kültürlerarası eğitimle ilgili derslerin konulması öğretmen adaylarının kültürlerarası yeterliliklerinin gelişmesine katkı sağlayacaktır.

Anahtar Sözcükler: kültürlerarası yeterlilik, öğretmen adayı, kültürlerarası eğitim, çok kültürlülük.

The Needs of Inclusive Preschool Teachers about Inclusive Practices[*]

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Abstract

Problem Statement: Since the law related to the inclusion of children with special needs was passed, the number of children with special needs in preschool classrooms has increased each year. Preschool teachers face serious challenges when they teach children with diverse abilities in the same environment. Although most of them support the idea of preschool inclusion, preschool teachers usually do not want children with special needs in their classrooms because of their lack of knowledge and skills regarding inclusive practices. It has been established that teachers are the most important component of inclusion, and in order to increase the success of inclusive practices, they should be prepared to teach in heterogeneous classrooms that include children with and without disabilities.

Purpose of Study: To develop and implement an effective and functional training program for inclusive preschool classroom teachers, we aimed to

thoroughly examine the needs of preschool teachers with regard to supporting the development of children with disabilities in their classes.

Method: In the first part of our study, semi-structured interviews were conducted with 40 teachers, and in the second part, in-depth interviews were held with four of the teachers from the first group. All of the teachers who participated in this study had one or more children with special needs in their classrooms. After completion of the interviews, the data from the two groups were analyzed separately.

Findings and Results: The analyses of both groups of data indicated that teachers mainly needed knowledge, skills, experience, and support when assessing the performance of children with special needs, working with their parents, preparing individualized education programs (IEPs), adapting and modifying their curriculum, and dealing with behavioral problems.

Conclusions and Recommendations: To make preschool inclusion successful and to have special needs children gain the expected benefits, teachers need to be provided with functional teacher training programs that foster positive attitudes and provide them with a meaningful experience. If preschool teachers in Turkey had access to these types of programs in both pre-service and in-service education, the quality of preschool inclusion would improve immensely.

Keywords: Preschool teachers, mainstreaming practices, needs, semi-structured interview

The quality of inclusion programs varies according to program philosophy, administrative support, teacher training, and attitudes of instructors (Buysse, Wesley, Bryant, & Gardner, 1999); however, the most fundamental element needed for successful inclusion is general education classroom teachers (Bruns & Mogharberrean, 2009; Burke & Sutherland, 2004; Frazeur-Cross, Traub, Hutter-Pishgahi, & Shelton, 2004; Odom, 2000). Teacher training, experience, attitudes, and knowledge are key indicators of the quality of inclusion, and teachers need to be knowledgeable about and experienced in inclusion practices as they work with children with special needs and attempt to meet the diverse needs of the all of the children in their classes (Crane-Mitchell & Hedge, 2007). In this sense, successful inclusion is closely related to the ability to adapt the instructional environment and methods to the needs of students, use effective instructional methods and strategies to teach children appropriate behaviors, and provide equal learning opportunities for all children (Bricker, 1995).

Preschool teachers generally believe that children with special needs should be educated in general education classrooms and that these students benefit from inclusion (Avramidis, Bayliss, & Burden, 2000; Crane-Mitchell & Hedge, 2007); however, these teachers report that they have insufficient knowledge about inclusion

practices and lack competency for educating children with special needs (Odom & Bailey, 2001). In addition, teachers indicate that they are in need of training, support from special education teachers, and additional materials and tools for inclusive classes (Eiserman, Shisler, & Healey, 1995; Coombs-Richardson & Mead, 2001). Moreover, they emphasize that their most fundamental need is learning how to adapt the preschool program to meet the requirements of inclusion and how to engage the children with special needs in daily routines (Hadadian & Hargrove, 2001). Furthermore, in their pre-service programs, only general information is given; hence, they desire workshops, seminars, and additional courses so that they can gain more knowledge as well as on-the-job (i.e., in-classroom) experience (Crane-Mitchell & Hedge, 2007). Preschool teachers in inclusion programs have indicated that their primary needs are related to the preparation of individualized education programs (IEPs), instructional adaptation, augmentative technology (Buell, Hallam, Gamel-McCormich, & Scher, 1999), behavioral and communication strategies, and appropriate positioning/transportation, especially for children with motor disabilities (Bruns & Mogharberran, 2009). In addition, they believe that inclusion would be more successful if they had appropriate on-the-job training. Providing teachers with one-time in-service training is not sufficient to equip them with the necessary skills to meet the needs of special needs children. In addition, a lack of monitoring to determine whether teachers are applying the knowledge they received from the in-service training, limited though it may be in our country, can inhibit the use of new techniques and strategies in classrooms (Bruns & Mogharberran, 2009; Crane-Mitchell & Hadge, 2007). The reality is that many teachers only gain knowledge and experience via trial and error after special needs children are placed in their classrooms (Clough & Nutbrown, 2004).

In Turkey, preschool inclusion started in 1997 with the passage of a decreed law (no. 573), and became more widespread in 2006 with the adoption of a special education services regulation (MEB, 2013) that included the following principles. First, it stated that the education needs of young children with special needs can be met in public and private preschools by providing the needed support services. This process should include providing training and consultancy, professional support, and the necessary equipment to children with special needs, their families, their teachers, and other school staff. Furthermore, children who are eligible for special education services but who do not have severe or multiple disabilities according to the Counseling and Research Centers (CRCs) where educational diagnoses and placement decisions are made should be placed in preschool classrooms. Additionally, teachers, psychologists, and administrators who are working in preschools should take the necessary measures to meet the needs of these children.

Research studies that have examined inclusion practices in Turkey and the factors that affect their success have shown that problems often occur when implementing inclusion practices and that administrators, parents, and teachers frequently bring up these problems, for example the higher numbers of children in classrooms, a lack of support services for the child and the teacher, insufficient knowledge on the part of

administrators and teachers regarding inclusion, and negative teacher attitudes (Aral, 2011; Batu, 2010; Gök & Erbaş, 2011). The report of the Education Reform Initiation (Eğitim Reformu Girişimi, 2011) on inclusion practices and problems in Turkey entitled "A Situational Analysis of Inclusion" demonstrated that even though teachers accept children with special needs into their classrooms, they lack the competence to deal with them and need appropriate training and knowledge to meet their needs. For instance, Varlıer and Vuran (2006) conducted interviews with 30 preschool teachers and found that in order for teachers to gain knowledge and experience in working with special needs children, they needed seminars, courses, in-service training, and training during their undergraduate studies. Two other related studies showed that teachers lacked knowledge about inclusion and therefore were unable to meet the needs of the children with special needs in their classrooms (Altun & Gülben, 2011; Gök & Erbaş, 2011). Furthermore, the studies noted that the teachers had difficulties in differentiating preschool programs that are developed for typically developing children, adapting their instruction to different children's characteristics, and utilizing effective classroom management strategies. Another issue that many of the teachers face is that they do not have access to professionals (i.e., psychologists, speech and language therapists, and physiotherapists), so they must try to resolve classroom problems on their own or with the help of the parents of children with special needs (Gök & Erbaş, 2011). Similarly, the majority of preschool teachers believe that they do not possess the skills to meet the needs of children with special needs (Kaya, 2005) and desire to gain the knowledge and support that they lack so that they can assist with the development of these children (Şen, 2003; Yavuz, 2005). In a study comprised of 183 preschool teachers, more than 60% reported that the most fundamental need to ensure the success of inclusion was gaining more knowledge and experience (Küçüker, Acarlar, & Kapçı, 2006).

Preschool teachers have only one compulsory special education course during their undergraduate programs, and some only offer inclusion as an elective course. Unfortunately, only general information related to inclusion is given in these courses, and pre-service teachers are not really expected to improve their knowledge and experience related to working with special needs children (YÖK, 2013). A similar situation occurs in in-service courses, seminars, and meetings, because teachers have no opportunity to apply the knowledge that is presented. For example, in the study by Özaydın and Çolak, (2011) researchers examined the opinions of preschool teachers concerning an in-service program they had attended. Even though instructors indicated that the program was useful because they acquired new information, they criticized the length of the training and the content because of the lack of visual examples and stated that they wished they had been provided with more knowledge about how to write IEPs.

Therefore, based on the findings of previous research studies, it is clear that if preschool inclusion practices are to be successful in Turkey, then providing more knowledge and experience regarding inclusion must be a priority. However, in order to achieve this goal and prepare appropriate programs, the needs should be

prioritized. Thus, as the first stage of a broader project in which we aimed to investigate the effects of a teacher training program to be developed based on teachers' needs and evaluate the outcomes, we examined the needs of preschool teachers who have children with disabilities in their classrooms regarding inclusive practices. For this purpose, our study was carried out in two stages. Semi-structured interviews were initially conducted with 40 teachers, and their primary needs and areas in which they considered themselves to lack competence were examined. In the second stage, in-depth interviews were conducted with four of the teachers from the first group who volunteered to provide more in-depth answers about what is necessary to effectively teach in heterogeneous classrooms.

Methods

Research Design

In Turkey, although the preschool teachers' opinions and their attitudes regarding inclusion have been investigated in several studies, their needs related to inclusive practices have not been well documented. Because our goal was to determine the needs of the preschool teachers who have young children with special needs in their classrooms, we used a case study approach, a type of qualitative research. The data were gathered via semi-structured interviews for both stages of the study and were analyzed using descriptive analysis in the first stage of the study and inductive analysis in the second stage of the study.

Study Group

Our study was made up of two groups of teachers. The first group included 40 female teachers who worked in Ankara in any one of the 14 public preschools affiliated with the Ministry of National Education. As previously mentioned, the second group consisted of four teachers from the first group. The characteristics of the teachers in both groups are given in Table 1. In the teachers' classrooms, there were 37 children who were officially diagnosed as having special needs, and three who consistently demonstrated different behavioral and developmental characteristics than their peers (children at risk). Although these three had similar characteristics to the children who had been diagnosed with special needs, they were not referred for diagnosis because their parents did not want them to be labeled.

Table 1.

Frequency and Percentage of the Participants' Characteristics

	First Group		Second Group
	f	%	f*
Age			
20-30	23	57.5	2
Older than 31	17	42.5	2
Education			
Associate's degree	3	7.5	
Bachelor's degree	37	92.5	4
Undergraduate department			
Child development	4	10.0	
Early childhood teacher education	32	80.0	4
Early childhood training	1	2.5	
Preschool teacher education	3	7.5	
Work experience			
1-10 years	37	92.5	3
More than 11 years	3	7.5	1
Experience with children with special needs			
Inexperienced	15	38.0	1
1-5 years	23	58.0	3
More than 6 years	2	4.0	
Classroom size			
10-15 students	8	20.0	
16-21students	21	52.5	2
More than 22 students	11	27.5	2
Types of disabilities			
Intellectual disabilities	14	35.0	1
Autism	13	32.5	3
Multiple disabilities	5	12.5	
Speech and communication disorders	3	7.5	
Hearing impairment	3	7.5	
Physical impairment	1	2.5	
Emotional and behavioral disorders	1	2.5	
Number of diagnosed or at-risk children			
At-risk	3	7.5	
Diagnosed	37	92.5	4
Special education support			
No support (either for the teacher or the student)	9	22.5	1
Special education support (for the student)	25	62.5	3
Special education support + in-class support (for the student)	5	12.5	
Special education consultation (for the teacher)	1	2.5	

*f= number of teachers. Since the second group consisted of only four teachers, percentages are not given.

Research Instruments and Procedure

Teacher Interview Form A: To begin, we generated the questions to be included in the interview form for the first stage of the studies by examining previous studies (Gök & Erbaş, 2011; Kapçı, Acarlar, & Küçüker, 2003; Orhan, 2010; Şen, 2003; Varlıer & Vuran, 2006; Yavuz, 2005). These questions were then analyzed by two experts in the field, and changes were made according to their suggestions. The first part of Form A included questions regarding demographic information about the teacher and the children with special needs, and the second part consisted of four questions related to the opinions of the teachers about inclusive practices in Turkey. The third part of the form consisted of three lists, each containing 10 items, with questions related to the difficulties the teachers encountered in their inclusive environments. The teachers were asked to rank the items according to whether they felt competent or lacked competence regarding the topic and whether they believed they needed more knowledge about the subjects on the first, second, and third lists, respectively.

Teacher Interview Form B: This form was developed to conduct in-depth interviews with four teachers and to reveal their needs concerning inclusion. For this purpose, 10 questions regarding preschool inclusion were prepared that covered the following topics: (a) the difficulties teachers encounter while they work with children with special needs, (b) physical adaptations and accommodations they make, (c) instructional goals they choose for special needs children, (d) methods they use to assess the children's performance, (e) difficulties they have in inclusive classroom management, (f) strategies they implement for individualized instruction, g) intervention methods they use to deal with problem behavior, (h) support they receive, (i) interaction with the families of their students, and (j) professional development. All interviews were conducted during suitable hours by a doctoral student with experience in qualitative research studies in a quiet room at the teacher's school, for example a meeting room, teachers' room, or school counselor's room. The interview sessions were recorded on audio and video tapes, with both stages lasting 30 minutes on average.

Data Analyses

For data analysis, QSR NVivo9 software (QSR International Pty, Ltd., Victoria, Australia) was used. The first researcher transcribed all of the interviews conducted with the 40 teachers who were coded as T1, T2, T3, etc. (descriptive information), and the third and the fourth authors confirmed the transcribed texts by comparing them with the audio recordings. Next, all of the written texts were separately transferred to electronic media and the teachers' answers were examined in detail. The answers were then divided into different categories by content. These categories were examined separately by the first and fifth researchers. In this process, 20% of the interview files were randomly compared in terms of the categories and statements (teacher codes/frequencies) and any disagreements were reviewed until the researchers reached an accord. Inter-coder agreement was calculated using the following point-by-point agreement formula (Tawney & Gast 1984): [(Agreement/

(Agreement + Disagreement) x 100]. For qualitative studies, Miles and Huberman (1994) suggest that finding agreement in more than 70% of the points means the coding is reliable. In the first stage of this study, the agreement coefficient was found to be reliable at 77%.

In the second stage, the data collected from the four teachers were analyzed by the first and fifth researchers using the same method. Themes and subthemes were formed, and agreement was reached on all of the themes. After the comparisons, any disagreements were resolved by discussion and agreement on coding, and in the end, five themes were predominant (Lincoln & Guba, 1985).

Results

The Results of the First Stage

Qualitative results. Our analyses showed that the first stage of the study had five main themes with 18 subthemes, as shown in Table 2. According to Table 2, all of the teachers in the first group seemed to believe that inclusion was a necessary practice and that it benefited all children, whether they had special needs or not. One of the teachers (T10) explained the benefits of inclusion for typically developing children: "*I think other students in my class are developing more than typical at the beginning of the year. I mean, when that student (with special needs) cannot take his bottle or bag, one of his classmates runs there and helps him, and when he cannot carry his chair, someone pulls the chair back. I mean, they have incredible cooperation.*" Another teacher (T1) added her thoughts on the same topic: "*She (special needs child) came out of her shell over time, and her friends are trying to help her all the time. She started to trust her friends, so she is more open now. I mean…I think she started to slowly overcome her problem. Her socialization…her relationship with her friends started to get much better.*" Another teacher (T11) stated, "*That setting is so important for the child...At least he is learning the rules, I think.*" Five teachers indicated that inclusion was a legal obligation, with one explaining it in the following way (T22): "*Now it is really their (children with special needs) right…They need to attend (preschools).*" Another teacher (T33) stated, "*There is an obligation to have one student with special needs in every classroom.*"

Table 2.

Themes and Subthemes Obtained by Descriptive Analyses

Area of Questioning (Semi-structured question)	Core Relevant Narrative Formed From Quotation (Key content summarized through relevant quotations and linked by formulated meaning statements)	Emergent Themes (Initial themes arising within quotation)	f*	%
The need for inclusion	*Inclusion is effective for children with and without special needs.* (T1, T10, T11)	1. The benefits of inclusion	40	100
	Inclusion is a legal obligation in Turkey. (T22, T23)	2. The legal obligation of inclusion	5	13
The success of inclusion	*Inclusion practices are not properly carried out.* (T29, T30)	3. Inclusion is unsuccessful/ insufficient	28	70
	Inclusion practices are implemented but practices are only partially sufficient/successful. (T3, T19, T21)	4. Inclusion is partly successful/partly sufficient	9	23
	Inclusion practices are sufficient and effectively carried out. (T2, T20, T34)	5. Inclusion is successful/sufficient	5	13
Factors affecting inclusion	*Teachers' knowledge and skills, classroom size, number of students with special needs in one classroom.* (T1, T2)	6. Factors related to school	36	90
	Type and severity of the disability of the student with special needs and existence of multiple disabilities. (T1, T28, T32)	7. Factors related to children with special needs	15	38
	Whether the family of the child with special needs accepts his/her condition and their cooperation with schools; positive/negative attitudes of other families towards children with special needs and their families. (T4, T11, T20, T22)	8. Factors related to families	13	33
	Approach and awareness of the society towards individuals with special needs. (T2, T3, T6)	9. Other factors	5	13
Support given for inclusion	*No support, such as consulting or in-class special education support (teacher aide).* (T5, T22, T28)	10. No support given to the teacher	23	58
	Support from school administration, school counselor or teacher candidates. (T13, T17, T23)	11. Support of school	35	88
	Family-teacher cooperation, families providing communication between classroom teacher and special education teacher. (T4, T12, T13, T14, T18, T20, T23, T38)	12. Support of family	26	65
	Face-to-face communication with or calling special education teacher. (T13, T19, T37, T8, T38)	13. Support of special education experts	15	38

Table 2 continue...

Area of Questioning (Semi-structured question)	Core Relevant Narrative Formed From Quotation *(Key content summarized through relevant quotations and linked by formulated meaning statements)*	Emergent Themes (Initial themes arising within quotation)	f*	%
Suggestions for inclusion	*Utilizing books or films about children with special needs.* (T8, T21, T22, T30)	14. Support of printed and visual media	8	20
	Teacher education, assistive personnel, physical construction of the school building, classroom size, materials/equipments in the classroom. (T10, T12, T13, T14, T20, T28, T30, T31)	15. Suggestions for school	34	85
	Separate classrooms, duration of inclusion, transition programs. (T1, T14, T18, T25)	16. Suggestions for children with special needs	9	23
	Raising awareness among families of children with and without special needs. (T20, T24, T34)	17. Suggestions for families	6	15
	Raising awareness in the society, personnel designation, checking related institutions and organizations. (T19, T20, T27, T40)	18. Other suggestions	5	13

Note: T: Teacher, *f = number of teachers

The second theme was related to the opinions of the teachers regarding the success of inclusion and the difficulties they encountered in their classes. When asked whether inclusion was successful or not, the majority of the teachers (f=28) reported that it was not (see Table 2). Those who thought that inclusion was successful (f=5) or partially successful (f=9) mentioned several factors that they believed contributed to the success. One of the teachers (T29) described it by saying, *"Why aren't they (these programs) successful? That's because the teacher isn't attending to them (children with special needs). You can't attend to them like you can in special education (centers). You have to attend and teach only to them."* Another teacher (T30) indicated that *"When I think about my methods, I don't think they are sufficient…because…I'm not knowledgeable about it (inclusion) at all."*

According to the teachers, the success of inclusion was negatively influenced by teacher factors, such as negative attitudes and a lack of knowledge and skills about the issue. In addition, as can be seen in Table 2, almost all the teachers (f=36) said that school factors, such as large class size, the number of children with special needs in one classroom, and the lack of assistants, also played a role. More than half of the teachers (f=25) indicated that they lacked the knowledge and skills to work with special needs children and that they especially had difficulty preparing IEPs and having students follow routines in classrooms with large numbers of students. One of the teachers (T1) put this into words by remarking, *"Teachers need training for this. I*

think teachers have to attend seminars and in-service trainings." Another (T12) said, *"I can't individualize the educational program. At least, I can't do this right now. That's because my classroom size is large. I have 28 students in my class."*

Thirty-eight percent of the teachers indicated that the characteristics of children with special needs affected the success of inclusion (f=15). When addressing this topic, one teacher (T1) remarked, *"The severity of the child's impairment must be taken into account. The child must have only one kind of impairment. I mean, a child with both a physical and a mental impairment would benefit less from the instruction. I think inclusion is appropriate for children with mild disabilities."* Another (T28) had this to say: *"The impairment level is important…I mean, other children hardly accept them (children with severe disabilities)."* Moreover, the teachers reported that they did not have the skills to manage the behavioral problems of special needs children (f=23). T1 explained this with the following example: *"She colors everywhere…the tables, the floor…after she finishes activities. I tell her that what she does is wrong. Other than that, I can't do anything else."*

Thirteen teachers explained that another factor that affects the success of inclusion is the families of children with and without special needs. For example, T20 described the importance of the relationship between a child with special needs and his family when she said that *"There is a big difference in him now than the day he started, and this pleases his family. This is really important because I always receive feedback from his parents. 'We have done this and that…and this or that happened.' When you hear that, you feel more self-confident, and once you feel that, you want to give more to the child."* Teacher 11 also explained how the families of children without special needs can affect inclusion. *"But the parents of my students are really great. They all accept the child, and I've never heard anything like 'Why do we have a child like this?' They are all good."* However, not all of the parents of children without special needs had positive things to say about inclusion, as T22 recounted: *"Some parents say, 'I don't want my child to see a child like that; she might be depressed (because of him/her).'"*

The fourth theme concerned the support that the preschool teachers receive, and more than half (f=23) indicated that they had no support (see Table 2). For example, T28 explained that she did not receive any support even though her student had a severe intellectual disability. She also complained, *"In addition, we don't have any aides in the school and we need them."* However, some teachers reported that they did receive limited support from the school, families, and school counselor. Teacher 13 described the support of a pre-service teacher: *"At least she is supporting…I mean, the teacher candidates…I mean, most generally we benefit from them…"* Meanwhile, T17 commented on the support of the school counselor: *"Thanks to her (school counselor), we arranged an IEP meeting and we talked with her (the child with special needs') teacher there (at the special education center)."* Some teachers also reported that they talked with special education teachers (outside of the school) either face-to-face, by telephone, or via the family to receive information to help develop the child's IEP.

The last theme of this study focused on suggestions from the teachers about inclusion. As Table 2 notes, 85% of the participants had suggestions for the schools (f=34), such as providing seminars, courses, in-service training, and real life experience regarding inclusive practices (f=18), having more assistive personnel, pre-

service teachers, etc. (f=14), and getting support from special education teachers, school counselors, or experts from CRCs. They also made other suggestions related to decreasing classroom size (f=6), organizing physical structure and architecture, and providing better resources (f=4). Teacher 31 suggested that "*Seminars must be organized. Something must be done in some way rather than leaving the child with special needs in the classroom with teachers who are unprepared.*" Nine teachers (25%) made suggestions related to the children with special needs themselves. For example, five of them believed that these children must be educated in separate classrooms; five thought that inclusion should not be full time, and one suggested that the children should participate in a transition program before they are enrolled in the regular classrooms. In addition, six teachers commented that the families of the children in the class, both children with and without special needs, must be informed about inclusion. Finally, five teachers also made recommendations that focused on informing society about inclusion (f=2), employing special education teachers in preschools (f=2), and reorganizing CRCs and special education centers (f=1).

Quantitative results. For the third part of Form A, the teachers were requested to rank the topics in which they felt competent or lacked competence, along with the primary topics that they deemed were areas in which they needed to increase their knowledge. Our findings are listed in Table 3. According to Table 3, 28-55% of the preschool teachers indicated that they felt competent when using different instructional methods, applying classroom and behavioral management strategies, and cooperating with families. However, half of the group reported that they lacked competence when it came to offering individualized instruction, assessing the performance of special needs children, and carrying out classroom and behavioral management. In addition, 50-58% of teachers stated that the main areas in which they needed to increase their knowledge were learning more about the characteristics of children with special needs, individualized instruction, and managing behavioral issues.

Table 3.

Topics in which the Teachers Felt Competent or Lacked Competence along with the Primary Topics for which They Needed to Increase Their Knowledge

Topics	Competent		Lacked competence		Primary Topics	
	f	%	f	%	f	%
Characteristics of young children with special needs	5	13	**11**	**28**	**23**	**58**
Assessment of performance	5	13	**17**	**43**	8	20
Individualized instruction	8	20	**24**	**60**	**21**	**53**
Use of different instructional methods	**20**	**50**	9	23	5	13
Supportive speech and language	6	15	**20**	**50**	**10**	**25**
Classroom management	**12**	**30**	17	43	8	20
Prevention and control of behavioral problems	**11**	**28**	**22**	**55**	**20**	**50**
Communication and cooperation with families	**22**	**55**	6	15	3	8

The Results of the Second Stage

In the second part of our study, we analyzed data gathered from the in-depth interviews with four teachers, and found that their needs regarding inclusion were similar to what we found in the first stage of the study. These teachers reported that they did not know the characteristics of children with special needs, had difficulty teaching children with and without special needs in the same environment, and could not deal with behavioral problems in the classroom. Moreover, some particular needs related to inclusive practices emerged from these interviews. For example, due to the impairments of the children with special needs, the teachers could not involve them with table activities, art, music, or play activities. Teacher 3 explained, *"You can motivate them in social areas in one way or another or you can communicate with them by giving instructions…but in academic skills, when you put a worksheet in front of them (children with special needs) and give them instructions on how to fill it in, you can't get them do it like the other children."* Teacher 1 agreed, and added, *"He (a special needs child) finds it too difficult to hold the scissors in cutting exercises."*

The teachers also believed that teaching daily life, self-care, social, adaptive, and communication skills to special needs children in preschools was sufficient. Teacher 1 stated, *"The child must learn about daily life and his/her self-care first of all."* Teacher 2 said that *"social development is my priority goal. These types of kids are socially excluded."* On the same topic, T3 noted, *"Teachers must work on socially adaptive behaviors and communication rather than academic areas. I think communication must be the most important basis of inclusive education."*

The teachers also answered questions about the need for more knowledge regarding the developmental characteristics of children with special needs. They reported that they had difficulties in communicating and supporting the communication attempts of these children and explained that they needed to know what they should teach and how to instruct them. One teacher (T2) commented, *"In particular, how should we approach them (children with special needs)? What should we teach them? What are their characteristics?"* Another (T4) added, *"For example, physical organization—we aren't knowledgeable about it."* The teachers also indicated that they had attended in-service training but that they had had no opportunities to use the newly learned strategies in their classrooms. As T4 stated, *"I've attended training-sessions about inclusion before… I've participated in seminars about special education…even preparing IEPs…but when you don't have a child with special needs in your classroom, it makes no sense. I see now that I have little knowledge about inclusion. I understand it now."*

The other specific needs that were mentioned focused on developing IEPs and adapting the curriculum. One of the teachers reported that she was making the instructional goals simpler for her special needs children, and another indicated that she was trying to adapt the instruction by grouping the children according to their developmental levels. However, they both said that even though they wanted to modify the goals, they needed support to know how to choose appropriate goals and targets for the developmental level of the children, prepare IEPs, and integrate the IEP goals into the classroom program. One of the teachers (T2) discussed her difficulty in choosing goals, noting, *"We tried to write an IEP, but we weren't sure if it*

was right or wrong." Two teachers stated that they tried to modify the instructional setting and activities (e.g., changing the duration of activities), and three others said that they offered physical and verbal cues and reinforcement during classroom instruction. Regarding the use of cues, one teacher remarked that "*…verbal (cues) are not so effective. I have to go right next to him and help.*" Another teacher (T4) indicated that she could not help the child as much as she needed. "*For example, the child with special needs just sits during the activity, whether it is story-reading or art, and she just waits. She waits for me, and other children need help individually, too. I help every child one by one, and when it's her turn, I help her, too.*" One teacher responded, "*His (child with special needs') work (worksheet) stays in front of him; I try to make him do that work individually for an hour.*" Another (T3) stated her ideas related to the problem of helping a special needs child in her classroom: "*His family and others want him to do things in a group here (in the school). Indeed, sometimes, because he doesn't like group activities, we should do things one-on-one.*"

Another important point that the four teachers emphasized was that they did not have sufficient instructional materials in the classrooms. Teacher 2 explained, "*We can't find them (appropriate materials) for different disabilities. And that's hard. Because they (these materials) aren't available all the time in the classroom, and since the classrooms are crowded, we can't get everyone access to appropriate materials.*" Another of the teachers' needs was to know how to assess whether the child was learning. The teachers indicated that they usually did this by observing the children, assessing their work, and having the students do a self-assessment. However, they found it difficult to apply these same methods to the children with special needs. One of the teachers said that she assessed her special needs child's performance by asking questions.

Similar to the findings of in the first stage of our study, the four teachers highlighted that the behavioral problems of the children with special needs negatively affected the classroom setting, and that they did not know how to deal with them. They also stated that they could not employ the same strategies that they normally used with children without special needs. Teacher 4 indicated that she left her special needs child alone: "*Sometimes this child (with special needs) affects it (my classroom management). He is hyperactive. He runs, runs, (and) runs in the classroom. Then he falls down and gets up again and starts to run again. I can't do much about him. I can't do anything but let him do the things he does. I mean, sometimes when there is a challenging situation, I tell him, (but) I don't know if he understands me.*" Teacher 1 indicated that she did not implement any special strategies for classroom and behavior management for her children with special needs. "*For my classroom management…I mean, I do what I generally do.*" Teachers 2 and 3 attributed the behavioral problems to the children's impairments when they said, "*The things I do are useless because these behaviors are his (child with disability) characteristics.*"

The teachers indicated that they tried to cooperate with the families, school counselors, and special education experts, and two said that they talk with the families of the special needs children to try and find common ways to deal with behavioral issues, especially if the child is exhibiting the same problems at home and at school." Teacher 3 stated that she was trying to cooperate with the special

education center regarding the special needs child in her class. "*Since we are in touch with her (child with special needs') teacher there, I inform her (special education teacher) about the methods I use. They (the parents) talk to me about what a special education teacher does.*" One of the teachers stated that she identified the instructional goals for her special needs student with the help of the school counselor. However, another teacher emphasized that school counselors also have limited knowledge about inclusion. In addition, one teacher (T3) stated that there was a need to prepare the children without special needs for inclusion saying, "*What and how will I explain to the other children about the child with special needs?*"

Discussion and Conclusions

In this two-staged study, the needs of inclusive preschool teachers were determined by analyzing qualitative data. The participants in both stages of the study believed that children with special needs must be educated alongside their peers. In addition, even though they indicated that they have had issues related to the system and difficulties in their inclusive classrooms; they believed that inclusion was still successful. It was very clear that the teachers did not think that they had sufficient knowledge and skills to work in inclusive classrooms, and that they had conflicts and doubts, especially with regard to their ability to prevent and control behavioral problems. Furthermore, having good classroom management and identifying the learning priorities of the children were also problematic. On one hand, the teachers believed that they could prevent and control behavioral issues, but at the same time, they expressed that this was sometimes difficult, and expressed a desire to learn more effective strategies. This might mean that these teachers saw the behavioral problems as a general characteristic of the children with special needs. Therefore, even though T1, T3, and T4 said that they have issues with classroom management and problem behavior, they did not mention this as a need because they felt like there was nothing that could be done. Lastly, the teachers stated that they needed training regarding the characteristics of children with special needs, behavioral strategies, prevention of behavioral problems, and assessment of special needs children. In addition, they felt that they needed additional experience and support in developing IEPs. Our findings were consistent with the results of previous studies conducted with preschool teachers working in inclusive schools both in Turkey and throughout the world (Buell et al., 1999; Crane-Mitchell & Hedge, 2007; Gök & Erbaş, 2011; Kapçı et al., 2003; Özaydın & Çolak, 2011; Soodak, Erwin, Winton, Brotherson, Turnbull, & Hanson, 2002; Şen, 2003; Varlıer & Vuran, 2006; Yavuz, 2005)

The teachers' needs with respect to all aspects of inclusion can be explained by two factors. First, in undergraduate education, there is only one introductory course on special education in Turkey, and many teachers graduate without having attended any courses or classes that focus on working with children with special needs. Moreover, pre-service teachers learn the methods and techniques needed to work with children with typical development in their undergraduate degrees, but they learn only that inclusion is an educational approach or service model. In

addition, applied courses or practicums in teacher training programs focus on working with children without special needs leads to the lack of experience that the teachers in our study expressed.

The second issue is that in-service teacher training programs on inclusion are provided in Turkey for preschool teachers. However, due to factors such as the teachers' heavy workload and financial issues, only a few teachers can attend these programs. In addition, the in-service courses only include general knowledge about the principles of inclusion along with methods and strategies that can be used in inclusive environments. Therefore, the teachers in our study reported that they have not been able to use these methods and strategies in their classrooms because they need more than just general knowledge (Batu, 2000; Özaydın & Çolak, 2011). Hence, preschool teachers in Turkey have limited knowledge and experience with working in heterogeneous classrooms and cannot meet the diverse needs of the children. Previous studies have shown that for inclusion to be successful, teachers need to be informed about this issue and have on-the-job training along with workshops. Furthermore, they need to be provided with additional special education courses during their undergraduate studies so that they can effectively work with children with special needs (Crane-Mitchell & Hedge, 2007). Besides access to informative courses, preschool teachers also need different types of training programs that include coaching and feedback (Hundert, 2007; Schepis, Reid, Ownbey, & Parsons, 2001; Yang & Rusli, 2012). Therefore, in order to increase the quality and redeem the promise of inclusion in Turkey, where these types of teacher training programs are rare, teachers must be offered a way to increase their knowledge and experience related to inclusive practices.

In Turkey, there is limited available special education support for the teachers in inclusive preschools. The results of the first stage of this study showed that 22% of teachers did not have any support, and 62% of the students with special needs received individualized support from special education centers (Table 1). Even though some teachers indicated that they had support from families and school counselors, the lack of systematic support services, assistive teachers, volunteers, and paraprofessionals in the classrooms makes inclusion difficult. Teachers are especially challenged in classrooms with large numbers of students that have children with severe disabilities.

In Conclusion, providing volunteers or paraprofessionals who can support the teachers as well as the special needs children might increase the expected benefits of inclusion. In order for preschool inclusion to be successful, teachers need to be provided with support systems and appropriate classrooms as well as functional teacher training programs, which would create positive attitudes and provide teachers with the appropriate knowledge, skills, and experience that they need. While we believe our results are pertinent to the current status of inclusive classrooms in Turkey, further research is needed regarding the measures necessary to assess the quality of inclusion programs to ensure their success; the evaluation of pre-service and in-service teacher training programs, along with their effects on teacher and child outcomes; and efforts needed to improve the inclusion system and increase its benefits.

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Okul Öncesi Öğretmenlerin Kaynaştırma Uygulamaları Konusundaki Gereksinimleri

Atıf:

Özet

Problem Durumu: Kaynaştırma uygulamalarının kalitesi, programın felsefesi, idarecilerin desteği ile öğretmen eğitimi ve açık fikirli öğretmenlere bağlı olarak değişmekte; ancak başarılı kaynaştırmayı sağlayan en temel *elemanın* sınıf öğretmenleri olduğu ifade edilmektedir. Öğretmenlerin eğitimi, deneyimi, tutumları ile bilgileri kaynaştırma kalitesinin göstergesi olarak kabul edilmektedir. Öğretmenlerin sınıflarındaki farklı beceri ve yetenekleri olan çocukların gereksinimlerini karşılamak için hem özel gereksinimli çocuklar hem de kaynaştırma uygulamaları hakkında bilgi ve deneyime sahip olmaları gerektiği vurgulanmaktadır.

Türkiye'deki kaynaştırma uygulamalarını inceleyen araştırmalarda, kaynaştırmaya ilişkin çeşitli sorunlar yaşandığı ortaya çıkmıştır. İdareciler, anne babalar ve öğretmenler sıklıkla uygulama sürecindeki sorunları gündeme getirmiş ve bu sorunlar nedeniyle okul öncesi sınıflarına devam eden özel gereksinimli çocuklar için beklenen yararların sağlanamadığını vurgulamışlardır. Okul öncesinde kaynaştırma uygulamalarında karşılaşılan temel sorunların sınıflardaki çocuk sayısının fazla olması, çocuk ve öğretmen için destek hizmetlerinin yetersiz olması, idareci ve öğretmenlerin kaynaştırma konusundaki bilgilerinin yetersiz olması ile olumsuz öğretmen tutumları olduğu belirlenmiştir.

Özel gereksinimli çocukların kaynaştırılmasına ilişkin yasal düzenlemelerin yapılmasından sonra her yıl okul öncesi sınıflardaki özel gereksinimli çocukların sayısı artmaktadır. Öğretmenlerin çoğu okul öncesi kaynaştırma fikrini desteklemesine karşın, kaynaştırma uygulamalarına ilişkin bilgi ve beceri yetersizlikleri nedeniyle genellikle özel gereksinimli çocukları kendi sınıflarında istememektedir. Kaynaştırmanın en önemli bileşeni öğretmenlerdir ve kaynaştırma uygulamalarının başarısını artırmak amacıyla, öğretmenlerin özel gereksinimli olan ve olmayan çocukları kapsayan heterojen sınıflarda öğretim yapabilmek için hazırlanmaları gerekmektedir.

Araştırmanın Amacı: Türkiye'de okul öncesi dönemde kaynaştırma uygulamalarının başarısını artırmak için öğretmenlerin kaynaştırma konusunda bilgi ve deneyim kazanmalarının öncelikli bir konu olarak ele alınması gerektiği düşünülmektedir. Ancak, okulöncesi öğretmenlerinin bilgi ve beceri kazanmalarını sağlayabilmek ve gereksinimlerini karşılayacak işlevsel programlar hazırlayabilmek için öğretmenlerin öncelikli gereksinimlerinin belirlenmesi gerekmektedir. Bu nedenle okul öncesi öğretmenler için hazırlanan bir eğitim programının öğretmen çıktıları üzerindeki

etkilerini araştırmak amacıyla yürütülen bir projenin ilk aşaması olarak planlanan bu çalışmada, sınıfında özel gereksinimli çocuk olan okul öncesi öğretmenlerinin kaynaştırmaya ilişkin gereksinimlerinin belirlenmesi amaçlanmıştır. Bu amaçla iki aşamalı bir çalışma planlanmış, ilk aşamada 40 öğretmenle yarı-yapılandırılmış görüşmeler yapılarak öğretmenlerin kaynaştırma konusundaki gereksinimleri ile kendilerini yeterli ve yetersiz gördükleri konular belirlenmeye çalışılmış, ikinci aşamada ise bu öğretmenlerden dördü ile derinlemesine görüşmeler yapılarak öğretmenlerin gereksinimlerinin ayrıntılı olarak ortaya konulmasına çalışılmıştır.

*Araştırmanın Yöntemi:*Nitel araştırma yönteminin kullanıldığı bu çalışmanın ilk aşamasına MEB'e bağlı 14 okul öncesi kurumda çalışan 40 öğretmen ile Öğretmen Görüşme Formu A kullanılarak yarı-yapılandırılmış görüşmeler yapılmıştır. Formun ilk bölümünde öğretmen ve özel gereksinimli çocukların demografik bilgilerine ilişkin sorulara, ikinci bölümünde kaynaştırma uygulamalarına ilişkin 4 açık uçlu soruya ve son bölümünde ise öğretmenlerin kaynaştırma uygulamalarında karşılaştıkları konuları içeren 10 maddelik üç listeye yer verilmiştir. Öğretmenlerden birinci listeyi kullanarak kendilerini yeterli gördükleri konuları, ikinci listeyi kullanarak güçlük çektikleri konuları ve üçüncü listeyi kullanarak ise öncelikli olarak bilgiye gereksinim duydukları konuları önem sırasına göre sıralamaları istenmiştir. Çalışmanın ikinci aşamasında ise, 40 öğretmen arasından gönüllü olan 4 öğretmen ile Öğretmen Görüşme Formu B kullanılarak derinlemesine görüşmeler gerçekleştirilmiştir. Görüşülen öğretmenlerin sınıflarında bir ya da birden fazla özel gereksinimli çocuk bulunmaktadır. İki grup öğretmenden toplanan veriler, QSR NVivo-9 yazılımı kullanılarak ayrı ayrı tümevarım yöntemi kullanılarak analiz edilmiştir.

*Araştırmanın Bulguları:*Çalışmanın birinci aşamasında yapılan analizler sonucunda, ilk olarak kaynaştırma uygulamalarının gerekliliği, başarısı, etkili faktörler, alınan destekler ve önerilerden oluşan beş ana tema ve bunlara bağlı onsekiz alt tema belirlenmiştir. İkinci olarak, öğretmenlerin %28 ile %55'inin farklı öğretim yöntemleri kullanma, sınıf yönetimi, problem davranışların kontrolü ve ailelerle işbirliği konularında kendilerini yeterli gördükleri, buna karşın grubun yaklaşık yarısının (%43-60) öğretimi bireyselleştirme, uygun öğretim materyali seçme, özel gereksinimli çocukların performanslarını değerlendirme, sınıf yönetimi ve problem davranışlarla baş etme konularında ise kendilerini yetersiz gördükleri belirlenmiştir. Üçüncü olarak, özel gereksinimli çocukların özellikleri, öğretimi bireyselleştirme ile problem davranışların kontrolü konularının öğretmenlerin yarıdan fazlasının öncelikli olarak bilgi edinmek istedikleri konular olduğu görülmüştür.

Araştırmanın ikinci aşamasında yapılan analizler sonucunda, dört öğretmeninde birinci aşamadaki öğretmenlere benzer şekilde kaynaştırmaya ilişkin bilgi ve deneyim gereksinimlerini vurguladığı görülmüştür. Bu öğretmenler özellikle özel gereksinimli çocukları tanımadıklarını, öğretim sürecinde güçlükler yaşadıklarını ve davranış problemleri ile baş edemediklerini açıklayarak bu konularda eğitim almaları gerektiğini belirtmişlerdir. Bu aşamada ayrıca, öğretmenlerin kaynaştırma uygulamalarına ilişkin bazı özel gereksinimleri de ortaya çıkmıştır. Örneğin, öğretmenler özel gereksinimli çocukların dil ve konuşma, bilişsel, motor ve sosyal

becerilere ilişkin yetersizlikleri nedeniyle masa başı etkinlikleri ile sanat, müzik ve oyun etkinliklerine katılımını sağlamada zorlanmaktadırlar. Öğretmenler yine özel gereksinimli çocuklarla iletişim kurma ve onların iletişimlerini destekleme konusunda güçlük çektiklerini belirtmişler ve çocuklara hem ne öğreteceklerini hem de nasıl öğretim yapacaklarını bilmek istediklerini dile getirmişlerdir. Öğretmenlerin önemle vurguladıkları bir diğer nokta, öğretim yöntemlerinde ve materyallerde uyarlamalar yapamamaları ve sınıflarında yeterince öğretim materyali bulunmaması ile ilgilidir. Bir başka gereksinim ise, özel gereksinimli çocukların performansını, bir başka deyişle öğrenip öğrenmediklerini değerlendirmek konusundadır. Öğretmenler ayrıca kaynaştırma konusunda kısa süreli hizmetiçi eğitim programlarına katılmalarına karşın bu programların özel gereksinimli çocuklarla çalışmak için yeterli olmadığını da belirtmişlerdir.

*Araştırmanın Sonuçları ve Önerileri:*Çalışmanın her iki aşamasında yer alan katılımcıların uygulamada karşılaştıkları güçlüklere karşın kaynaştırmanın tüm çocuklar için uygun olduğuna ve özel gereksinimli çocukların akranları ile birlikte eğitim almaları gerektiğine inandıkları görülmektedir. Bazı öğretmenler sistemdeki sorunlara ve karşılaştıkları güçlüklere karşın, kaynaştırma uygulamalarını başarılı bulmaktadır. Ancak öğretmenler kaynaştırma konusunda kendilerini rahat hissetmediklerini, özel gereksinimli çocukların bulunduğu sınıflarda çalışmak için kendilerini yeterli görmediklerini ifade etmişlerdir. Öğretmenler çocukların özellikleri, öğretimi bireyselleştirme, davranışsal stratejiler, problem davranışlarla baş etme, özel gereksinimli çocukların performansını değerlendirme gibi neredeyse kaynaştırmanın tüm boyutlarında eğitime, deneyime ve desteğe gereksinimleri olduğunu belirtmişlerdir.

Sonuç olarak, okul öncesinde kaynaştırmanın başarılı olmasını sağlayacak faktörlerin iyi eğitim almış personel, uygun destek hizmetleri, uygun fiziksel koşullar ve özel gereksinimli çocukların gereksinimlerini karşılayacak araç-gereçler ile olumlu öğretmen tutumları olduğu açıktır. Bir başka deyişle, okul öncesi kaynaştırmanın başarılı olması için, öğretmenlere destek hizmetleri ile uygun fiziksel koşulların sağlanmasının yanı sıra, bilgi beceri ve deneyimlerini artıracak ve olumlu tutumlarını geliştirecek işlevsel öğretmen eğitimi programlarının uygulanması gereklidir. İleri araştırmalarda kaynaştırma uygulamalarının kalitesinin sorgulanarak başarıyı artıracak önlemlerin belirlenmesi, hizmet öncesi ve hizmet-içi öğretmen eğitimi programları hazırlanarak bu programların öğretmen ve çocuk çıktıları üzerindeki etkilerinin araştırılması ile elde edilen bulgular temel alınarak sistemin iyileştirilmesi için gerekli çalışmaların yapılabileceği düşünülmektedir.

Anahtar Sözcükler: Okul öncesi öğretmenler, kaynaştırma uygulamaları, gereksinimler, yarı-yapılandırılmış görüşme

The Role of Peer Pressure, Automatic Thoughts and Self-Esteem on Adolescents' Aggression

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Abstract

Problem Statement: Aggression is defined as any kind of behavior intended to hurt others. Aggression generally arises due to the interaction between individual (e.g., social and emotional difficulties, low self-esteem, peer rejection, academic failure) and environmental (e.g., poverty, lack of family supervision, limited social support, conflicts within the family) characteristics. Identifying the factors which cause aggressiveness in adolescents is vital to finding precautions against it.

Purpose of Study: The purpose of this study was to examine the effects of peer pressure, automatic thoughts and self-esteem variables on the aggression levels of male and female adolescents.

Methods: This is a relational and quantitative research aimed to examine the effects of peer pressure, automatic thoughts and self-esteem variables on the prediction of adolescents' aggression levels. The study sample consisted of 411 volunteer students who were chosen through random sampling from a total of 720 9th grade students from various high schools in Antalya, Turkey. Participants completed the Aggression Questionnaire, Peer Pressure Scale, Automatic Thoughts Scale and Self-Esteem Scale in their classrooms during counseling sessions. Data were analyzed using hierarchical multiple regression analysis.

Findings and Results: In the hierarchical multiple regression analysis for female and male adolescents, it was found that peer pressure and automatic thoughts were effective predictors in explaining adolescents'

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aggression levels. Furthermore, it was found that automatic thoughts fully mediated the relationship between self-esteem and aggression for both male and the female adolescents.

Conclusions and Recommendations: It was found that peer pressure and automatic thoughts have a significant effect on adolescent aggression. In works related to the prevention of aggression, it is vital to teach adolescents how to cope with peer pressure and how to say "no". On the basis of these results, we recommend that schools implement workshops to educate adolescents in aggression and violence prevention. In addition, we recommend using cognitive-behavioral techniques to raise adolescents' awareness of nonfunctioning and aggression-triggering automatic thoughts in order that they may modify these thought patterns.

Keywords: Aggression, peer pressure, automatic thoughts, self-esteem, adolescents

Aggression is defined as "any kind of behavior intended to hurt others" (Freedman, Sears & Carlsmith, 1989, p. 191). Theories about the causes of aggression vary according to the subjects they emphasize. Many researchers, such as Freud, McDougall and Lorenz have claimed that people have aggressive urges and instincts from birth (Freedman et al., 1989, p. 194). Bandura (1973) states that children learn aggressive behavior by observing and modeling others. The opposite is also true: children learn not to be aggressive by observing nonaggressive models. Others claim that aggression occurs from the interaction between individual (e.g., social and emotional difficulties, low self-esteem, peer rejection, academic failure) and environmental (e.g., poverty, lack of family supervision, limited social support, conflicts within the family) characteristics (Coie et al., 1993; Miller, 1994). Today, this latter view is widely accepted.

Since adolescence is a transitional phase between childhood and adulthood in which physiological, psychological and social changes occur, adolescence is a stormy and stressful period which can causes an imbalance in the adolescent's thoughts, feelings and behaviors. The fundamental problem in this period is the concept of individuation, which refers to consistent self-development. One of the main areas of focus for adolescent behavior is friend and peer relations. Peer groups provide support, security, membership, autonomy, self-expression and common experiences to adolescents, and peer pressure is "the influences and pressures adolescents feel from their peers" (Adriaansz, 2002). Adolescents inevitably look to their peers for approval and support.

For adolescents who lack positive family relationships, peer pressure plays a larger role in their psychosocial development. Peer pressure can range from positive effects to negative effects such as criminal behaviors. Many researchers point out that adolescents feel an especially strong need to belong to a certain group, which can lead adolescents to engage in risky behaviors (Adriaansz, 2002; Berten, 2008). Austin and Sciarra (2012) express that aggression can be the result of wanting to assert

power, wanting to have an effect over peers or wanting to be a part of this kind of power. There are many studies which show the relationship between adolescent aggression and peer pressure (Berten, 2008; Farrell, Kung & White, 2000; Eldeleklioglu, 2007; Gunduz & Celikkaleli, 2009; Hamarus & Kaikkonen, 2008; May, Nichols & Eltzroth, 1999; Sahan, 2007; Yildirim, 2007).

Although many studies have examined the relationship between aggression and self-esteem, this relationship still remains controversial. According to one opinion, aggression and anti-social behavior is a sign of low self-esteem (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Duncan, 1999; Sahan, 2007; Yavuz, 2007). This view suggests that individuals with low self-esteem behave dominantly or aggressively mostly in order to increase their own self-esteem. On the other hand, some researchers claim that aggression is due to high (i.e., inflated) self-esteem (Baumeister, Bushman, & Campbell, 2000; Bushman & Baumeister, 1998; Bushman et al., 2009; Perez, Vohs & Joiner, 2005; Schreer, 2002). According to this perspective, if children's high self-evaluations of behavior and competencies do not correspond with their peers' evaluations, children may act aggressively toward those who with divergent evaluations. In other words, children with high self-esteem may choose to protect it by acting aggressively towards people who do not agree with their evaluations. In addition, while the self-esteem of arrogant people increases, their anger experiences and anger expressions also increases. Furthermore, researchers have found that high self-esteem is sometimes characterized by hostility and aggressiveness, by disregarding others and by, self–centered and egotistic attitudes. Because of this, high self-esteem may be linked to aggression (Perez et al., 2005). According to a third view, there is no link between aggression and self-esteem (Aricak, 1995; Bushman & Baumeister, 2002).

According to Beck's cognitive theory, experiences in childhood cause certain fundamental thoughts and belief systems to be formed through learning, a structural-level development called "schema". Life events activate the schemas and bring about "negative automatic thoughts", which lead to unpleasant feelings like anger, anxiety, guilt and sadness (Demiralp & Oflaz, 2007). Automatic thoughts are "the interpretations that people make related to a situation" (Beck, 2001). They are the internal dialogues that individuals have about themselves, their world and their future. Generally, being spontaneous, latent and serial, they can appear suddenly in the human mind. They are combined with certain feelings based on their content and meaning. Individuals are not generally aware of automatic thoughts, though they are aware of the accompanying feelings. According to Beck (2001), there are five fundamental cognitive distortions that cause emotional stress. These are personalization, polarized thinking (all-or-nothing thinking), selective abstraction, arbitrary inference and overgeneralization. The cognitive structure in Beck's model has been created mostly to explain disorders such as depression and anxiety. Therefore, there is not much research that studies the relationship between this cognitive structure and externalizing disorders. In their study of the relationship between psychological symptoms and the structure of automatic thoughts, Calvete and Conner-Smith (2005) found that negative automatic thoughts lead to anxiety and

aggressive behavior. Schniering and Rapee (2004) state that automatic thoughts on hostility or revenge were the strongest predictors of aggression. Beck and Freeman (1990) observed that individuals with passive aggressive behavior disorder have automatic thoughts such as "How dare they tell me to do that", "I will do what I want to do", "People are using me", "Nothing is going my way" or "People should respect me more". Furthermore, Calvete, Estevez, Arroyable and Ruiz (2005) found a relationship between cognitive schemas, emotional disorders (depression, anxiety and anger) and automatic thoughts (positive, depressive, anxious and anger-related). In addition, Kurtoglu (2009) found a positive significant relationship between adolescents' levels of aggression and automatic thoughts (negative feelings and thoughts towards themselves, bewilderment, -run-away fantasies, personal incompatibility and a desire to change, loneliness-isolation, and hopelessness). Identifying the factors which cause aggressiveness in adolescents is vital to finding precautions against it. Accordingly, the purpose of this study was to examine the effects of peer pressure, automatic thoughts and self-esteem variables on the prediction of male and female adolescents' aggression levels.

The recent rise in aggressive behaviors in adolescents calls for research related to the causes of this aggression and ways to reduce it. Investigating the variables related to aggression will certainly help identify and prevent the problem. Moreover, the present study is important because there is currently little research like it, and it can serve as resource for future research in the field.

Method

Research Design

This is a relational and quantitative study aimed to examine the effects of peer pressure, automatic thoughts and self-esteem variables on male and female adolescents' aggression levels.

Participants

The study sample consisted of 411 volunteer students who were chosen through random sampling from a total of 720 9th grade students from various high schools in Antalya, Turkey. Two hundred thirty-eight (57.4%) of these participants were female, and 173 (42.6%) were male.

Research Instruments

*Aggression Questionnaire (AQ).*Developed by Buss and Perry and updated by Buss and Warren (2000), the Turkish version of the Aggression Questionnaire scale was prepared by Can (2002). The scale consists of five-point Likert responses and 34 items. The highest possible score is 170 and the lowest is 34 (Buss & Warren, 2000; Can, 2002). The Aggression Questionnaire is made up of five subscales: physical aggression, verbal aggression, anger, hostility and indirect aggression. While both the subscale scores and the total scores can be examined, this study used the total scores. Can (2002) applied the scale to 300 healthy volunteers who were not diagnosed according to the Diagnostic and Statistical Manual Disorders IV criteria. In

Can's test, the Cronbach's alpha coefficient was $r=0.91$. For test-retest reliability, the correlation coefficient between the two applications in total scores was $r=0.85$. For similar scale reliability, the Permanent Anger-Anger Expression Scale was used with an Aggression Questionnaire. In the sub-scales, correlation coefficients varied from $r=0.55$ to $r=0.74$ (Can, 2002). Kula (2008), Karatas and Gokcakan (2009), Eroglu (2009), Yavuzer and Ure (2010), Gundogdu (2010) and Donat Baci (2011) used the scale after testing its validity and reliability. In this study's context, the internal consistency coefficient of the scale was found to be 0.89.

Peer Pressure Scale (PPS). Developed by Kiran-Esen (2002), the Peer Pressure Scale consists of 34 items. It is a five-point Likert scale and uses the ratings of "never" (1 point), "infrequently" (2 points), "sometimes" (3 points), "frequently" (4 points), "always" (5 points). The lowest possible score is 34 and the highest is 170, with higher scores indicating high levels of peer pressure. Factor analysis was applied for the scale's structure validity, and it was found that 19 out of 34 items were combined in the first factor and 15 items were combined in the second factor (Kiran-Esen, 2002). The total variance that was explained by the two factors was 40.527%. For all of the 34 items, the consistency correlation coefficient was 0.90. As a result of the test-retest method, the stability coefficient for the whole test was 0.82. In this study, the total points were used and the internal consistency coefficient was found to be 0.93.

Rosenberg Self-Esteem Scale (RSES). Developed by Rosenberg (1965) and adapted into Turkish by Cuhadaroglu (1986), the Rosenberg Self-Esteem Scale has 12 subscales and 63 items. This study used the Self-Esteem subscale, which consists 10 items. It is a four-point Likert-type scale including the ratings of "Strongly Disagree" (1 point), "Disagree" (2 points), "Agree" (3 points) and "Strongly Agree" (4 points). The possible scores range from 10 to 40 points, with a higher score indicating high self-esteem for that individual. In the test-retest that was done four weeks after, the correlation between the two measurements was found to be $r=0.71$ (Cuhadaroglu, 1986). In this study, the internal consistency coefficient was found to be 0.83.

Automatic Thoughts Scale (ATS). Developed by Hollon and Kendall (1980) and adapted into Turkish by Sahin and Sahin (1992), the Automatic Thoughts Scale contains 30 items. It is a five-point Likert-type scale consisting of the ratings "Never crossed my mind" (1 point), "Rarely crossed my mind" (2 points), "Occasionally crossed my mind" (3 points), "Frequently crossed my mind" (4 points) and "Always crossed my mind" (5 Points). The lowest possible score is 30 and the highest is 150, and a higher score indicates that the individual's automatic thoughts emerge frequently. According to Sahin and Sahin (1992), item total correlation between points taken from each item and from the whole scale was 0.30-0.69. In this study, the scale's internal consistency coefficient was 0.97. The Automatic Thoughts Scale was developed to identify the automatic thoughts accompanying depression. In the literature, it has also been used in studies examining the relationship between automatic thoughts and externalizing disorders (Calvete & Connor-Smith, 2005; Calvete et al., 2005; Kurtoglu, 2009).

Data Analysis

In the study, a t test was used to identify the effect of gender on aggression, Pearson's Product Moment Correlation Analysis was used to identify the relationships between variables, and hierarchical multiple regression analysis was used to identify the variables that predict aggression. Prior to analysis, the hypothesis of the hierarchical multiple regression analysis was tested. It was found that the normality and linearity hypotheses met. In the data analysis, data were examined in terms of outlier value. Ten observations from the female participant data and 10 observations from the male participant data which had outlier value and Mahalanobis distance value were taken out of the data set. A moderate level of two-point correlation between variables indicates that there was no multicollinearity between the variables. In addition, the tolerance and VIF values were within the accepted limits. A Durbin-Watson coefficient was used to test autocorrelation, yielding Durbin-Watson values of 1.694 and 2.142. A 0.05-level of significance was taken into account in the data analysis. The data from the study were analyzed with a SPSS 13.00 package program.

Procedure

The scales were applied to the participants in their own schools and classrooms during students' guidance hour. Basic information about the purpose of the study was given to the participants and scales were distributed to the adolescents who volunteered. They were informed that there would be a collective evaluation, and they were not asked for their credentials personal information. The scales took approximately 30-35 minutes to complete.

Results

Examination of the effect of gender on aggression

The effect of gender on aggression scores were meaningful ($t= 3.363$, $p<0.001$). According to this finding, male adolescents' aggression scores ($M=89.598$, $SD= 19.633$) were higher compared to female adolescents' aggression scores ($M=83.259$, $SD= 18.269$).

Correlation among the variables

For aggression, correlation analysis and hierarchical multiple regression analysis based on preliminary analysis showing the gender differences was done separately for female participants and for male participants. Table 1 shows the correlations among the variables.

Table 1

Correlation Coefficients between the Variables and Mean and Standard Values Related to the Variables

		M	SD	1	2	3
Male	1.AQ	89.530	19.590	1.000		
	2.PPS	59.028	16.239	0.590*	1.000	
	3.ATS	55.872	21.658	0.437*	0.226*	1.000
	4.RSES	31.971	5.630	-0.230*	-0.087	-0.661*
Female	1.AQ	83.277	18.305	1.000		
	2.PPS	44.458	12.672	0.464*	1.000	
	3.ATS	57.399	26.067	0.421*	0.425*	1.000
	4.RSES	31.256	5.713	-0.293*	-0.173*	-0.631*

*$p < 0.01$

Note: AQ= Aggression Questionnaire, PPS=Peer Pressure Scale, ATS= Automatic Thoughts Scale, RSES=Rosenberg Self-Esteem Scale.

Table 1 demonstrates that there is a moderate level and a positive correlation between male adolescents' aggression scores, peer pressure scale scores ($r=0.590$; $p<0.01$) and automatic thoughts scores ($r=0.437$; $p<0.01$), as well as a moderate level and negative correlation between self-esteem scores ($r=-0.230$; $p<0.01$). The data related to female adolescents suggests that while there is a moderate level and positive correlation between aggression scores peer pressure scale scores ($r=0.464$; $p<0.01$) and automatic thoughts scores ($r=0.421$; $p<0.01$), there is a moderate level and negative correlation between self-esteem scores ($r=-0.293$; $p<0.01$). Predictors of aggression were examined in three steps using hierarchical multiple regression analysis to consider the correlation coefficients between variables. The first step evaluated peer pressure; the second step, automatic thoughts; and the last step, self-esteem. The analysis results are shown in Table 2.

Table 2

Hierarchical Multiple Regression Analysis Results Related to Predicting Adolescents' Aggression Scores

	Mod.	Independent Variables	β	t	R^2_{ch}	F_{ch}
Male	1	PPS	0.590	9.565*	0.349	91.483*
	2	ATS	0.320	5.460*	0.097	29.812*
	3	RSES	-0.047	0.615	0.001	0.378
Female	1	PPS	0.464	8.041*	0.215	64.664*
	2	ATS	0.273	4.454*	0.061	19.841*
	3	RSES	-0.102	1.412	0.006	1.994

*$p < 0.001$

Note: PPS= Peer Pressure Scale, ATS= Automatic Thoughts Scale, RSES= Rosenberg Self-Esteem Scale.

Table 2 shows that two variables (peer pressure and automatic thoughts) are significant predictors in explaining the aggression level of male adolescents. The results of the first step of analysis indicate that peer pressure had a significant effect (β=0.590, p<0.001). The findings also show that peer pressure scores account for 34.9% of the total variance in male adolescents' aggression levels. Furthermore, it appears that the contribution of the automatic thoughts entered in the second step of the model was significant (β=0.320, p<0.001), accounting for 9.7% of variance related to aggression. Together, these two variables explain 44.6% of the male adolescents' aggression. On the other hand, it appears that self-esteem, entered in the third step, was not a significant predictor (β=-0.047, p>0.05).

It was found that peer pressure and automatic thoughts are significant predictors in explaining female adolescents' aggression levels as well. It appears that the contribution of peer pressure, which was entered into the model in the first step, was significant (β=0.464, p<0.001), accounting for 21.5 % of the total variance in the female adolescents' aggression levels. Immediately following was automatic thoughts, with a 6.1 % contribution to the variance (β=0.273, p<0.001). The two variables together explain 27.6 % of the female adolescents' aggression. It is found that self-esteem, which was entered in the last step, was not a significant predictor (β=-0.102, p>0.05).

The findings indicate a moderate level and negative correlation between male and female adolescents' aggression scores and self-esteem scores. It was therefore decided to examine the mediation role of ATS and the relationship between RSES and AQ.A regression analysis of the mediating role of ATS in the relationship between AQ and RSES was conducted in 3 steps, following the model of Baron and Kenny (1986).The findings are shown in Table 3.

Table 3

Regression Analysis of the Mediating Role of ATS in the Relationship between AQ and RSES

	Model	Dependent Variables	Independent Variables	β	t	R^2_{ch}	F_{ch}
Male	1	AQ	RSES	-0.230	-3.093*	0.053	9.566*
	2	ATS	RSES	-0.661	-11.511**	0.437	132.510**
	3	AQ	RSES	0.104	1.139		
			ATS	0.509	5.529**	0.197	20.893**
Female	1	AQ	RSES	-0.293	-4.702**	0.086	22.108**
	2	ATS	RSES	-0.631	-12.497**	0.396	156.181**
	3	AQ	RSES	-0.045	-0.589	0.178	25.517**
			ATS	0.393	5.151**		

*p<0.01, **p<0.001

Note: AQ= Aggression Questionnaire, ATS= Automatic Thoughts Scale, RSES= Rosenberg Self-Esteem Scale.

For the male adolescents, in the first step RSES negatively and significantly predicted AQ (β =-0.230, p<0.01), and explained 5.3% of the variation. In the second step RSES negatively and significantly predicted ATS (β =-0.661, p<0.001), and explained 43.7% of the variance. In the third step, ATS was identified as a mediating variable that positively and significantly predicted AQ (β =0.509, p<0.001). RSES and ATS together explained 19.7% of the variance. Furthermore, RSES together with the mediating variable (ATS) did not significantly predict AQ (β=0.104, p>0.05). For the female adolescents, RSES negatively and significantly predicted AQ (β =-0.293, p<0.001), and explained 8.6% of the variation. In the second step RSES negatively and significantly predicted ATS (β =-0.631, p<0.001), and explained 39.6% of the variance. In the third step, it was observed that taken together with the moderator variable (ATS), there was a reduction in the strength of the correlation between the RSES and the AQ (see Table 3). These findings indicate that ATS fully mediated the relationship between RSES and AQ for the male adolescents (*Sobel z*=2.714, p<0.01) and for the female adolescents (*Sobel z*=2.584, p<0.01).

Discussion and Conclusion

In this study of the effects of peer pressure, automatic thoughts and self-esteem on predicting female and male adolescents' aggression levels, it was found that there was a moderate level and positive correlation between male and female adolescents' aggression scores, peer pressure and automatic thoughts scores and a moderate level and negative correlation between self-esteem scores. Furthermore, in the hierarchical multiple regression analysis for female and male adolescents, it was found that peer pressure and automatic thoughts were significant predictors in explaining adolescents' aggression levels. The findings also suggest that the most important contribution to the prediction of adolescents' aggression score levels was peer pressure. This finding is in agreement with previous research findings which demonstrate that peer pressure in adolescents is related to aggression (Berten, 2008; Farrell et al., 2000; Eldeleklioglu, 2007; Gunduz & Celikkaleli, 2009; Hamarus & Kaikkonen, 2008; May et al., 1999; Sahan, 2007; Yildirim, 2007). Adolescents' social needs such as belonging to a group, bonding, and finding acceptance may encourage adolescents to submit to the control of a peer group potentially leading them to participate in risky behavior. The literature generally agrees that aggression may be the result of wanting to affect and ascertain power among peers, or of wanting to be a part of such power (Adriaansz, 2002; Austin & Sciarra, 2012; Berten, 2008).

In predicting adolescents' aggression scores, automatic thoughts came in second place. A number of research findings which prove that automatic thoughts cause aggressive behavior (Beck & Freeman, 1990; Calvete & Connor-Smith, 2005; Calvete et al., 2005; Kurtoglu, 2009; Schniering & Rapee, 2004) support the findings of this study. Safran and Segal (1990) point out that there are many non-functional thoughts, and that in some cases the individual may exhibit behavior which is consistent with these thoughts. For example, if the individual perceives other people as aggressive, he/she may act defensively or aggressively.

Another finding was that self-esteem was not a significant predictor of female and male adolescent aggression. This finding is consistent with the findings of Aricak (1995) and Bushman and Baumeister (2002). However, previous studies related to the relationships between self-esteem and aggression has reported conflicting results. There are studies showing that low self-esteem is related to aggression (Donnellan et al., 2005; Duncan, 1999; Sahan, 2007; Yavuz, 2007) and other studies showing that high self-esteem is related to aggression (Baumeister et al., 2000; Bushman & Baumeister, 1998; Bushman et al., 2009; Perez et al., 2005; Schreer, 2002). The present study found a moderate level and negative correlation between male and female adolescents' aggression scores and self-esteem scores. After examining the mediation role of ATS on the relationship between RSES and AQ, it was found that ATS fully mediated the relationship between RSES and AQ for both the male and female adolescents. This result shows that, low self-esteem results in automatic thoughts and that automatic thoughts leads to aggression. As developed by Beck et al., the concept of the cognitive triad is explained as "a state of having negative thought for one's self, the world, and the future". Individuals with this kind of thinking come to humiliating conclusions about their self-esteem and identity they perceive themselves as incomplete, worthless, or problematic (Hicdurmaz & Oz, 2011). The related literature agrees that once automatic thoughts increases, self-esteem decreases (Daly & Burton, 1983; Mclennan, 1987; Nielsen et al., 1996; Koydemir & Demir, 2008; Hamarta & Demirbas, 2009; Nasir et al., 2011). According to some, aggression is a sign of low self-esteem (Donnellan et al., 2005), so adolescents may act aggressively in order to increase their own self-esteem.

Another finding was that peer pressure and automatic thoughts predicted adolescent aggression in the same prediction order for both sexes but that the prediction values were different between females (27.6%) and males (44.6%). It was found that automatic thought provided a 9.7 % contribution in males and 6.1 % contribution in females, which explains the variance (Table 2). The differences among the values may be attributed to the peer pressure value. It has been proven previously that male adolescents are exposed to more peer pressure than female adolescents (Cigdemoglu, 2006; Gunduz & Celikkaleli, 2009; Demir, Baran & Ulusoy, 2005; Sari & Kuguoglu, 2009). Moreover, it is more likely for boys to find friends with negative behavior characteristic (Erdem, Eke, Ogel & Taner, 2006). The reason why peer pressure is a stronger predictor of male adolescents' aggression is likely due to the effect of gender-related perceptions and cultural values. In contemporary culture, male gender roles are more extroverted compared to those of women. In this context, male adolescents who spend more time outside the house with their peers may be more exposed to greater peer pressure.

It was found that peer pressure and automatic thoughts have a significant effect on adolescent aggression. In this study, it was found that ATS fully mediated the relationship between RSES and AQ for male and female adolescents. In works related to the prevention of aggression, it is vital to teach adolescents how to cope with peer pressure and how to say "no", and for that reason we recommend workshops in schools to teach students skills in aggression and violence prevention. In addition, we recommend using cognitive-behavioral techniques to raise

adolescents' awareness of nonfunctioning and aggression-triggering automatic thoughts so that they may change and better control these thoughts.

The study group consisted of adolescents at different high schools in the Antalya city center. Therefore, the results can be generalized to groups with similar characteristics. In addition, the data was obtained based on adolescents' self-evaluations. In future studies, self-evaluations and observers' (e.g., peers') ratings will be used together. Another limitation of the study is that the study group consisted only of adolescents in the 9th grade. However, as the grade level (age) increases, adolescent aggression and peer pressure levels may change. Finally, this study only considered adolescents' total scores from the applied scales. In future studies, there can be further investigation using scores obtained from the various subscales.

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Akran Baskısı, Otomatik Düşünceler ve Benlik Saygısının Ergenlerin Saldırganlığı Üzerindeki Rolü

Özet

Problem Durumu: Saldırganlık, başkalarını incitmeyi amaçlayan her türlü davranış olarak tanımlanmaktadır. Saldırganlığın bireysel (sosyal ve duygusal zorluklar, düşük benlik saygısı, akran reddi, akademik başarısızlık gibi) ve çevresel (yoksulluk, ailenin denetim eksikliği, sosyal desteğin sınırlı oluşu, aile içi çatışmalar gibi) özelliklerin etkileşimi sonucunda oluştuğunu öne süren görüşler de bulunmaktadır. Günümüzde ergenlerdeki saldırgan davranışların bireysel ve çevresel özelliklerin bileşimi sonucunda oluştuğu görüşü yaygındır. Ergen davranışlarının odaklandığı temel alanlardan biri arkadaş ve akranlarıyla ilişkileridir. Akran baskısı olumlu etkilerden olumsuz ya da suçlu davranışlara kadar uzanabilir. Birçok araştırmacı ergenlik döneminde bir gruba ait olma ihtiyacının çok güçlü olduğunu ve bunun da ergenlerin riskli davranışlara katılmasına neden olduğunu belirtmektedirler. Saldırganlık ve benlik saygısı arasındaki ilişkiyi inceleyen çok sayıda çalışma yapılmasına rağmen bu ilişki halen tartışmalı bir konudur. Bir görüşe göre saldırganlık ve anti-sosyal davranış düşük benlik saygısının bir işaretidir. Diğer taraftan bazı araştırmacılar, saldırganlığın yüksek (şişirilmiş) benlik saygısından kaynaklandığını ileri sürmektedirler. Bir diğer görüşe göre ise saldırganlık ve benlik saygısı arasında bir ilişki yoktur. Otomatik düşüncelerin ise dışavuruk bozukluklarla ilişkisini inceleyen çalışma çok fazla değildir. Bu çalışmalarda özellikle düşmanlık ve intikamla ilişkili otomatik düşüncelerin saldırganlığın en güçlü yordayıcıları olduğu saptanmıştır. Türkiye'de bu konuda yapılan araştırmalar oldukça azdır. Son yıllarda gençler arasında saldırgan davranışlardaki artış; ergenlerde saldırganlığın nedenlerini ve bu tür davranışların azaltılmasını sağlayacak yolları araştırmayı gerekli kılmaktadır. Kuşkusuz, saldırganlıkla ilişkili olabilecek değişkenlerin incelenmesi sorunu betimleme ve önleme süreçlerini destekleyecektir.

Araştırmanın Amacı: Bu çalışmanın amacı, akran baskısı, otomatik düşünceler ve benlik saygısı değişkenlerinin kız ve erkek ergenlerin saldırganlık düzeyleri üzerindeki rolünü incelemektir

Araştırmanın Yöntemi: Araştırmanın çalışma grubu, Antalya il merkezindeki farklı liselerde 9. sınıfta öğrenim gören toplam 720 ergenden seçkisiz olarak belirlenen 411 ergenden oluşmaktadır. Ergenlerin 238'i (%57.4) kız, 173'ü (%42.6) erkektir. Araştırmada Saldırganlık Ölçeği, Akran Baskısı Ölçeği, Rosenberg Benlik Saygısı Ölçeği ve Otomatik Düşünceler Ölçeği kullanılmıştır. Ölçekler katılımcılara öğrenim gördükleri okullarda kendi sınıflarında ve rehberlik saatlerinde uygulanmıştır. Katılımcılara, araştırmanın amacına ilişkin kısa bir bilgi verilmiş ve gönüllü olan ergenlere ölçekler dağıtılmıştır. Toplu değerlendirme yapılacağı belirtilerek kimlik bilgileri istenmemiştir. Ölçeklerin uygulanması yaklaşık olarak 30-35 dakika sürmüştür. Araştırmada cinsiyetin saldırganlık üzerindeki etkisini belirlemek için t testi, değişkenler arasındaki ilişkileri belirlemek için Pearson Momentler Çarpımı Korelasyon analizi, saldırganlığı yordayan değişkenlerin belirlenmesi için çoklu hiyerarşik regresyon analizi kullanılmıştır. Analiz yapılmadan önce çoklu hiyerarşik regresyon analizinin varsayımları test edilmiştir. Normallik ve doğrusallık varsayımlarının karşılandığı belirlenmiştir. Veri analizinde veriler aykırı değer açısından incelenmiş Mahalanobis uzaklık değerine sahip olan aykırı değerlerin yer aldığı kızlara ait verilerden 10 ve erkeklere ait verilerden 10 gözlem veri setinden çıkarılmıştır. Bağımsız değişkenler arasındaki ikili korelasyonların orta düzeyde olması değişkenler arası çoklu bağlantının (Multicollinearity) olmadığını göstermektedir. Ayrıca, Tolerans ve VIF değerleri de kabul edilir sınırlar içindedir. Otokorelasyonu test etmede Durbin-Watson katsayısı kullanılmıştır. Durbin-Watson değerleri 1.694 ve 2.142'dir. Verilerin analizinde .05 anlamlılık düzeyi esas alınmıştır. Araştırmadan elde edilen veriler SPSS 13.0 paket programıyla çözümlenmiştir.

Araştırmanın Bulguları: Akran baskısı, otomatik düşünceler ve benlik saygısı değişkenlerinin kız ve erkek ergenlerin saldırganlık düzeylerini yordamadaki katkılarını inceleyen bu araştırmada cinsiyet farklılıklarını gösteren ön analize dayalı olarak korelasyon analizi kızlar ve erkekler için ayrı ayrı yapılmıştır. Kız ve erkek ergenlerin saldırganlık puanları ile akran baskısı ve otomatik düşünceler puanları arasında orta düzeyde ve pozitif yönde, benlik saygısı puanları arasında ise orta düzeyde ve negatif yönde bir ilişki olduğu saptanmıştır. Diğer taraftan, kız ve erkek ergenler için yapılan aşamalı regresyon analizinde, ergenlerin saldırganlık düzeylerini açıklamada akran baskısı ve otomatik düşüncelerin anlamlı yordayıcılar oldukları görülmüştür. Ergenlerin saldırganlık puanlarının yordanmasına en önemli katkıyı akran baskısının yaptığı bulunmuştur. Ergenlerin saldırganlık puanlarının yordanmasında ikinci sırada otomatik düşünceler gelmektedir. Araştırmanın diğer bulgusu benlik saygısının kız ve erkek ergenlerin saldırganlığı üzerinde anlamlı bir yordayıcı olmadığıdır. Ancak, korelasyon analizinde ergenlerin saldırganlık puanları ile benlik saygısı puanları arasında negatif yönde bir ilişki olduğu saptanmıştır. Bu nedenle saldırganlık ve benlik saygısı arasındaki ilişkide otomatik düşüncelerin aracı rolü olabileceği düşünülmüştür. Otomatik düşüncelerin saldırganlık ve benlik saygısı arasındaki ilişkide otomatik düşüncelerin aracı rolüne ilişkin hiyerarşik regresyon analizi sonucunda, otomatik düşüncelerin tam aracı rolü olduğu bulunmuştur.

Araştırmanın Sonuçları ve Önerileri: Akran baskısı ve otomatik düşüncelerin ergenlerin saldırganlıkları üzerinde önemli derecede etkili oldukları saptanmıştır. Ayrıca araştırma bulguları saldırganlık ve benlik saygısı arasındaki ilişkide otomatik düşüncelerin tam aracılık rolünün olduğunu ortaya koymuştur. Saldırganlığı önlemeye yönelik çalışmalarda akran baskısıyla baş etme becerileri ve hayır diyebilme becerilerinin kazandırılması oldukça önemlidir. Uygulamalarda bu becerilerin de okullarda saldırganlık ve şiddeti önleme çalışmaları kapsamına alınması önerilebilir. Ayrıca, ergenlerin işlevsel olmayan ve saldırganlığı tetikleyen otomatik düşüncelere ilişkin farkındalık kazanması ve bu düşüncelerini değiştirebilmesi için bilişsel-davranışçı tekniklerin kullanılması önerilebilir.

Araştırmanın çalışma grubu Antalya il merkezindeki farklı liselerde öğrenim gören ergenlerden oluşmaktadır, dolayısıyla sonuçlar sadece benzer nitelikli gruplara genellenebilir. Ayrıca, veriler ergenlerin öz-değerlendirmelerine dayalı olarak elde edilmiştir. Gelecek çalışmalarda öz-değerlendirme ve gözlemci değerlendirmesi birlikte kullanılabilir. Araştırmanın sınırlılıklarından biri de çalışma grubunun yalnızca 9. sınıfa devam eden ergenlerden oluşmasıdır. Oysa sınıf düzeyi (yaş) arttıkça ergenlerin saldırganlık ve akran baskısı düzeyleri değişebilir. Ayrıca, bu çalışmada ergenlerin kullanılan ölçeklerden aldıkları toplam puanlar incelenmiştir. İlerde yapılacak çalışmalarda ölçeklerin alt boyutlarından elde edilen puanlarla daha detaylı inceleme yapılabilir.

Anahtar Sözcükler: Saldırganlık, akran baskısı, otomatik düşünceler, benlik saygısı, ergenler.

The Relations Between the Acceptance and Child-Rearing Attitudes of Parents Of Children With Mental Disabilities

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Suggested Citation:

Abstract

Problem Statement: The relationship between parent and child plays a fundamental role in the social and emotional development of the child. Parental acceptance-rejection behavior may be critical in shaping the quality of the affective bond between parent and child and is established within the specific contexts of the parent-child environment. Psychological, socioeconomic, and other difficulties introduced into family life by having a child with mental disability may affect parental acceptance-rejection levels. Difficulties resulting from the disability and related social pressures and expectations might also influence child-rearing attitudes.

Purpose of Study: To investigate the correlation between parents' acceptance-rejection of their children with mental disability (7-12 years of age) and their child-rearing attitudes in relation to sociodemographic variables.

Method: A total of 234 fathers and 129 mothers of children with mental disability (7-12 years of age) were included via a random sampling method in this relational screening modeled study. Data were collected via the Parental Acceptance-Rejection/Control Questionnaire (PARQ/C) and the Parental Attitude Research Instrument (PARI) to assess parental acceptance-rejection behavior and parents' attitudes towards their children, respectively.

Findings and Results: A positive correlation was found between the PARI dependency subscale and the PARQ/C subscales of warmth/affection and undifferentiated rejection and control. The PARI subscale of rejection of

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the homemaking role was positively correlated to the PARQ/C subscales of hostility, indifference/neglect, undifferentiated rejection and control, and to the PARQ/C total score. The PARI marital conflict subscale was significantly correlated to the PARQ/C subscales of hostility, indifference/neglect, undifferentiated rejection and control and to the PARQ/C total score. The PARI strictness and authoritarianism subscale was significantly correlated to the PARQ/C subscales of hostility/aggression, indifference/neglect, undifferentiated rejection and control and to the PARQ/C total score.

In conclusion, our findings indicate a positive association between acceptance-rejection behaviors and child-rearing attitudes of parents of children with mental disabilities and highlight the impact of the gender and the educational status of the parents, but not the gender of the child, on parental acceptance-rejection behavior and child-rearing attitudes.

Recommendations: Future studies may include children with varying disabilities from different age groups and socioeconomic backgrounds, which may provide data on the likelihood of change in parental behaviors in relation to the age of the child, type of disability, and family's socioeconomic status. Comparisons between parents of children with normal development and with disability in relation to parental acceptance-rejection behavior and child-rearing attitudes would contribute to improvement of services provided for parents of children with disability.

Keywords: children with mental disability, acceptance- rejection, child-rearing attitudes, mother, father

Children interact with their parents the moment they are born. The behaviors and attitudes of the parents towards the children may be effective in shaping this interaction as well as the children's developmental traits. A newborn starts life with quite a few emotional reactions, while at the end of age one, the relationship the baby establishes with the mother or caregiver lays the foundation for the reactions he/she structures with other individuals (Ahmetoğlu, 2004). In the early years of life, parents bear particular importance and the caregiving styles of parents leave permanent and immediate effects on a wide range of social developmental domains, including the moral development of the child, peer games, and academic burgeoning (Bornstein & Bornstein, 2007). Parent-child relationships have an impact on the future psychological health of the child (Turner, Sarason, & Sarason, 2001).

The establishment of an affirmative connection between parent and child may be bound to the parental acceptance-rejection of the child. Accepting parents are capable of demonstrating their reactions verbally or physically whereas increased aggressiveness and negligence towards the child are considered among the parental rejection behaviors (Kitahara, 1987). Parental acceptance-rejection theory (PARTheory), an evidence-based theory of socialization and lifespan development that attempts to explain and predict the antecedents, correlations, and consequences

of parental acceptance-rejection (Rohner, Khaleque, & Cournoyer, 2009), has provided a broader point of view and made significant and sustained contributions to parent-child interaction research (Kasuto, 2005).

PARTheory focuses on the quality of the affectional bond between parents and their children, and the physical, verbal, and symbolic behaviors parents use to express these feelings as well as the mental design of this social interaction by the child. The warmth/affection is a continuum from a great deal to none, one end denoting parental acceptance and the other rejection (Rohner, 1986). Parental acceptance refers to the warmth, affection, care, comfort, concern, nurturance, support, or simply the love that the child can experience from their parents and other caregivers. At the other end of the continuum, parental rejection is marked by the absence or withdrawal of these feelings and behaviors significantly and by the presence of a variety of physically and psychologically hurtful behaviors and effects. A child's feeling of being neglected and not loved while his/her parents are not observed to have a cold and unaffectionate attitude is known as the undifferentiated rejection, while parent control represents the two dimensions including overpermissiveness and authoritarianism (Rohner, 1986; Rohner, 1998; Eryavuz, 2006). The theory asserts that the cultural variability in parental behaviors leads to acceptance-rejection patterns with specific consequences of perceived rejection and self-value in different societies (Rohner, 1986). A child born after an unplanned pregnancy and the mother's feelings of loneliness or of overburden at having multiple children, or the presence of negative physical circumstances and the overresponsibility of mother for home and the child, are considered among the determinants of parental rejection (Rohner & Rohner, 1980).

Yavuzer (2010) stated that the acceptance of the child by the mother is one of the primary determinants of a positive connection between the mother and child. Psychological, socioeconomic, and other difficulties introduced into family life by having a child with mental disability may affect parental acceptance-rejection levels. Regardless of the kind or severity of disability, the birth of a child with disability or the discovery of a disability in a child is an event that changes the whole system in the family (Eripek, 1996). Families face a wide range of negative outcomes on account of having a child with disability, which can drive them into a depressive mood (Küçüker & Kanik-Richter, 1994). The failure to satisfy the expectation of having a healthy baby and related future dreams may also have a significant impact on acceptance-rejection behaviors of parents of children with disability. According to Onder and Gulay (2010), higher rejection levels were determined among the parents of children with mental disability compared to parents of children with normal development. The developmental disability of a child can act as a prominent factor in affecting parental acceptance-rejection behaviors. The failure of a child with mental disability to meet the expectations of the parents and the difficulties he/she encounters in learning and social adaptation may have equal effect on parental behaviors as well as attitudes. Attitudes are strictly organized, long-term emotions, beliefs, and behavioral tendencies (Cüceloğlu, 2010), organizing an individual's thoughts, emotions, and conducts related to a psychological object (Kağıtçıbaşı,

2010). Difficulties resulting from the disability and related social pressures and expectations might also influence child-rearing attitudes. Kermanshahi et al. (2008) reported that the Iranian mothers having a child with mental disability identified themselves as socially, physically, and emotionally affected. Anjel and Erkman (1993) evaluated the relationship of parental acceptance-rejection to family environment, anxiety, and child-rearing attitudes in 129 mothers and reported that higher scores in rejection were associated with lower scores in unity-solidarity and democracy and higher scores in strictness and rejection of the homemaking role. Keskin, Bilge, Engin, and Dülgerler (2010) reported the predominance of pressure, discipline, and overprotection in the child-rearing attitudes of parents of children with mental disability in relation to the effort to cope with the disability. Given the sociodemographic differences in child-rearing attitudes and parental acceptance-rejection behaviors and the specific importance of the schooling age in terms of challenges facing the child in a new social environment, the present study was designed to investigate the relationship between acceptance-rejection behaviors and child-rearing attitudes of the parents of children between 7 and 12 years of age with mental disability in relation to gender and educational status.

Method

Research Design

This is a relational screening modeled study probing into the relationship between acceptance-rejection behaviors and child-rearing attitudes of parents having a child with mental disability in relation to sociodemographic variables. A Relational Screening Model is a research model aiming to detect the existence and/or level of covariance between two or more variables (Karasar, 2009).

Study sample

A total of 15 special education schools, special classrooms, and special education centers serving children with mental disability in Istanbul, Turkey, were selected via a random sampling method between 2010 and 2011. Children between 7 and 12 years of age with mental disability were identified in collaboration with the school administrations. Parents were informed about the study in detail, and they participated on a voluntary basis. A total of 650 parents agreed to participate and were asked to fill out the questionnaires. However, only 465 parents returned the questionnaires. Of these 465 parents, 363 (234 fathers and 129 mothers) who returned completed forms, were included in the study.

Research Instruments

Demographical Information Form. Data on the educational level of the parents and the gender of the parents and children were collected.

Parental Acceptance-Rejection/Control Questionnaire (PARQ/C). The Parental Acceptance-Rejection Questionnaire (PARQ) has been developed by Rohner, Saavedra, and Granum (1978) for measuring parents' self-perception of their acceptance- rejection behaviors towards the child. The questionnaire consists of 60

items with four subscales of *warmth/affection* (20 items), *hostility/aggression* (15 items), *indifference/neglect* (15 items) and *undifferentiated rejection* (10 items). The PARQ was first adapted to Turkish by Anjel (1993) under the supervision of Erkman and with an internal consistency of .90. The construct validity was obtained with respect to the comparisons made via the Family Environment Questionnaire and the Parental Attitude Research Instrument (Anjel & Erkman, 1993). Later, a final 73-item form of the questionnaire (Parental Acceptance-Rejection Questionnaire/Control, PARQ/C Parent form) was developed by Khaleque and Rohner (2002) via the addition of 13 items related to parental control. Reliability analyses of the PARQ/C have been repeated by Erkman (2004) with an overall internal consistency of .74. Its subscales internal consistency coefficients ranged from .59 to .79, with an internal consistency of .69 for the control subscale. In this study, the 73-item adaptation of PARQ/C was used.

The responses are given on a four-point Likert type scale including the following options: "4: true almost all the time", "3: true at times", "2: rarely true" and "1: almost never true". For the total score of rejection, all items in the warmth/affection subscale are first reversely scored and then are added to the scores of the hostility, indifference/neglect, and undifferentiated rejection subscales. The total scores vary between 60 (minimum score) and 240 (maximum score), a higher score indicating a higher level of rejection.

Parental Attitude Research Instrument (PARI). This questionnaire was developed by Schaefer and Bell (1958) to evaluate mothers' feelings towards family life and their children. The PARI was first adapted to Turkish in a shortened form by Le Compte, Le Compte, and Özer (1978). Reliability coefficients were reported to be .58 and .88, and the alpha reliability coefficient was .64. The questionnaire was divided into five factors for conceptual validity, revealing a correlation coefficient of .59 in factor II, .90 in factor V, while in the five subscales a defined median of *r* was detected as .81. The second adaptation has been performed by Küçük (1990). The adapted form consists of 60 items with five subscales: *dependency* (16 items measuring the overprotective and overcontrolling attitudes towards the child); *egalitarianism and democratic attitudes* (9 items measuring the ability to have a cooperating and friendly attitude towards the child), *rejection of the homemaking role* (13 items measuring negative attitudes, the feelings of incompetency, and dissatisfaction with parenting), *marital conflict* (6 items measuring tension between parents), and *strictness and authoritarianism* (16 items measuring the expectations of obedience from the child) (Yurdusen, Erol, & Gencoz, 2013). The responses are given on a four-point scale, ranging from 'I find it not appropriate at all' to 'I find it quite appropriate', and the total score equals the sum of the 60-items. The higher scores on a subscale correspond to the approval of the attitude measured in this subscale (Öner, 1997).

Data Analysis

Arithmetic means, standard deviation, and standard error values of the PARI subscale scores and the PARQ/C total and subscale scores were calculated. For the analysis of the PARQ/C total and subscale scores and the PARI subscale scores in

relation to demographic variables, independent group t-test and, for not normally distributed variables, the Kruskal Wallis-H test were performed. In order to determine the origin of differentiation among groups, the Mann Whitney-U test was performed after the Kruskal Wallies-H test. A Pearson analysis was used to determine the relationships between the PARQ/C and the PARI scores.

Results

According to the sociodemographic data on parents, 179 (49.3%) were of 36-45 years old, 187 (51.5%) were married for 6-15 years, 274 (75.5%) were primary school graduates, 219 (60.3%) were unemployed, while 267 (73.6%) had low-income levels (≤1000 TL). External support for childcare was available only in 45 (12.4%) cases, while 62 parents (17.1%) confirmed the presence of another family member attending special education schools or classes. Out of the 363 (60.6% males) children with mental disability, 117 (32.2%) were born from an unplanned pregnancy, 61(16.8%) had another disability, 318 (87.6%) attended school on a regular basis, while 129 (35.5%) had been attending special education schools for 4-5 years (Table 1).

Table 1

Sociodemographic Characteristics of Participants

Parents		Children with mental disability	
(*N*= 363)		(*N*= 363)	
Age	*n* (%)	**Age**	*n* (%)
20-35 years	124 (34.2)	7 years	49 (13.5)
36-45 years	179 (49.3)	8 years	44 (12.1)
≥45 years	60 (16.5)	9 years	62 (17.1)
Gender	*n* (%)	10 years	53 (14.6)
Female	234 (64.5)	11 years	66 (18.2)
Male	129 (35.5)	12 years	89 (24.5)
Marital status	*n* (%)	**Gender**	*n* (%)
Married	346 (95.3)	Female	143 (39.4)
For 1-5 years	6 (1.7)	Male	220 (60.6)
For 6-15 years	187 (51.5)	**Born from a planned pregnancy**	*n* (%)
For 16-25 years	142 (39.1)	Yes	246 (67.8)
Other	28 (7.7)	No	117 (32.2)
Divorced	13 (3.6)	**Years in special education**	*n* (%)
Widow/widower	3 (0.8)	1 year	54 (14.9)

Table 1 continue...

Parents (*N*= 363)		Children with mental disability (*N*= 363)	
Other	1 (0.3)	2-3 years	102 (28.1)
Educational status	*n* (%)	4-5 years	129 (35.5)
Illiterate	25 (6.9)	Other	78 (21.5)
Primary school	274 (75.5)	**Regular attendance to school**	*n* (%)
High school	49 (13.5)	Yes	318 (87.6)
University/postgraduate	15 (4.1)	No	45 (12.4)
Occupational status	*n* (%)	**Presence of another disability**	*n* (%)
Employed	129 (35.5)	Yes	61 (16.8)
Unemployed	219 (60.3)	No	302 (83.2)
Other	15 (4.1)		
Number of children	*n* (%)		
1	40 (11.0)		
2	148 (40.8)		
3	98 (27.0)		
≥4	77 (21.2)		
Monthly income (TL)	*n* (%)		
≤1000	267 (73.6)		
1001-2000	76 (20.9)		
2001-3000	15 (4.1)		
≥3001	5 (1.4)		
Another family member in special education	*n* (%)		
Present	62 (17.1)		
Absent	301 (82.9)		
External support for childcare	*n* (%)		
Yes	45 (12.4)		
No	318 (87.6)		

Mean (SD) value for the total PARQ/C score was 129.88 (18.26), while the subscale mean (SD) scores included 68.44 (5.69) for warmth/affection, 23.80 (6.77) for hostility/aggression, 21.25 (5.06) indifference/neglect, 15.38 (4.97) for undifferentiated rejection, and 37.89 (4.46) for control (Table 2). Mean (SD) scores for the PARI subscales were 51.28 (5.69) for dependency, 25.80 (2.84) for egalitarianism and democratic attitudes, 31.48 (7.61) for rejection of the homemaking role, 15.83 (4.18) for marital conflict, and 44.31 (8.51) for strictness and authoritarianism (Table 2).

Table 2

The PARQ/C and the PARI Total and Subscale Scores (N=363)

PARQ/C Scores	Mean (SD)	PARI Scores	Mean (SD)
Warmth/affection	68.44 (5.69)	Dependency	51.28 (7.36)
Hostility/aggression	23.80 (6.77)	Egalitarianism and democratic attitudes	25.80 (2.84)
Indifference/neglect	21.25 (5.06)	Rejection of the homemaking role	31.48 (7.61)
Undifferentiated rejection	15.38 (4.97)	Marital conflict	15.83 (4.18)
Control	37.89 (4.46)	Strictness and authoritarianism	44.31 (8.51)
Total Score	129.88 (18.26)		

The analysis of the relations between the PARI and the PARQ/C scores revealed significant positive correlations of the PARI subscales to most of the PARQ/C subscales and to the total PARQ/C score, except for the PARI egalitarianism and democratic attitudes subscale. The PARI dependency subscale was significantly correlated to the PARQ/C subscales of warmth/affection (r=.195; $p<.001$), undifferentiated rejection (r=.115; $p<.05$), and control (r=.439; $p<.001$) (Table 3).

Table 3

The Relations Between the PARI and the PARQ/C Scores (N=363)

PARI \ PARQ/C	Warmth/ affection	Hostility/ aggression	Indifference/ neglect	Undifferentiated rejection	Control	Total Score
Dependency	.195**	.059	.007	.115*	.439**	.101
Egalitarianism and democratic attitudes	.084	.065	-.093	.073	.073	.010
Rejection of the homemaking role	-.029	.353**	.290**	.361**	.262**	.382**
Marital conflict	.079	.216**	.125*	.195**	.223**	.198**
Strictness and authoritarianism	.106*	.213**	.131*	.268**	.479**	.272**

 * $p<.05$ and **$p<.001$ *(Pearson analysis)*

Compared to fathers, mothers had significantly higher scores on the warmth/affection ($p<.05$) and lower scores on the indifference/neglect ($p<.05$) subscales of the PARQ/C and higher scores on the egalitarianism and democratic attitude ($p<.05$) and the marital conflict ($p<.001$) subscales of the PARI. There was no significant gender influence on the other subscales of the PARI and the PARQ/C or on the total PARQ/C score (Table 4).

Table 4

The PARQ/C and the PARI Subscale Scores in Relation to the Parent's Gender (N=363)

PARQ/C Scores	Gender	n	Mean (SD)	t^1	p^1
Warmth/affection	Female	234	68.94 (5.40)	2.244	**.025**
	Male	129	67.54 (6.11)		
Hostility/aggression	Female	234	23.91 (6.84)	.432	.666
	Male	129	23.59 (6.68)		
Indifference/neglect	Female	234	20.75 (4.87)	-2.545	**.011**
	Male	129	22.16 (5.31)		

Table 4 continue...

PARQ/C Scores	Gender	n	Mean (SD)	t1	p1
Undifferentiated rejection	Female	234	15.35 (5.02)	-.117	.907
	Male	129	15.42 (4.90)		
Control	Female	234	37.91 (4.49)	.077	.939
	Male	129	37.87 (4.42)		
Total score	Female	234	128.99 (18.34)	-1.250	.212
	Male	129	131.49 (18.07)		
PARI Scores					
Dependency	Female	234	51.24 (7.70)	-.170	.865
	Male	129	51.37 (6.73)		
Egalitarianism and democratic attitude	Female	234	26.03 (3.05)	2.070	**.039**
	Male	129	25.39 (2.39)		
Rejection of the homemaking role	Female	234	31.73 (7.35)	.857	.392
	Male	129	31.02 (8.07)		
Marital conflict	Female	234	16.50 (4.07)	4.216	**.000**
	Male	129	14.61 (4.11)		
Strictness and authoritarianism	Female	234	44.31 (8.57)	-.011	.991
	Male	129	44.32 (8.44)		

[1]Independent t-test

Parents with a university degree or higher qualification had significantly lower scores for the PARQ/C subscales of undifferentiated rejection (112.30 vs. 221.22, $p<.05$) and control (119.40 vs. 238.02, $p<.05$) and the PARQ/C total (109.10 vs. 212.16, $p<.05$) as well as for the PARI subscales of dependency (111.8 vs. 236.84, $p<.001$), rejection of the homemaking role (122.30 vs. 249.98, $p<.001$), marital conflict (141.83 vs. 238.74, $p<.01$), and strictness and authoritarianism (109.13 vs. 243.54, $p<.001$). The egalitarianism and democratic attitudes subscale score of the PARI was also significantly higher in this group, compared to high school graduates (209.63 vs. 142.60, $p<.05$). Educational status had no significant influence on the PARQ/C warmth/affection, hostility/aggression, and indifference/neglect subscale scores (Table 5).

Table 5

Average Scores for the PARQ/C and the PARI in Relation to the Educational Status of Parents (N=363)

	Educational status				X^{2a}	p^a
	Illiterate (*n*=25)	Primary education (*n*=274)	High school (*n*=49)	≥University (*n*=15)		
PARQ/C scores						
Warmth/affection	198.38	179.39	178.07	215.23	2.363	.500
Hostility/aggression	212.36	183.58	173.38	130.70	6.093	.107
Indifference/neglect	196.32	183.56	179.50	137.73	3.243	.356
Undifferentiated rejection	221.22	186.51	158.11	112.30*	13.274	**.004**
Control	238.02	185.98	150.35	119.40*	17.413	**.001**
Total	212.16	186.14	165.77	109.10*	10.911	**.012**
PARI Scores						
Dependency	236.84	189.45	133.86	111.80***	25.289	**.000**
Egalitarianism and democratic attitude	188.90	186.90	142.60	209.63+	8.786	**.032**
Rejection of the homemaking role	249.98	188.47	129.40	122.30***	28.752	**.000**
Marital conflict	238.74	184.99	148.62	141.83**	14.771	**.002**
Strictness and authoritarianism	243.54	188.97	133.91	109.13***	27.385	**.000**

[a]Kruskal Wallis-H Test

*p<.05, ** p<.01 and *** p<.001; compared to illiterate parents (Mann-Whitney U test)

+ p<.05 compared to high school graduates (Mann-Whitney U test)

Discussion and Conclusion

Our findings indicate a positive correlation between the dependency fostering attitude of parents and their behaviors of parental control, warmth/affection, and undifferentiated rejection. This finding is parallel to past research (Glidden & Schoolcraft, 2003; Macias, Saylor, Rowe, & Bell, 2003). The anxiety levels of parents with a mentally or physically disabled child are higher compared to parents without a disabled child (Macias et al., 2003). As a consequence of this experienced anxiety, parents' child-rearing attitudes may tend towards pressure and discipline as a solution developed for the faced disability (Macias et al., 2003).

Parents of children with mental disabilities might exhibit overprotective attitudes also due to the social and psychological difficulties faced by the child. Parental acceptance-rejection theory defines parents who incessantly control their children's behaviors as highly controlling parents. The positive correlation between dependency and control behavior in this study is therefore meaningful. The dependency fostering attitudes of the parent may be attributed to the inclination to protect the child from potential threats, yet such attitudes might induce in the child feelings of being rejected, pitied, and distrusted.

Our findings indicate a positive correlation between the PARI subscales of rejection of the homemaking role, marital conflict, strictness and authoritarianism and the PARQ/C subscales of hostility/aggression, indifference/neglect, control, undifferentiated rejection, and parental rejection (total score). Sarısoy (2000) has pointed out that the joy parents feel at the start of marriage and the birth of their child leaves its place to bitter memoirs that eventually lead, by blocking emotional contact with the partner, towards matrimonial problems. The mother, in particular, might go through greater stress because of the restrictions on her free time and social activities and due to her increased role as a housewife (Sarısoy, 2000). The fact that a mother with a disabled child spends most of her time dealing with the child's problems, which further limits her free time and social activities, might be the catalyst in her rejection of the homemaking role.

Parents of children with special needs are further obliged in a constant struggle to create a better future with minimum risks for the child. This never-ending fight is likely to adversely affect the matrimonial relations as well. If the experienced problem is solved, there is a possibility that the matrimonial relations may improve. Parents with higher problem-solving skills are less likely to experience rejection of the homemaking role and marital conflict (Ravindranadan & Raju, 2007).

A parent negatively affected by marital conflict might be negative towards the child, and the child might perceive this behavior as more rejecting. One of the most influential factors in maternal parenthood is the mother's relationship with her spouse (Rogers & White, 1998; Krishnakumar & Buehler, 2000; Koerner, Wallace, Lehman, & Raymond, 2002; Hipke, Wolchik, Sandler, & Braver, 2002). Some parents might be convinced that the child's disability and the associated problems are at the root of the marital conflict and the rejection of the homemaking role. In such cases, parents may neglect or even reject the child as they identify him/her with their problems. Other parents might respond with controlling and overmothering attitudes. Compared to parents with a normal child, parents of children with disability are far more anxious, and they might develop pressure, discipline, and overmothering attitudes to cope with the experienced problems (Macias et al., 2003).

In our study, mothers scored higher on the PARQ/C subscale of warmth/affection, and the fathers scored higher on the indifference/neglect subscale. The differences between the mothers and fathers on the hostility/aggression, the undifferentiated rejection, and the control subscales and the total score were statistically insignificant. Parental perceived rejection might change according to the parent's gender (Rohner, 1998). Fathers with a disabled child might

be more accepting than mothers, whereas the mother could be comparatively more rejecting (Ansari, 2002). Or, due to a perceived biological bond, mother and children might also feel closer. Dwairy (2010) has reported fathers who were more rejecting and less accepting than mothers. Higher warmth/affection scores of the mothers might be related to the fact that they spend more time caring for the child as fathers are employed out of the house and fail to spend time with the child when at home. The conflicting total score for the parental acceptance-rejection of a child with disability might have stemmed from the nonmatching numbers of mothers and fathers in the sample group.

Mothers also scored higher on the PARI subscale of marital conflict. Influence of gender on the subscales of dependency, egalitarianism and democratic attitude, rejection of the homemaking role, and strictness and authoritarianism were statistically insignificant. In Turkey, in line with the overresponsibility attributed to the mother as a partner, parent, and housewife by the society, it is reasonable to argue that mothers who spend more time with a disabled child have little time left for themselves, and they become even more anxious. Anxiety in any of the partners might be a factor in the emergence of marital conflict. Owing to their emotionality and restricted social activities, this conflict might have deeper outcomes for mothers such as rejection of the homemaking role, feeling overloaded, feelings of rage against the child with disability, and a consequently rising sense of guilt with probable negative feelings and rejection behaviors towards the child.

Analysis of the parents' educational status showed that illiterate parents had significantly higher points in the PARQ/C subscales of undifferentiated rejection and control, and the PARQ/C total score, compared to parents with university education or higher qualification. The influence of educational status on the subscales of warmth/affection, hostility/aggression, and indifference/neglect was statistically insignificant. This finding is similar to past research (Dwairy, 2010; Roskam, 2005; Erkan & Toran, 2004). According to Erkan and Toran (2004), mothers' attitudes towards children become more accepting with the increase in their educational level, and the mothers' accepting positive attitudes towards the children decrease and rejecting-negative behaviors rise with the decrease in their educational levels. Bond and Burns (2006) likewise have asserted that mothers with extensive knowledge on child development possess a less categorical and multidimensional attitude on child development and employ less authoritarian and more cognitively supportive parental styles for their children.

Parents with a higher educational level may also have easier access to resources with information about ways to attend to the needs of their disabled child and to the institutions that provide assistance. They might further be able to use such information more effectively than other parents. Consequently, they can find quicker solutions to problems arising from the traits of the child. This advantage might be effective in the positive bond of higher educated parents and their higher degrees of acceptance.

In our study, illiterate parents had significantly higher scores on the PARI subscales of dependency, rejection of the homemaking role, marital conflict, and strictness and authoritarianism compared to parents with a university degree or higher qualification. These findings might point to the added impact of adverse socioeconomic living conditions on the family dynamics and relations of the illiterate parents, who most likely have a low-income status. Compared to parents with a high school diploma, parents with a university degree or higher qualification had significantly higher scores on the subscales of egalitarianism and democratic attitude, parallel to past research (Kazemi, Ardabili, & Solokian 2010; Ravindranodan & Raju, 2007; Tabak, 2007; Sarı, 2007; Ayyıldız, 2005; Baran & İçöz, 2001;). The increase in the educational level of mothers might be associated with an increase in the interest and awareness about the written and visual sources related to the disability of the child (Baran & İçöz, 2001). Furthermore, mothers with higher educational levels avoid discriminating their child from normally developing children and try to provide the same rights insofar as possible. Demiriz and Öğretir (2007) have also marked parents' educational level as a salient factor in their child-rearing attitudes.

Inclusion of children aged 7-12 years and the lack of a comparison group composed of children with normal development are the two important limitations of the present study. Additionally, while likely to influence study results, lack of data on the socioeconomic status of the parents and the past history of the family education is another limitation. Future studies may include children with varying disabilities from different age groups and socioeconomic backgrounds and thus may provide data on the likelihood of change in parental behaviors in relation to the age of the child, the type of disability, and the family's socioeconomic status. Comparisons between parents of children with normal development and with disability in relation to parental acceptance-rejection behavior and child-rearing attitudes would also contribute to the improvement of services provided for parents of children with disability.

In conclusion, our findings indicate a positive association between acceptance-rejection behavior and child-rearing attitudes of parents of children with disabilities and highlight the impact of gender and educational status of the parents, but not the gender of the child with the mental disability, on the parental acceptance-rejection behavior and child-rearing attitudes.

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Zihinsel engelli çocukların ebeveynlerinin çocuklarını kabul ve çocuk yetiştirme tutumları arasındaki ilişki

Özet

Atıf:

Problem Durumu: Ebeveyn ve çocuk arasındaki ilişki çocuğun sosyal ve duygusal gelişimi açısından önemli bir yere sahiptir. Ebeveynin çocuğuna yönelik kabul veya ret davranışı spesifik ebeveyn-çocuk bağlamı içerisinde şekillenir ve ebeveyn ile çocuk arasındaki duygusal bağın niteliği açısından kritik bir rol oynar. Zihinsel engelli bir çocuğun dünyaya gelmesiyle beraber ailenin hayatında gelişen psikolojik, sosyo-ekonomik ve diğer zorlukların ebeveynlerin çocuğunu kabul-ret düzeyini etkileyebileceği alanyazında vurgulanmaktadır. Ayrıca, zihinsel engel bağlamında yaşanan zorluklar ve ilgili sosyal baskı ve beklentilerin ebeveynlerin çocuk yetiştirme tutumlarını etkileyebildiği de saptanmıştır.

Çocuğun zihin engelli olması durumunda, ebeveynlerin çocuklarına yönelik kabul veya ret davranışlarının çocuk yetiştirme tutumlarını etkileyebileceği varsayımından hareketle, ebeveynlerin 7-12 yaş arası zihinsel engeli olan çocuklarını kabul-reddi ile çocuk yetiştirme tutumları arasındaki ilişki bu araştırmanın problemini oluşturmaktadır.

Araştırmanın Amacı: Bu araştırmanın amacı, 7-12 yaşları arasında zihinsel engelli çocuğu olan ebeveynlerin, çocuklarını kabul-ret düzeyi ile çocuk yetiştirme tutumları arasında bir ilişki olup olmadığını çeşitli sosyodemografik faktörler açısından incelemektir.

Araştırmanın Yöntemi: 7-12 yaşları arasında zihinsel engelli çocuğu olan ebeveynlerin, çocuklarını kabul-ret düzeyi ile çocuk yetiştirme tutumları arasındaki ilişkinin incelenmesine yönelik bu ilişkisel tarama modelli araştırmaya, zihinsel engelli çocuğu olan toplam 234 baba ve 129 anne rastgele örnekleme yöntemi kullanılarak dahil edilmiştir. Demografik bilgi formu ile ebeveynlerin eğitim düzeyleri ve ebeveyn ve çocukların cinsiyetine dair bilgi toplanmıştır. Araştırmada ebeveynlerin çocuğu kabullenme ve reddetme davranışlarını ve algılanan ebeveyn kontrolünü belirlemek amacıyla kullanılan Ebeveyn Kabul-Ret/Kontrol Ölçeği (EKRÖ/K), 73 maddeden oluşmakta ve *sıcaklık/sevgi*, *düşmanlık/saldırganlık*, *kayıtsızlık/ihmal*, *ayrışmamış reddetme* ve *kontrol* olmak üzere beş alt ölçek içermektedir. Ebeveynlerin çocuklarına karşı tutumlarını belirlemek amacıyla kullanılan Aile Hayatı ve Çocuk Yetiştirme Tutumu Ölçeği (PARI), 60 maddeden oluşmakta ve *aşırı koruyuculuk*, *demokratik tutum ve eşitlik tanıma*, *ev kadınlığı rolünü reddetme*, *evlilik çatışması ve sıkı disiplin* olmak üzere beş alt ölçek içermektedir.

Araştırmanın Bulguları ve Sonuçları: Zihinsel engelli çocukların ebeveynlerinin, çocuk yetiştirme tutumları ile çocuklarını kabul-ret düzeyleri arasında bir ilişki olup olmadığının karşılaştırıldığı araştırma sonucunda, PARI aşırı koruyuculuk alt ölçeği ile EKRÖ/K sıcaklık/sevgi, ayrışmamış reddetme ve kontrol alt ölçekleri arasında pozitif yönde ilişki saptanmıştır. Bu durum alanyazındaki benzer çalışmalarla örtüşmektedir. Çocukları zihin engelli olan ebeveynler, çocuklarının deneyimlediği sosyal ve psikolojik zorluklardan ötürü onlara yönelik aşırı koruyucu bir tutum sergileyebilmektedir.

PARI ev kadınlığı rolünün reddedilmesi alt ölçeği ile EKRÖ/K düşmanlık/saldırganlık, kayıtsızlık/ihmal, ayrışmamış reddetme ve kontrol alt ölçekleri ve EKRÖ/K toplam puanı arasında pozitif yönde ilişki saptanmıştır. Annenin zamanın çoğunu zihinsel engelli çocuğunun ihtiyaçlarını karşılamaya ayırması nedeniyle sosyal aktivitelerine ayırabileceği boş zamanının iyice daralması ev kadınlığı rolünün reddedilmesinde katalizör etkisi görebilir.

PARI evlilik çatışması alt ölçeği ile EKRÖ/K düşmanlık/saldırganlık, kayıtsızlık/ihmal, ayrışmamış reddetme, kontrol alt ölçekleri ve EKRÖ/K toplam puanı arasında pozitif yönde ilişki saptanmıştır. Özel ihtiyaçları olan çocuklara sahip ebeveynlerin çocukları için en az tehdit içerecek şekilde bir gelecek hazırlamak için sürekli bir yaşam kavgası içinde olmaları evlilik ilişkilerini zorlayabilir. Kendilerini aşırı yüklenmiş olarak hissetmelerine ve evlilikteki rollerini sorgulamalarına neden olabilir.

PARI sıkı disiplin alt ölçeği ile EKRÖ/K düşmanlık/saldırganlık, kayıtsızlık/ihmal, ayrışmamış reddetme, kontrol alt ölçekleri ve EKRÖ/K toplam puanı arasında pozitif yönde anlamlı ilişkiler olduğu gösterilmiştir. Ebeveynler yaşamlarındaki

güçlüklerinin bir parçası olduğuna inandıkları zihin engelli çocuğuna ya da engeline karşı olumsuz duygular ve ret davranışlarını sergileyebilirler.

Çalışmamızda annelerin EKRÖ/K sıcaklık/sevgi alt ölçeği, babaların ise kayıtsızlık/ihmal alt ölçeğinde yüksek skor almaları ebeveyn kabul-ret davranışının cinsiyet ekseninde değişebileceğini göstermektedir. Annelerin çocuğun bakımına daha fazla zaman ayırmaları, babaların ise hem işleri nedeniyle çoğunlukla evde olmamaları hem de evdeyken çocuk ile ilgilenmeye vakit ayırmamaları bu sonuçta etken olabilir. Annelerin PARI evlilik çatışması alt ölçeğinden de daha yüksek skor almış olmaları önemlidir. Bu durum, Türkiye'de eş, ebeveyn ve ev kadını olarak anneye atfedilen aşırı sorumluluk düzeyine bağlı olarak, engelli çocuğuna babadan daha fazla zaman ayıran ve bunun sonucunda zaten kısıtlı olan zamanı daha da daralan annenin endişe düzeyinin de arttığını düşündürtmektedir.

Ebeveynlerin eğitim düzeyine dair bulgular, üniversite mezunu ve üstü bir dereceye sahip ebeveynlerle karşılaştırıldığında, okuryazar olmayan ebeveynlerin hem EKRÖ/K ayrışmamış reddetme ve kontrol alt ölçeklerinde, hem de PARI aşırı koruyuculuk, ev kadınlığını/işlerini reddetme, evlilik çatışması ve sıkı disiplin alt ölçeklerinde daha yüksek skor almış olduğunu göstermektedir. Ayrıca, üniversite mezunu ve üstü bir dereceye sahip ebeveynler, lise mezunu ebeveynlerle karşılaştırıldığında, PARI demokratik tutum ve eşitlik tanıma alt ölçeğinde daha yüksek skor elde etmiştir. Alanyazınla örtüşen bu bulgular, genellikle düşük gelir statü sahibi olan okuryazar olmayan ebeveynlerin ağır sosyo-ekonomik yaşam koşullarının aile içi dinamik ve ilişkiler üzerindeki baskıyı ağırlaştırabildiğini; eğitim düzeyinin artmasının ise, zihinsel engel ile ilgili bilgi ve kaynaklara erişimde görülen artışa paralel olarak, çocuk yetiştirme tutumuna olumlu etki yapabildiğini düşündürtmektedir.

Sonuç olarak, bulgularımız zihinsel engelli çocukların ebeveynlerinin çocuklarını kabul-ret davranışı ve çocuk yetiştirme tutumları arasında pozitif yönde bir ilişki olduğuna ve kabul-ret davranışı ve çocuk yetiştirme tutumunun ebeveyn cinsiyeti ve eğitim düzeyine gore değişebileceği ancak zihinsel engelli çocuğun cinsiyetinden bağımsız olduğuna işaret etmektedir.

Araştırmanın Önerileri: Farklı yaş gruplarından ve farklı sosyo-ekonomik düzeylerden farklı tipte engelleri olan çocuklarla yapılacak araştırmalar, ebeveynlerin çocuklarını kabul-ret düzeyi ile çocuk yetiştirme tutumları arasındaki ilişkinin incelenmesine yönelik daha kapsamlı veriler elde edilmesi ve bu sayede gerek yaş ve sosyo-ekonomik koşullar gerekse engel tipinin ebeveyn davranışı üzerine olası etkisinin anlaşılması bakımından önemlidir. Ayrıca normal çocuklarla çeşitli engel gruplarının ebeveyn kabul reddi ve ebeveynlerinin çocuklarını yetiştirme tutumları açısından karşılaştırılarak incelenmesi, engelli çocukların ebeveynlerine sunulacak hizmetlerin iyileştirilmesi açısından değerlendirilebilir.

Anahtar Sözcükler: zihinsel engelli çocuk, kabul- ret, çocuk yetiştirme tutumu, anne, baba

Evaluating the Testing Effect in the Classroom: An Effective Way to Retrieve Learned Information

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Abstract

Problem statement: Evaluation, an important step in educational settings, is usually understood as a process to measure what students know or what they have learned. A variety of methods can be used for assessment and tests are one of the most important and widely-used. While being tested, one may learn or retrieve previously learned information via some mental processes that work on the memory. This phenomenon is called the "testing effect." Despite some disadvantages, tests can also be used as learning materials. So, we will present our study on the testing effect in the classroom setting.

Purpose of study: The purpose of this study was to investigate whether the testing effect occurs in a classroom setting while using a test consisting of multiple choice and matching questions and a worksheet that summarizes the topic, and also to examine the effects of feedback and time.

Methods: In this study, the testing effect was investigated in a college chemistry course, and 98 pre-service science teachers participated. A pre-test, post-test, control group research design was followed to investigate the testing effect. A pre-test that has 100 short-answer questions was performed and students were grouped according to scores from that test. Seven groups (six experimental and one control) were constituted with the requirement that each group had the same average score on the pre-test. An intervening test was applied to four groups (two of them received feedback immediately after the test), a worksheet that summarizes the topic was studied by two groups and one group (control group) had no additional activity. The same pre-test was applied as a post-test to determine final retention. Three groups received this post-test a day later,

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and the other three experimental groups and the control group received it a week later. Final retention of previously learned information and the effects of testing, receiving feedback and re-studying were investigated.

Finding and Results: The results of this study showed that exposing students to supporting practices has a positive effect on retention of previously learned information regardless of the type of the practice. Specifically, tests, which educational professionals frequently use to assess their students' learning, should be used to support teaching and learning processes instead of just to determine the level of learning.

Conclusions and Recommendation: The results have important implications for classroom practice. That is, since much research supports the claim that testing has an important effect on students' retention of previously learned information, it, therefore, should be used to improve classroom practices, and support teaching and learning processes.

Keywords: Testing effect, feedback, retrieval, retention, science education

Introduction

Evaluation, an important step in educational settings, is usually understood as a process to measure what students know or what they have learned (Roediger & Karpicke, 2006a, 2006b; McDaniel, Anderson, Derbish, & Morrisette, 2007). A variety of methods can be used for assessment and tests are one of the most important and widely used. They are generally used because they require a shorter time for assessment (McDaniel, Roediger & McDermott, 2007). Although preparation of tests requires spending a lot of time, since they can be administered to large groups easily and scored objectively, they are frequently used (Chang, Yeh & Barufaldi, 2010). Besides, students may also prefer tests for evaluation. They may think that they have a chance to find the correct answer even if they do not have enough subject knowledge, which is true. One can choose the right answer in a test only by chance. This reality, actually, is a restriction, or a disadvantage of these evaluative materials. Moreover, tests restrict the ideas of students by giving them choices. Since students are forced to choose an answer from choices provided to them, they cannot express their own ideas or explanations about that topic (Mintzes, Wandersee & Novak, 2001).

Despite all of these disadvantages, tests can also be used as learning materials. While taking a test, one may learn or retrieve previously learned information via some mental processes that work on the memory. This phenomenon is called the "testing effect." Tests can enhance retention of previously learned information even if no additional study or feedback was provided, an effect investigated in many research studies, especially in the field of cognitive psychology (Roediger & Karpicke, 2006a).

In this study, we will first briefly summarize the literature about the testing effect, try to explain the mechanism behind this phenomenon and different variables

(different kinds of tests, delay between tests, feedback etc) to understand the effect under different conditions (psychology labs and classroom). Then we will present our study on the testing effect in the classroom setting.

In most of the studies, word lists (Carpenter & DeLosh, 2006; Cull, 2000; Wheeler, Ewers & Buonanno, 2003), animations (Johnson & Mayer, 2009), figure lists (Wartenweiler, 2011) or prose passages (Thomas & McDaniel, 2007; Agarwal, Karpicke, Kang, Roedieger & McDermott, 2007) have been used as materials, and with a post-test their effect on retrieval was examined. Roediger and Karpicke (2006a) have investigated the testing effect through two experiments using prose passages. They created a study aiming to see the testing effect with one testing group versus one re-studying group. Their study also tried to determine the effect of time. It was concluded that re-studying enhances performance on immediate retention tests; however, testing has a more positive effect on delayed retention tests. They also concluded that repeated studying had a positive effect on an immediate retention test (5 min.), whereas repeated testing enhanced performance better on a delayed retention test. Wheeler, Ewers & Buonanno (2003), have also investigated the testing effect by comparing test trials and re-studying conditions. Their results shared the same pattern with many other investigations (Roediger, & Karpicke, 2006b; Butler & Roediger, 2007), that re-studying enhances retention in short intervals while testing enhances retention on delayed tests.

How the Testing Effect Occurs

One of the explanations of how the testing effect occurs is that additional exposure to learning material (the amount of processing hypothesis) enhances retention. However, many researchers have refuted this explanation in different studies (Carpenter & DeLosh, 2006; Roediger & Karpicke, 2006b) in which control groups were exposed to material (for instance, by re-studying) for the same amount of time as other groups spent being tested. Today, two main views are thought of as explanations of testing effect: the transfer-appropriate processing view and the elaborative retrieval processing view. According to transfer-appropriate processing view, the testing effect occurs because of the similarities between intervening and final tests. This explanation has found support in many research studies (Thomas & McDaniel, 2007; Butler & Roediger, 2007). A study by Wartenweiler (2011) showed that the testing effect can be explained by the transfer-appropriate processing view. He used figure lists as material and formed study-only and study-test groups. The testing effect, however, was only found to be significant for the transfer final test, not for the standard final test. In a study by Thomas and McDaniel (2007), prose passages were used as materials. Researchers gave two different types of passages to students, either letters were missed or sentences were disordered. Therefore, they wanted students to perform two types of encoding: letter insertion and sentence sorting. At the end of the study, it was argued that the testing effect occurred due to transfer-appropriate processing, since letter insertion encoding yielded better performance on the final cued recall test. Similarly, Johnson and Mayer (2009) have argued that the testing effect occurs according to the transfer-appropriate processing view.

The other explanation of the testing effect is that tests evoke more elaborative retrieval processing than studying. In other words, information that requires more mental processing leads to better retention when it is being tested. Several studies have supported this view (Carpenter & DeLosh, 2006; Wheeler, Ewers & Buonanno, 2003; McDaniel, Roediger & McDermott, 2007; Carpenter, 2009; Karpicke & Zaromb, 2010) and concluded that when an intervening test presents the information in a more complex way, participants' retention of that information on the final test will be improved. For this reason, free recall tests perform better than cued recall tests and they also perform better than recognition tests. Carpenter and DeLosh replicated Glover's fourth experiment in his study (1989; as cited in Carpenter and DeLosh, 2006) about the testing effect, and they investigated the elaborative retrieval processing view of the testing effect. Wheeler, Ewers and Buonanno (2003) examined the mechanism of the testing effect by using word lists as materials in two experiments; repeated study (multiple study trials without a test) and repeated test (a study trial followed by multiple recall tests) conditions and it was concluded that an item's storage strength would be increased by retrieval, and, therefore, it can be remembered easily. Instead of word lists, brief articles, lectures and materials were used as lecture materials in a college course used in a study by McDaniel, Roediger and McDermott (2007), and they found that an initial short-answer test produced greater gains on a final test than did an initial multiple-choice test.

Although there are two main explanations of the testing effect, it also should be noted that these explanations are not separated from each other with sharp lines. Both play a role in the testing effect.

Effect of Feedback

In some experiments the effects of feedback were also investigated. For instance, Agarwal, Karpicke, Kang, Roedieger and McDermott (2007) examined the testing effect in open-book and closed-book tests, with and without feedback. The conclusion of their study was that providing feedback resulted in better long-term retention than providing immediate feedback. While in many investigations feedback was found to have a positive effect on final retention (Kang, McDermott & Roediger, 2007; Cull, 2000), a surprising result that feedback is ineffective has been found in a study by Butler and Roediger (2007). Video lectures were used in their study of three groups: a studying group (viewing lecture notes after watching video lecture), a short answer testing group and a multiple choice test group. Half of both testing groups were given feedback after testing while the other half were not. Retention of information was tested in a short-answer final test one month later. The surprising result in this study is that feedback had no effect on the final retention test. The researchers explained this result as due to the amount of time participants were given to process the feedback and the fact that it occurred immediately after subjects responded. Feedback was presented for only 6 seconds and this amount of time may not have been sufficient to allow participants to fully process the information.

Testing Effect Studies in Classroom

Most of the studies conducted on the testing effect have been done in psychology laboratories. However, in order to answer the question of whether tests are helpful to learning outcomes in a real classroom environment, it is required to study a classroom environment. Actually, there are many differences between the laboratory and the classroom. First of all, the amount of information that is to be learned by students is much more in the classroom than in laboratory designs. In the classroom, students may also differ in their attitude toward a lecture and in their motivation to learn the information. Every student requires a different amount of time to understand and learn material. Also, the materials to be learned are served in a variety of ways, such as textbooks, lectures, and classroom discussions. These differences between the classroom and the laboratory, and also the uncontrollable parameters in a classroom, make classroom studies harder to conduct than laboratory studies. (Roediger and Karpicke, 2006b)

However, the testing effect has been studied by some researchers in classroom settings. Bangert-Drowns et al. (1991) have studied whether tests affect learning outcomes in the classroom. With this aim, in many studies they grouped students in testing and no-test (control group) groups. Students in the testing group were administered a test during the semester, while the control group students did not have any test, but re-read lecture notes. Researchers investigated the testing effect by examining the students' final exam scores. They have found a positive effect of testing on the final score in 29 studies (of 35 studies), a negative effect in five studies, and no difference in one study. They concluded that the testing effect is also robust in the classroom. Bangert-Drowns et al. also investigated the number of tests in the testing group on the final performance. The number of tests taken in the testing group was changed between 3 and 75 while the control group received 0-15 tests. The results showed that as the number of tests increases, the positive effect on performance also increases. The important finding of the study is that the biggest difference in the effect of testing has been found when the control group had no test and the testing group had only one test. Therefore, they concluded that having only one test can produce better retention than a no-test condition. Although they found that tests are important tools and have a positive effect on final retention, they did not study the different kinds of tests or feedback conditions.

McDaniel et al. (2007) studied the testing effect in a web-based lecture course throughout a semester. As in many studies, they grouped students into a testing group and a re-studying group. McDaniel et al. used two different types of tests (multiple-choice and short-answer tests), which differed from Bangert-Drowns et al.'s study. The final exam scores of all students were examined, and they showed that students in the testing groups performed better than students in the re-studying group. From this result, researchers concluded that tests have positive retention effects. One other result from this study was that short-answer tests produce more gain than multiple-choice tests. This result has been paralleled in laboratory studies, in which recall tests produced more retention than recognition tests.

Another study revealing the testing effect in the classroom was done by Leeming (2002). He used an exam-a-day procedure, in which students take a test before every lecture, instead of four exams throughout a semester. He used this procedure for two lecture courses (Introductory Psychology and Learning and Memory) with 22-24 exams per course, and at the end of the semester students' final exam scores were compared to those in previous years. He concluded that students performed better when the exam-a-day procedure was used. Also, students' responses to a questionnaire related to the application of the procedure was analyzed, and it was discovered that students have positive attitudes toward this procedure and said they spent more study time and thought that they had learned more.

Another study dealing with the testing effect in the classroom was done by Chang, Yeh and Barufaldi (2010). Different from other studies, the participants of this study were primary school students (N=208), and the amount of retrieval was determined via the flow-map technique, a baseline instrument used to probe students' cognitive structures. Testing groups and a control group were constructed according to the scores that were obtained using a flow-map technique. A multiple-choice test, a correct-concept test and an incorrect-concept test were used as materials. Chang et al. concluded from the results of the study that tests led to better retention of learned material, and that, from a conceptual-change point of view, the increase in students' correct concepts stem from correct statements in a test, while incorrect statements may cause misunderstanding.

In the last decade, as part of educational reforms, new science education programs were prepared using a student-centered approach. These programs, which put students at the center of the system, have an evaluation method that supports learning activities and also gives feedback. It has great importance that process should be evaluated with outcomes as well according to educational reforms. However, if it was taken into consideration that in our country individuals were exposed to tests frequently and teachers use tests in their classess to evaluate students' performances, it is important that these evaluation materials should also be used in retrieving the learned information. Therefore, studies about the retrieval effects of testing materials are promising.

Another purpose of our study was to investigate the testing effect in a classroom setting using a test consisting of multiple-choice and matching questions and a worksheet that summarizes the topic (for re-studying). A pre-test that has 100 short-answer questions was taken and students were grouped according to scores from that test. Seven groups (six experimental and one control) were constituted, with the requirement that each group had the same average score on the pre-test. An intervening test was given to four groups (two of them received feedback immediately after the test), a worksheet that summarized the topic was studied by two groups and one group (control group) had no activity. The same pre-test was given as a post-test to determine final retention. Three groups received this post-test a day later and the other three experimental groups and the control group received it a week later. Therefore, final retention of previously learned information and the effects of testing, receiving feedback and re-studying were investigated.

Method

Research Design

This study was carried out as quasi-experimental design. Quasi-experiment includes assignment, but not random assignment, of participants to groups (Creswell, 2005). In this study, there were seven groups. One of them was a control group while others were experimental groups. The groups were equal on the pre-test score.

Participants

The participants of this study were 98 freshmen from the Elementary Science Education department of Sakarya University in Turkey. Of the participants, 30 were male and 68 were female, and all were enrolled in the General Chemistry I course. Before we conducted the study, they were all informed about the procedure and all of them participated voluntarily.

Research Instrument and Procedure

Pre-test and Post-test

A form consisting of 100 short-answer questions (which is enough to understand whether students learned the subject and to minimize their finding the right answers only by chance) about the naming of compounds (whether the name of the compound was given and the formula of it was asked or vice versa) was prepared and used as pre-test and post-test in this study. In 50 of the questions, the formula of the compound was given and the name of the compound was asked (e. g. Formula: Na_2SO_4, Name=?), and in the other 50 the name was given and the formula was asked (e.g. Name: Potassium Chloride, Formula=?).

Intervening Test

An intervening test on naming compounds and consisting of two parts was used. In the first part, 10 multiple-choice questions on the rules of naming of chemical compounds were asked. The second part was composed of 100 matching questions in which students were asked to match the name and formula of a compound. Since it would be very confusing and difficult for students to find the right answer among 100 alternatives, this part was divided into 10 subparts composed of 10 questions in the same format. The names and formulas of 10 different chemical compounds were given without any order in the same section in two columns and participants were asked to match the name and the formula of a compound. All tests were examined by an outside chemistry specialist before administration.

Worksheet

A two-page worksheet, summarizing the topic with the basic rules of naming chemical compounds and examples, was used for re-studying practice. All basic rules of naming chemical compounds were summarized in this worksheet and examples of each rule were provided below the explanation. Students in re-studying groups studied this worksheet during the same time period as the test administration.

Design and Procedure

In this study, the naming of chemical compounds was chosen for the General Chemistry I course because this topic has great importance throughout this course and other chemistry courses as well. Students usually have difficulties in applying naming rules and learning this topic. It often seems like learning a foreign language. The study was conducted after that topic was taught in the classroom. All of the

participants attended the same lessons and were exposed to the same information on the topic by the same instructor.

A pre-test, post-test, control group research design was followed to investigate the testing effect of different interventions in a classroom setting. First, the pre-test was administered to all of the participants at the same time, and seven sub-groups (six experimental groups and a control group) with equal mean pre-test scores (33.29) were formed by entering the pre-test scores into an Excel spreadsheet. Six experimental groups (G1 to 6) were again divided into three different practice groups: Of the six experimental groups, two groups were administered the intervening test (G1 and G3), two groups took the intervening test and then received feedback (G2 and G4) and the other two groups (G5 and G6) studied the worksheets. The reason three different practice groups were formed was to be able to investigate whether there is a difference between the effectiveness of testing, receiving feedback and re-studying worksheets on retention of previously learned information, or if the testing effect occurs regardless of the type of study material. Since one of the earlier explanations of the testing effect is re-exposure to the material, a re-studying group was formed to examine whether this explanation is true or not. That is also why the control group was formed; to be able to see the effectiveness of all the practices.

Three weeks after the pre-test administration, the intervening practices were administered to the six experimental groups at the same time; four of the groups (G1 to 4) were administered the intervening test and two groups (G5 and G6) studied the worksheets for a class hour (50 minutes). The control group did not receive any interventions. At the end of that class hour, two of the groups (G2 and G4), which were exposed to intervening test administration, were given feedback immediately after the test; the instructor explained the correct answers to all of the questions in the test and supported these explanations with appropriate examples.

One day later, the post-test was administered to three practice sub-groups; a testing sub-group (G1), a testing with feedback sub-group (G2) and a re-studying sub-group (G5). The other three experimental sub-groups (G3,G4 and G6) and the control group (G7), which had no intervening activity, took the post-test one week later. In this way, the effect of time on retention of previously learned information was also to be investigated. A clear summary of the intervention program and time schedule of the study can be seen on Table 1.

Table 1

Time Schedule for Post-Test Administration

	Experimental groups						Control group
	1	2	3	4	5	6	
Intervening application	Test	Test + Feedback	Test	Test + Feedback	Worksheet	Worksheet	-
Post-test administration	1 day later	1 day later	1 week later	1 week later	1 day later	1 week later	1 week later

Scores on the post-test from all the experimental sub-groups and the control group were calculated and the results were analyzed. A schematic view of the study can be seen in Figure 1.
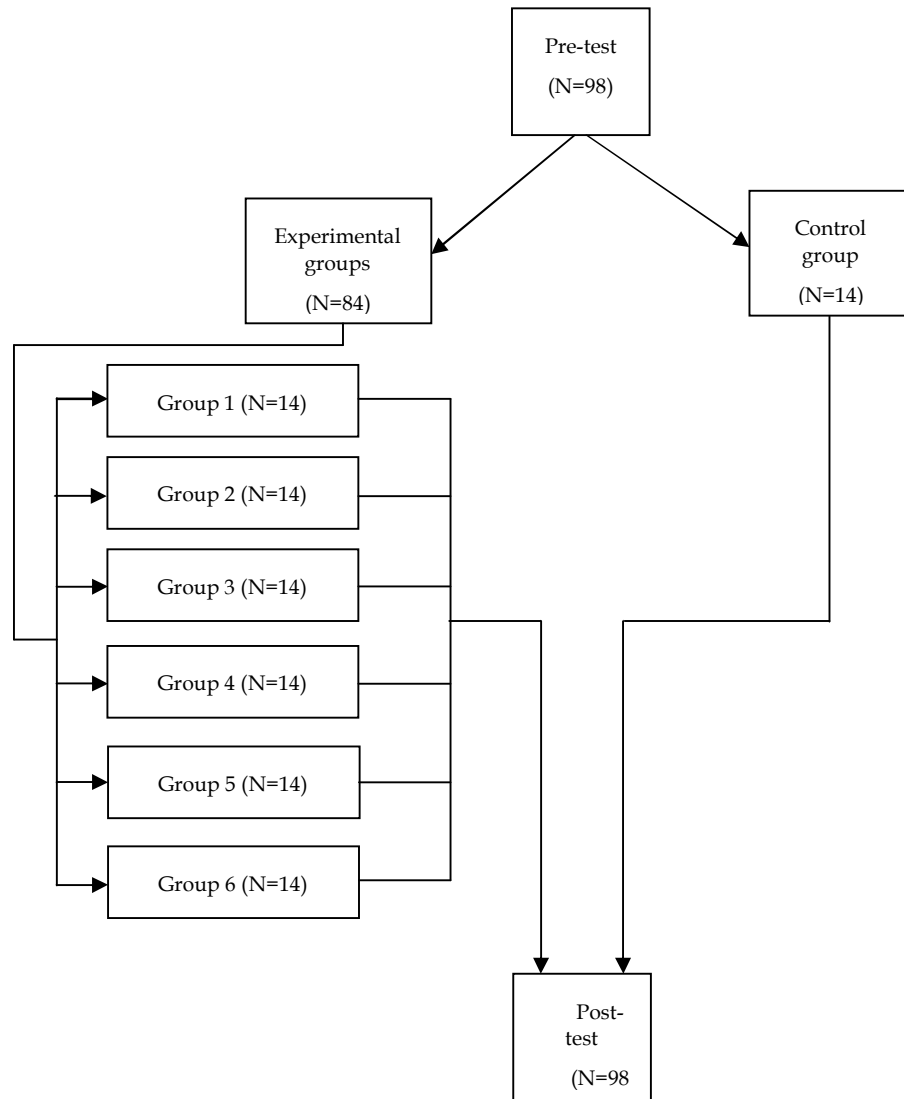
Figure 1. A schematic view of the study

Results

Descriptive Statistics

Descriptive statistics for pre-test and post-test scores of the groups are presented in Figure 2. Sub-groups of the study were formed based on their pre-test scores; mean pre-test scores of all sub-groups were equal with slightly different standard deviations. When post-test scores are considered, it is clear that all groups performed

better in the post-test. However, the increase in the mean score of the control group was very low; it only increased 3.78 points (M1=33.29, M2=37.07). Since the control group did not receive any intervention related to this topic in the classroom, this small difference may be explained by the practice effect, or students might have studied during the time period between pre-test and post-test administration.
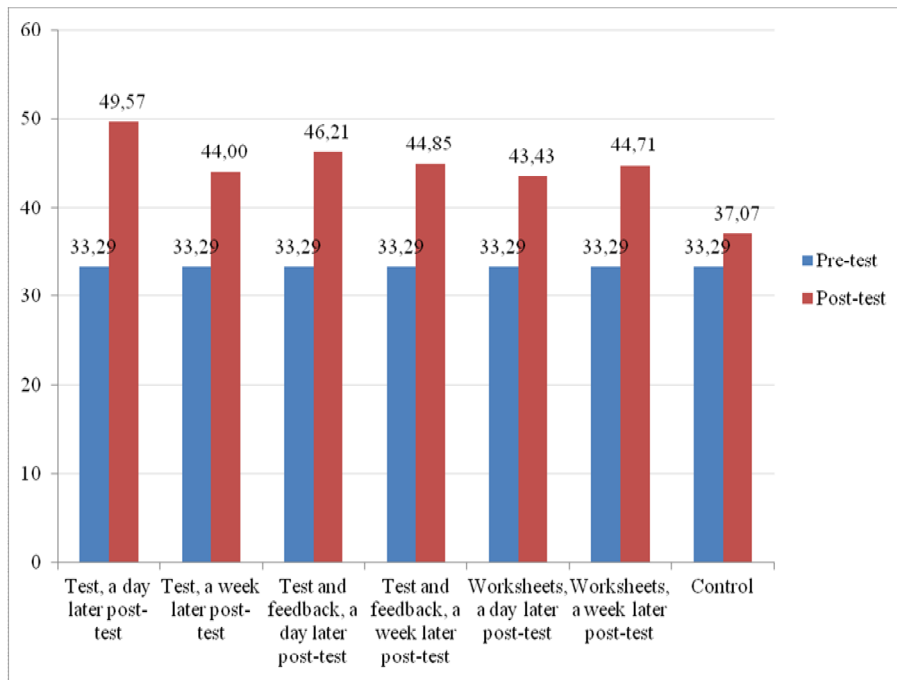
Figure 2. Pre-test & post-test scores of the sub-groups.

Wilcoxon Signed Rank Test Results

Descriptive statistics results (see Figure 2) showed that there is an increase in test scores of all sub-groups from pre-test to post-test. In order to investigate whether these increases were statistically significant, the Wilcoxon Signed Rank Test was used. The results of the test were presented in Table 2.

Table 2

Wilcoxon Signed Rank Test results

Group	Pretest - Posttest	
	Z	Asymp. Sig. (2-tailed)
Test, a day later post-test	-3.297[a]	0.001
Test, a week later post-test	-3.112[a]	0.002
Test and feedback, a day later post-test	-2.860[a]	0.004
Test and feedback, a week later post-test	-3.298[a]	0.001
Worksheets, a day later post-test	-2.732[a]	0.006
Worksheets, a week later post-test	-3.235[a]	0.001
Control	-1.855[a]	0.064

a. Based on positive ranks.

The Wilcoxon Signed Rank Test revealed a statistically significant increase in mean scores of all sub-groups that participated in interventions. However, for the control group, who did not receive any intervention, the increase in mean score was not statistically significant ($p>0.05$).

The effect size for this test can be calculated by dividing Z value by the square root of N, where N is the number of observations over the two time points (14x2=28 for each sub-group), (Pallant, 2007). Effect size values for each practice sub-group were calculated and found to indicate a large effect (see Table 3). According to Cohen (1988), ≥ 0.1 indicates small effect, ≥ 0.3 indicates medium effect and ≥ 0.5 indicates a large effect.

Table 3

Effect size values

Group	Effect size (r)
Test, a day later post-test	0.62
Test, a week later post-test	0.59
Test and feedback, a day later post-test	0.54
Test and feedback, a week later post-test	0.62
Worksheets, a day later post-test	0.52
Worksheets, a week later post-test	0.61

ANCOVA Results

A one-way between-groups analysis of covariance was conducted to compare effectiveness of the three different interventions designed to increase students' test scores with the effect of time. The independent variables were the type of intervention (test, test and feedback, worksheets) and the time, and the dependent variable consisted of post-test scores. Students' pre-test scores were used as the covariate of the analysis.

Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes and reliable measurement of the covariate. After adjusting for pre-test scores, there was no significant difference between the practice groups on post-test scores, $F(5, 77)=0.80$, $p=0.55$, partial eta squared=0.05. There was a strong relationship between the pre-test and post-test scores, as indicated by a partial eta squared value of 0.59. Since there were no differences found between any two of the groups, no follow-up analysis was conducted.

Discussion and Conclusion

In this study, six practice sub-groups and a control group were formed according to their pre-test scores, and the results of the analyses showed that with the administration of tests and worksheets significant differences arose between practice sub-groups' mean pre-test and post-test scores. In the control group, which did not receive any intervention, there was not a significant difference between mean pre-test and post-test scores. However, although this difference was not statistically significant, the mean post-test score of the control group was slightly higher than its mean pre-test score. This small increase in the mean score of the group might have resulted from the re-exposure of the testing material, which is one of the explanations of the testing effect. The use of a pre-test may create a practice effect that can affect the results; practice on the pre-test by itself may be responsible for the improvement (Fraenkel & Wallen, 2006).

The significant difference between mean pre-test and post-test scores of each practice sub-group indicated that practicing and testing helped with the retention of previously learned information. When the literature was reviewed, many studies were found with similar results, suggesting that practicing and testing helped with the retention of previously learned information (Butler & Roediger, 2007; Agarwal, Karpicke, Kang, Roedieger & McDermott, 2007; Roediger & Karpicke, 2006a, 2006b; Wheeler, Ewers & Buonanno, 2003; Chang, Yeh & Barufaldi, 2010; McDaniel, Anderson, Derbish, & Morrisette, 2007; McDaniel, Roediger & McDermott, 2007). As a result of educational reform, using methods that aim to evaluate process in addition to traditional assessment and measurement methods is inevitable. But for assessment and measurement, tests are frequently preferred in education since they are time-saving and easy to administer and evaluate.

According to Dempster (as cited in Roediger & Karpicke, 2006b), there are two possible explanations for the positive effects of testing on learning: (1) the testing effect may be a result of additional exposure to learning material during a test and (2) tests may enhance learning via retrieval processes that work on memory. When similar studies were investigated, it was discovered that the testing effect was mostly studied in the field of psychology, in laboratory settings in which administrations occur in a short time period, rather than in the field of education, in which studies generally require a longer time period. In the present study, while investigating the testing effect, test administrations and interventions were done in a classroom setting and, instead of studying the current topic, a previously taught topic was used to study retention of the previously learned information. With this aspect of the study, it can be claimed that testing is effective even after some time passes after learning information. Therefore, in this study, it is possible that the testing effect resulted from tests' enhancing power on learning via retrieval processes rather than additional exposure to learning material via tests.

When the mean pre-test and post-test scores of the practice sub-groups (G5 and G6), to which worksheets were administered, were compared, a significant difference was found. This result indicated that worksheets or a summary of the lecture notes also help with retention of previously learned information. However, Butler and Roediger (2007) conducted a study to determine different types of lecture materials' effect on retention of previously learned information and the results indicated that short-answer exams were superior to multiple-choice tests and worksheets on retention of previously learned information. The difference between the results of that study and the present study may have resulted from differences in learning and study styles of the participants or differences in educational policies of the two countries. In the country in which present study was conducted, the re-studying method was preferred by most of the students in examination periods. Most of the students use this technique to get ready for their examinations. It is thought that this situation affects the results. Moreover, although the difference between the mean post-test scores of the practice sub-groups was not statistically significant, when Figure 2 is examined, it can be seen that the practice sub-groups to which tests were administered performed better on the post-test than the practice groups to which worksheets were administered. Therefore, it can be said that tests may be superior to work sheets on retention of previously learned information. In the study of Roediger and Karpicke (2006a), in which the effects of testing and re-studying on remembering words in previously read paragraphs were investigated, post-tests were administered after different time periods (5 min, 2 days and a week), and it was found that tests were superior to re-studying for remembering previously learned information.

In this study, mean post-test scores of the practice sub-groups were compared in order to investigate whether the effects of different interventions differed. It was seen that mean post-test scores of the sub-groups were different from each other, and practice type had an effect on retention of the previously learned information, but these differences were not statistically significant. Moreover, when the effect of time

passed between pre-test and post-test administration was investigated, it was found that among the practice sub-groups (test, test and feedback, worksheets), administration of post-test a day later or a week later did not create a statistically significant difference. However, in test and test and feedback groups (G1 to G4), mean post-test scores of the groups to which post-test was administered a week later were lower than the groups to which post-test was administered a day later. Similarly, Roediger and Karpicke (2006a) found that as the time period between pre-test and post-test administration was strung out, retention of the previously learned information decreased.

Another finding of this study was that feedback given immediately after the test administration did not create a significant difference in retention of the previously learned information. When similar studies were investigated, in accordance with this study's results, Butler and Roediger (2007) also concluded that regardless of the test type, feedback does not have a significant effect on retention of previously learned information. On the other hand, there are also studies with findings supporting feedback as being effective on recall (McDaniel, Roediger, & McDermott, 2007). Moreover, the time period between feedback and test administration, and the allocated time for giving feedback, also influence the effectiveness of feedback on retention of previously learned information. Feedback given within a short time period may not give students enough time to process given information. For this reason, sufficient time should be allocated for giving feedback. In this study, feedback was found to be ineffective on retention of previously learned information; this result might be explained with the short time allocated for giving feedback and the short time period between giving feedback and test administration.

In summary, the results of this study showed that exposing students to supportive practices has a positive effect on retention of previously learned information regardless of the type of the practice. Specifically, tests, which educational professionals frequently use to assess their students' learning, should be used to support teaching and learning processes and not just to determine the level of learning.

Implications

The results of the present study, as well as the number of other studies investigating the testing effect, have important implications for classroom practice. That is, since much research supports the claim that testing has an important effect on students' retention of previously learned information, it therefore should be used to improve classroom practice and support teaching and learning processes. Test use should be encouraged in educational settings not only for evaluation purposes but also for learning purposes. However, they should not be used as alternatives to lecture notes, but as supporting materials. Future research needs to investigate the effect of feedback in a more detailed way; for instance, feedback may not be effective when given immediately after testing. Moreover, the time period between testing and post-test might be lengthened, and also the effect of other test types on retention of previously learned information can be investigated.

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Sınıflarda Test Etkisinin Değerlendirilmesi: Öğrenilmiş Bilgilerin Geri Çağırılmasında Etkili Bir Yol

Atıf:

Atabek Yiğit, E., Balkan Kıyıcı, F. & Çetinkaya, G. (2014). Evaluating the testing effect in the classroom: An effective way to retrieve learned information, *Eurasian Journal of Educational Research*, 54, 99-116.

Özet

Problem durumu: Öğretim uygulamalarında önemli bir adım olan değerlendirme genellikle öğrencilerin ne bildiklerini ya da ne kadar öğrendiklerini ölçmek amacıyla yapılan bir işlem olarak düşünülmektedir. Ölçme işlemini gerçekleştirmek için farklı yollar kullanılabilmektedir ve testler bu yollar arasında en önemlisi ve en yaygın olarak kullanılanıdır. Testler kullanılarak gerçekleştirilen ölçme ve değerlendirme işlemleri genelde uzun zaman gerektirmediği için tercih edilen bir yöntemdir. Testlerin hazırlanma aşaması zaman alıcı bir ölçme yöntemi olmasına rağmen, kalabalık gruplar için kolaylıkla uygulanabilir ve objektif olarak puanlaması yapılabildiği için yaygın olarak kullanılmaktadır. Ayrıca öğrencilerde ölçme aracı olarak testleri tercih etmektedirler. Özellikle doğru cevabı bulma şansına sahip

olabilme, öğrenciler için testleri öncelikli olarak tercih edilebilir yapmaktadır. Yapılan çok sayıda arştırmaya göre; testlerin uygulanması sırasında zihinde gerçekleşen bir takım zihinsel aktiviteler yardımıyla öğrenciler eski bilgilerini hatırlayabilir ya da yeni bir öğrenme işlemi gerçekleştirebilirler. Bu eski bilgileri hatırlama ve öğrenme işleminin gerçekleşmesi işlemine kısaca test etkisi ismi verilmektedir. Test uygulamalarının sağladığı avantajlarının yanında bazı dezavantajları da olmasına rağmen, öğrencilerin sıklıkla karşı karşıya kaldıkları testler, test etkisi dolayısıyla sınıflarda bir öğrenme materyali olarak kullanılabilir. Bu sebepten bu çalışmada, sınıflarda test etkisi araştırılmaya çalışılmıştır.

Araştırmanın amacı: Bu araştırmanın amacı sınıflarda test etkisinin araştırılmasıdır. Test etkisini belirleyebilmek amacıyla çoktan seçmeli test, eşleştirme testi ve konuyu özetleyen bir çalışma yaprağı (tekrar çalışma grubu için) kullanılmıştır. Araştırma grubuna ön test olarak 100 kısa sorudan oluşan bir ön test uygulanmış ve öğrenciler ön test sonucuna göre gruplandırılmışlardır. Ön test sonuçlarına göre öğrenciler her bir grubun ortalama puanı aynı olacak şekilde ayarlanarak yedi gruba (altı grup deney grubu bir grup kontrol grubunu oluşturacak şekilde) ayrılmışlardır. Ön test uygulamasından sonra, 4 deney grubuna müdahale testi uygulanmış ve bu gruplardan 2 gruba test sonrasında dönüt verilmiştir, deney gruplarından 2 gruba ise müdahale testi uygulanmamış ve çalışma kağıdı verilmiştir. Kontrol grubuna ise herhangi bir işlem uygulanmamıştır. Öğrencilerin son öğrenmelerini belirlemek üzere ön test olarak kullanılan test son test olarak da uygulanmıştır. Deney gruplarından üç gruba son test bir gün sonra uygulanırken, diğer 3 deney grubuna ve kontrol grubuna son test bir hafta sonra uygulanmıştır. Sonuç olarak; öğrencilerin öğrendikleri bilgileri hatırlama düzeylerinde test etkisi, dönütün hatırlama üzerine etkisi ve tekrar çalışmanın hatırlama üzerine etkisi araştırılmıştır.

Araştırmanın Yöntemi: Bu çalışmada Eğitim Fakültesinde yer alan Genel Kimya dersinde öğrenilen bileşiklerin isimlendirilmesi konusu ele alınarak test etkisi belirlenmeye çalışılmıştır. Bu konu öğrenciler için anlaşılması zor ve kolay unutulan bir konudur. Araştırmanın örneklemini bu dersi alan fen bilgisi öğretmen adayları oluşturmakta olup, araştırmaya katılmaya gönüllü olduğunu belirten 98 fen bilgisi öğretmen adayı oluşturmaktadır. Araştırmada test etkisini belirlemek üzere ön-test, son-test kontrol gruplu araştırma deseni kullanılmıştır.

Araştırmanın Bulguları: Araştırma sonucunda ön test puanları eşit olan altı deney grubu ve kontrol grubuna uygulanan son test puanlarından elde edilen veriler istatistiksel olarak analiz edilmiştir. Araştırma sonuçları, uygulama tipinin ne olduğu önemli olmaksızın öğrenilmiş bilgilerin hatırlanmasında, destek etkinliklerinin olumlu bir etkiye sahip olduğunu göstermektedir. Bu çalışmada testlerin geri çağırma sürecine yardımcı olmasıyla test etkisi sonucundan söz etmek mümkündür. Aynı zamanda araştırmanın sonuçlarından bir diğerine göre; çalışma yaprakları da öğrenilmiş bilgilerin hatırlanmasında öğrencilere yardımcı olmaktadır. Bu sonuç literatürdeki diğer çalışmalarla benzer bir sonuca işaret etmemektedir. Ancak çalışmanın yapıldığı ülkede sınav dönemlerinde öğrencilerin sınava hazırlık için çoğunlukla bu metodu tercih ediyor olmasının sonucun bu şekilde çıkmasını etkilediği düşünülmektedir. Farklı deney gruplarındaki ön test ve son test

uygulamaları arasında zaman farkı dikkate alınarak yapılan analizler sonucunda ise son testlerin bir gün sonra veya bir hafta sonra uygulanmasının herhangi bir önemi olmaksızın, istatistiksel olarak anlamlı bir fark oluşturmadığı tespit edilmiştir. Bu çalışmanın sonuçlarından bir diğeri ise; öğrencilere testlerin arkasından dönüt verilmesinin öğrenilen bilgilerin hatırlanmasında gruplar arasında anlamlı bir farklılık oluşturmadığıdır. Bu sonuçlardan hareketle özellikle eğitim uzmanları tarafından öğrenci öğrenmelerini belirlemek amacıyla sıklıkla kullanılan testlerin, öğrenme seviyesine belirlemenin yanı sıra, öğrenme öğretme süreçlerini desteklemek amacıyla da kullanılabileceğini söylemek söz konusudur.

Araştırmanın Sonuç ve Önerileri: Araştırma sonuçları göstermektedir ki; öğrenciler testler ve çalışma yaprakları ile karşı karşıya kaldığında bu uygulamalar öğrenilmiş bilgilerin hatırlanmasında öğrencilere yardımcı olmaktadır. Araştırma sonuçları sınıf etkinlikleri için önemli uygulamalar geliştirmeye yardımcı olabilecek niteliktedir. İlgili literatür incelendiğinde; yapılan birçok araştırma da test uygulamalarının öğrenci performansı ve daha önce öğrenilen bilgileri hatırlama üzerinde önemli etkisi olduğunu göstermektedir. Dolayısıyla test uygulamaları, sınıf içi öğrenme uygulamalarını geliştirmek ve öğrenme öğretme süreçlerini desteklemek amacıyla kullanılmalıdır. İleriki araştırmalar için dönüt etkisinin daha ayrıntılı olarak araştırılması önerilebilir, örnek olarak dönüt test uygulamasının hemen arkasından verilmeyip, daha sonra verildiği araştırmalar planlanarak etkisi değerlendirilebilir.

Anahtar sözcükler: Test etkisi, dönüt, hatırlama, geri çağırma, fen eğitimi

An Explanatory Item Response Theory Approach for a Computer-Based Case Simulation Test

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Suggested Citation:

Abstract

Problem: Practitioners working with multiple-choice tests have long utilized Item Response Theory (IRT) models to evaluate the performance of test items for quality assurance. The use of similar applications for performance tests, however, is often encumbered due to the challenges encountered in working with complicated data sets in which local calibrations alone provide a poor model fit.

Purpose: The purpose of this study was to investigate whether the item calibration process for a performance test, computer-based case simulations (CCS), taken from the United States Medical Licensing Examination® (USMLE®) Step 3® examination may be improved through explanatory IRT models. It was hypothesized that explanatory IRT may help improve data modeling for performance assessment tests by allowing important predictors to be added to a conventional IRT model, which are limited to item predictors alone.

Methods: The responses of 767 examinees from a six-item CCS test were modeled using the Partial Credit Model (PCM) and four explanatory model extensions, each incorporating one predictor variable of interest. Predictor variables were the examinees' gender, the order in which examinees encountered an individual item (item sequence), the time it took each examinee to respond to each item (response time), and examinees' ability score on the multiple-choice part of the examination.

Results: Results demonstrate a superior model fit for the explanatory PCM with examinee ability score from the multiple-choice portion of Step 3. Explanatory IRT model extensions might prove useful in complex performance assessment test settings where item calibrations are often problematic due to short tests and small samples.

Recommendations: Findings of this study have great value in practice and implications for researchers working with small or complicated response data. Explanatory IRT methodology not only provides a way to improve data modeling for performance assessment tests but also enhances the

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inferences made by allowing important person predictors to be incorporated into a conventional IRT model.

Keywords: Explanatory Item Response Theory, Partial Credit Model, Item Response Theory, Performance Tests, Item calibration, Ability estimation, Small tests

Introduction

Over the past few decades, Item Response Theory (IRT) applications have become a vital part of the scoring processes in many large-scale test settings. IRT encompasses a family of nonlinear models that provide an estimate of the probability of a correct response on a test item as a function of the characteristics of the item (e.g., difficulty, discrimination) and the ability level of test takers on the trait being measured (e.g., Hambleton, Swaminathan & Rogers, 1991; McDonald, 1999; Skrondal & Rabe-Hesketh, 2004). IRT models are particularly appealing in that if the IRT model fits the data set, the resulting item and ability parameters can be assumed to be sample independent (item and ability parameter invariance property). Practitioners working with *multiple-choice tests* have long utilized IRT models to link observable examinee performance on test items to an overall unobservable ability, as wells as to evaluate performance of test items and test forms for quality assurance (See Hambleton & Van der Linden, 1982, for an overview).

Applications of IRT models to *performance tests*, however, have long been encumbered by the challenges encountered in modeling novel performance test data. Historically, one issue was that the IRT models were developed for dichotomous items (Spearman, 1904; Novick, 1966). This made them unsuited for performance tests that often had items with ordinal categorical scales (to allow scoring partially correct answers). However, extensions for polytomous items (Bock, 1972; Fitzpatrick, Link, Yen, Burket, Ito, & Sykes, 1996; Samejima, 1969) soon emerged and solved this particular issue. Another issue that remains to date is goodness of model fit. Although performance tests with novel item formats are believed to be more suited for measuring higher-level examinee abilities (Kane & Mitchell, 1996; Nitko, 1996), they are also typically very difficult to model (e.g., Masters, 1982; Yen, 1983). One reason is that performance tests are almost always drastically shorter than their multiple-choice counterparts. This makes it very challenging for many performance tests to satisfy the demand for large numbers of items for IRT models because it is often very expensive to develop and administer performance tests that are as lengthy as their multiple-choice counterparts. Another reason is the contextual effects introduced by the novelty of test. The influence of various person and test design variables is often amplified for performance tests, undermining the goodness of fit for the estimated IRT models. To this end, the current study investigates whether an alternative IRT modeling approach with added covariates from the generalized linear and non-linear mixed modeling framework (Embretson, 1998; De Boeck & Wilson, 2004; Wang, Wilson & Shih, 2006) can be used to help improve model estimation for a novel performance tests, namely, for computer-based case simulations (CCS).

Purpose

The current study was undertaken to investigate whether the item calibration process for the CCS examination could be improved using an explanatory IRT model. The CCS is a part of the United States Medical Licensing Examination® (USMLE®) Step 3 and was introduced in 1999, when the examination transitioned from paper-and-pencil administration to computer-based administration. This examination uses a small series of computer-based case simulations (CCS items) to expose examinees to interactive patient-care simulations; for each simulation they must initiate and manage patient care, while receiving patient status feedback and managing the simulated time in which the case unfolds (Margolis, Clauser, & Harik, 2004; Clauser, Harik, & Clyman, 2000).

The explanatory IRT model application presented in this paper explores the usefulness of four different predictor variables in improving the item calibration process of the CCS examination: examinees' gender, the order in which each individual CCS item was presented during the examination (item sequence), the time it took each examinee to respond to each item (response time), and examinees' ability score on the multiple-choice part of Step 3. Although only the latter covariate was hypothesized to be an important predictor of examinee performance on the CCS, as it is the only construct-relevant covariate, the importance of the other variables were also tested as potential predictors. The usefulness of item sequence and response time were explored, relying on the recent literature that suggests their usefulness as predictors of examinee performance (e.g., Ramineni, Harik, Margolis, Clauser, Swanson & Dillon, 2007; Lu & Sireci, 2007; Leary & Dorans, 1985; Yen, 1980). The importance of the gender variable was tested mainly to investigate whether CCS items were easier for one of the gender subgroups.

A series of alternative explanatory IRT models were estimated using the Partial Credit Model (PCM) and with one predictor variable at a time. This resulted in the following models: (1) a base model (no covariates), (2) an explanatory model with gender effect, (3) an explanatory model with item response time effects, (4) an explanatory model with item sequence effects, and (5) an explanatory model with examinees' scores on the multiple-choice part of the Step 3 examination (MCT score). Table 1 gives an overview of the estimated models. The PCM model with no covariates was used as a base model to evaluate the hypothesized improvement in model fit for each explanatory model with one added covariate. This "one covariate" at a time approach was to ensure that, if and when observed, any improvement in model fit is due to the added covariate alone.

Table 1.

Estimated Models and Covariates

Models	Covariates			
	Gender	Item response times	Item sequence	Step 3 MCQ Test Score
1. PCM				
2. PCM with gender	X			
3. PCM with response times		X		
4. PCM with item sequence			X	
5. PCM with MCT score				X

Method

Data

Study data included the responses of 767 examinees to a six-item CCS test, each of which was administered in random order under standard testing conditions with a maximum of 25 minutes of testing time per item. For this analysis, examinee responses were coded using a 3-point category scale from 0 to 2, with 2 representing maximum credit for a given CCS item.

Model Estimation

For dichotomous items, under the Rasch model (Rasch, 1960; Wright, 1997), the probability of a positive response (or a correct answer) to item *i* for person *j* with latent trait θ is

$$P\left(Y_{ji} = 1 \mid \theta_j, \beta_i\right) = \frac{\exp\left(\theta_j - \beta_i\right)}{1 + \exp\left(\theta_j - \beta_i\right)}$$

(1)

where β_i is the difficulty of item *i*. The probability of a person's answering an item correctly is, therefore, a function of the difference between the person's ability and the difficulty of the item. The person parameters are assumed to be independently and normally distributed with a mean of zero and a variance of σ^2. In other words, the person parameter is a random effect while the item parameter is a fixed effect.

The partial credit model (PCM, Masters, 1982) extends the Rasch model for binary responses to pairs of adjacent categories in a sequence of ordered responses. For an item on an m-point scale, there are m-1 step parameters to estimate. Step parameters, β_{im}, refer to the value of θ_j where the probabilities of responding in category m and m-1 are equal. For an item with a 3-point scale, the probabilities of responding to each of the categories are given by

$$P\left(Y_{ji} = 0 \mid \theta_j, \beta_{im}\right) = \frac{1}{1 + \exp\left(\theta_j - \beta_i\right) + \exp\left(2\theta_j - \beta_{i1} - \beta_{i2}\right)},$$

$$P\left(Y_{ji} = 1 \mid \theta_j, \beta_{im}\right) = \frac{\exp\left(\theta_j - \beta_{i1}\right)}{1 + \exp\left(\theta_j - \beta_i\right) + \exp\left(2\theta_j - \beta_{i1} - \beta_{i2}\right)},$$

$$(2)$$

$$P\left(Y_{ji} = 2 \mid \theta_j, \beta_{im}\right) = \frac{\exp\left(2\theta_j - \beta_{i1} - \beta_{i2}\right)}{1 + \exp\left(\theta_j - \beta_i\right) + \exp\left(2\theta_j - \beta_{i1} - \beta_{i2}\right)}.$$

Figure 1 plots category response functions for an illustrative CCS item with a 3-point scale with β_{i1}=-1 and β_{i1}=1. In the figure, it can be seen that the category response functions for categories 0 and 1 intersect at β_{i1} while the category response functions for categories 1 and 2 intersect at β_{i2}.
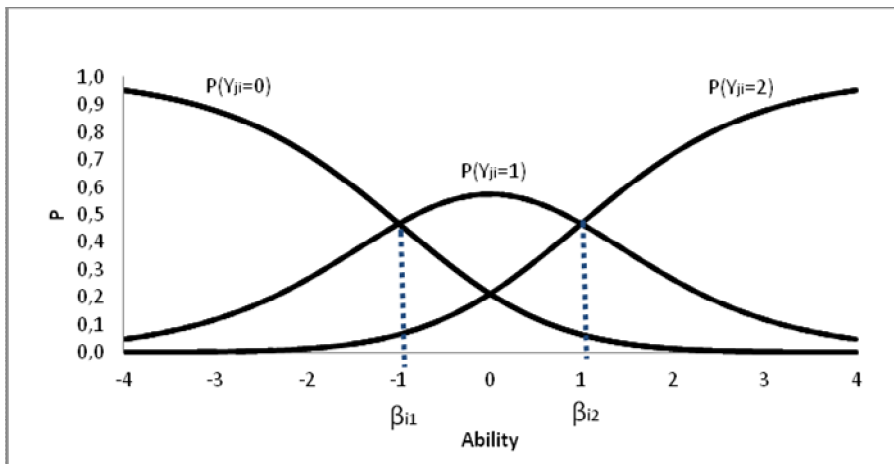
Figure 1. Category Response Functions for an illustrative CCS item with a three-point scale

The Partial Credit Model with random effects

The linear random effects PCM with a person covariate Z_{ji} is given by

$$P\left(Y_{ji} = 0 \mid Z_{jim}\theta_j, \beta_{im}\right) = \frac{1}{1 + \exp\left(Z_{ji1}\theta_j - \beta_i\right) + \exp\left(2Z_{ji2}\theta_j - \beta_{i1} - \beta_{i2}\right)}$$

$$P\left(Y_{ji} = 1 \mid Z_{jim}\theta_j, \beta_{im}\right) = \frac{\exp\left(Z_{jii1}\theta_j - \beta_{i1}\right)}{1 + \exp\left(Z_{ji1}\theta_j - \beta_i\right) + \exp\left(2Z_{ji2}\theta_j - \beta_{i1} - \beta_{i2}\right)},$$

(3)

$$P\left(Y_{ji} = 2 \mid Z_{jim}\theta_j, \beta_{im}\right) = \frac{\exp\left(2Z_{ji2}\theta_j - \beta_{i1} - \beta_{i2}\right)}{1 + \exp\left(Z_{ji1}\theta_j - \beta_i\right) + \exp\left(2Z_{ji2}\theta_j - \beta_{i1} - \beta_{i2}\right)}$$

The PCM and the explanatory PCMs were estimated using the PROC NLMIXED routine of the Statistical Analysis System (SAS version 9.1.3). For the analysis we used a quasi-Newton-Raphson optimization technique and a non-adaptive Gauss-Hermite approximation with 10 quadrature points for each dimension (the SAS code used in calculations is given at the end of this paper as an appendix). Goodness of model fit was evaluated using the -2 log likelihood, the *Akaike information criterion* (AIC) (Akaike, 1974) and the *Bayesian information criterion* (BIC; Schwarz, 1978), with lower values indicating better fit.

Results

The results summarized in Table 2 show that by adding the MCT score of examinees to the model as a random effect, the PCM model fit was improved, producing the lowest -2 log likelihood, AIC, and BIC. There was no improvement over the base PCM for the remaining explanatory models with gender, item sequence, or item response time as a covariate. Table 3 lists category threshold and variance parameter estimates produced by these models. As revealed by the observed improvement in the corresponding model fit statistics, MCT score was the only significant predictor (0.50) among the four considered. Item sequence, response times, and gender effects were all approximately zero (0.01, smaller than 0.001, and 0.04, respectively).

Table 2.

Model Fit Comparisons

Model	Number of Parameters	-2 Log Likelihood	AIC	BIC
PCM	13	8909	8935	8996
PCM with gender	14	8908	8936	9002
PCM with response times	14	8896	8924	8989
PCM with item sequence	14	8906	8934	8999
PCM with MCT score	14	8862	8889	8955

* Models with multiple predictors were not feasible for this data set since only the MCT score was useful as a predictor among the four considered.

Table 3.

Parameter Estimates

Parameter	Models				
	PCM	PCM with gender	PCM with response times	PCM with item sequence	PCM with MCT score
$b1_{cat1}$	-0.74	-0.72	-1.06	-0.66	-1.06
$b2_{cat1}$	-0.74	-0.72	-1.03	-0.66	-0.17
$b3_{cat1}$	-1.35	-1.33	-1.62	-1.28	-0.78
$b4_{cat1}$	-0.33	-0.31	-0.59	-0.25	0.24
$b5_{cat1}$	-0.47	-0.45	-0.78	-0.40	0.10
$b6_{cat1}$	-0.97	-0.95	-1.25	-0.90	-0.40
$b1_{cat2}$	-0.86	-0.84	-1.16	-0.79	-0.29
$b2_{cat2}$	-1.14	-1.12	-1.41	-1.07	-0.57
$b3_{cat2}$	0.31	0.32	0.05	0.37	0.87
$b4_{cat2}$	-0.61	-0.59	-0.85	-0.54	-0.04
$b5_{cat2}$	-0.71	-0.69	-1.00	-0.64	-0.14
$b6_{cat2}$	0.51	0.52	0.25	0.58	1.07
Effect of the predictor variable	-	0.04	0.00	0.01	0.50
σ^2	0.21	0.21	0.23	0.21	0.17

* Standard Error of the estimates ranged between 0.08 and 0.16.

Figure 2 and Figure 3 plot category response functions for the six CCS items using threshold parameters estimated by the base PCM and the best fitting explanatory PCM with MCT Score predictor, respectively. Comparing the graphical displays of probabilities computed for each response category given in Figure 1 with Figure 2 reveals that aiding the base PCM model with MCT score greatly improves the functional form of CCS items.

Discussion

Explanatory IRT models incorporating item or person covariates are increasingly used in many test settings to learn more about predictors of examinee performance (e.g., Fischer, 1983; De Boeck & Wilson, 2004; Embretson, 1984; Embretson, 1997) and to help improve item calibration and scoring procedures (e.g., Fox, 2005; Harting, Frey, Nold & Klieme, 2012; Zinderman, 1991). The premise of the current paper is that they may also be useful in the context of authentic performance assessment tests with small tests. This paper demonstrates that explanatory PCMs with meaningful

predictors might prove useful in calibrating complex performance tests similar to the USMLE CCS, which otherwise could not be calibrated.

For the CCS application presented in this paper, the meaningfulness of four individual predictor variables was tested: examinees' gender, the order in which each individual CCS was presented during the examination (item sequence), the time it took each examinee to respond to each case (response time) and examinees' ability score on the multiple-choice part of Step 3. While only the latter predictor variable was found to be of statistical and practical significance, the results nicely illustrate how an explanatory approach can be used to investigate the usefulness of individual predictor variables in model estimation. Although it was not feasible for the present application, as only one of the covariates was found to be of statistical importance, it is recommended that researchers explore multivariate model extensions to further assess if a more complex model with multiple predictors may further improve model fit.

The findings of this study have great value for researchers and practitioners working with small performance tests and complex response data in which local calibrations alone provide a poor model fit. Explanatory model extensions of PCM not only provide a way to improve data modeling for short performance assessment tests but also open other possibilities by allowing various person predictors to be added to conventional item response models, which are limited to item predictors alone. Future research should investigate the influence of other item and person predictors on CCS performance to determine if any can lead to a stronger model fit, more stable parameter estimates, or a more precise measure of CCS proficiency. One predictor of future interest, for example, could be the examinees' postgraduate medical training (Dillon, Henzel & Walsh, 1997; Feinberg, 2012). Examinees who are exposed to a broad range of training during their residency or clinical experience might perform better on the MC items of Step 3 as compared to examinees who have a narrow training focus (Sawhill, Dillon, Ripkey, Hawkins, & Swanson, 2003).
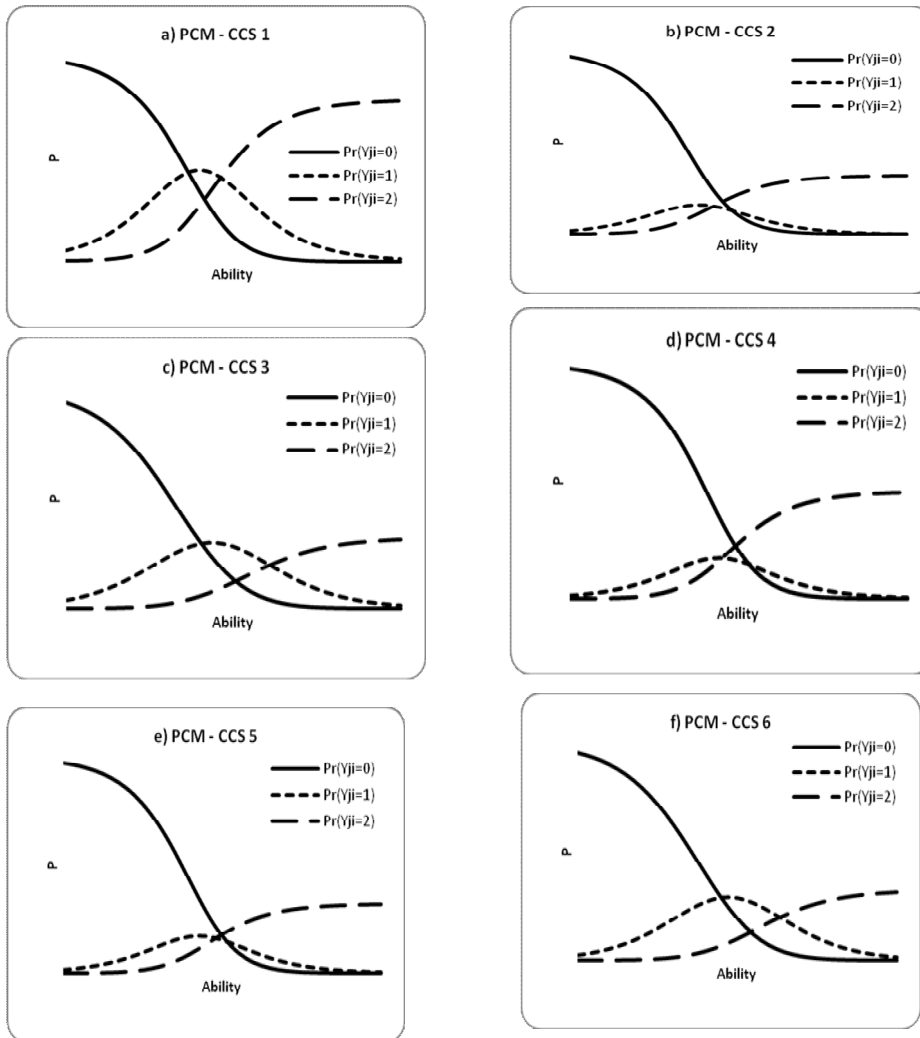
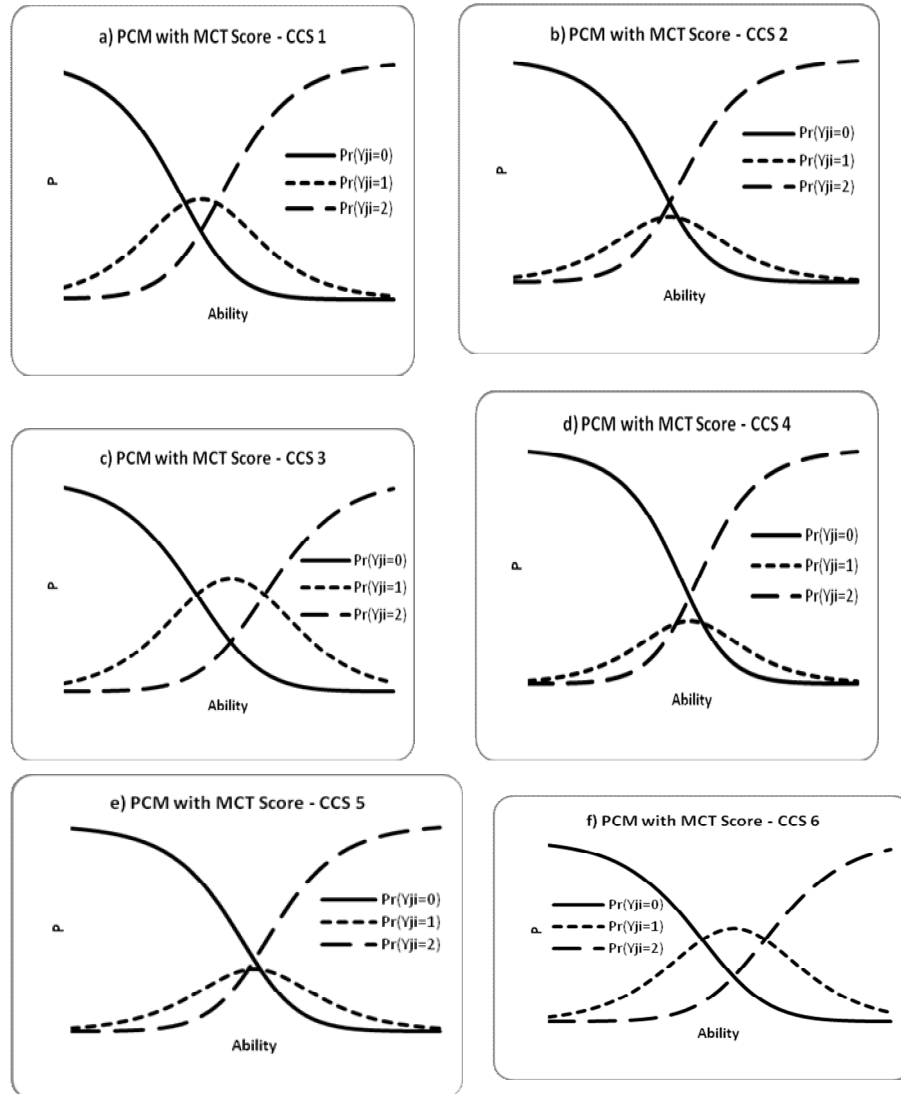*Figure 2.* Item Characteristics Curves for the six CCS items estimated by the base PCM

Figure 3. Item Characteristics Curves for the six CCS items estimated by the explanatory PCM with MCT Scores

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Açıklayıcı Madde Tepki Kuramının İnteraktif Bir Bilgisayar Simülasyon Testine Uygulanması

Atıf:

Özet

Problem: Test geliştirme ve geliştirilen testlerin güvenirlik ve geçerliğini araştırmada sıkça kullanılan Madde Tepki Modelleri çoktan seçmeli testlerde uzun zamandır madde ve test kalitesini kontrol amacıyla kullanılmaktadır. Bu modellerin aynı amaçla uygulamalı testlerde kullanımı ise birçok zorluk ile karşılaşmıştır. Bu zorluklardan ilki ilk geliştirilen Madde Tepki Modellerinin sadece ikili puanlanan test maddeleri için uygun olmasıydı. Oysa uygulamalı test maddeleri çoğunlukla kısmı puanlama gerektirecek şekilde geliştirilir. Kısmi puanlamaya uygun Madde Tepki Modellerinin geliştirilmesiyle bu sorun kısa zaman içerisinde çözümlendi. Bir diğer zorluk ki hala güncelliğini korumaktadır, uygulamalı test verilerinin Madde Tepki Modelleri ile modellenmeye daha az uygun oluşlarıdır. Bir başka deyişle, uygulamalı testlerde kullanıldığında Madde Tepki Modelleri uygulamaları güvenirliği çok iyi olmayan madde ve kişi istatistikleri ile sonuçlanabilmektedir. Bunun iki önemli nedeni uygulamalı testlerin çoktan seçmeli testlere göre daha kısa oluşları ve de uygulamalı test sorularının ölçülmesi istenen becerilerle direk olarak ilgili olmayan birçok faktörlerin etkisine çoktan seçmeli sorulardan daha açık oluşlarıdır. Uygulama testleri ile çalışan psikometristler de diğer testlerle çalışan meslektaşları gibi Madde Tepki Modellerinin sağlayacağı örneklem bağımlılığı oldukça düşük olan madde ve kişi istatistiklerine ihtiyaç duymakta ve yukarıda sayılan zorlukları aşabilecek yeni modellerin geliştirilmesini beklemektedir.

Amaç: İkincil değişkenleri model hesaplamalarına yordayıcı olarak dahil etmeye izin veren Açıklayıcı Madde Tepki Modelleri birçok farklı ortamda uygulanan bir çok testin madde ve kişi istatistiklerinin kalitesinin arttırılmasında kullanılmaktadır. Ancak bu modellerin uygulamalı testlerde kullanıldıklarında sıkça karşılaşılan düşük model uygunluğu ve düşük güvenirlik problemlerini çözmede kullanılması ile ilgili bir çalışma henüz yapılmamıştır. Bu çalışmanın amacı Madde Tepki Modelleri kullanıldığında veriye uygunluk indeksleri düşük çıkan altı adet interaktif

uygulamalı madde içeren bir uygulama testi için Açıklayıcı Madde Tepki Modellerinin iyi bir alternatif olup olmadığını değerlendirmekti.

Yöntem: Bu çalışmanın örneklemi araştırmaya konu olan uygulamalı CCS (Computer Case Simulations) testini alan 767 kişinin altı uygulama sorusuna verdiği cevaplardan oluşmaktadır. CCS Amerika'da çalışma lisansı almaya hak kazanabilmek için hekim adaylarının aldıkları üç aşamalı bir testin, üçüncü ve son aşamasında verilen bir uygulama testidir. Hekim adayları bu son aşamada çoktan seçmeli bir testin yanı sıra bu uygulama testini de alırlar. Sınav sırasında, her bir CCS uygulaması için hekim adaylarına bilgisayar ortamında bir hasta profili verilir. Hekim adayları uygun olduklarını düşündükleri teşhis ve takipleri interaktif bir ortamda yapabilmektedir. Her bir CCS için hekim adayları maksimum 25 dakika harcayabilir. Bu çalışmada örneklemdeki kişiler her uygulama sorusundaki performansları için yanlış uygulamaya 0, kısmi doğru uygulamaya 1 ve doğru uygulamaya 2 puanla puanlanmıştır.

Kısmi puanlama kullanıldığı için, Kısmi Puanlama Madde Tepki Modelleri (Partial Credit Modeling) ile hesaplanan beş ayrı model kullanılmıştır. İlk model hiçbir yordayıcı değişken olmadan, yani geleneksel kısmi puanlama Madde Tepki Modelleri ile hesaplanmıştır. İkinci model uygulama sorusunun sırası, üçüncü model uygulama sorusuna ne kadar zaman harcandığı, dördüncü model hekim adayının cinsiyeti ve beşinci model hekim adayının son aşama sınavının çoktan seçmeli sorulardan oluşan kısmından aldığı puanı yordayıcı olarak kullanarak hesaplanmıştır. Her yordayıcının faydalılığını test etmek için her bir Açıklayıcı Madde Tepki Modeli için hesaplanan veriye uygunluk indeksleri geleneksel Madde Tepki Modeli için hesaplanan indeksleri ile karşılaştırılmıştır.

Bulgular: Model uygunluk indeksleri çoktan seçmeli bölümden alınan test puanının iyi bir yordayıcı olduğunu göstermektedir. Uygulama sorusunun hangi sırayla cevaplandığı, uygulama sorusuna harcanan toplam zaman ve hekim adayının cinsiyeti yordayıcı olarak faydalı bulunmamıştır. Karşılaştırıldığında Madde Tepki Modeli ve çoktan seçmeli test puanı ile hesaplanan Açıklayıcı Madde Tepki Modelli ile hesaplanan madde eşik değerlerini kullanarak elde edilen figürler açıkça göstermektedir ki iyi bir yordayıcı ile kurulan bir Açıklayıcı Madde Tepki Modeli madde istatistikleri ile kişilerin beceri düzeyleri arasındaki fonksiyonel ilişkiyi iyi yönde değiştirebilecektir.

Öneriler: Uzmanlar kişilerin bilgi ve becerilerini ortaya koyabilecekleri uygulama sınavlarının, çoktan seçmeli sınavlara birçok bakımdan üstün olduğunu düşünürler. Ancak uygulama sınavları ile elde edilen test puanlarının güvenirliği çoktan seçmeli sınavlarla karşılaştırıldığında genellikle düşüktür. Test güvenirliğini arttırmanın en olağan yolu olan madde sayısını arttırma uygulama sınavları için çok kolay olmamaktadır. Uygulama sorularını geliştirmek, uygulamak ve puanlamak oldukça emek yoğun ve pahalı olabilmektedir. Test maddeleri artırılamıyorsa, bir alternatif uygulama elde bulunan ek verilerin yapılan model tahminlerinde kullanılması olabilir. Bu çalışma böylesi bir yaklaşımla yapılmıştır.

Bulgular göstermektedir ki geleneksel Madde Tepki Modeli uygulandığında kabul edilebilir veriye uygunluk indeksleri ve güvenilir madde istatistikleri elde etmede güçlük çeken uygulama testleri Açıklayıcı Madde Tepki Modellerinin uygulamalarından yararlanabilir. Bu araştırmaya konu olan CCS uygulama testi için alınan sonuçlar göstermektedir ki ikincil değişkenlerin sağlayacağı ek bilgi, bu bilgi olmadan elde edilecek tahminleri iyi yönde değiştirecektir. Elbette Açıklayıcı Madde Tepki Model'inin başarılı olması için ikincil verilerin elde bulunması ve modele eklenmesi başlı başına yeterli olmayacaktır. Bu ikincil değişkenlerin katkısının ne olacağı bu araştırmada da kullanılan aşamalı bir yaklaşım ile ayrı ayrı değerlendirilmelidir. Açıklayıcı Madde Tepki Model uygulamaları kullanıcılara farklı model geliştirme imkanı da sunmaktadır. Örneğin, araştırmacılar, eldeki veriler uygun olduğunda, birden fazla ikincil değişkenin de dahil edilebileceği alternatif modeller ile interaksiyon ihtimallerini de kolayca çalışabilirler.

Anahtar Sözcükler: Kısmı Puan Modeli, Madde Tepki Modeli, uygulama testleri, madde istatistikleri, başarı tahmini

APPENDIX A. SAS SYNTAX

```
/* Read in*/
data CCS;
infile "H:\CCS\DATA\SASdataIN.dat";
INPUT per index y3 I1 I2 I3 I4 I5 I6 niseq time MC male;
RUN;


/* Estimate*/
/* Model 1 - PCM no covariates, CCS data - PCM three categories 0-2, */
PROC NLMIXED data=CCS method=gauss technique=quanew noad qpoints=10;
PARMS  b1_1-b1_6=0 b2_1-b2_6=0 sd=0.5;
beta1=b1_1*I1+b1_2*I2+b1_3*I3+b1_4*I4+b1_5*I5+b1_6*I6;
beta2=b2_1*I1+b2_2*I2+b2_3*I3+b2_4*I4+b2_5*I5+b2_6*I6;
        exp1=exp(theta-beta1);
        exp2=exp(2*theta-beta1-beta2);
denom=1+exp1+exp2;
if (y3=0) then p=1/denom;
else if (y3=1) then p=exp1/denom;
else if (y3=2) then p=exp2/denom;
if (p>1e-8) then ll=log(p);
else ll=-1e100;
Model y3~general(ll);
```

```
RANDOM theta~normal(0,sd**2)subject=per;
ESTIMATE 'sd**2' sd**2;
RUN;


/* Model 2 - PCM with item sequence covariate, CCS data - PCM three categories: 0-2 */
PROC NLMIXED data=CCS method=gauss technique=quanew noad qpoints=10;
PARMS  b1_1-b1_6=0 b2_1-b2_6=0 ts=0 sd=0.5;
          theta=eps+ts*niseq;
beta1=b1_1*I1+b1_2*I2+b1_3*I3+b1_4*I4+b1_5*I5+b1_6*I6;
beta2=b2_1*I1+b2_2*I2+b2_3*I3+b2_4*I4+b2_5*I5+b2_6*I6;
        exp1=exp(theta-beta1);
        exp2=exp(2*theta-beta1-beta2);
        denom=1+exp1+exp2;
if (y3=0) then p=1/denom;
else if (y3=1) then p=exp1/denom;
else if (y3=2) then p=exp2/denom;
if (p>1e-8) then ll=log(p);
else ll=-1e100;
Model y3~general(ll);
RANDOM eps~normal(0,sd**2)subject=per;
ESTIMATE 'sd**2' sd**2;
RUN;


/* Model 3 - PCM with response time covariate, CCS data - PCM three categories: 0-2 */
PROC NLMIXED data=CCS method=gauss technique=quanew noad qpoints=10;
PARMS  b1_1-b1_6=0 b2_1-b2_6=0 ti=0 sd=0.5;
          theta=eps+ti*time;
beta1=b1_1*I1+b1_2*I2+b1_3*I3+b1_4*I4+b1_5*I5+b1_6*I6;
beta2=b2_1*I1+b2_2*I2+b2_3*I3+b2_4*I4+b2_5*I5+b2_6*I6;
        exp1=exp(theta-beta1);
        exp2=exp(2*theta-beta1-beta2);
        denom=1+exp1+exp2;
if (y3=0) then p=1/denom;
else if (y3=1) then p=exp1/denom;
else if (y3=2) then p=exp2/denom;
```

```
if (p>1e-8) then ll=log(p);
else ll=-1e100;
Model y3~general(ll);
RANDOM eps~normal(0,sd**2)subject=per;
ESTIMATE 'sd**2' sd**2;
RUN;


/* Model 4 - PCM with gender covariate: male coded as 1, CCS data, PCM three
categories: 0-2*/
PROC NLMIXED data=CCS method=gauss technique=quanew noad qpoints=10;
PARMS  b1_1-b1_6=0 b2_1-b2_6=0 g=0 sd=0.5;
            theta=eps+g*male;
beta1=b1_1*I1+b1_2*I2+b1_3*I3+b1_4*I4+b1_5*I5+b1_6*I6;
beta2=b2_1*I1+b2_2*I2+b2_3*I3+b2_4*I4+b2_5*I5+b2_6*I6;
        exp1=exp(theta-beta1);
        exp2=exp(2*theta-beta1-beta2);
        denom=1+exp1+exp2;
if (y3=0) then p=1/denom;
else if (y3=1) then p=exp1/denom;
else if (y3=2) then p=exp2/denom;
if (p>1e-8) then ll=log(p);
else ll=-1e100;
Model y3~general(ll);
RANDOM eps~normal(0,sd**2)subject=per;
ESTIMATE 'sd**2' sd**2;
RUN;


/* Model 5 - PCM with MCT Scores as a person covariate, CCS data - PCM three
categories: 0-2, */
PROC NLMIXED data=CCS method=gauss technique=quanew noad qpoints=10;
PARMS  b1_1-b1_6=0 b2_1-b2_6=0 t=0 sd=0.5;
            theta=eps+t*MC;
beta1=b1_1*I1+b1_2*I2+b1_3*I3+b1_4*I4+b1_5*I5+b1_6*I6;
beta2=b2_1*I1+b2_2*I2+b2_3*I3+b2_4*I4+b2_5*I5+b2_6*I6;
        exp1=exp(theta-beta1);
        exp2=exp(2*theta-beta1-beta2);
```

```
        denom=1+exp1+exp2;
if (y3=0) then p=1/denom;
else if (y3=1) then p=exp1/denom;
else if (y3=2) then p=exp2/denom;
if (p>1e-8) then ll=log(p);
else ll=-1e100;
Model y3~general(ll);
RANDOM eps~normal(0,sd**2)subject=per;
ESTIMATE 'sd**2' sd**2;
RUN;
```

Problematic Internet Use and Body Mass Index in University Students

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Abstract

Problem Statement: Today, immobility and resulting weight gain constitutes one of the greatest problems among young people. The greatest problem for individuals spending a lot of time on the Internet is immobility. The result of this status is spending less energy than the amount required daily. Immobility is considered a cause of being overweight, and being overweight creates a vicious cycle by leading to further lack of mobility.

Purpose of Study: The purpose of this research is to investigate the relationship between the level of problematic Internet use (PIU) among Turkish university students and their body mass indexes (BMI).

Methods: The study sample consists of 525 university students studying at different departments (Elementary, Fine Arts and Turkish Language Education) at Fatih Faculty of Education at Karadeniz Technical University during the 2010-2011 academic year. Participants were selected through stratified sampling. Accordingly, in this study the departments were determined randomly from Faculty of Education. Distribution of the sample by gender was 234 males (44.6%) and 291 females (55.4%). The mean age of the students was 21.8 (SD=0.72). Racial distribution of participants was homogenous. Questionnaires were administered to students in groups, in a class environment, by the author. Participation was voluntary. In total, six hundred students participated in this study. Seventy five of them had to be excluded for not responding properly to all questionnaires, so the final sample consisted of 525 participants.

Findings and Results: The results indicate a significant relationship between BMI and PIU. A significant difference was determined between the students' BMIs (moderate or severe weakness, normal, weight, semi-obese and obese) and their PIU levels. Levels of PIU in those with obesity-level BMIs were found to be higher than the other groups.

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Conclusions and Recommendations: These results reveal that the use of communication technologies such as the Internet has a number of negative consequences for university students. In respect to the duration of students' daily Internet use, students may benefit from having to plan how and when they will use the Internet, in order to limit how frequently they use the Internet and to use it effectively.

Keywords: Problematic internet use, body mass index, university students

Along with rapid development of technology, use of computers and the Internet has become the indispensable requirement of human lives. The rate of access in places such as homes, offices, schools, Internet cafes etc., is growing particularly rapidly, and many studies (Anderson, 2001; Grohol, 1999; Kandell, 1998; Whang, Lee & Chang 2003) confirm that, today, a great majority of students has the opportunity to access computers and the Internet easily. Although the main functions of the Internet include assisting with communication in the developing world and increasing research opportunities by facilitating information sharing, the Internet's faster-than-expected spread throughout the world has also brought along several problems. While some individuals limit the use of the Internet to their needs only, some have suffered problems due to the excessive use of it in their business, school or social lives since they were incapable of such limitation. We observe studies showing that these problems have reached a clinical scale (Chin-Chung & Sunny 2003; Davis, 2001; Niemz, Griffiths & Banyard 2005; Young, 1996a; Young, 1996b; Young & Rodgers, 1998). Following the cases reported by clinicians, discussions began as to whether the Internet led to addiction or if excessive use of Internet was a behavioral indicator of existing psychological problems and exhibited itself through use of the Internet (Keser-Ozcan & Buzlu 2005; King & Barak 1999).

Along with beginning to define the behavioral pattern that caused problems for individuals as "pathologic" or "problematic", since they are damaging, various definitions were created for excessive use of the Internet. In the studies conducted, many concepts such as "Internet addiction", "Internet dependence", "pathologic use of Internet", "Internet behavioral addiction" and "cyber addiction" were used. Young (1996a) preferred the term "Internet addiction", and compared it with drug and alcohol addiction, since it caused academic, social and professional damage. In the later studies, Young defined problematic Internet use based on the criteria for "pathologic gambling" as contained in DSM-IV (Young, 1996b; Young & Rodgers 1998). Kandell (1998) defined Internet addiction as a psychological addiction and particularly considered the young a risky group for this addiction, emphasizing that it may lead to problems regarding health, relationships and time management. While many researchers (Young, 1996a; Young, 1996b; Young & Rodgers, 1998) consider the time spent by individuals on Internet an important criterion in the diagnosis of Internet addiction, pathologic or problematic Internet use, the time spent by individuals on the Internet alone is not sufficient for diagnosis of problematic Internet use; compulsive use of the Internet where excessive use leads to negative consequences is considered an important criterion (Caplan, 2005; Davis, 2001; Young

& Rodgers, 1998). Compulsive use of the Internet means that the individual cannot achieve the desired control over his/her use of Internet, and failure to achieve this control results in major trouble in his/her real life (Padwa & Cunningham, 2010).

The Internet is used for different purposes, and more widely by university students in particular. Fast and easy access to the Internet at universities, responsibility for homework and contacts in courses, following the course statuses, and the need to conduct research ensure that even university students who didn't use the Internet become Internet users. The social and academic difficulties, and, particularly, the health problems suffered by an individual as a result of problematic Internet use exhibiting itself during the university period may lay the groundwork for suffering, loneliness and social isolation, and may lead to difficulties in business and family life in later years (Young, 2004; Young, Yue & Ying, 2011).

A great majority of university students use the Internet for academic and social reasons at least once a week: doing homework, conducting research, and communicating with family and friends (Niemz et al., 2005). While the Internet and computer games are considered technological miracles that support the young in accessing information, conducting research, and developing skills such as problem solving, creativity and critical thinking (Kubey, Lavin & Barrows, 2001; Wright, 2001), they also cause anxiety and fear with excessive, uncontrolled, misuse and unconscious use, and are thought to affect development of personal skills negatively (Mathy & Cooper 2003; Scherer, 1997; Young, 2000).

In addition to this, computer and Internet use have negative physical effects on individuals, which have been revealed in the results of many studies (Attewell, Suazo-Garcia & Battle, 2003; Mendoza, Zimmerman & Christakis, 2007). One of these negative effects is the health problem called excessive weight gain or obesity. All people need to take adequate and balanced nourishment to be developed, healthy and productive physically, spiritually and socially (Stunkard, Sorenson & Haris, 1986). Obesity, the most serious health problem caused by unbalanced nutrition, is a pathological condition characterized by storage of more fat than is needed for optimal body function (Seidell, 1995). Studies reported that obesity has increased throughout the world as an epidemic. Researchers focused on the role of physical activity and exercise in prevention of obesity and other health associated problems (Chakraborty, Bose, Khongsdier & Bisai 2009; Prentice, 1997; Vandewater, Shim & Caplovitz, 2004). Obesity occurs when the ratio of height to weight exceeds the optimal level due to the excessive increase in the ratio of the fatty mass of the body to the muscle mass (Deurenberg, Deurenberg-Yap & Guricci 2002). The World Health Organization (WHO) uses the Body Mass Index (BMI) defined by Garrow to identify obesity (Garrow & Webster, 1985). BMI is the ratio of weight in kilograms to the square of height in meters. BMI is a good indirect indicator of weight problems. The measure has been proven to show the amount of fat in the body with accuracy higher than 90%. It is a useful index, since it is relatively independent of height. Because of this, it is used for comparison of individuals of different height. (Flier & Folder, 1998).

The primary reason for the increase in the incidence of obesity within the last 10 to 20 years seems to be the transition from a lifestyle based on physical strength to a lifestyle based on inactivity, industrialization, and consumption of calorie-intensive food (World Health Organization, 2011). Many studies have revealed significant a relationship between weight gain and immobility (Buchowski & Sun, 1996; Dennison, Erb, & Jenkins, 2002; Mendoza, et al., 2007; Shannon, Peacock & Brown 1991). Immobility is one of the greatest problems for individuals spending a lot of time on the Internet (Attewell, et al., 2003; Fotheringham, Wonnacott & Owen, 2000; Matusitz & McGormick, 2012). Inactivity results in less energy being expended than required for good health. Immobility is considered a cause of being overweight, and being overweight creates a vicious cycle by leading to further lack of mobility (Fitzgerald, Kriska, Pereira & Courten, 2001).

Due to these reasons, the belief that PIU may have a negative effect on the physical health of the individual has emerged. Research has demonstrated the accuracy of this belief (Robinson & Killen 1995; Wake, Hesketh & Waters 2003). Particularly, studies on children and adolescents reveal that the pathologic use of the Internet at an addiction scale affects the health negatively (Jackson, Eye, Fitzgerald, Witt & Zhao 2011; Kim, Lau, Cheuk, Kan, Hui & Griffiths, 2010). Consequently, it is suggested that this problem may be prevalent among the university students, especially when university students' wider access (Young, 2004; Young, et al., 2011) to the Internet is taken into account.

On the basis of conclusions drawn from the related literature, PIU among university students is thought to have a negative effect on their BMI. This study aims to determine what kind of relationship exists between university students' level of PIU and their BMI. The following hypotheses will be tested within the aim of the study;

a. There is a significant relationship between problematic Internet use (PIU) and body mass index (BMI) in university students.

b. Problematic Internet use (PIU) in university students varies according to their body mass index (BMI).

Methods

Participants and Procedure

The study sample consists of 525 university students studying at different departments (Elementary, Fine Arts and Turkish Language Education) of Fatih Faculty of Education at Karadeniz Technical University during the 2010-2011 academic year. Participants were selected through stratified sampling. This sampling method is used for examining sub-populations of a sample, of which limits were determined (Şahin, 2009). Accordingly, in this study the departments from Faculty of Education were chosen randomly. Distribution of the sample by gender was 234 males (44.6%) and 291 females (55.4%). The mean age of the students was 21.8 (SD=0.72). 294 (56%) of participants had their own computers while 231 (44%) did

not. Racial distribution of participants was homogenous. Questionnaires were administered to students in groups, in a class environment, by the author. Before administration of the questionnaires, students were given the requisite information about the aim of the research and how the measurement scales should be answered. Required permissions were obtained. Participation was voluntary. In total, 600 students participated in this study. Seventy five of them had to be excluded for not responding properly to all questionnaires, so the final sample consisted of 525 participants.

Table 1.

Distribution of Students in Terms of Departments

	N	*%*
Elementary School Education	245	46.6
Fine Arts Education	154	29.4
Turkish Language Education	126	24
Total	525	100

Data Collection Tools

Demografic list: First, the information comprising the demographic characteristics (gender, department, height and weight values) of the students participating in the study was collected from a demographic list.

Online cognition scale (OCS)*: This scale was used to measure the level of problematic use among the participants. The original scale, drawn up by Keser-Özcan and Buzlu (2005) to study validity and reliability in university-student sampling with the aim of determining problematic Internet use, was developed by Davis, Flett, and Beser (2002). The OCS consists of 36 statements (e.g., "the Internet represents an important part of my life"; "I feel helpless when not online"; "I can escape my worries when I am online") to which responses are given on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). During testing of the scale's test-repeat test reliability, .90 was significant for Pearson product-moment correlation co-efficient total scale scores, .87 for social support sub-group scores, .76 for loneliness/depression sub-group scores, .89 for reduced impulse control sub-group scores and .85 for distraction sub-groups cores at a level of $p<0.001$. In this study, to determine problematic Internet use, a loneliness/depression sub-scale was used. OCS has an internal consistency coefficient of .91 and items' total reliability

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coefficients range between .17 and .66. High scores taken from this scale indicate that problematic Internet use level is rising.

Body mass index (BMI): The height and weight values were initially taken to calculate the BMI of the participants. The BMI was calculated (BMI= weight (lb)/height² (ft) **(**Frankenfield, Rowe, Cooney, Smith & Becker 2001).

Analysis

The SPSS software (Statistical Package for the Social Sciences, version 15.0, SPSS Inc., Chicago, USA) was used for data analysis. Firstly, mean and standard deviation values were calculated for variables with statistical techniques (Table 2). It is determined that the data were distributed normally by using Kolmogorov Smirnov test. Statistical analysis was performed using the Pearson product-moment correlation co-efficient, one-way analysis of variance and LSD tests.

Results

In this section, the findings and results relating to PIU, BMI and demographic variables are presented.

Descriptive Statistics

Table 2.

Descriptive Statistics for Body Mass Index, Body Weight, Height, Problematic Use of Internet.

	M	*SD*	*N*	Minimum	Maximum
PIU	10.83	6.18	525	6.00	38.00
BMI	21.61	2.93	525	15.02	33.33
BW	60.60	11.24	525	43.00	103.00
Height	167.78	8.03	525	150.00	190.00

Note: PIU = Problematic Internet Use. *SD*= Standard Deviation. BMI = Body mass index. BW = Body weight. BMI = weight (lb)/ height (ft)².

Descriptive statistics for the three body size measures – body weight (lb), height (ft) and the BMI (computed as follows: BMI = weight (lb)/height² (ft)) are presented in Table 2.

Correlation Between Problematic Internet Use (PIU) By University Students And Body Mass Index (BMI).

Table 3.
Correlations Between Variables

	1	2
1.PIU	1	.39(**)
2.BMI		1
SD	0.59	6.02
M	2.08	10.72

Note: ** Correlation is significant at the 0.01 level. PIU = Problematic Internet Use. *SD*= Standard Deviation. BMI = Body mass index. BMI coded as moderate and severe weakness=1 (BMI: 0- 18.4); normal= 2 (BMI= 18.5- 24.9); semi-obese= 3 (BMI= 25- 29.9); obese= 4 (BMI=30 and higher) .

The correlation between PIU and BMI among university students was tested using Pearson product-moment correlation co-efficient, and the results are shown in Table 3. Pearson correlation analysis results reveal significant and positive relationship between PIU and BMI (r= 0.39, p< 0.01). This result validates hypothesis a.

Variability of PIU In Terms of BMI

Table 4.
Problematic Internet Use and Body Mass Index

	Factor	*Ss*	*df*	*MS*	F
PUI and BMI	Between groups	299.69	2	149.84	3.91*
	Within group	10721.72	523	38.29	
	Total	11021.42	525		

Note: * p value is significant at the 0.05 level. PIU = Problematic Internet Use. BMI = Body mass index. BMI coded as moderate and severe weakness=1 (BMI= 0- 18.4); normal= 2 (BMI= 18.5- 24.9); semi-obese= 3 (BMI= 25- 29.9); obese= 4 (BMI=30 and higher) . Ss= Sum of squares, df=degree of freedom, MS= Mean of squares

Table 5.
LSD Test Results for Multiple Comparisons

(I) BMI	(J) BMI	Mean Difference (I-J)	*SE*
0- 18,4	18,5-24,9	-,32	,87
	25-29,9	-4,36(*)	1,08
	30 and higher	-20,69(*)	1,81
18,5-24,9	0- 18,4	,32	,87
	25-29,9	-4,04(*)	,78
	30 and higher	-20,37(*)	1,65
25-29,9	0- 18,4	4,36(*)	1,08
	18,5-24,9	4,04(*)	,78
	30 and higher	-16,32(*)	1,77
30 and higher	0- 18,4	20,69(*)	1,81
	18,5-24,9	20,37(*)	1,65
	25-29,9	16,32(*)	1,77

Note: * p value is significant at the 0.05 level. BMI coded as moderate and severe weakness=1 (BMI= 0- 18.4); normal= 2 (BMI= 18.5- 24.9); semi-obese= 3 (BMI= 25- 29.9); obese= 4 (BMI=30 and higher) .

One-way analysis of variance was used to determine whether PIU varied in terms of BMI. One-way analysis of variance indicates significant differences between groups (F= 3.91, p<0.05) (Table 4 and 5). Post-hoc analysis (the LSD test) was used to determine those groups between which there was a difference. The LSD test results reveal that levels of PIU among university students whose BMI scores are 30 and over were determined as meaningfully higher than university students whose BMIs are between 0- 18,4; 18,5-24,9 and 25-29,9. Moreover, PIU levels of the university students with a BMI of 25 to 29.9 were found to be significantly higher than those with a BMI of 0 to 18.4 and those with a BMI of 18.5 to 24.9. These results validates hypothesis b.

Discussion and Conclusions

With the results of this study, it was concluded that there was a positive relationship between the levels of students' PUI and BMI, and there also were significant differences between the BMI groups (being obese, semi-obese, normal, medium-weight or weak) in terms of PIU. Therefore, the results proved hypotheses (a) there is a significant relationship between the levels of PIU by students and BMI; (b) Problematic Internet use (PIU) in university students varies according to their body mass indexes.

In recent years, an increase in time spent on the Internet led to the investigation of the effects on people of the Internet and communication media carrying on its development (Young, 1996a; Young, 1996b; Young & Rodgers, 1998; Goldberg, 1999). The studies conducted were concentrated mainly on the negative effects of the Internet. One of these effects is the problem caused by excessive Internet use in physical terms. These studies usually were conducted among children and adolescents (Attewell et al., 2003; Marshall, Biddle, Gorely, Cameron & Murdey 2004; Mendoza et al., 2007; Vandewater et al., 2004; Yen et al., 2010). The common conclusion of these studies is that when children and adolescents spend more than the normal amount of time with computers, Internet and video games, it has a negative effect on their physical health. People tend to stay immobile while using such technologies, resulting in the expenditure of less energy in a day than the amount required to stay healthy. So, the individuals tend to gain excessive weight (Durant, Baranowski, Johnson & Thompson 1994). Other studies also point out a relationship between the use of technology and BMI, or body weight, and are available in the literature (Buchowski & Sun, 1996; Dennison et al., 2002; Kautiainen, Koivusilta, Lintonen, Virtanen & Rimpelä, 2005; Mendoza et al., 2007). These studies have revealed that misuse of technology had a direct effect on the health of the individuals studied.

If the matter is considered in terms of Turkey, according to the data of Turkish Statistics Institute (TSI) 2010, computer and the Internet use continue to increase in the country. Computer and Internet usage rates in people ages 16 and 74 was 53.4% and 51.8% , for the males, 33.2% and 31.7%, respectively for the females. During the period between January and March 2010, 60.8% of those surveyed used a computer, and 59.3 of the respondents used the Internet. The increase in the Internet user

population, particularly in Turkey, took place by means of Internet cafes. Even those who had not used a computer or the Internet before met the virtual world thanks to the cafes, which ensure making use of the technology may lead to social deviation of the young (Gurol & Sevindik 2006). These data reveal that the tendency to PIU increases along with increase of the Internet usage rate. Individuals showing indications of PIU are usually seen alone, and live in social isolation. As a result of their evaluation using Scheduled Interview for DSM Disorders (SCID) in the study conducted by Shapira, Goldsmith, Keck, Khosla, and McElroy (2000) were diagnosed with "Impulse Control Disorder Not Otherwise Specified". The individuals in that study did not seem disturbed by the idea, impulse or desire to use the Internet, but did have difficulty resisting excessive Internet use.

The university students may exhibit the behavior of excessive Internet use to cope with various factors involving developmental problems, or their inability to establish close relationships with peers of the opposite sex may result in Internet addiction. The social and academic difficulties that may be suffered by the individual as a result of PUI, which exhibits itself in the university study period, may constitute grounds for suffering, loneliness and social isolation, and may result in difficulties in business and family life in later years. This seems to be significant from the aspect of immobility and weight gain. Several studies addressing the relationship between the duration of Internet use by individuals and PUI have been conducted (Keser- Ozcan & Buzlu, 2005; Morahan-Martin 1992; Odaci & Kalkan, 2010). The common conclusion of these studies is that Internet use poses a problem for the individuals after a certain point.

These results reveal that use of communication technologies such as the Internet has a number of negative consequences for the children, adolescents and young adults. The contribution of this study to the literature is disclosing the relationship between problematic Internet use and body mass index in university students who have wider access to the Internet. The Internet is the common communication infrastructure which enables people worldwide to communicate and share information with each other with very broad purpose and content. Technologies that can be used individually, such as Internet, give people the chance to feel free. People can socialize, do shopping, and experience romantic relationships in such environments. Such factors make people more dependent on the Internet. This tendency may sometimes affect the physical health of people as well as their emotional well-being. Prevention of this is important for protection of the health of the young and of society as a whole.

Finally, the study makes the following recommendations, to guide future studies: With respect to the duration of students' daily Internet use, they may benefit from having to plan how and when they will use the Internet, in order to limit how frequently they use the Internet and to use it effectively. Thus, it may be ensured that students enjoy their lives beyond the Internet and live more active lives. Several social projects and events may be held to prevent particularly those students experiencing their first years in the university from looking excessively to the Internet to make up for their difficulties in adapting to their new social environments

and establishing new friendships. Students could be informed about the physical health risks of excessive Internet use, especially, and in addition to this, seminars could be held about proper use of technology and dangers of misuse. Media campaigns, especially public service broadcasts, could be used to attract the attention of young adults to the relationship between obesity and technology use. With these activities, young adults can be helped to be physically and psychologically more healthy, as well as academically and vocationally more successful.

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Üniversite Öğrencilerinde Problemli İnternet Kullanımı ve Vücut Kitle İndeksi

Atıf:

Özet

Problem Durumu: Teknolojinin hızla ilerlemesi ile bilgisayar ve internet kullanımı hayatın vazgeçilmez gereklilikleri haline gelmiştir. Yapılan araştırmalarda öğrencilerin büyük bir çoğunluğunun rahatlıkla ulaşabilecekleri bilgisayar ve internet imkanlarına sahip olduğu görülmektedir. Gelişen dünyada iletişimi arttırmak ve bilgi paylaşımını kolaylaştırarak, araştırmacıların olanaklarını arttırmak internetin temel işlevleri arasında olsa da, internetin tahmin edildiğinden daha hızlı yaygınlaşması, beraberinde bir takım problemleri de ortaya çıkarmaya başlamıştır. Bazı bireyler internet kullanımını gereksinim duydukları miktarla sınırlarken, bazılarının bu sınırlamayı yapamadığı için okul ve sosyal yaşamlarında aşırı kullanım nedeniyle sorunlar yaşadığı görülmüştür. Yapılan araştırmaların ardından, internetin mi bağımlılığa yol açtığı yoksa aşırı internet kullanımının var olan psikolojik sorunların davranışsal bir göstergesi olup, kendini bağımlılık yoluyla mı gösterdiği tartışmaları başlamıştır. Bireylere sorun yaşatan davranış örüntüsü, zarar verici olması nedeniyle "patolojik" ya da "problemli" olarak tanımlanmaya başlanmış, aşırı internet kullanımı için de çeşitli tanımlamalar yapılmıştır. Yapılan araştırmalarda; "internet bağımlılığı", "problemli internet kullanımı", "patolojik internet kullanımı" ve "siber bağımlılık" gibi pek çok kavramın kullanıldığı gözlenmektedir. İnternetin bahsedilen bu olumsuz kullanımının en önemli etkilerinden biri de beden sağlığı üzerinde olanlarıdır. Bilgi ve iletişim teknolojilerinin bireyler üzerindeki olumsuz bedensel etkilerini ortaya koyan bazı araştırmalarda, teknolojinin yanlış ve aşırı kullanımı insanoğlunun beden sağlığı üzerinde olumsuz etkilere sahip olduğu ortaya konmuştur. Bu bağlamda günümüzde gençlerin en büyük sorunlarından birini internetin doğru kullanılmamasından kaynaklanan hareketsizlik ve kilo alma problemleri oluşturmaktadır. Uzun süre internet başında zaman harcayan bireylerin yaşadıkları en büyük sorun hareketsiz kalmaktır. Bu da bireylerin günlük yakmaları gereken enerji miktarından daha azını harcamalarına neden olmaktadır. Hareketsizlik şişmanlık nedeni olarak görülmekte, şişmanlık ise hareket eksikliğine yol açarak kısır bir döngü oluşturmaktadır. İnternet, özellikle üniversite öğrencileri tarafından

yaygın bir biçimde kullanılmaktadır. Üniversitelerde internete ulaşımın hızlı ve kolay olması, ödevler ve ders sorumlusu ile bağlantılar, ders durumlarının takibi, araştırma yapma ihtiyacı gibi durumlar interneti kullanmayan üniversite öğrencilerinin de, internet kullanıcısı olmasını sağlamaktadır. Literatürde yer alan ilgili araştırmaların sonuçları, üniversite öğrencilerinin problemli internet kullanımlarının onların vücut kitle indeksleri üzerinde olumsuz bir etkisi olabileceği fikrini vermektedir. Bu bağlamda bu araştırma, üniversite öğrencilerinde problemli internet kullanımı ile vücut kitle indeksi arasındaki ilişkiyi belirlemeyi amaçlamaktadır.

Araştırmanın Amacı: Bu araştırmanın amacı üniversite öğrencilerinin problemli internet kullanım düzeyleri ile vücut kitle indeksleri arasındaki ilişkiyi incelemektir. Bu bağlamda araştırmada iki hipotez sınanmıştır. Bunlar;

1.Öğrencilerin problemli internet kullanım düzeyleri ile vücut kitle indeksleri arasında anlamlı bir ilişki vardır.

2.Öğrencilerin problemli internet kullanım düzeyleri vücut kitle indekslerine göre anlamlı şekilde farklılaşmaktadır.

*Araştırmanın Yöntemi:*Araştırmanın katılımcıları Karadeniz Teknik Üniversitesi Eğitim Fakültesinde 2010- 2011 akademik yılında farklı bölümlere (İlköğretim, Güzel Sanatlar ve Türkçe Eğitimi bölümleri) devam etmekte olan, tabakalı örnekleme yöntemi ile seçilen 525 üniversite öğrencisinden oluşmaktadır. Örneklemin cinsiyete göre dağılımı 234 erkek ve 291 kız şeklindedir. Öğrencilerin yaş ortalaması 21.8'dir. Araştırmaya katılan bireylerden 294'ü (%59.7) kendi bilgisayarlarına sahipken, 231'i (%40.3) değildir. Katılımcıların ırksal dağılımı homojendir. Katılımcıların çoğu (n=363, %69.1) orta sosyoekonomik gelir düzeyine sahip ailelere mensupturlar. Araştırmanın verileri araştırmacı tarafından geliştirilen bilgi toplama formu ve "İnternette Bilişsel Durum Ölçeği*" kullanılarak elde edilmiştir. Bilgi toplama formunda araştırmaya katılan öğrencilerin sosyo - demografik özelliklerini (yaş, cinsiyet, bilgisayar sahibi olma, boy ve kilo değerleri) içeren bilgileri alınmıştır. Ayrıca katılımcıların vücut kitle indekslerinin hesaplanması için son bir hafta içindeki boy ve kilo değerleri alınmıştır. Araştırma kapsamında toplanan verilerin analizinde SPSS 15.0 programı kullanılmıştır. Araştırma verilerinin normal dağılıma uygunluğunun test edilmesinde Kolmogorov Smirnov testi kullanılmıştır. Verilerin analizinde Pearson product momentler çarpımı korelasyon analizi, tek yönlü varyans analizi (One- way ANOVA) ve çoklu karşılaştırmalar için LSD testi kullanılmıştır.

*Araştırmanın Bulguları:*Araştırmada ulaşılan bulgulara göre öğrencilerin problemli internet kullanım düzeyleri ile vücut kitle indeksleri arasında pozitif yönde anlamlı bir ilişki vardır. Öğrencilerin problemli internet kullanım düzeyleri ile vücut kitle indeksleri düzeyleri arasındaki ilişki temel alındığında gruplar arasında anlamlı farklılıkların olduğu belirlenmiştir. Buna göre vücut kitle indeksleri 30 ve üzerinde

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olan üniversite öğrencilerinin problemli internet kullanım düzeyleri vücut kitle indeksleri 0- 18,4; 18,5-24,9 ve 25-29,9 arasında olan öğrencilerden anlamlı düzeyde yüksek olarak bulunmuştur.

Araştırmanın Sonuç ve Önerileri: Genç yetişkinler için internet gibi bilgi ve iletişim teknolojilerinin kullanılmasının bazı olumsuz sonuçları bulunmaktadır. İnternet gibi bireysel kullanılabilen teknolojiler insanlara daha özgür olma şansı vermektedir. İnsanlar bu gibi ortamlarda sosyalleşebilmekte, alış - veriş yapabilmekte, romantik ilişkiler yaşayabilmektedir. Bu gibi unsurlar bazı insanları internete daha eğilimli hale getirmektedir. Bu eğilim zaman zaman insanların psikolojisi üzerinde etkili olduğu kadar beden sağlıkları üzerinde de etkili olabilmektedir. Bu durumun önüne geçilmesi gençlerin ve toplumun sağlığının korunması için önemlidir. Bu bağlamda bazı öneriler geliştirilmiştir. Öncelikle öğrencilerin günlük internet kullanım sürelerine yönelik; interneti ne sıklıkta ve ne amaçla kullandıklarının planını yapmaları konusunda eğitim programları geliştirilebilir. Özellikle üniversitede ilk yılını yaşayan öğrencilerin yeni sosyal ortamlarına uyum sağlama ve yeni arkadaşlıklar kurma konularındaki eksiklikleri için internete aşırı düzeyde başvurmalarını önlemek adına çeşitli sosyal proje ve etkinlikler düzenlenebilir.

Anahtar Sözcükler: Problemli internet kullanımı, vücut kitle indeksi, üniversite öğrencisi

The Development of a Student Teacher Concerns Scale

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Abstract

Problem Statement: Practice teaching is an important element in teacher education programs and it plays an active role in student teacher's obtaining and improving their teaching skills. However, student teachers have some concerns, since they are observed and evaluated by their supervisors in terms of class management, methods and techniques, preparation, and communication with students. A unique concern scale might be developed to measure the nature and degree of the concerns that affect student teachers.

Purpose of the Study: The purpose of the study is to develop a unique scale that measures the types and degrees of student teachers' concerns over the course of practice teaching period.

Method: A student teachers' Concern Scale was developed based on the literature and on interviews with 98 student teachers (50 males, 48 females) from different departments of Education Faculty of Gazi University in 2011-2012 academic year. The form was revised in response to peer review, and student teachers of different departments from three universities (n=681) in Ankara (Gazi University n=348; Hacettepe University n=296; Ankara University n= 37) were given the revised draft of the 23-item form 423 of participants were females and 258 of them were males (Median=22). The construct validity of the scale was examined via exploratory and confirmatory factor analyses. The reliability of the measurement was tested using Cronbach's alpha and stratified alpha methods.

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Findings and Results: Principle component and exploratory factor analyses showed a two-factor solution of (1) class management (11 items; variance explained: 23.16%), (2) evaluation (8 items; variance explained: 17.29%) in the first sample. Confirmatory factor analysis revealed acceptable goodness of fit indices ($x^2_{151} = 724.02$; *p*=.00; Normed x2= 4.79; CFI=.88; GFI= .94; AGFI= .92; RMSEA=.11 and 90% C.I. =.10 - .11for RMSEA), and item-total correlations were between .38 and .69. Reliability coefficients were .84 and .95 for class-management, .79 and .92 for evaluation, .84 for overall scale.

Recommendation: Student teacher Concern Scale can be utilized to eliminate some weaknesses in practice teaching experience, improvement in programs in teacher education institutions, to guide related researchers.

Keywords: concern in the teaching practicum, teaching practicum, student teacher concern scale

Countries successful in education give a special importance on teacher education (OECD, 2012; Eraslan, 2009; Simola, 2005; Türkoğlu, 2005). Internal and external conditions such as characteristics of student teachers, quality of teaching services, and learning outputs are considered in forming teacher education programs. Cognitive and affective onset behaviors constitute student teacher characteristics. Cognitive onset behaviors include basic learning in related field, while the affective onset behaviors consisted of teachers' overall and academic self-concept of ability, beliefs of success, interests, and attitudes. Student teachers' concerns primarily affect characteristics of student teachers, and they also have impact on the other internal and external conditions of education programs like the quality of teaching service and learning outputs. An examination of these concerns would guide developing teacher education programs (Murray-Harvey, Slee, Lawson, Silins, Banfield & Russel, 2000).

Anxiety in general is defined as a reaction of meaningless fear created by danger, a fear of unluckiness or the expectation of bad fortune (Budak, 2000). Teacher anxiety is especially observed in the last year of teacher education program in which student teachers participate in the teaching practicum. Practice teaching is a critical part of teacher education programs and it has a great effect and active role on improving student teachers' teaching skills. With practice, student teachers gain experience, however it can also lead to worrying problems that have to be dealt with. In addition, in a real classroom setting, teaching actual students under the observation of a faculty member and supervising teacher - that is, finding materials and methods for the topic, preparing the lesson plan, managing the classroom, and establishing collaborative communication with students- all increase the concern of the student teacher. There are investigations about student teachers' and teachers' occupational concerns in the literature (Fuller, 1969; Reeves & Kazelskis, 1985; Weinstein, 1989, 1990; O'Connor & Taylor, 1992; Guillaume & Rudney, 1993; MacDonald, 1993; O'Connell, 1994; Pigge & Marso, 1997; Morton, Vesco, Williams & Awender, 1997;

Chan & Leung, 1998; Ghaith & Shaaban, 1999; Murray-Harvey et al., 2000; Capel, 1997, 2001; Swennen, Jörg & Korthagen, 2004). Fuller's studies about concern in 1960s pioneered this field. According to Fuller, student teachers experience some concerns related to either their own development as students or to teaching. Fuller's concern model is a sequential, stable, and hierarchic model. In 1969, Fuller discussed concern-based model of teacher in three stages: self-related, task-related, and impact related stages.

As they proceed through the practice teaching period, student teachers experience concerns about the congruency between them and teaching as an occupation, they experience performance-related concerns when practicing, and they experience some concerns about the degree to which they have positive and significant impact on their students (Fuller, 1969). After some reviews, Fuller in 1970s and Fuller and Bown in 1975 demonstrated the stages of student teachers' concerns as follows: self-related concerns, task-related concerns, and impact-related concerns. Fuller stated that each teacher experienced these stages sequentially but the length of each period could vary with the individual. In the context of self-related concerns, the student teacher asks himself the following question: Will the students like me? Can I control the classroom? Gradually, these concerns self-related concerns decrease and task-related concerns begin to increase. With task-related concerns, the student teacher asks the following kind of questions: Will I have time enough to prepare the classroom for the lesson? How will I deal with high number of students? In the third stage, there are concerns related to student needs and the impact of teaching on student learning. How will I deal with the social and affective needs of my students? How will I adapt myself to different needs of students?

In some studies, Fuller's model was validated (O'Sullivan & Zielinski, 1988; Butler & Smith, 1989). For example, Conway and Clark (2003) investigated student teachers' concerns during 30-week formation education program. Interviews with six teachers showed that student teachers experienced some self-related concerns in the beginning of the program, later, some teaching and impact related concerns began to emerge.

Other research showed some different results. According to those studies, the student teacher experiences concerns not in a sequential way, rather, concerns emerge in unordered way (Tabachnick & Zeichner, 1984; Reeves & Kazelskis, 1985; Hord, Rutherford, Huling, Austin & Hall, 1987; Smith & Sanche, 1993). In Pigge and Marso's longitudinal (1997) study, they examined the concern levels of student teachers prior to practice teaching period, following the practicum, in the third year post graduation, and in the fifth year post graduation.

Capel (2001) used a measure called the Teacher Concerns Questionnaire (TCQ) (developed by George, 1978) in his study, and the questionnaire was given to student teachers of different backgrounds in three times. The result showed that the greatest reasons for concern were the self and impact; concerns about the task of teaching were found to be lower than the others. The author contended that the participating student teachers were well prepared for the teaching task. When analyzing the

concerns of student teachers, Morton *et al.* (1997) concluded that the student teachers had some level of confidence in terms of class management, pedagogy, evaluation, and staff relations, and their concerns were related to demographic, experiential, and dispositional variables. Hart (1987) associated concerns with 4 factors; evaluation concerns, pupil and professional concerns, class control, and teaching practice requirements. Hart's Student Teacher Anxiety Scale (STAS) is a 7-point and 26-item scale.

Studies related to Turkish student teachers' concerns are as follows: In his study, with 339 student teachers, Boz (2008) used the Teacher Concern Control List, which had been developed by Borich in 1992. The measure was adapted to Turkish by Boz. As in Fuller's model, the measure had items related to self-related concerns, teaching related concerns and impact related concerns. The results showed that teachers had concerns in all three dimensions, with the task related concerns being the highest. In the task related concerns, teachers reported that they were most concerned about dealing with high number of students in the classroom, disputes related to school management, and inflexibility of curriculum.

Student teachers have lower levels of concerns. Yayli and Hasirci (2009) and Saban, Korkmaz, and Akbasli (2004) supported Boz's study. These concerns reflect classrooms and their curricula's structures. In Turkey, classrooms in general are crowded, curricula are densely packed with content, and the programs are inflexible. Teachers' concerns were affected by school, program and classroom structures (Pigge & Marso, 1997; Richardson & Placier, 2001).

While concern was higher in all three levels, it decreased in second year, but it gradually increased in the following years. In his study, Paker (2011) adapted Hart's (1987) STAS measure, which was adapted to classroom student teachers by Morton *et al.* (1997), to English teacher education field. 101 student teachers participated to the study. In addition to application of the scale, some interviews were conducted. Results indicated that student teachers had concerns the most serious level of concern about the evaluation of their performance and classroom management.

Cakmak (2008) administered his own Likert-type measure to 156 student teachers. According to the results of the study, student teachers had deep concerns about classroom management. Student teachers' concerns also affected their occupational improvement, so this topic is worth investigating (Guillaume & Rudney, 1993). General concerns determined via measures might be useful in improving the content and sequence of teacher education programs (Capel, 2001).

Research indicates that student teachers experience a specific concern and their occupational concern was measured by scales that were specific to that concern. Practice teaching has some national and cultural elements. Class size where practice teaching is conducted is high. Equipment that student teachers can use when preparing or practicing for the classroom is not adequate (Uzel, Diken, Yılmaz & Gül, 2011; Aşan, 2002). Candidates have problems such as not getting feedback from their supervisors and not having adequate contact with them (Paker, 2005). Because curricula are densely packed with content, student teachers might have some

problems with time management. Considering the research in Turkey, there was not any unique scale development study in relation to teacher or student teacher concerns. The research that has been conducted consists of surveys or adaptations of the existing measures. Different adaptation studies for the same measure showed that their findings about validity and reliability were considerably different from each other. In addition, no study was found examining concern about being evaluated by supervisor, other than Paker's (2011) adaptation study of Hart's (1987) scale. Therefore, developing a unique student teacher concern scale involving local practices is needed.

Method

Model and Participants

The study was conducted in a survey model. 5.4% of the participants (n=37) were students of Ankara University, whereas 51.1% of the participants (n= 348) were students of Gazi University, and 43.5% (n=296) of them were from Hacettepe University. 62.1% (n=423) of the participants were females, and 37.9% (n=258) of them were males. Age ranges of the participants were 20 to 39, with the average being 22.40 (sd=1.40). Convenience sampling method was used and the participants were reached from the departments of faculty of education in three universities of Ankara. Participants' variances its according to their departments were as follows: 16.3% (n=111) Computer Education and Instructional Technology, 14.8% (n=101) Primary Education, 7.3% (n=50) History Education, 6.3% (n=43) Social Science Education, 14.8% (n=101) English, 5.3% (n=36) Geography, 14.0% (n=95) Mathematics, 5.0% (n=34) Science Education, 2.1% (n=14) Secondary Turkish Language Education, 1.3% (n=9) Turkish Language and Literature Education, 2.5% (n=17) Physics Education, 8.1% (n=55) Chemistry Education, and 2.2% (n=15) Biology Education.

Research Instrument

Demographic questionnaire: The questionnaire was developed by the researchers to collect university, department and sex information of the participants.

Student teacher concern scale (STCS). The scale was developed in this study. It contained 23 items with two factors, which were called class management and concern of being evaluated. The scale was a 5-point Likert-type scale ranged from 1 to 5 (1=never; 2=rarely; 3=sometimes; 4= often and 5=always). Numbers of the the scale range from 19 to 95. The higher scores indicated higher levels of tendency to concerns.

Development process of the STCS. In the development process of Student Teacher Concern Scale, literature involving concerns related to teaching profession was reviewed based on the knowledge gathered from this literature review, 98 (50 males, 48 females) student teachers from different departments of Faculty of Education of Gazi University, were asked open-ended questions about their concerns in relation to practice teaching, and their responses were obtained in written format (e.g. what are your concerns about classroom management?) An item pool was prepared according

to those responses. Peer reviews of three faculty members of Curriculum and Instruction Department and three faculty members of Psychological Counseling and Guidance Department were made. Then, common comments were selected and a draft of 23-item form obtained from the item pool was created. Six experts from Counseling and Curriculum Department of Gazi University reviewed the draft. The draft administered to the students from three universities (n=681).

Procedure

The items of the scale were generated based on interviews with 98 student teachers (50 males, 48 females) from different departments of Education Faculty of Gazi University. The draft was administered to student teachers from three universities (n=681) in Ankara in 2011-2012 academic year. Permission was obtained from the ethics committees of the universities. Participants were asked to complete the scale in the classes. The scale was administered to students who participated voluntarily. The scale was administered by the researchers. The scale was completed in 15 minutes. The required instructions were given in advance to better inform and motivate them to complete the scale in appropriate and timely manner.

Data analysis

Construct validity of the scale was examined using exploratory and confirmatory factor analysis, and evidence for construct validity was explored via convergent and discriminant validities (Hair et al., 2010). Reliability of the measurement was tested using Cronbach's alpha, stratified, and composite alpha methods. In the first stage of analysis, observations in the data set were divided into two parts randomly, and principal component and exploratory factor analyses were run for the first data set (n=338), whereas a confirmatory factor analysis was conducted for the second data set (n=343) (Tabachnick & Fidell, 2013).

For the first study, outlier check, multicollinearity, linearity, and normality assumptions were examined (Hair et al., 2010; Kline, 2010; Tabachnick & Fidell, 2013). There was no multicollinearity and it was seen that removing the univariate and multivariate outlier cases orperforming appropriate transformations for the variables having skewness (range from -1.964 to 1.347; p=.00) or kurtosis (range from -1.55 to 4.75; p=.00) did not make any substantial change in the structure extracted from the raw data. After reversed–scored items were transformed, analyses were conducted on those raw scores. For the analyses, Factor 8.1 and SPSS 21 packages software were utilized for EFA and lisrel 880 was used for CFA. Along with the methods of minimum rank factor analysis for extracted dimensions; size of eigenvalues, screeplot, parallel analysis, MAP test and average eigenvalue approaches were utilizedfor determining the number of factors while performing principal component analysis on polychoric correlations(Lorenzo-Seva & Ferrando, 2013). Since the correlations between the factors were lower than .30, varimax rotation method was used. The items loaded on a factor with the value of higher than .30 remained in the final form. In addition, cross-loaded items with minor weight differences (lower than .20) were removed (Hair, Black, Babin& Anderson, 2010).

Tabachnick and Fidell (2007) stated that for an exploratory factor analysis to be run, a sample comprised of at least 300 observations was needed. On the other hand,

MacCallum, Wideman, Zhang, and Hong (1999) asserted that determining any common criteria for sample size was useless. According to MacCallum et al. (1999), even a sample size of 100 participants would be adequate for factor analysis, when all of the factors in a model explain higher than .60 communality variance of each of the items, and the factor loadings are higher than .80 for each of the items. They suggested, however, when the communalities were at lower levels (>.40), a higher number of factors existed, and there were only a few items per factor, then even a sample of 500 participants would not be adequate.

Similarly, De Winter, Dodou and Wieringa (2009) concluded that with the help of estimating a proportion of sample size or the number of participants with the number of items was no longer needed, the sample size can vary according to communalities, factor loadings, the number of items in each of the factors, and the number of factors in the model.

Stevens asserted that the sample size is not the critical issue for a reliable factor having at least 3 items with the loadings of at least .80, or at least 4 items with the loadings around .60. In the case of a factor having at least 10 items with the loadings of around .40, the sample size could be ≥150; for the factors having only few loadings, it should be ≥300. In this study, the communalities ranged between .16 - .59 (*M*=.35). As seen above, there are many opinions about to determination of the factor number and the size of factor loadings. Performing a synthesis of the views, it is accepted that the loading sat own factor to be more than.40. Besides, considering other criteria, a sample size of 338 participants would be seen as adequate.

In structural models, sample size with 200 participants was acceptable, but it was reported that the sample size should be ten times higher than number of parameters (Kline, 2010). Hypothesis model involved 39 free parameters. In this case, 39*10=390 participants were needed. However, there has been an argument on sample size for confirmatory factor analysis, as there was on exploratory factor analysis. Therefore, a power analysis using a SAS syntax written by MacCallum, Browne, and Sugawara (1996) was performed to determine the sample size for confirmatory factor analysis. When conducting the power analysis, a power value of .80, and the following values were taken as reference: RMSEA .00 - .03, alpha level=.05, df=151, and group=1. Based on those reference values, the sample size was calculated as 359 participants. Along with this calculation, assumptions of confirmatory factor analysis were checked prior to running the analysis, as was the case in the exploratory factor analysis.

Results

In this section, findings of exploratory, confirmatory factor analyses, and internal consistency of STCS were given.

Validity and Reliability Study

Principal component analysis (PCA) revealed seven components with the eigenvalues higher than 1.00. Half of the eigenvalues obtained from 23-item data set was calculated as 6.88. This approach indicated a removal of two components (5.10 and 3.04) from the scale was needed. In addition, results of scree plot (as seen Figure

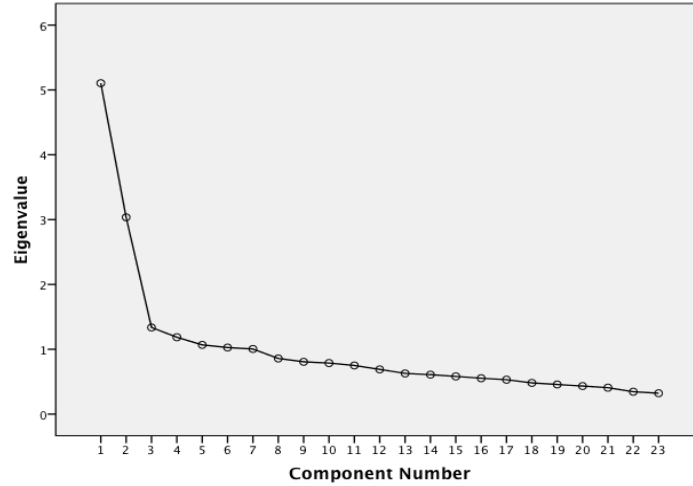1), MAP test and parallel analyses showed that these two components were statistically significant.

Figure 1: Scree plot

PCA's KMO was found to .85; Barlett's Test of Sphericity (x^2_{253}) was 1773.00, *p*= .00. In the light of these findings, an exploratory factor analysis (EFA) was performed for a two-factor structure. Findings revealed that two factors explained 35.11% of total variance (sum of eigenvalues=8.08). In addition, it was seen that item-factor relationships did not vary based on using different rotations and factor extraction methods. Factor analysis results are given in Table 1 in which minimum rank factor extraction and varimax rotation methods were used.

Table 1

STCS' Factor Loadings with Varimax Rotation and Item – Dimensions Correlations

	ITEMS	I-T Cor.**	F1	F2
1.	I get irritated when I can't find adequate amount of resources related to topic.			
2.	I don't have any concerns about class management.*	.59	.68	
3.	I worry about giving insufficient answers to the questions of students.	.52	.62	
4.	I know how to deal with unexpected cases.*	.60	.68	
5.	I believe that I can give lectures in an effective and amusing way.*	.46	.59	
6.	I worry about the thought that I fail to establish effective communication with the students.	.47	.58	
7.	I don't have any concerns about finding methods and techniques appropriate for the topic.*	.42	.51	

Table 1 comtinue…

ITEMS	I-T Cor.**	F1	F2
8. I fear that I cannot keep the attention of the students.	.69	.74	
9. I am concerned about how to deal with the problematic students.	.56	.63	
10. I am concerned about using Turkish in a correct way.			
11. I have some concerns about whether my physical appearance is appropriate for teaching.			
12. I get upset when I cannot motivate the students about the lesson.	.41		.59
13. I experience the fear of not being able to use body language effectively.	.53	.64	
14. I feel tension because of being overexcited.	.44	.52	
15. I am negatively affected by students' lower levels of readiness.			
16. I am positively affected if the students are respectful to me. *	.34		.51
17. I am concerned about my practice supervisor's negative evaluation of my performance.	.45	.56	
18. I feel offended if my practice supervisor is uninterested and distant from me.	.43		.54
19. I feel offended if my practice supervisor criticizes me in front of the students.	.54		.65
20. I get motivated if my teaching supervisor is respectful to me and regards me as a colleague*	.54		.67
21. I feel discomfort when a faculty member finds my performance inadequate.	.38		.50
22. I feel discomfort if the faculty member acts strictly and intolerantly to me.	.64		.75
23. I feel offended if the faculty member does not make an objective evaluation.	.52		.67

Total variance explained (%)   20.44   14.67

* Reversely scored items ** Item - Dimension (Total) Correlations

As it was seen in Table 1, items in the first factor had factor loadings from .56to .74. In the second factor, factor loadings were between .50 and .75. Based on the contents of the items loaded on the factors, the first factor was called as "Class management" and the second factor was named as "Concern about being evaluated". In addition, items 1, 10, 11, and 15 were excluded from the data set because of their lower levels of factor loadings (<.40). Following the exclusion of those items, exploratory factor analysis was performed again. The first factor explained variance increased to 23.16%, and the secondfactor explained rose to 17,29% of the total variance (total=40.45%). Item-total correlations for the first factor were between .42 and .69; for the second factor they were between .34-.64. Internal

consistencies of the factors (Cronbach's alpha) were .84and .77respectively. Stratified alpha was found to be .84using the equation below:

$$\textit{Stratified } \alpha = 1 - \frac{\sum \sigma_{xj}^2 (1 - \alpha_j)}{\sigma_x^2}$$

$$= \frac{46.08(1 - .84) + 24.48(1 - .77)}{82.55}$$

In the second stage of the analysis, a confirmatory factor analysis was conducted on the second half of the data set to examine how well the two-factor structure explains the relationships among data gathered for the second half of the data set. Results are presented in Figure 2. As seen in the Figure 2, standardized weights of items in the class management dimension were between .74and .93, whereas the standardized weights in the evaluation dimension were between .63and .91. Goodness of fit indices for the model was found to be acceptable: (x_{151}^2 =724.02; p=.00; Normed x^2 = 4.79; CFI=.88; GFI=.94; AGFI= .92; RMSEA=.11and GA=.10-.11). In the first dimension, item total correlations were between .45 and .68; those correlations were between .41and .62for the second dimension. Cronbach's alpha for the first dimension was .85, Cronbach's alpha for the second dimension was found to

$$CR = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + (\sum_{i=1}^n \delta_i)}$$

be .79.. Raykov and Shrout (2002) stated that when only the error terms were uncorrelated and factor loading were equal (tau equation) in the model, internal consistency could calculate the reliability correctly. In the other cases, estimations made using this method could reveal results higher or lower than the actual results (Hair, Black, Babin& Anderson, 2010). For this reason, reliability coefficients for subdimensions and for the overall scale were calculated separately.

(CR= reliability, λ_i = i. standardized item weight and δ_i = i. error term of item)

With the help of the equation above, t reliability coefficients were found to be .95 for class management, .92 for concern of being evaluated, and .91 for the overall scale.
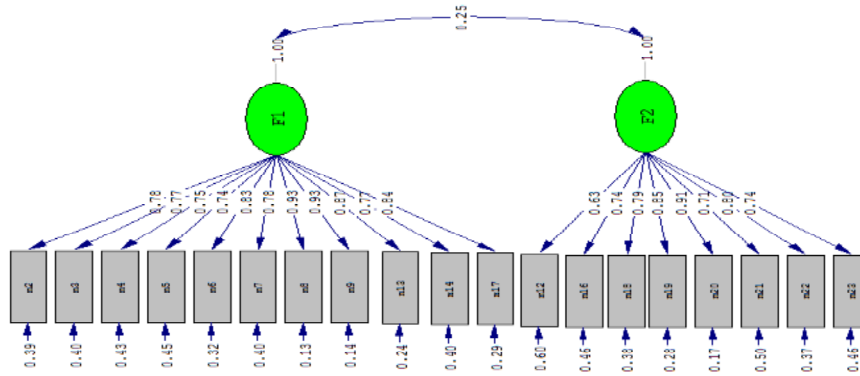
Figure 2. Confirmatory factor analysis (Standardized weights)

Furthermore, the average variance explained (AVE) was found to be .67 for class management (F1), and .60 for being evaluated with the help of the equation below:

$$AVE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

According to these results, in addition to goodness of fit indices, having standardized weights higher than .50, calculating .90and higher values of reliability coefficients, having reliability coefficients bigger than AVE indicated that the model had an acceptable convergent validity.

Square of coefficient between two dimensions were compared with the explained mean variances of the dimensions to calculate the discriminant validity of STCS: The correlation between two dimensions was .25, so .25² is .06. The mean variances explained by the two dimensions were .67and .60respectively. These coefficients were considerably higher than the squared correlation of dimensions. Moreover, since the confidence interval for .25(CI=.25± 1.96*.03) were between .19and .31; and it did not cover "1". It can be concluded that the scale did not have a one-factor structure.

These results indicated that the scale has discriminant validity. In other words, the items had stronger relationships with the existing structure rather than with other potential structures. Moreover, when dividing the coefficient between two dimensions to its standard error, a value of t=8.33, *p*<.01 was found. This means that the relationship between the dimensions was low but statistically significant. When the items were examined in terms of their contents, a significant relationship between the dimensions was expected, which means nomologic validity was met. Therefore, evidence for convergent and discriminant validities indicates the presence of construct validity.

Discussion and Conclusions

The purpose of the present study was to develop a measure describing student teacher's concerns about practice teaching process. Firstly, an item pool was constituted, then some amendments on the items were performed based on the peer reviews, and a form for pilot study was acquired.

Factor structure (exploratory factor analysis) of the scale was determined, construct validity was tested, and the reliability was calculated. Results of the exploratory factor analysis extracted two-factor solution: (1) class management, and (2) being evaluated. The class management dimension had 11 items, while 8 items were loaded in the dimension of being evaluated. Both validity and reliability coefficients were at acceptable levels.

Class management was one the most frequent concerns reported by student teachers. A great amount of research has supported this finding (Fuller & Bown, 1975 ; Moore & Cooper, 1984; Hart, 1987; Maynard & Furlong, 1993; Jones & Vesilind, 1995; Capel, 2001; Hsu, 2005; Moore, 2003; Poulou, 2007). Cakmak (2008), Boz (2008), and Tok's studies conducted among Turkish student teachers indicated that behavior management skills, motivating the students, and establishing communication were the most frequent class management-related problems that student teachers experienced.

One of the other concerns that student teachers frequently have was being evaluated by faculty member and supervising teacher. Similar findings in the previous research support this finding (MacDonald, 1993; Capel, 1997, 1998, 2001; Fives, Hamman & Olivarez, 2007; Paker, 2011).

Student teachers' roles both as teachers and students, regulations like professional tasks established by the teachers, the obligation to comply with the decisions previously made, and being under limited control in the educational settings, made the student teachers experience burnout, especially during the practice teaching period. In this case, supervisors' task is critical according to Fives, Hamman, and Olivarez (2007). McDonald (1993) stated that inconsistent evaluations, expectations and feedback of teaching supervisors can create overstress on student teachers.

In order for student teachers to be self-confident, their concerns are needed to be determined. To help them decrease their concerns, they need to be supported in dealing with crowded classrooms and strict curriculum structure. Determining the concerns of student teachers might help in the development of better teacher education programs. Teacher educators should determine pre-service teachers' concerns and support strategies that can help deal with those concerns. Moreover, a sharing atmosphere can be established to show student teachers that other student teachers and even professional teachers can have similar concerns.

In this study, measures in the literature having different subdimensions related to concerns of the student teachers were examined, and a detailed, reliable, and useful new scale was developed. This student teacher concerns scale involved only concerns

during the practice teaching period. This scale is thought to be utilized in determining the difficulties student teachers have in practice teaching, in improving the teacher education programs, and in helping supervisors and related researchers. Future, more detailed, studies might focus on the improvement of the measurement of student teacher concerns.

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Öğretmen Adayı Kaygı Ölçeğinin Geliştirilmesi

Atıf:

Özet

Problem Durumu: Öğretmen adayı özelliklerini bilişsel ve duyuşsal giriş davranışları oluşturmaktadır. Bilişsel giriş davranışları alanıyla ilgili ön öğrenmeleri içerirken, duyuşsal giriş davranışları ise genel ve akademik benlik tasarımını, başarıya olan inancı, ilgilerini ve tutumlarını içermektedir. Öğretmenlik uygulaması, öğretmen adayının öğretim becerilerini kazanması ve geliştirmesinde etkin rol oynar. Öğretmenlik uygulamasında öğretmen adayları bazı kaygılar yaşamaktadırlar. Öğretmen adayı kaygıları, başta öğretmen adayı özellikleri olmak üzere öğretim hizmetinin niteliği, öğrenme ürünleri gibi eğitim programını oluşturan diğer içsel ve dışsal koşulları etkilemektedir. Öğretmen adayları, sınıf yönetimi, uygun yöntem-teknik kullanma ve materyal seçme ve hazırlama, öğrencilerle iletişim, uygulama öğretmenlerinin ve öğretim üyelerinin performanslarını gözlemliyor ve değerlendiriyor olması gibi nedenlerden dolayı kaygı duymaktadırlar. Türkiye'de yapılan araştırmalara bakıldığında, öğretmen veya öğretmen adayı kaygılarına ilişkin özgün bir ölçek çalışması ile karşılaşılmamıştır. Yapılan çalışmalar, araştırmalara özgü hazırlanmış anketler ve mevcut ölçeklerin uyarlanmasıdır. Bu yüzden yerel uygulamaları kapsayan bir öğretmen adayı kaygı ölçeğinin geliştirilmesine gereksinim duyulmuştur.

Araştırmanın Amacı: Öğretmen adaylarının öğretmenlik uygulaması sürecinde yaşadıkları kaygıların ve düzeylerinin belirlenmesine yönelik özgün bir ölçek geliştirmektir.

Araştırmanın Yöntemi: Öğretmen Adayları Kaygı Ölçeğinin geliştirildiği bu araştırmada, önce Gazi Üniversitesi Eğitim Fakültesinin farklı bölümlerinde, 2011-2012 eğitim ve öğretim yılında öğrenime devam eden 98 öğretmen adayından (50 erkek, 48 kadın) elde edilen görüşler ve literatür taraması sonucunda 40 maddelik bir havuz oluşturulmuştur. Bu havuz 6 uzmanın incelemeleri sonucunda 23 maddeye indirilmiş, daha sonra 23 maddelik form Ankara ilindeki 3 üniversitede 2011-2012 eğitim ve öğretim yılında öğrenimlerine devam eden toplam 681 öğretmen adayına (% 63.3'ü (423) kadın, % 36.7'si (258) erkek) uygulanmıştır. Öğretmen adaylarının yaşları 19 ile 39 arasındadır (Ortanca=22). Formdan elde edilen ölçümler önce rastgele ikiye bölünmüş, veri setinin ilk parçasında betimleyici; ikinci setinde doğrulayıcı faktör analizi yapılarak ölçümlerin yapı geçerliği araştırılmıştır. Ayrıca her iki veri setinde ölçümlerin güvenirlikleri de Cronbach ve tabakalı alfa, yapı güvenirlik katsayılarıyla araştırılmıştır.

Bulgular ve Sonuçlar: Bu çalışmada öğretmen adayının öğretmenlik uygulaması sürecinde yaşadığı kaygıları betimlemeye yönelik bir ölçeğin geliştirilmesi amaçlanmıştır. Öncelikle öğretmen adayı kaygı ölçeği madde havuzu oluşturulmuş, daha sonra uzman görüşlerine dayalı olarak maddelerde gerekli düzeltmeler yapılarak, ön uygulamaya hazır hale getirilmiştir. Ölçeğin faktör yapısının belirlenmesi, yapı geçerliğinin test edilmesi ve güvenirlik çalışmalarının yapılması işlemleri gerçekleştirilmiştir. Betimleyici faktör analizi sonucunda ölçeğin iki faktörden oluştuğu görülmüştür. Bu faktörlere; (1) Sınıf Yönetimi, (2) Değerlendirilme adı verilmiştir. Sınıf yönetimi 11; değerlendirilme boyutu 8 maddeden oluşmaktadır. Birinci boyutta yer alan maddelerin faktör yükleri .56 ile.74; ikinci boyutta yer alan maddelerin faktör yükleri ise .50 ile .75 aralığındadır. Buna ek olarak 1, 10, 11 ve 15. maddeler düşük faktör yüklerine (<.40) sahip olduklarından veri setinden çıkarılmışlardır. Düşük yüke sahip maddeler veri setinden çıkarıldıktan sonra betimleyici faktör analizi tekrarlanmış, açıklanan varyansın ilk boyutta % 23.16'ya, ikinci boyutta ise % 17.29'a yükseldiği saptanmıştır (Toplam % 40.45). İlk boyutun madde toplam korelasyonları .42 ile .69; ikinci boyutun .34 ile .64 arasındadır. Boyutların iç tutarlık katsayıları (Cronbach alfa) sırasıyla .84 ve .77'dir. İki boyutun bileşiminden elde edilen tabakalı alfa katsayısı .84'tür. Analiz sürecinin ikinci aşamasında, iki boyutlu yapının, araştırma örnekleminin diğer parçasından elde edilen veriler arasındaki ilişkileri ne ölçüde açıkladığını incelemek amacıyla doğrulayıcı faktör analizi yapılmıştır.

Sınıf yönetimi boyutunda yer alan maddelerin standartlaştırılmış ağırlıkları .74-.93; değerlendirme boyutunda yer alan maddelerin ağırlıkları ise .63-.91 aralığındadır. Modele ilişkin genel uyum katsayıları yeterli düzeydedir. İlk boyutta madde toplam korelasyonları .45-.68; ikinci boyutta .41-.62 arasındadır. İlk boyutun iç tutarlık katsayısı .85 iken; ikinci boyutun 79'dur. Yapı güvenirlik katsayısı sırasıyla.92 ve .91'dir. Bu sonuçlara göre, kabul edilebilir düzeyde genel uyum ek olarak, standartlaştırılmış ağırlıkların (12 ve 21. maddeler dışında) .50'den, güvenirlik

katsayılarının (CR) .70'den büyük olmaları, CR'lerin AVE'lerden büyük olmaları modelin benzeme geçerliğinin varlığına işaret ederken; boyutların açıkladıkları ortalama varyansın .50'den küçük olması, maddelerdeki hata varyansının faktör tarafından açıklanan varyanstan daha büyük olduğu anlamına gelmektedir. Ayrıca iki boyut arasındaki ilişki katsayısı (r= .25), standart hatasına (.03) bölündüğünde, t=8.33, *p*<.01 değeri elde edilmektedir. Bu değer, boyutlar arasındaki ilişkinin düşük fakat istatistiksel bakımdan önemli olduğunu göstermektedir. Maddeler içerik açısından incelendiğinde, boyutlar arasında anlamlı bir ilişkinin olması beklenen bir durumdur. Sonuç olarak, benzeme ve ayırma geçerliklerine ilişkin kanıtlar, ölçeğin yapı geçerliğinin varlığını işaret etmektedir.

Sınıf yönetimi, öğretmen adayı kaygıları arasında sıklıkla yer almaktadır. Birçok araştırma ÖAKÖ'nün sonucunu desteklemektedir. Öğretmenlik uygulaması sürecinde öğretim elemanı ve uygulama öğretmeni tarafından değerlendirilme kaygısı öğretmen adayının yüksek oranda yaşadığı kaygılardan bir diğeridir.

Bu çalışmada, literatürdeki çeşitli alt boyutlardan oluşan öğretmen adayı kaygı ölçekleri incelenerek; güvenilir, kullanışlı ve yeni bir ölçek geliştirilmeye çalışılmıştır. Öğretmen adayı kaygı ölçeği öğretmenlik uygulaması süreciyle sınırlandırılmıştır. Bu ölçeğin öğretmen adaylarının öğretmenlik uygulamasında yaşadıkları güçlüklerin belirlenmesinde ve öğretmenlik uygulaması sürecindeki eksiklerin giderilmesinde, öğretmen yetiştiren kurumların programlarının geliştirilmesinde; öğretmenlik uygulamasının yapıldığı ilköğretim - orta öğretimde - üniversitede görevli öğretmenlere-öğretim elemanlarına ve konuyla ilgili araştırmacılara yol göstereceği düşünülmektedir

Öneriler: Öğretmen eğitimcileri öğretmen adaylarının kaygılarını belirlemeli ve adayların bu kaygılarla başa çıkmasını sağlayıcı stratejileri kazanmalarını desteklenmelidir. Ayrıca adayların kaygılarını paylaşmaları sağlanarak, diğer adayların ve hatta öğretmenlerin de benzer kaygılar yaşadıklarını görmeleri, kaygıların azalmasına yardımcı olabilir.

Anahtar Sözcükler: Öğretmenlik uygulamasında kaygı, öğretmenlik Uygulaması, öğretmen adayı kaygı ölçeği

The Effects of Intertextual Reading Approach on the Development of Creative Writing Skills

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Abstract

Problem Statement: The aim of the first five years of primary school is to teach and help the students develop basic skills as stated in the Primary School Language Program and Guide. Creative thinking and intertextual reading are among these skills, and it is important to give these to the students during language courses.

Purpose of Study: The purpose of this study is to determine the effectiveness and efficiency of an intertextual reading approach on the improvement of writing skills among primary school fifth-grade students.

Methods: The "Pretest – Post-test with Control Group" experimental research model has been used. The sample for the study is comprised of fifth-grade students at Akpinar Primary School, located at Kirsehir. The "Creative Writing Rubric" has been used as the data gathering tool. The "Creative Writing Rubric" has eight subdimensions, namely *Originality of Ideas, Fluency of Thoughts, Flexibility of Thoughts, Vocabulary Richness, Sentence Structure, Organization,* and *Writing Style and Grammar".* In this study, the creative writing works of the students have been examined and evaluated in terms of "*Originality of Ideas"* and "*Vocabulary Richness".*

One-Way Anova has been used to analyze the relations inside test and control groups and the interrelations between them. Normal distribution of the obtained data has been analyzed in order to determine the reason for the differences between groups. "Post-hoc" has been applied, and the "Scheffe" test's results have been used.

Findings and Results: At the end of the study, it was found that the *Originality of Ideas* and the *Vocabulary Richness* scores of the students from the test group, to whom the intertextual reading approach had been applied, are higher than from the students of the control group, where the courses had been conducted conventionally. This difference is statistically significant. These results show that the intertextual reading approach that

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has been applied to the test group is effective for improving the creative writing skills of the students in terms of "*including creative and original ideas*" and "*word selection*" (using the words appropriately and in line with the purpose of the text and making right usage choices, etc.).

Conclusions and Recommendations: By using an intertextual reading approach, students' thought generation as well as their formation of relations between ideas, have improved. Thus, by using these activities during the creative writing skill development process, original idea generation can be established.

Texts studied using an intertextual approach create a significant difference in the creative writing of fifth-grade students in terms of *word selection*. Thus, through the higher connections made while applying intertextual reading, students learn more new words and can use them with different meanings, in the right places, and in line with their aims.

Keywords: Intertextuality, reading, intertextual reading, writing, creative writing

Spoken and written language is an important tool for expressing feelings, thoughts, and desires at every stage of life. Writing is an important element for transferring the cultural heritage to subsequent generations. In order to use written language effectively, writing should be emphasized in all stages of training and education; an appropriate environment leading to better writing should be set and different methods, techniques, and strategies should be applied.

Writing is the process of transferring structured information to texts. "To do this, students should have a good understanding of what they read and they should structure it in the brain" (Ministry of National Education [MoNE], 2005, p. 22). "Writing is the skill of kinesthetically producing the symbols and signs required for expressing thoughts" (Akyol, 2010, p. 51). Writing is explaining feelings, thoughts, and projects that have been seen and experienced. "Like speaking, it is a way to express ourselves, to communicate with others" (Sever, 2004, p. 24).

Writing, which constitutes an important area of language education, requires skill as well as knowledge. Writing has two important dimensions: Firstly, it might be written fast and legible. Secondly, feelings and thoughts should be communicated in an original way via writing. The first dimension is taught in the first classes of primary school, whereas the second dimension is a skill that should be developed during an entire lifetime and is directly related with creativity.

Sever (1991) emphasizes the parallel nature of writing and literary creativity. According to Sever, literary creativity is the bringing to life of basic elements of a creative work and its applications, such as self-recognition and decision making by thinking, planning, and converting decisions into action using these plans.

"Creativity is the ability of developing new ideas, solving problems using original solutions, and being superior to others in terms of imagination, behavior, and productivity" (Buzan, 2003, p. 12). Creativity is setting relations among unrelated contacts, creating a new experience, and introducing experiences, ideas, and products. Creativity is restructuring our meaning of the universe and adding novelty to the reality for individuals or for the culture (San, 1985). Parham (1998, p.

279) defines creativity as "the skill of finding out new, original and useful solutions to problems".

Creativity can be displayed with several products such as painting, constructing a building, or composing a song. Or it can be demonstrated by having different and original ideas and expressing them. One of the most important ways of expressing creativity is writing genuine and original texts.

Creative writing is "expressing the impressions received from the outer world with a different presentation" (Aşılıoğlu, 1993, p. 146). According to Oral (2003, p. 7), creative writing is "one of the methods that will improve creativity and personality". According to Brookes and Marshall (2004), creative writing is authenticity and imagination instead of standardization and the accuracy of thoughts. Also, creative writing is more than transferring knowledge; it is possessing language usage ability. Since creative writing is a personal expression, it does not have a standard format. Sharplas (1996, p. 134) also mentions that creative writing cannot accompany limited and standard thinking. He believes that the main philosophy of creative writing is the "recreation of sentimental experiences within the mind".

According to Rawlinson (1995, p. 20), creative thinking, which is the basis of creative writing, is "establishing relationship among unconnected objects or thoughts". The main idea here is that the departure points of creative thinking are existing objects or thoughts (Temizkan, 2010, p. 624). The individual's connection of these aspects with outside events has considerable importance for realizing these mental relations. The basis of an intertextual reading approach is making connections with other texts.

Texts are meaningful structures formed by consecutive sentences, words and visuals, and all kinds of information; feelings or thoughts are added into this structure following a logical order. (Güneş, 2007). Akyol (1996, p. 8) defines text as follows: "everything from which a meaning can be formed is a text". Kristeva (1969) states that every text is a structure formed by quoted passages and a product of blending with other texts.

Every text is sited inside a culture; thus it may refer not only to the reality of the world we live in, but also to its predecessors, other written or oral texts; these referrals are called intertextual relations (Kıran, 2000). From this perspective, the text meaning is shaped by another text. While setting up such a meaning, the reader uses a top-level cognitive effort. The reader is reading and at the same time discussing the texts (authors). Intertextual reading and meaning formation allow the reader to think intertextually and develop alternative perspectives. (Akyol, 2010).

According to Bothorel, Duberg, and Thoraval (1976, p. 94), a text does not belong to one person; it belongs to everybody. It cannot be limited by a language or by a thought or a world. Each text is a re-reading, a highlighting, a relocation, and a profound expression. Each text is located at the intersection point of many texts. Each kind of text possesses many meanings, independent of its content. A text is the property of its writer until its production; afterwards it is the anonymous property of the reader.

"Intertextuality is the sharing of a text with other ones; it is a cooperation of texts" (Ögeyik, 2008, p. 21). It is a kind of exchange, a speech or communication

format among two or more texts (Ünal, 2007, p., 29). Kristeva (2003) names all kinds of relationships among texts as intertextuality and saw them as a measure of literality (Aktulum, 2000). Scholes (1985) indicates three main elements of the relationships among the concepts of "reading","intertextual meaning setting", and "intertextuality": reading, commenting, and criticizing.

According to Hartman (1992), intertextuality should be based on three factors: the writer of the text, the reader of the text, and the context. The expression of style in the text is based on the texture (Cited in Ünal, 2007). "Intertextual reading is producing new meanings by setting up relationships among the thoughts and ideas of the texts" (Akyol, 2010, p., 233). It is running two or more texts at the same time to get meaning (Ünal, 2007). "The intertextual reader gets rid of the limited meaning restrictions of texts. There is not a route directing the reader" (Irwin, 2004, p. 230).

Barthes (1998) argues that with an intertextual approach, the writer disappears at the point in the text where the reader finds himself. Barthes insists that the validity of a text does not lie on its originality; what should be counted is the way that the text directs the reader. Comprehensibility of the text is determined by the understanding of the reader from the text, not from what the writer has written. The learning level of the reader is directly proportional to the meaning assigned to the text by the reader.

Scholes (1985, p. 24) defines the relation between reading and text as, "producing a text inside a text while reading", "producing a text over a text while commenting", and "producing a text versus a text while criticizing". For the importance of the connections, each text should systematically have unlimited connections with another text. Scholes states further that if a text has no connections with the others, it is like emptiness.

This study aims to reveal the effectiveness and efficiency of an intertextual reading approach on the improvement of writing skills among primary school fifth-grade students. Davaslıgil (1994, p. 53) states that "creativity is not a rare ability owned by a minority; it is a cognitive skill that can be developed, improved, and owned by everybody. Primary school students who experience the pleasure of writing, express their feelings comfortably through writing, and reveal their creativity are encountering something really important in terms of education. But conducted studies reveal that students have a negative attitude towards writing; schools have insufficiencies in teaching writing skills, and most of the graduated students have difficulties with writing. (Akkaya, 2011; Öztürk, 2007; Allen, 2003; Hansen and Hansen, 2003; Richards 2000 (cited in İnal, 2006); Gökalp-Alpaslan (2000); Essex, 1996).

The writing skill, which is quite difficult to acquire, should be taught and improved in schools using different techniques and methods. Students who have a positive attitude towards writing and get pleasure from it have reached that position through a teacher's appropriate creative writing methods and techniques in the education environment. Because of applications' difficulties, which are exposed by students, the writing skills should have priority over the other learning areas of language study.

In addition, it is obvious that the creative writing skills of the students cannot be improved by using conventional methods; the methods often applied are insufficient. Therefore, providing concrete results that display the improvement of students' creative writing skills and offering recommendations based on these results is quite important for future studies. This study, revealing the relation between an intertextual reading approach and creative writing skills, will provide an important contribution to the literature.

Method

Research Design

This study, which investigates the effectiveness and efficiency of an intertextual reading approach on the improvement of writing skills among primary school fifth-grade students, is designed as a "Pretest – Post-test with Control Group" experimental research model. The Pretest – Post-test with Control Group model consists of two randomly determined groups. One of them is used as the test group, whereas the other is the control group. Measurements are taken in both groups before and after the experiment. Pretests of the model help to reveal the similarity levels of the groups before the experiment and also help to calibrate post-test results accordingly (Karasar, 1994). Experimental studies are the kind of research where the most accurate results must be obtained. Because the researcher uses comparable applications and observes their effects, the results of these studies are expected to lead the researcher to the most accurate comments. (Büyüköztürk, Kılıççakmak, Akgün, Karadeniz & Demir, 2009)

During the study, an intertextual approach was applied to the students from the test group, whereas students from the control group continued with their normal training. At the end of the application, a creative writing activity was conducted with both groups, and the differences between groups were investigated.

Research Sample

The research sample composed of primary school fifth-grade students in Kırşehir provinces in 2012 academic term. The sample of the study was obtained by randomly selecting fifth-grade students at Akpinar Primary School.. In order to guarantee internal validity of the data, the test and the control groups were determined by drawing. There were 42 students, 21 in the test group and the remaining 21 in the control group.

Research Instrument

Data from the study was gathered and assessed according to the "Creative Writing Rubric" developed by Öztürk (2007). The "Creative Writing Rubric" has eight subdimensions, namely "*Originality of Ideas, Fluency of Thoughts, Flexibility of Thoughts, Vocabulary Richness, Sentence Structure, Organization, Writing Style, and Grammar*". The creative writing samples from the students were examined and evaluated in terms of "*Originality of Ideas*" and "*Vocabulary Richness*". Scores from each subdimension could vary between 1 and 5. Thus the score of each student could vary between 2 and 10.

Experimental Application

Within the content of the study, three texts were chosen *(The Foundation of the Union, The Old Holiday Fragrances,* and *Atatürk Became Children)* under the theme *"Our Values"* from the course book, published by Engin Publishing House and distributed to the students by the Ministry of National Education. The students of the test group were instructed using an intertextual approach. The same texts were instructed to the students of the control group by following the conventional text processing steps of a language course. After completing each text, both test and control group students were asked to write an informative or narrative essay (creative writing) about the subject of the text. The research took place between April 4 and 29 (year?) as an experimental study.

Experimental Process Stages. Each text was taught to both test and control groups on the same dates for six hours. During the instruction, *intertextual connection categories* prepared by Pappas, Maria, Anne, and Amy (tran. by Ünal, 2007 from 2003) were applied to the test group by the researcher in four categorical operations. The intertextual connection categories used in the research are as follows: 1. making connections with other written texts about the same subject, 2. making connections with research outputs, 3. making connections with communicated events, and 4. making connections with other situations that were not explicitly explained, only implied. During the same time interval, the same texts were taught to the students of the control group by following the conventional steps of a typical language course. Following each text, the test and the control group students were asked to write an essay about the subject of the text, using either "narrative" or "informative" style.

The first text, in line with the sequencing of the language course book, is "The Foundation of the Union". The works written by the students after completing this text were scored separately by the researcher and two specialists (one language teacher and one class teacher) according to the Creative Writing Rubric. "Midtest 1" data were formed by figuring the arithmetic mean of these three scores. Data obtained by scoring the writings of students from the test and the control groups after reading and discussing the second text, "Atatürk Became Children," were recorded as "Midtest 2". The same procedure applied to the last text, "The Old Holiday Fragrances"; the arithmetic mean of the scores was recorded as "Mid-test 3".

After reading and writing about all texts and performing the measures mentioned above, students from the test and the control groups were asked to write an essay, on the subject and in style that they prefer, in order for the researcher to make a general evaluation. These writings were scored the same way. This essay was designated as the "Final Test". Midtest 1, Midtest 2, and Midtest 3 were tests given to evaluate the students after each text of the "Out Values" theme, during the process, whereas the final test was a general evaluation aiming to determine the level of the students after the whole process.

Data Analysis

At the beginning of the study, students from the test and the control groups were asked to write a free text about a subject that they chose themselves (adventure, excitement, death, image, environment, friendship, etc.) in order for the researcher to determine the starting levels of their creative writing skills. The students' creative writing was scored separately by the researcher and two specialists (one language

teacher and one class teacher). The pretest data of the study were formed by taking the arithmetic mean of these three scores. There was no significant difference between the pretest results of the test and the control groups. Data obtained from this evaluation have a normal distribution for both the test and the control groups. In this context, One-Way Anova was used to analyze the data from all the students' essays evaluated according to the rubrics. "Post-hoc" was applied to determine the source of the difference between the groups and the "Scheffe" test's results were used. A 0.05 significance level was taken as significant differences.

Results

Outputs of the study are summarized and interpreted in the tables below. Table 1 displays the pretest results that show the starting creative writing levels of the students from the test and the control groups.

Table 1
One-way Anova Results of Creative Writing Analysis of Test and Control Groups - Pretest

Source of Variance	SS	df	MS	F	P	Significant Difference
Between Groups	2,881	1	2,881			
Inside Group	99,238	40	2,481	1,161	,288	P>.05
Total	102,119	41				

SS: Sum of Squares, *df*: Degree of freedom, *MS*: Mean Square,

The output displayed in the table shows that there is not a significant difference between the pretest scores of the students from the test and the control groups [*F*(1,161); *p*>.05]. This means that, before the investigation, the creative writing level of the test group was close to the creative writing level of the control group.

Table 2
One-way Anova Results of Creative Writing Analysis of Test and Control Groups - Post-Test

Source of Variance	SS	df	MS	F	P
Between Groups	54,857	1	54,857		
Inside Group	163,429	40	4,086	13,427	,001
Total	218,286	41			

SS: Sum of Squares, *df*: Degree of freedom, *MS*: Mean Square,

As displayed in Table 2, the difference between the means of the post-test in the test and the control groups is significant [*F(13,427); p<.0*].

Table 3

Findings about the "Originality of Ideas" in the Test and the Control Groups

Source of Variance	SS	df	MS	F	P
Between Groups	18,667	1	18,667		
Inside Group	48,952	40	1,224	15,253	,000
Total	67,619	41			

SS: Sum of Squares, *df*: Degree of freedom, *MS*: Mean Square,

The findings in the table show that texts taught using an intertextual approach in primary school fifth-grade students create a significant difference in terms of "*featuring creative and unusual ideas (originality of ideas)*" [*F(15,253); p<.05*]. The Scheffe test was conducted in order to see the groups whose means have created this difference. The data is represented in Table 4.

Table 4

Mean Scores of Test and Control Groups in Terms of Originality of Ideas and Significance Levels

	Test Pre-test	Test Mid-test 1	Test Mid-test 2	Test Mid-test 3	Test Final test	Control Pre-test	Control Mid-test 1	Control Mid-test 2	Control Mid-test 3	Control Final test
Test Pre-test	M=2,00									
Test Mid-test 1		M=2,90				,023	,035		,023	,035
Test Mid-test 2			M=2,14							
Test Mid-test 3				M=2,23						
Test Final test					M=2,90	,023	,035		,023	,035
Control Pre-test		p<.05			p<.05	M=1,52				
Control Mid-test 1		p<.05			p<.05		M=1,57			
Control Mid-test 2								M=1,66		
Control Mid-test 3		p<.05			p<.05				M=1,52	
Control Final test		p<.05			p<.05					M=1,57

M: Aritmetic Mean; P: Significance

According to the findings of Table 4, the difference between pretest mean scores of the test (M =2.00) and the control (M =1.52) groups' students is not significant (p>.05). Thus, before the application, both groups were at similar levels in terms of "*originality of ideas*". On the other hand, the difference (M test final-test – control final test =1.33) between the final test mean scores of the test group (M =2.90) and the control group (M =1.57) is found to be significant in favor of test group (p<.05). This finding shows that an intertextual reading approach, which has been applied to the test group, increases the success of students in terms of "*originality of ideas*".

It was also found that midtest 1, midtest 2, and midtest 3 mean scores of the test group are higher than the mean scores of the control group and these differences are statistically significant. We can possibly to view these results as signifying that an intertextual reading approach applied to the test group is effective in improving students' creative writing skills in terms of "*originality of ideas*".

Findings about the comparison of the creative writing of the test and the control groups in terms of "*Vocabulary Richness*" (richness of word meanings, appropriate usage of the words, words being in line with the purpose of the text, etc.) are displayed in Table 5 and Table 6.

Table 5

Findings About the "Vocabulary Richness" Dimension In the Test and the Control Groups

Source of Variance	SS	df	MS	F	P
Between Groups	9,524	1	9,524		
Inside Group	40,952	40	1,024	9,302	,004
Total	50,476	41			

SS: Sum of Squares, *df*: Degree of freedom, *MS*: Mean Square,

Table 5 shows that the difference between the final-test mean scores of the test and the control groups' students in terms of "*Vocabulary Richness*" is significant [*F(9,302); p<.0]*). The Scheffe test was conducted in order to see the groups whose means have created this difference. The data is represented at Table 6.

Table 6

Mean Scores of the Test and the Control Groups in Terms of Vocabulary Richness and Significance Levels

	Test Pre-test	Test Mid-test 1	Test Mid-test 2	Test Mid-test 3	Test Final test	Control Pre-test	Control Mid-test 1	Control Mid-test 2	Control Mid-test 3	Control Final test
Test Pre-test	M =1,66									
Test Mid-test 1		M =2,80					,015	,003		
Test Mid-test 2			M =2,23							
Test Mid-test 3				M =2,23						
Test Final test					M =2,66			,015		,150
Control Pre-test						M =1,61				
Control Mid-test 1	p<.05						M =1,47			
Control Mid-test 2	p<.05			p<.05				M =1,33		
Control Mid-test 3									M =1,66	
Control Final test				p<.05						M =1,33

M:Mean; P: Significance

According to the findings in Table 6, the difference between pretest mean scores of the test (*M* =1.66) and the control (*M* =1.61) groups' students is not significant (*p*>.05). It is clear that, before the application, both groups were at similar levels in terms of "*vocabulary richness*". On the other hand, the difference (*M* test final-test – control final test =1.33) between the final test mean scores of the test group (*M* =2.66) and the control group (*M* =1.33) is found to be significant in favor of the test group (*p<.05).*

This finding shows that an intertextual reading approach, which has been applied to the test group, increases the success of students in terms of "*vocabulary richness*".

It also was found that the midtest 1, midtest 2, and midtest 3 mean scores of the test group are higher than the mean scores of the control group, and these differences are statistically significant. These results show that an intertextual reading approach applied to the test group is effective in improving students' creative writing skills in terms of "*vocabulary richness*".

Discussion and Conclusion

In this study, where the effect of an intertextual reading approach on the writing skills of primary school fifth-grade students has been investigated, a significant difference has been revealed between the final test scores of the test group's students to whom intertextual reading activities were conducted and the control group's students to whom intertextual reading activities were not applied. In his study, Ünal (2007) also discovered that an intertextual reading approach positively affects students' understanding of what they read. In addition, there are several studies stating that creative writing activities provided in class contribute to the creative writing skills of the students (Akkaya, 2011; Susar Kırmızı, 2009; Öztürk, 2007). These findings support the output of the study.

Primary school fifth-grade texts taught using an intertextual reading approach create a significant difference in "*featuring creative and unusual (original) ideas*". Öztürk (2007), in his study "Creative writing skill evaluation of primary school fifth-grade students", identified that creative writing strategies done with the students improved the "*originality of ideas*" dimension. The findings of Öztürk support the findings of this study.

Primary school fifth-grade texts presented using an intertextual reading approach create a significant difference in the "*Vocabulary Richness*" (richness of word meanings, appropriate usage of the words, words being in line with the purpose of the text, etc.) dimension. Öztürk (2007) also indicated that using creative writing methods with the primary school fifth-grade students to improve their creative writing skills improved the "*vocabulary richness*" dimension. The findings of Öztürk overlap with the findings of this study.

In Conclusion, an intertextual reading approach can be used to reach effective results in the achievement and improvement of students' creative writing skills. Intertextual reading allows for an increase in the idea generation of the students; it creates interaction among thoughts by making connections between them. These kinds of activities should take place in order to produce fluency of thought and originality of ideas. In addition, using an intertextual reading approach increases the thinking capacity of the students, and thought disconnection can be prevented. The use of an intertextual reading approach is important for achieving thought flexibility. While applying intertextual reading, the increased number of connections means that students learn new words. They can use these learned words in their creative writing with different meanings, in the right places and to support the purpose of the text.

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Yaratıcı Yazma Becerisinin Geliştirilmesinde Metinler Arası Okuma Yaklaşımının Etkisi

Atıf:

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Özet

Problem Durumu: Hayatın her aşamasında konuşma ve yazı dili; duyguları, düşünceleri, istekleri açıklamada kullanılan önemli bir araçtır. Kültürün gelecek kuşaklara aktarılması için de yazı önemli bir unsurdur. Yazı dilinin etkin bir şekilde kullanılması için yazma öğretimine, eğitim-öğretimin bütün aşamalarında gereken önem verilmeli, öğrencilerin daha iyi yazmaları için uygun ortam hazırlanıp farklı yöntem, teknik ve stratejiler işe koşulmalıdır. Metinler arası okuma yaklaşımı da öğrencilerin yazma becerilerinin geliştirilmesi için başvurulabilecek stratejilerden birisidir.

Metinler arasılık, bir metnin başka metinlerle olan paylaşımıdır, metinlerin iş birliğidir. İki ya da daha çok metin arasında bir alışveriş, bir tür konuşma ya da söyleşim biçimidir. Metinler arası okuma ise metinlerdeki düşünceler ve fikirler arasında ilişkiler kurarak yeni manalar üretmektir. İki ya da daha çok metni anlam kurmak için işe koşmaktır.

Yazma, beyinde yapılandırılmış bilgilerin yazıya dökülmesi işlemidir. Bunun için öğrencilerin dinledikleriyle okuduklarını iyi anlamaları ve beyinde yapılandırmaları gerekmektedir. Yazma, düşüncelerin ifade edilebilmesi için gerekli olan sembol ve işaretleri kinestetik olarak üretebilme becerisidir. Yaratıcı yazma ise; dış dünyadan edinilen izlenimlerin farklı bir sunumla ortaya konulmasıdır. Düşüncelerdeki doğruluktan ya da standartlaştırmadan daha çok özgünlük ve hayal gücüdür. Ayrıca yaratıcı yazma bilgiyi aktarmaktan ziyade, dili kullanabilme yeteneğine sahip olmaktır. Pek çok uzmana göre yaratıcı yazma, "yaratıcılığı ve kişiliği geliştirecek yöntemlerden birisidir.

Problemlere farklı çözüm yolları üretebilmek, üretilen çözüm yollarından yola çıkarak yeni fikirler oluşturabilmek ve yeni buluşlar gerçekleştirebilmek kişilerdeki yaratıcılık becerisi ile paralellik göstermektedir. Eğitim-öğretim sürecinde yaratıcı yazma becerilerinin geliştirilmesinde uygun yöntem ve yaklaşımların kullanılması öğrencilerin daha başarılı eserler ortaya koyabilmelerini sağlamaktadır.

İlköğretimin ilk beş sınıfında İlköğretim Türkçe Dersi Öğretim Programı ve Kılavuzunda yer alan temel becerilerin öğrencilere kazandırılması ve geliştirilmesi amaçlanmaktadır. Bu becerilerden olan "yaratıcı düşünme ve metinler arası okuma becerilerinin" Türkçe dersleri içerisinde öğrencilere kazandırılması önem arz etmektedir.

Araştırmanın Amacı: Bu araştırmada Türkçe derslerinde metinler arası okuma yaklaşımını uygulamanın, ilköğretim beşinci sınıf öğrencilerinin yaratıcı yazma becerilerinin geliştirilmesinde etkili olup olmadığının tespit edilmesi amaçlanmıştır.

Araştırmanın Yöntemi: Araştırmada "Ön Test – Son Test Kontrol Gruplu" deneysel araştırma modeli kullanılmıştır. Araştırmanın çalışma grubunu Kırşehir Millî Eğitim Müdürlüğüne bağlı Akpınar İlköğretim Okulunun 5. sınıf şubelerinde okuyan öğrenciler oluşturmuştur. Araştırma sürecinde deney grubundaki öğrencilere Türkçe derslerinde metinler arası okuma yaklaşımı uygulanırken, kontrol grubundaki öğrenciler Türkçe derslerinde normal öğretimlerine devam etmişlerdir. Uygulamalar sonrasında her iki gruptaki öğrencilere yaratıcı yazma etkinliği yaptırılmış ve metinler arası okumanın öğrencilerin yaratıcı yazmalarında farklılık oluşturup oluşturmadığı belirlenmeye çalışılmıştır.

Veri toplama aracı olarak "Yaratıcı Yazma Rubriği" kullanılmıştır. Yaratıcı Yazma Rubriği; "*Fikirlerin Orijinalliği, Düşüncelerin Akıcılığı, Düşüncelerin Esnekliği, Kelime Zenginliği, Cümle Yapısı, Organizasyon, Yazı Tarzı ve Dil Bilgisi*" olmak üzere sekiz alt boyuttan oluşmaktadır. Araştırmada öğrencilerin yaratıcı yazma eserleri bu boyutlardan "*Fikirlerin Orjinalliği*" ve "*Kelime Zenginliği*" bakımlarından incelenmiş ve değerlendirilmiştir.

Çalışmada deney ve kontrol gruplarının kendi içlerinde ve birbirleri ile ilişkilerinin tespitinin veri analizinde, tek yönlü varyans analizi (One-Way Anova) kullanılmıştır. Elde edilen verilerin normallik dağılımları incelenmiş, gruplar arası farkın kaynağının belirlenmesi amacıyla "Posthoc" yapılmış ve bu kapsamda "Scheffe" testi sonuçları kullanılmıştır.

Araştırmanın Bulguları: Uygulamalar öncesinde deney ve kontrol grubundaki öğrencilerin hazırbulunuşluluk seviyelerinin belirlenmesi amacıyla yapılan ön test puanları arasında anlamlı bir farklılığın olmadığı görülmüştür.

Deney grubundaki öğrencilerin fikirlerin orjinalliği boyutuyla ilgili ara test 1, ara test 2 ve ara test 3 ortalamalarının kontrol grubu öğrencilerinden daha yüksek olduğu belirlenmiştir. Ayrıca deney grubunun son test ortalamaları (M =2,90) ile kontrol grubunun son test ortalamaları (M =1,57) arasında farkın ($M_{\text{deney son test -kontrol son test}}$ =1,33) deney grubu son test lehine anlamlı olduğu saptanmıştır ($p < .05$). Bu durum

deney grubuna uygulanan metinler arası okuma yaklaşımının, öğrencilerin *"fikirlerin orijinalliği"* boyutundaki başarılarını arttırdığını göstermektedir.

Deney grubundaki öğrencilerin kelime zenginliği boyutuyla ilgili son test ortalamaları (M =2,66) ile kontrol grubunun son test ortalamaları (M =1,33) arasında farkın ($M_{\text{deney son test-kontrol son test}}$ =1,33) deney grubu son test lehine anlamlı olduğu saptanmıştır ($p<.05$). Bu durum metinler arası okuma yaklaşımının uygulandığı deney grubundaki öğrencilerin yaratıcı yazmalarında daha farklı ve daha çok kelime kullandıklarını göstermektedir. Kelime zenginliği ile ilgili ara test 1, ara test 2 ve ara test 3 ortalamaları karşılaştırıldığında da deney grubundaki öğrencilerin puanlarının, kontrol grubundaki öğrencilerin puanlarından daha yüksek olduğu ve bu farklılığın istatistiksel olarak anlamlı olduğu belirlenmiştir. Bu sonuçlar deney grubuna uygulanan metinler arası okuma yaklaşımının öğrencilerin yaratıcı yazma becerilerinin geliştirilmesinde, *"kelime zenginliği"* boyutunda etkili olduğunu göstermektedir.

Sonuçlar ve Öneriler: Araştırma sonucunda, metinler arası okuma yaklaşımının uygulandığı deney grubundaki öğrencilerin yaratıcı yazma eserlerinin orijinal fikirlere yer verme ve kelime zenginliği boyutlarındaki puanlarının, geleneksel yöntemlerle derslerin işlendiği kontrol grubu öğrencilerinden daha yüksek olduğu ve bu farklılığın istatistiksel olarak anlamlı olduğu saptanmıştır.

Metinler arası okuma yaklaşımı ile öğrencilerin düşünce üretimlerinin artmasını sağlanırken, fikirler arasında bağlar kurdurularak düşüncelerin birbirleriyle etkileşimi sağlanabilmektedir. Bu nedenle İlköğretim sınıflarında öğrencilerin yaratıcı yazma becerilerinin geliştirilmesi sürecinde, bu tür etkinliklere yer verilerek orijinal fikirlerin ortaya konulması sağlanabilir.

İlköğretim 5. sınıfta metinler arası okuma yaklaşımıyla işlenen metinler, öğrencilerin yaratıcı yazmalarında *"kelime seçimi"* boyutunda anlamlı bir fark oluşturmaktadır. Bu nedenle metinler arası okuma uygulanırken ne kadar çok bağlantı yaptırılırsa; öğrencilerin yeni kelime öğrenmeleri, öğrendikleri kelimeleri farklı anlamlarda ve doğru yerlerde, amaçları doğrultusunda kullanmaları sağlanabilir.

Anahtar Kelimeler: Metinler arasılık, okuma, metinler arası okuma, yazma, yaratıcı yazma.

Teaching Practice of a Social Studies Practicum Student Who is Blind: a Case Study

Erdoğan KAYA*

Suggested Citation:

Abstract

Problem Statement: It is emphasized in the Council of Europe's action plan for people with disabilities (PD) that it is important to solve the employment problem to enable PD to integrate into society and improve the quality of their lives. In order to achieve this, educational opportunities along with employment for PD at places in which physical conditions are adjusted should be provided. Disability prevents PD from joining educational life which also increases the burden of their disability. Education will help them integrate with the society they live in and therefore prevent isolation. However, some people in Turkey have doubts about the professional competencies of PD.

Purpose of Study: In this study, the social studies teaching practice conducted by a practicum student who is blind is described.

Methods: The holistic single case design, which is one of the qualitative research techniques, was used through interviews and observations in this study. The university supervisor, mentor teacher, sighted practicum students and students who continually interact with the main participant who is a blind practicum student (BPS) make up the other participants. In analyzing the student interviews, content analysis was carried out.

Findings and Results: The findings of the study are as follows: first Impressions of the BPS, the BPS beginning the lesson, classroom management, teaching the lesson, evaluation, ending the lesson, his differences from other practicum students, the problems that occur in the social studies lessons of the BPS, suggestions for the BPS's lessons.

Conclusions and Recommendations: The results suggest that all school stakeholders should be educated and prepared for the education process with people who are blind or visually impaired (BVI). This practice conducted by the BPS revealed the importance of education, social and physical conditions.

Keywords: Social studies lessons, teaching practice, people who are blind, practicum student who is blind

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In the past, in some religions, it was believed that blindness was punishment for a sin. Although this belief has changed today, many people who are sighted still have misconceptions about people who are BVI. It is this question "How will those misconceptions regarding the BVI people change?" that needs to be answered concerning these prejudices, which are the biggest obstacles they face (Hardman, Drew & Egan, 2008). To eradicate prejudices, it is necessary for PD to take on social responsibilities. The Council of Europe's action plan on PD (2010) highlights that it is important to provide PD with occupations to enable them to take active roles in their society and improve the quality of their lives. It is clear that educational opportunities should be expanded to solve the problem because education is the most basic factor improving a person's level of health, work, income, and involvement in a social life. Disability prevents PD from joining the educational life, which also increases the burden of their disability (Cavkaytar, 2005).

While the PD comprise approximately 10% of the world's population (*World Health Organization*, 2010), in Turkey it is estimated as 12.29%. Of all the disabled, 0.60% are visually handicapped. (Turkish Statistical Institute, 2010). Only 2.42% of them have access to the opportunities of higher education. The rate of unemployment among PD is 78.29% (Administration for Disabled People, 2006). In the Turkish Disability Act 2005, education and employment of PD are highlighted with great importance. The act specifies that PD must constitute at least 3% of the employees working at government agencies and businesses with 50 employees. Those places have to make work environments suitable for PD and provide them with assistive technologies (Turkish Republic Prime Ministry, 2010).

Discussions about the employment and studies of BVI teachers occupied Turkey's agenda for a long time. In recent years, it has been understood from the discussions in Turkey that educators and parents are doubtful about the quality of education that is being and will be provided by the teachers who are BVI. One of the quality indicators of education is teaching competencies. Mastership level of teaching competency of practicum students defines the productivity of teaching practices (Yeşil, 2009). However, BVI teachers need different environments to fulfill their teaching competencies than sighted teachers because the program, school culture, administration, teachers, assistant staff, supportive services and physical structure in the teaching environment of PD are very important (Argyropoulos & Stamouli, 2006; Bardin & Lewis, 2008; Sharma, Moore, Furlonger, King, Kaye & Constantinou, 2010). BVI people need specially organized schools. In Turkey, there are three different applications of special education and they are as follows: (1) formal education in special education schools, (2) special education in inclusive classrooms and schools (3) support services such as physical and speech therapy, occupational therapy in private special education and rehabilitation centers. These services are provided in cooperation with the Ministry of National Education, general directorate of special education and guidance, city organizations, and special education and guidance centers (Cavkaytar, 2006).

What really matters is to create appropriate educational environments for BVI people in schools. In this context, materials and facilities such as, libraries, accessible

computers, media resources, tactile teaching devices, braille and auditory tools, and revolving doors positively affect the education of BVI people. It is very important to develop sound-based communication skills in these environments where classroom teachers, assistant teachers, families and peers take part (Koening & Friend, 2006).

In Turkey, higher education exams for PD are conducted through a special method that considers their type of disability and preferences as well as their health reports and needs. PD take exams in specific classrooms and are given assistants (Student Selection and Placement Center, 2010). BVI undergraduate students, like those who are sighted, take theoretical courses in the first two years at university and practice-focused courses in the following years.

The literature review suggests that most studies have been conducted on BVI students, but almost none of them concerned BVI practicum students. However, education faculties sometimes admit BVI students, and those faculties and practicum schools are not necessarily prepared for the BVI practicum students. Therefore, this study aims at contributing to the teaching practices of BVI students, and it is significant in terms of emphasizing the importance of the issue. Besides this, the doubtful attitudes toward the job efficiency of BVI students manifest the necessity of this study.

The main purpose of this study was to describe the social studies teaching practices conducted by a senior BPS in a social studies teaching programme. The study posed the following questions:

1. What are the first impressions of the participants about the BPS?

2. How does the BPS begin his lesson?

3. How does the BPS manage the class?

4. How does the BPS teach a lesson?

5. How does the BPS evaluate?

6. How does the BPS end the lesson?

7. What are the differences between the BPS and sighted practicum students?

8. Which problems occur in the BPS's social studies lesson?

9. What are the suggestions for the BPS's social studies lesson?

Method

Research Design

The holistic single case study which is one of the qualitative research methods was used in this study. It is important to study the research topic deeply in qualitative research (Bogdan & Biklen, 1998). There is a unit (BPS) in the focus of the holistic single design. This design can be used when situations are typical (Yıldırım & Şimşek, 2005). BPS's teaching practice was considered a typical situation. In typical

sampling, the aim is not to generalize but to get information. This condition was the reason to do content analysis.

Participants

Participants should be people who know each other, share the same field and are involved in an interaction (Patton, 2002). The BPS, the university supervisor, the mentor teacher, a sighted practicum student and 22 elementary school students (10 female and 12 male) who continually interact with the main participant, a BPS, constitute the participants. Therefore, the data triangulation technique was used. The aim in triangulation is to determine the different and similar perspectives (Bogdan & Biklen, 1998). The students are the ones who received instruction from the BPS during the 12-week teaching practice. The BPS conducted the practice process using the lessons of the mentor teacher along with a sighted prospective teacher. All participants are the individuals who witnessed the teaching process of the BPS. In this study, the role of the teacher, who is also the practice supervisor evaluating the BPS by observation, was to conduct the interviews.

Data Collection and Procedure

In case studies, it is suggested to collect data using multiple techniques because, with a rich data base, the results are analyzed with a greater perspective; with various interpretations, the ratios of validity and reliability may increase (Merriam, 1998). The actual question that is necessary to be answered in case studies is "What is a case?" in case studies since all techniques are used to describe the sample case. The teaching practice lasted for 12 weeks and data were collected in the 2010-2011 academic year in Eskişehir. The BPS practiced six lessons per week for twelve weeks. In the process of data collection, firstly the permissions from the Ministry of National Education, mentor teacher and practicum students were obtained. The BPS's materials included his laptop with screen-reading, voice-recorder and braille. He transferred the voice recording of his lessons to a computer with the support of a volunteer assistant practicum student.

Subsequently, interview forms including nine questions parallel to the aims of the study were prepared. The forms were first examined by experts for their validity. After the experts presented their opinions and the pilot application was completed, the forms took their final shapes. The semi-structured interviews with participants were conducted with a voice recording device. The researcher completed the interviews in 19 days in the spring term. They lasted for between 15 and 40 minutes. The university supervisor filled out the evaluation form while observing the BPS as he was teaching a lesson at the end of the term. In another lesson, the supervisor carried out an unstructured observation. The observation records were filmed with the help of another experienced university supervisor. The observation forms were used to get supportive data.

Data Analysis

In analyzing the student interviews, content analysis was used. The data were examined in accordance with the aim of the study and coded by a researcher and an expert separately. Subsequently, by comparing the codes, a compromise was attained

and the inter-coder reliability ratio was 95.45%. The following formula was used; Reliability= Agreement/Agreement+Disagreement x 100 (Miles & Huberman, 1994). The codes were classified under specific themes and digitized to compose meaningful totals in the findings. The findings were presented simply parallel to the questions and themes obtained. QSR NVivo was used only in modelling the data. Nicknames were used in place of students' real names in quotations.

The findings on students were supported with other findings obtained from other sources. At the final stage of the analysis, they were reorganized in accordance with the suggestions of all sources. Those findings were interpreted in the discussion part and confirmed in comparision with the findings of other related studies.

Findings and Results

First Impressions on BPS

Students expressed their first impressions as seen in Figure 1.
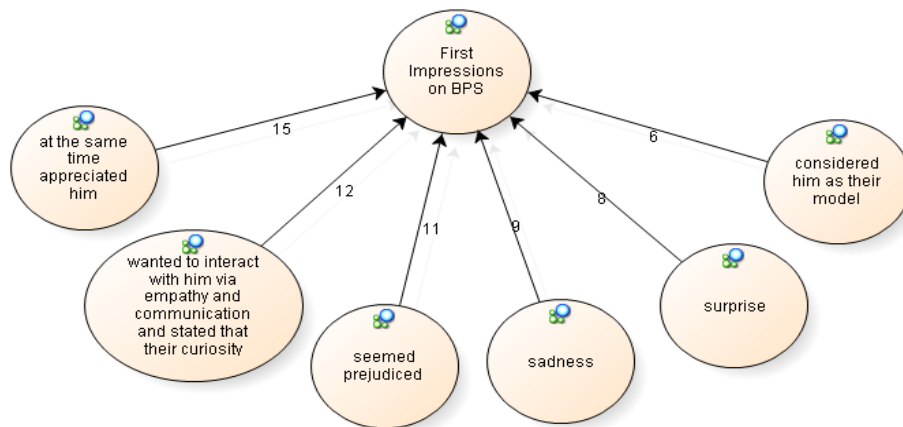
Figure 1. First impressions on student opinions towards BPS

One of the students, called Ozan, said "I had never seen a teacher with disability. First of all, I was surprised and sad. I thought that he wouldn't conduct the course very well. I put myself into his shoes. I was curious about how he was going to teach the lesson."

The mentor teacher said "When I met the BPS, my reaction was similar to reactions of the majority. First, I was surprised. He arouses my curiosity. I asked myself whether he could do this or not as a practicum student, but I was happy. The fact that he was self-confident being a practicum student ignoring his disability made me really happy."

BPS Beginning the Lesson

As seen in Figure 2, students talked about the BPS beginning the lesson.
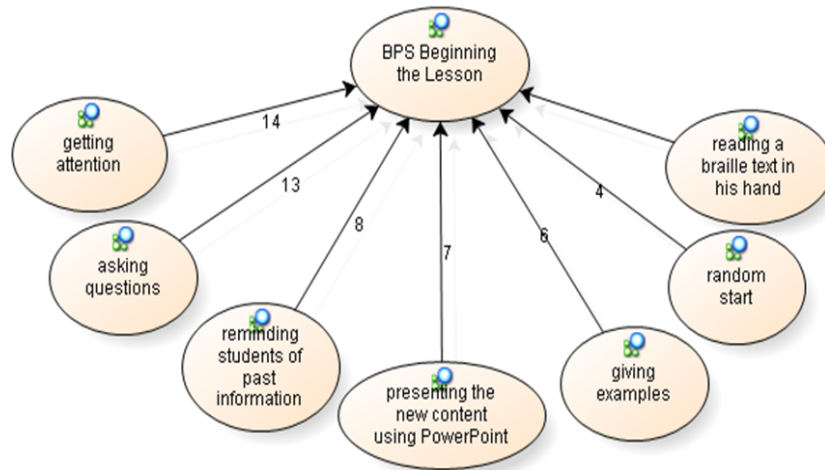
Figure 2. Student opinions towards the BPS beginning the lesson

One of the students called Deniz stated, "He enters the classroom with a smiling face. He explains what we will do step by step. He begins with entertaining questions and giving examples. Then he touches a special paper in his hand and explains what he is going to teach us."

The mentor teacher stated "Before he begins the lesson, he chats with his students. It is a positive attitude that he begins his lesson by asking questions like 'How are you?, What else did you do?' and therefore motivates them." The BPS explained his opinion as "When I begin my lesson, first of all I motivate my students. Subsequently, I tell or show them what we are going to do in that lesson using PowerPoint. Then, I activate their prior-knowledge." The sighted practicum student said "One of the first things that the BPS does in the classroom is to discover the physical structure and get students' attention. After greeting them, he asks students social chat questions like how they are and what they do in general. Later on, he makes revisions concerning the previous lesson and presents the lesson he will teach." The University supervisor expressed his observation as, "The BPS begins the lesson saying 'Good Morning!', and explains what they would do in the lesson step by step. He said that he heard news on the radio related to the topic. After all, he said that If you listen to me, you are going to learn about infectious diseases and you will have awareness about a healthy life."

BPS's Classroom Management

As seen in Figure 3, students stated their opinions about BPS's classroom management.
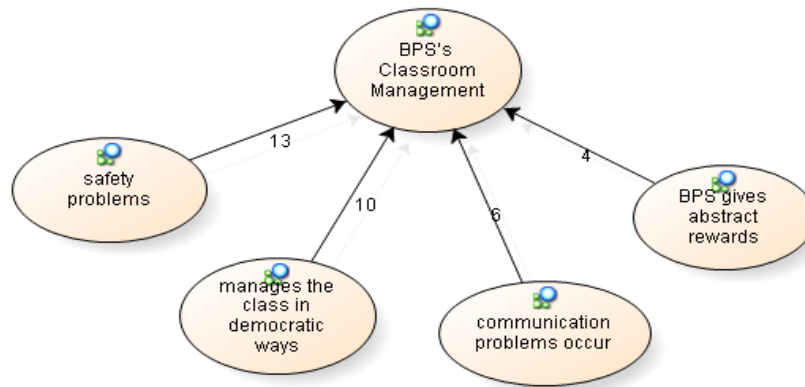
Figure 3. Student opinions towards BPS's classroom management

One of the students, İpek, said, "As our teacher cannot see, he wants us to speak saying 'I' instead of raising a hand. He generally approaches us warmly. He sometimes has some problems. There are some students who don't behave appropriately and are not respectful because our teacher doesn't see. Apart from these, he is a flexible teacher, not a harsh one."

The mentor teacher said, "Even though he is visually impaired, he is able to distinguish the voices of students. He has an affectionate, nice attitude towards everybody. He visits the teachers' room before he comes to the classroom. He chats with students to make them ready for the lesson. He asks questions about what they do at home, on holiday and therefore, he tries to motivate them." The BPS commented "I put greater importance on communicating with my students via voices as I cannot see. Therefore by learning their names, I know who wants to speak and who behaves inappropriately. I generally warn them verbally." The sighted practicum student said, "As the BPS has a strong hearing ability, he establishes all communication via voices and question-answer technique. He first instructs students to call out 'I' instead of raising their hands when they want to speak."

The university supervisor shared his observation "The BPS gave instructions to students about how they should behave. Students conveyed their requests calling out their teacher. Throughout his speaking, he sometimes asked 'Are you listening to me?' to his students. He said, 'Thank you for your careful listening, well-done.' He asked questions to them. He provided clues. He got answers and reinforced the correct ones. He corrected the wrong ones. Furthermore, he approached the students who asked questions by listening to them carefully and he tried to reply to those

questions face to face. He strained to make all students participate in the learning process. He established a democratic atmosphere."

BPS's Teaching of the Lesson

Figure 4 shows the methods and techniques that the BPS employed in his teaching.
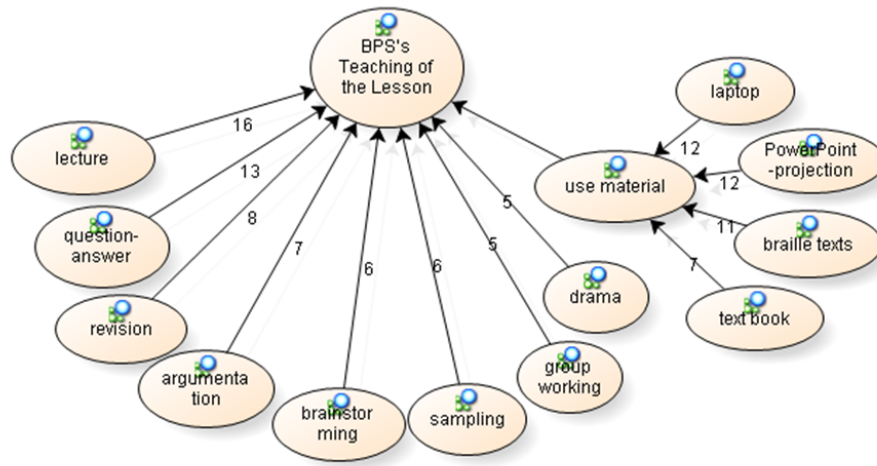
Figure 4. Student opinions towards the BPS's teaching of the lesson

Kerim, one of the students, said, "First of all, he explains the topic. He asks questions related to the topic. If we cannot answer properly, he retells the answer. In other words, he summarizes the topic. He demonstrates something using projection and he makes us write."

The mentor teacher commented, "He certainly comes to the classroom prepared. While managing the visuals/PowerPoint presentations he got help from his friend. It is difficult for him to use our most important lesson materials like maps, globes, etc. I can say that even though the materials for PD do not exist in our school, he is so eager to benefit from the existing opportunities to meet the requirements of conducting the lesson. For the rest, he always follows his braille text. He can feel what students do even though he cannot see. He understands when they are distracted from the lesson and he tries to motivate them by giving examples from real life." The BPS said, "While I am getting prepared, I first examine the text books and workbooks. I look for alternative methods and techniques to the ones in the books considering the flexibility of the curriculum. I test my prior-knowledge and browse resources. Among the methods and techniques I use are speech, question-answer, argumentation, brainstorming and drama. I select my materials in an elaborate manner before I bring them to the class. The materials I generally use are,

computer, projection/PowerPoint presentation and textbook." The sighted practicum student said, "He mostly uses speech and question-answer methods. In spite of the fact that he knows many different methods and techniques, his visual disability makes it harder for him to use them all. He efficiently uses his laptop with screen-reading and he prepares presentations. With the help of the projection, he uses them in the lesson." The university supervisor expressed his observation as "The BPS mostly used speech and question-answer methods and techniques while teaching his lesson. He associated his examples with real life. He used computer, projection and braille texts in the lesson."

BPS's Evaluation

As seen in Figure 5, the question "How does the BPS evaluate you?" was answered.
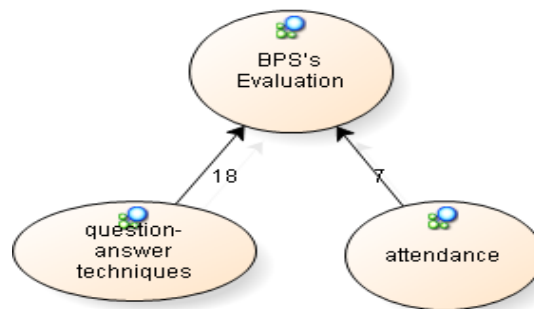
Figure 5. Student opinions towards the BPS's evaluation

A student called Ozan said, "He understands whether we have learned or not from our answers and participation. He asks questions and explains our pluses and minuses."

The mentor teacher said "The BPS tried to distinguish students. I saw that he distinguishes most of them by their voices or names. At break and lunch times, he evaluated students with me. There can be a problem transferring the evaluation into a document." The BPS commented, "I prepare open-ended and multiple choice questions to evaluate students. Generally, at the end of the lesson, I conduct an evaluation session using PowerPoint presentations and a couple of questions" The sighted practicum student said, "He evaluated the written examinations with my help. However, he verbally transferred his assessments concerning his teaching to mentor teacher and students." The university supervisor stated, "The BPS stimulates students to attend the process. He gives feedback like 'You are fine with general knowledge', 'Thanks for your participation', 'Yes, you are right'. He tries to encourage students with verbal rewards."

BPS's Ending of the Lesson

Students stated that the BPS ended his lesson as seen in Figure 6.
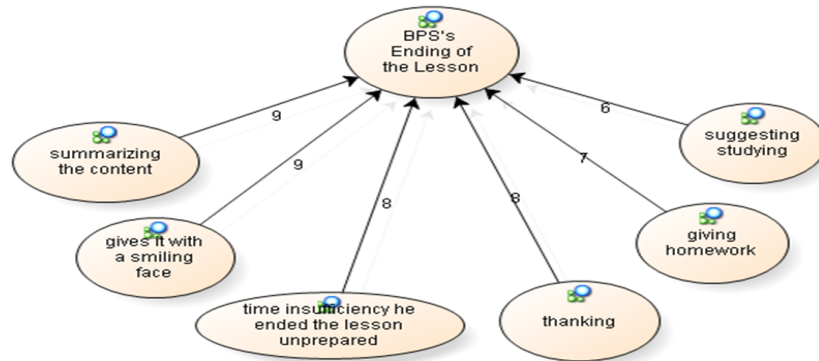
Figure 6. Student opinions towards the BPS's ending of the lesson

One of the students, Ege, said, "He makes us understand the topics. He ends the lessons by giving homework and summarizing."

The mentor teacher said "When there is not enough time to complete the lesson, students immediately begin to walk. Naturally, they cause trouble for their teacher. This problem can be solved over time. What is important for him is to end the lesson by giving feedback and homework. He already does this." The BPS commented "I generally summarize the content taught at the end of lesson. Then, I ask my students whether there is something that they couldn't understand and if there is, I go over that". The sighted practicum student said "The BPS summarizes the lesson. He makes a revision using the question-answer technique." The university supervisor stated his observation "While he was teaching the lesson, the bell rang. However, the BPS did not let students leave the classroom. He went on speaking about the lesson. While he was saying 'Thank you.', students were already leaving the classroom."

BPS's Differences from Other Practicum Students

Some students considered the BPS as seen in Figure 7, as different.
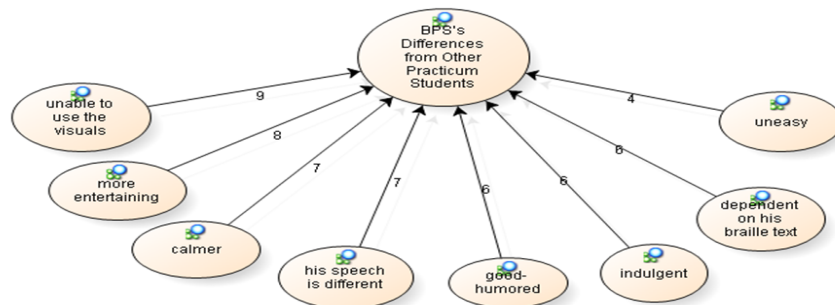
Figure 7. Student opinions towards the BPS's differences from other practicum students

One of the students, Bora, said, "He is calmer when compared to the sighted practicum student. He teaches the lesson without getting angry, and he entertains us. When we have not done our homework, he says 'Please, do your homework next week'. He does not write on the board like others do. He cannot use the map. He just teaches the content."

The mentor teacher stated, "I believe in the importance of eye-contact and BPS is not able to do this. It is very difficult for him to keep the students' attention to the lesson for 40 minutes. While other teachers have the ability to manage the class by monitoring everybody and following the needs of students, the BPS has to follow a regular pattern by using only his sensations and students' reactions. There is not much difference in his knowledge. I could not see a difference or shortfall in terms of effort."

Problems in the BPS's Lessons
As seen in Figure 8, students mentioned some problems.
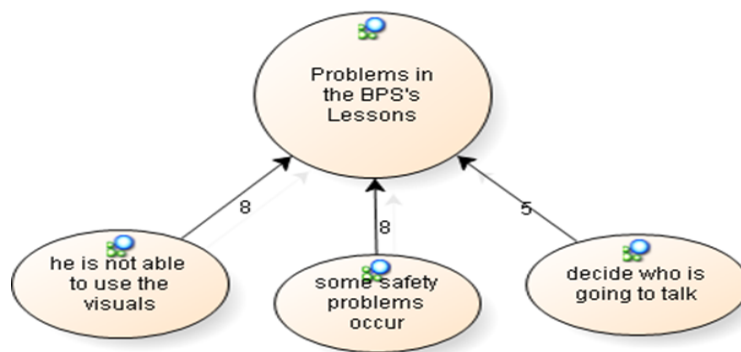
Figure 8. Student opinions towards the problems in the BPS's lessons

One of the students, Canan, stated, "It is difficult for him to use the visuals. For example, when he wants to turn the pages on PowerPoint presentations, he gets help. He cannot decide about who will speak. We have to call out our names 'I' to him."

The mentor teacher said, "So, he is going to have some problems in social studies in terms of using materials. Our most important materials are maps and globes. There can be difficulties on some geography topics that depend on visuals." The BPS stated, "One of the basic difficulties that I face is the material usage. For instance, when I need to use a map, I cannot benefit from this educational tool. Another problem is that physical structure is not organized for PD. I have some small problems in terms of classroom management, too."

Suggestions for the BPS's Lessons

As seen in Figure 9, students put forward various suggestions.
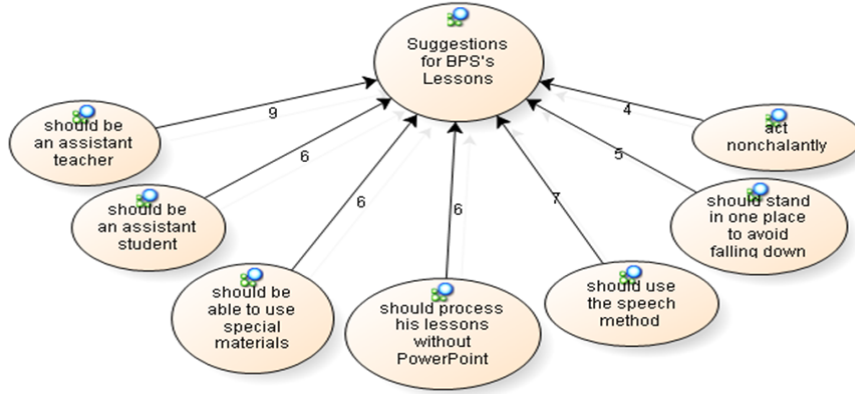
Figure 9. Student opinions towards suggestions for the BPS's lessons

One of the students, Yaman, said, "I worry if he is going to fall down. If he falls down, students will laugh and he will be embarrassed. There should be an assistant teacher near him."

The mentor teacher suggested, "Being educators and social studies teachers who aim at raising social individuals, we should prepare our people to live together with PD. That is to say, this is the first time I have worked with a BPS. As I have grown up with feelings like compassion since my childhood, but this situation broke many of my taboos. I really believe that he is going to succeed. Also, we need to ease their work as a society. We should make them feel our respect and trust, and we should delegate more responsibility to them. The physical structure of schools should be suitable for PD and a special classroom should be developed. At some schools, each course has its own laboratory. Therefore, if the BPS works at a school in which there is a special social studies classroom, and organizes it according to his own needs and knows where the materials are, his stress could be reduced." The BPS suggested that, "The physical environment in a classroom or school should be organized by the experts. The Ministry of National Education should provide schools with every kind of material that is needed for PD to do their job efficiently. Students need to be educated on how to behave when they encounter BVI teachers."

Discussion and Conclusions

The first impressions of all the participants were similar. First of all, seeing a BPS as a prospective teacher surprised them and how he would teach became a topic of curiosity. Students of the BPS have doubts and are biased about his teaching. On the other hand, it is appreciated that even though the teacher is a BPS, he completed his education to become a teacher. In Hess's (2010) research, which supports these findings, it was determined that the success of PD is closely related to the attitude of

people around them. Carroll, Forlin and Jobling (2003), found that practicum students have feelings for PD like; sympathy, guardianship, compassion, fear, anxiety, distress and deficiency before they get a special education course.

At the beginning the lesson, the BPS greets students and gets them to speak asking how they are. At the same time, he shares their experiences and prepares them for the lesson psychologically. He draws their attention to the topic with examples and motivates them. He relates the new content to the past using the question-answer technique, and then explains what he is going to do with PowerPoint or verbally. While doing this, he benefits from his braille text. In Yeşil's (2008) study supporting these findings, it was stated that at the beginning of the lesson, sighted social studies practicum students similarly use motivation techniques. However, the revision of principles ranks last in the list of the techniques they use.

It is understood that the BPS communicates via his ability to distinguish voices and through guiding students by giving instruction while managing the classroom. The BPS, creating a democratic atmosphere, displays his effort to communicate using examples, clues, encouragement, rewards, and motivating activities. Despite this, it is understood that the lack of eye-contact prevents communication from reaching its' expected level of success. In the study of Yeşil (2009), supporting all these findings, it was identified that while sighted social studies practicum students are good at efficient listening and the democratic approach in classroom management, they are incompetent at using stress and intonation while speaking and leading students to act democratically. Therefore, it can be said that the BPS focuses more on his verbal communication skill than other practicum students.

It is seen that the BPS, while teaching the lesson, mostly uses the speech and question-answer methods. Similarly, in Yeşil's (2009) study it was identified that sighted practicum students are less competent at using different methods-techniques together. It is clear the materials that the BPS uses most are braille texts, laptops with screen-reading and projection. However, physical insufficiencies prevent him from using other techniques and materials. Nevertheless, it is known that there are some materials for PD in social studies education.

The BPS carries out evaluation with question-answers, presentations or verbally. However, it seems difficult for him to record the evaluation results using existing methods. A social studies teacher makes an evaluation, which is included in social studies teachers' specific area competencies, (Ministry of National Education, 2009) giving feedback to students with a critical assessment and sharing with his colleagues.

At the end of the lesson, the BPS summarizes, makes revisions and gives feedback. Supporting all these, Yeşil's study (2008), identified that social studies practicum students are most competent at giving feedback, correction and reinforcement in terms of teaching-learning principles. In the context of differences from the sighted practicum student, the BPS was found to be calmer, more good-

humored, indulgent and perceptive. However, it can be said that since he is unable to make visual contact, he feels dependent on over the physical-social environment and this makes him distressed in the lessons. In parallelism with the findings, it was determined that BVI people have more trouble with social adaptation and are more tempted to resort to passive behaviors than individuals with sighted people because they have developed more skill through the hardship of movement, and their psychomotor and social skills are not as well developed. In addition to the difficulties mentioned, it is stated that the anxiety level increases when their needs are not met (Konarska; 2007; Wong, Machin & Tan, 2009; Bolat, Doğangün, Yavuz, Demir & Kayaalp, 2010). Furthermore, in some studies, it was stated that BVI children demonstrated more limited gestures and gave fewer responses than sighted children. The researchers emphasized that social smiling was very important in an individual's development and this remained undeveloped due to the lack of eye contact (Bolat et al., 2010).

It is understood that the problems of the BPS in the social studies lesson stem from the physical structure and materials. He gets help while using the materials. He needs special materials at each stage of the lesson. The physical structure at most schools is not appropriate for BVI people. The inclusion education which has been widespread in recent years has resulted in the questioning of the educational environment in terms of suitability for BVI people. Another difficulty the BPS faces is his ability to keep students' attention, motivation and safety in classroom management which reflects his differences from sighted practicum students. Bardin and Lewis stated in their studies (2008) that schools without proper environments for BVI people affect their academic achievement negatively.

Taking the results of the research into consideration, some suggestions can be put forward. As is clear from the first impressions, the biggest problem BVI people face is social prejudice. It is necessary to create a society in which their responsibilities are shared to eradicate those prejudices.

The educational environments of BVI people should be prepared for them along with the physical and social elements of their surroundings. As the BPS lacks the ability to see, necessary efforts should be made to take advantage of his abilities such as smelling, touching, hearing and talking. He also needs drama education and technical training to use his voice and intonation efficiently. It is thought that this would be useful for him to communicate with problematic students and interact with administrators, families and the guidance service on a regular basis. He needs to use different methods-techniques and materials to make students actively participate in the process and keep their attention on the lesson. The BPS should constantly be guided on how to educate sighted students. For this, a special education supervisor can be commissioned in the teaching practices. After he becomes a teacher, guidance services can be provided with a BVI monitoring unit. The support requirement can be met by special education consultants, itinerant teaching systems (Argyropoulos & Stamoulis 2006; Bardin & Lewis, 2008; Sharma et al., 2010) and teaching practice and community services at educational facilities.

Schools should be organized considering BVI people in terms of physical environment and materials. According to Suvak (2004), teachers need classrooms prepared by special educators and equipped with special techniques, materials and physical space. Safhi, Zhow, Derric, and Kelley (2009), showed that BVI students need assistive technologies, strategies and support services in their studies. In addition, it is suggested that the education of BVI students should be easier, economical and adapted with new technologies. It is understood from the literature that new technologies are developed for BVI people every day. It is foreshadowed that the materials like navigation, and smart boards with screen-reading and tactile maps will increase the efficiency of social studies teaching. For evaluation and recording, exams need to be turned into braille texts or audio optical systems need to be used.

All school stakeholders should be educated and prepared for the education of BVI people. Moreover, educational environments, with their physical structures and materials, should be made appropriate for BVI people. As a result, BVI people might be less dependent on other people and be more productive.

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Görme Engelli Bir Sosyal Bilgiler Öğretmen Adayının Öğretmenlik Uygulamasına İlişkin Durum Çalışması

Atıf:

Özet

*Problem Durumu:*Avrupa Konseyi'nin 2010-engelliler eylem planında onların toplumla bütünleşmesi ve yaşam kalitelerinin artırılması için istihdam sorununun çözülmesi gerektiği vurgulanmaktadır. Bunu sağlamak amacıyla politikalar geliştirilerek eğitim olanaklarının yaygınlaştırılması gerektiği belirtilmektedir. Çünkü sağlık, çalışma, gelir ve sosyal yaşama katılma düzeyini artıran en önemli etmen eğitimdir. Engellilik eğitim yaşamına katılmayı engellediği gibi, eğitimden yararlanamamak da engelliliğin yükünü artırmaktadır. Son yıllarda görme engelli öğretmenlerin istihdamı ve çalışmalarına ilişkin tartışmalar, Türkiye gündemini uzun süre işgal etmiştir. Bunlardan, eğitimci ve velilerin onların vereceği eğitimin niteliği konusunda kuşkulu oldukları anlaşılmaktadır.

Geniş bir alanyazın taramasının ardından eğitim alanında görme engellilere yönelik araştırmaların çoğunlukla öğrenci odaklı gerçekleştirildiği görülmektedir. Oysa zaman zaman eğitim fakültelerine görme engelli öğretmen adayları da gelmektedir. Fakülte ve okulların buna yeterince hazırlıklı olduğu söylenemez. Bu nedenle yapılan araştırmayla görme engelli öğretmen adaylarının öğretmenlik uygulamalarına dikkat çekilmek istenmektedir.

*Araştırmanın Amacı:*Araştırmanın temel amacı; eğitim fakültesi sosyal bilgiler öğretmenliği programı son sınıf öğrencisi bir görme engelli öğretmen adayının gerçekleştirdiği sosyal bilgiler öğretimi uygulamalarının betimlenmesidir.

Araştırmanın Yöntemi

Araştırmada, nitel yöntemlerden durum çalışması kapsamında bütüncül tek durum deseninden yararlanılmıştır. Durum çalışması aşamalarına uyularak çalışılacak durum, araştırma soruları, katılımcılar belirlenmiş, veriler toplanmış, analiz edilmiş ve raporlaştırılmıştır.

Görme engelli öğretmen adayı (GEÖA), on iki hafta boyunca her hafta altı derse girerek uygulama yapmıştır. Uygulama döneminin sonunda sürecin paydaşları olan öğrenciler, rehber öğretmen, görme engelli öğretmen adayı, gören öğretmen adayı ve danışman öğretim elemanının görüşlerine başvurulmuştur. Ayrıca GEÖA'nın dönem sonundaki derslerinde yapılandırılmamış gözlem yapılmıştır.

Görüşler araştırmanın amacı doğrultusunda incelenmiş, araştırmacı ve bir uzman tarafından ayrı ayrı kodlanmıştır. Daha sonra kodlar karşılaştırılarak uzlaşmaya gidilmiş ve güvenirlik oranı % 95.45 olarak hesaplanmıştır. Kodlar belli temalar altında sınıflandırılmış ve bulgularda anlamlı bütünler oluşturularak

sayısallaştırılmıştır. Örnek görüşler kod adlarıyla verilmiştir. Sonuç bölümündeyse yorumlanmış ve başka araştırmaların bulgularıyla karşılaştırılarak teyit edilmiştir.

Araştırmanın Bulguları: Katılımcıların GEÖA'na ilişkin ilk izlenimlerinin benzerlikler taşıdığı görülmektedir. Bir engelliyi öğretmen adayı olarak görmek katılımcılarda şaşkınlık, merak ve kuşku yaratmıştır. Ancak engelli olmasına karşın eğitim alması ve öğretmen olma mücadelesi taktir de oluşturmuştur.

GEÖA derse başlarken öğrencileri selamlayıp, konuşturmakta yaşantılarını paylaşmakta ve psikolojik olarak derse hazırlamaktadır. Örneklerle onların dikkatlerini çekmekte ve dersten kazanımlarını ileterek güdülenmelerini sağlamaktadır. Önceki konuyla bağlantıyı soru-yanıt tekniğiyle kurmakta, söz veya PowerPoint'le ne işleyeceğini açıklamaktadır. Bunu yaparken braille metninden yararlanmaktadır.

Sınıfı yönetirken GEÖA'nın sesten tanıma yeteneğiyle iletişim kurduğu öğrencileri yönergelerle yönlendirdiği anlaşılmaktadır. Demokratik bir ortam oluşturan GEÖA, örnekler, ipuçları, yüreklendirme, ödüllendirme, güdüleme etkinlikleriyle iletişim kurma çabasını sergilemektedir. Ayrıca öğrencilere yaklaşarak iletişim kurmaktadır. Buna karşın göz temassızlığının iletişimi istenen düzeyde kurmasını engellediği görülmektedir. Dersi işlerken GEÖA'nın ağırlıklı olarak anlatım ve soru-yanıt yöntem-tekniklerini kullandığı anlaşılmaktadır. Bu süreçte ekran okuyuculu dizüstü bilgisayar, PowerPoint ve braille metni kullanmaktadır.

GEÖA, ölçme-değerlendirmeyi soru-yanıtlarla sözel veya sunuyla, eleştirel bir değerlendirmeyle öğrencilere dönüt vererek ve meslektaşlarıyla paylaşarak gerçekleştirmektedir. Ancak var olan koşullarda bunları kayda geçirmesi zor gözükmektedir.

Dersi sonlandırırken GEÖA dönüt, tekrar ve özetle toparlamakta ödev vermektedir. Süre yetmediğindeyse kontrolsüz bir biçimde sonlandırmak zorunda kalmaktadır. Bu da dersin bitirilmesinde onun zorluk yaşadığı şeklinde yorumlanabilir.

Gören öğretmen adaylarından farkları bağlamında GEÖA daha güler yüzlü, hoşgörülü, anlayışlı, sakin bulunmuştur. Ancak görsel iletişim kuramaması nedeniyle kendini fiziksel-sosyal ortama hakim hissetmemesinin onu derste daha tedirgin ve mesafeli olmaya ittiği söylenebilir. En belirgin fark ise görselleri kullanamamak olarak ortaya çıkmaktadır.

GEÖA'nın Sosyal Bilgiler dersinde sorunların fiziki yapı ve materyaller üzerinde yoğunlaştığını anlaşılmaktadır. Materyal kullanımında yardım almakta ve özel materyallere gereksinim duymaktadır. Okulların çoğunda fiziki yapı görme engellilere uygun değildir. Son yıllarda yaygınlaştırılmaya çalışılan kaynaştırma eğitimleri eğitim ortamlarının "engellilere uygunluk" açısından sorgulanmasına yol açmıştır. GEÖA'nın yaşadığı diğer bir sorun da sınıf yönetiminde derse ilgi ve güdünün sürekliliğiyle güvenliği sağlamada zorlanmasıdır. GEÖA öğrenme sürecini bütün öğrencilerin ilgi ve gereksinimlerine göre düzenlemeye çalışmaktadır. Ancak fiziki yapı ve materyal eksikliği onun çabasını olumsuz yönde etkilemektedir. Sosyal Bilgiler dersi alan yeterlikleri arasında bulunan mekanı algılama becerisini de GEÖA'nın materyalsiz bir ortamda kazandırması oldukça zordur.

Araştırmanın Sonuçları ve Önerileri: GEÖA'nın öğretmenlik uygulamasının sosyal ve fiziki bağlamda çeşitli sonuçları ortaya çıkmıştır. Öncelikle sosyal bağlam ele alındığında ilk izlenimlerden başlayarak engellilerin önündeki en büyük sorunun önyargılar olduğu anlaşılmaktadır. Bunların olumlu hale getirilebilmesi için etkili bir eğitimle engellilerle sorumluluğun paylaşıldığı bir toplum yaratılmalıdır. Engellilerin bulunduğu eğitim ortamları sosyal ve fiziki öğeleriyle birlikte onlara hazır duruma getirilmelidir. Çeşitli araştırmalarda engellilerin başarılarında çevrelerindeki insanların tutumlarının etkileyici olduğu belirlenmiştir. Hatta kimilerinde engellilerle ilişkilere yönelik eğitimden sonra insanların onlara yaklaşımlarında olumlu yönde değişiklikler yaşandığı saptanmıştır. Bu nedenle okullardaki tüm insanların eğitilerek engellilere hazır duruma getirilmesi önemlidir.

GEÖA'na gören öğrencilere nasıl eğitim vereceği konusunda sürekli rehberlik yapılmalıdır. Bunun için öğretmenlik uygulamalarında özel eğitim uygulama akademisyeni de görevlendirilebilir. Mesleğe başladıktan sonra da bir engelli-izleme birimiyle rehberlik hizmetleri sürdürülebilir. Destek gereksinimi, özel eğitim danışmanı gibi olan yardımcı ve gezgin öğretmenlik sistemleriyle eğitim fakültelerindeki öğretmenlik ve topluma hizmet uygulamalarıyla karşılanabilir.

Sınıf yönetiminde görmeden yoksun olması nedeniyle GEÖA'nın koklama, dokunma, işitme, konuşma gibi becerilerini geliştirici önlemler alınmalıdır. Bu nedenle ses ve tonlamaları etkili kullanabilmesi için drama eğitimi ve teknik alt yapıya gereksinimi bulunmaktadır.

GEÖA'nın öğretmenlik uygulamasını etkileyen bir diğer etmenin ortamın fiziki koşulları olduğu görülmektedir. Okullar fiziki yapı ve materyaller açısından engellilere yönelik olarak düzenlenmelidir. Görme engelliler yardımcı teknoloji, strateji ve destek hizmetlerine gereksinim duymaktadırlar. Alanyazından her geçen gün görme engellilere ilişkin yeni teknolojiler geliştirildiği anlaşılmaktadır.

GEÖA'nın ders işlerken en çok yararlandığı materyallerin braille metni, ekran okuyuculu dizüstü bilgisayar ve projeksiyon olduğu görülmektedir. Ancak fiziki yetersizliklerin farklı yöntem-teknik ve materyalleri kullanmasını engellediği anlaşılmaktadır. Oysa özellikle sosyal bilgiler eğitiminde engellilere yönelik kimi materyallerin var olduğu bilinmektedir. Ekran okuyuculu CBS, akıllı tahta ve dokunmatik harita gibi materyallerin sosyal bilgiler öğretimindeki verimi artıracağı öngörülebilir. Değerlendirme ve kayıt tutma için de sınavların braille'e dönüştürülmesi veya sesli optik bir sistemden yararlanılması sağlanabilir.

Sonuç olarak sosyal bağlam ve fiziki yapı engellilerle eğitime uygun duruma getirilmelidir. Böylece görme engelli öğretmen adaylarının diğer insanlara bağımlılığı azaltılarak üretken yapıya kavuşmaları sağlanabilir. Ayrıca yönetici ve eğitimciler engellilere uygun eğitim ortamları yaratılmasının gerekliliğine inandırılmalıdır. Bu, engellilere yönelik materyallerin diğer öğrencilerin de kullanabileceği biçimde tasarlanması yanında kolay ulaşılabilir ve ekonomik duruma getirilmesiyle de sağlanabilir.

Anahtar Sözcükler: Sosyal Bilgiler dersi, öğretmenlik uygulaması, görme engelliler, görme engelli öğretmen adayı

Early Prediction of Students' Grade Point Averages at Graduation: A Data Mining Approach

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Suggested Citation:

Abstract

Problem Statement: There has recently been interest in educational databases containing a variety of valuable but sometimes hidden data that can be used to help less successful students to improve their academic performance. The extraction of hidden information from these databases often implements aspects of the educational data mining (EDM) theory, which aims to study available data in order to shed light on more valuable, hidden information. Data clustering, classification, and regression methods such as *K*-means clustering, neural networks (NN), extreme learning machine (ELM), and support vector machines (SVM) can be used for to predict aspects of the educational data. EDM outputs can ultimately identify which students will need additional help to improve their grade point averages (GPAs) at graduation.

Purpose of Study: This study aims to implement several prediction techniques in data mining to assist educational institutions with predicting their students' GPAs at graduation. If students are predicted to have low GPAs at graduation, then extra efforts can be made to improve their academic performance and, in turn, GPAs.

Methods: NN, SVM, and ELM algorithms are applied to data of computer education and instructional technology students to predict their GPAs at graduation.

Findings and Results: A comparative analysis of the results indicates that the SVM technique yielded more accurate predictions at a rate of 97.98%. By contrast, the ELM method yielded the second most accurate prediction rate (94.92%) evaluated based on the criterion of correlation coefficient. NN reported the least accurate prediction rate (93.76%).

Conclusions and Recommendations: The use of data mining methodologies has recently expanded for a variety of educational purposes. The

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assessment of students' needs, dropout liability, performance, and placement test improvement are some important emerging data mining applications in education. Since educational institutions have several seemingly unsolvable domain-related problems, this study's results reveal that EDM can assist with how educational institutions analyze and solve these problems. Furthermore, ensemble models can be used to obtain improved results, while feature selection algorithms can be used to reduce the computational complexity of the prediction methods.

Keywords: GPA prediction, educational data mining, prediction methods, higher education

Data mining is the process of extracting important patterns from a given database and is therefore a valuable tool for converting data into usable information. Data mining has a wide range of applications in different areas, including marketing, banking, educational research, surveillance, telecommunications fraud detection, and scientific discovery (Han & Kamber, 2008). More specifically, data mining can discover hidden information to inform decision-making in various domains. The education system is one of these domains in which the primary concern is the evaluation and, in turn, enhancement of educational organizations.

Institutions of higher learning such as universities are at the core of educational systems in which extensive research and development is performed in a competitive environment. The prerequisite mission of these institutions is to generate, collect, and share knowledge. Specifically, universities commonly require knowledge mined from past and current data sets that, once mined, can be used for representing and delivering information to university administrators for monitoring conditions and taking action to resolve problems.

A growing volume of data is currently stored in educational databases that contain various hidden information that can help to improve the academic performance of students. Educational data mining is thus used to study available data and extract the hidden information for subsequent processes. This hidden information can be used in several educational processes such as predicting course enrollment, estimating student dropout rate (Yukselturk, Ozekes, & Turel, 2014), detecting abnormal values in the result sheets of students, and predicting student performance. Several prediction techniques can be used to help the educational institutions to predict their students' grade point averages (GPAs) at graduation. If this prediction output indicates that a student will have a low GPA, then extra efforts can be made to improve the student's academic performance and, in turn, his or her GPA at graduation. In this context, neural networks (NN), support vector machines (SVM), and extreme learning machine (ELM) algorithms can be applied to such data, and the comparative analysis of results can indicate that which students should receive extra academic help.

Since data mining techniques can be used to identify student performance trends, many researchers and authors have investigated EDM. In this study, a literature

review concerning the EDM was conducted to better understand the importance of EDM's applications in higher education, especially regarding the improvement of student performance.

Bharadwaj and Pal (2011a) used EDM to evaluate student performance among 300 students from five different colleges who were enrolled in an undergraduate computer application course. The study employed a Bayesian classification scheme of 17 attributes, of which student performance on a senior secondary exam, residence, various habits, family's annual income, and family status were shown to be important parameters for academic performance. In a subsequent study, Bharadwaj and Pal (2011b) constructed a new data set with the attributes of a student attendance and test, seminar, and assignment scores in order to predict academic performance. Meanwhile, Ramaswami and Bhaskaran (2009) compared various feature selection methods for obtaining the best feature combination for improving prediction accuracy. Their data set included several interesting features such as student vision, eating habits, and family attributes. More recently, Sen, Uçar, and Delen (2012) used various data mining models to predict secondary education placement test results. They investigated sensitivity analysis identifying the most important predictors and also demonstrated that compared to NN, SVM, and logistic regression models, the C5 decision tree algorithm was the best predictor. A similar work was earlier proposed by Kovacic (2010), who used EDM to identify the extent to which enrollment data could be used to predict student academic performance. For this purpose, CHAID and CART algorithms were used on a dataset of student enrollment of information system students at the Open Polytechnic of New Zealand. Among other studies, Ben–Zadok, Hershkovitz, Mintz, and Nachmias (2009) presented a student warning scheme that uses student data to analyze learning behavior and warn them of risk before their final exams. Al-Radaideh, Al-Shawakfa, and Al-Najjar (2006) used data mining methods to analyze student academic data and improve the quality of the higher educational system. Feng, Beck, Heffernan, and Koedinger (2008) conducted a study to predict the standardized tests scores of students in middle and high schools that used a regression model with 25 variables. Kobrin, Camara, and Milewski (2002) studied student SAT scores and high-school grades within several diverse student bodies and ultimately determined three groups. While the first group comprised students with no significant variance in grades or test scores, the second group contained students whose SAT scores were significantly better than their grades would have otherwise suggested. Finally, the third group consisted of students whose SAT scores were abnormally low compared to their high-school performance and, interesting, was represented by women and minority students more heavily than the other two groups. An unsupervised *k*-means clustering algorithm was proposed by Shaeela, Tasleem, Ahsan, and Khan (2010) to predict student's learning activities; results suggested that the outputs could be helpful for both instructors and students. A similar work was conducted by Erdoğan and Timor (2005), who proposed the *k*-means algorithm to identify student characteristics of 722 students at Maltepe University; the study sought a probable relationship between the university entrance exam results and other academic achievements. Luan (2002) proposed a data mining application in which the

satisfaction of students at institutions of higher education was measured according to various student characteristics. Vranić, Pintar, and Skoćir (2007) investigated the use of data mining for improving various aspects of educational quality for students in specific courses as target audiences in academic environments. A final grade prediction system was also proposed by Minaei–Bidgoli, Kashy, Kortmeyer, and Punch (2003), who used several features obtained from logged data in an educational web-based system. In this study, it was shown that a genetic algorithm-based ensemble model yielded improvements against a single model. The accuracy improvement ranged from 10–12%. Kotsiantis, Patriarcheas, and Xenos (2010) developed an ensemble model for predicting student performance in a distance learning system for which an incremental version of Naive Bayes, 1-NN, and WINNOW algorithms were combined by way of voting.

Method

Data mining, which is considered as an interdisciplinary aspect of computer science, is a computation-based pattern search process for large datasets. It involves several methods such as artificial intelligence, machine learning, statistics, and database systems. Predicting student GPAs is one application within the domain of education, though it requires that several parameters be considered. According to Sen at al. (2012), the effective prediction of student academic performance requires a prediction model that includes all personal, social, psychological, and other environmental variables.

Research Design

In this study, the GPAs of student in computer education and instructional technology at the end of their first-, second-, and third-year courses were used to predict their GPAs at graduation. Although the nature of this study can be defined as descriptive study, a data mining methodology was followed that involves data preparation, the creation of the prediction model, and the evaluation of the created model. A schematic illustration is depicted in Figure 1. A common data preparation step involves data preprocessing, data cleaning, and data transforming, all of which use several algorithms. Model creation requires generating a wide range of models using analytical techniques, and selecting the appropriate modeling technique and subsequent selected model parameters is necessary for optimal performance. To this end, several artificial intelligence models can be tuned to model the investigated system. Model evaluation involves assessing the validity and utility of the models against each other and against the goals of the study.
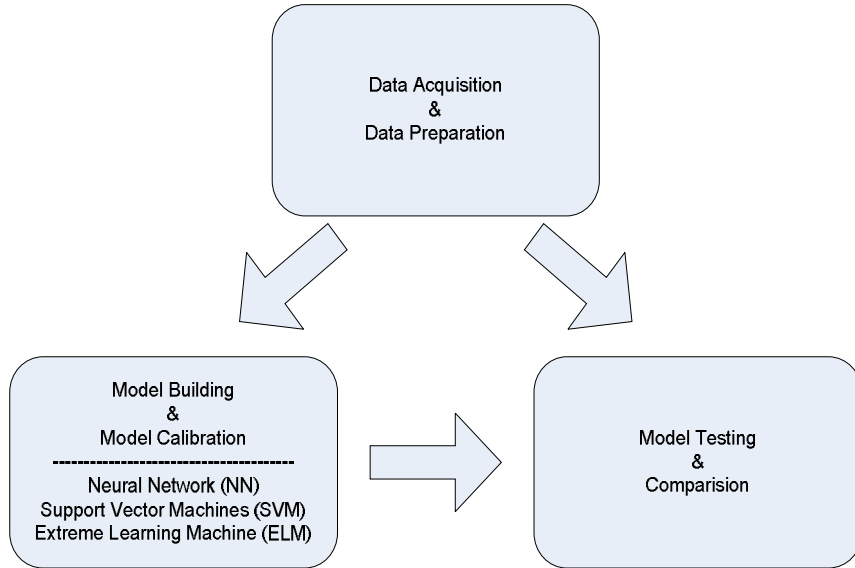
*Figure 1.*Illustration of the proposed methodology.

Research Sample

The dataset used in this study was acquired from Student Affairs of Fırat University in Turkey. The data consisted of 127 unique undergraduate student records of students of the Department of Computer Education and Instructional Technology enrolled in the university either from 2006 to 2010 or from 2007 to 2011.

Research Instruments and Procedures

Datasets contain scores of students' 49 vocational and cultural courses that are required to be successfully passed by students prior to their graduation. A student's score in a course was calculated by using the relative evaluation system, the principles of which were determined by the university senate. Exams were evaluated out of 100 points possible. Course scores were calculated according to the contribution of the mid-term exam (40%) and the general or supplementary exam (60%). As a result, the calculated course scores were converted to success coefficients shown in Table 1.

Table 1.
Course Score Conversion Table.

Course Score	Success Coefficients
AA	4.0
BA	3.5
BB	3.0
CB	2.5
CC	2.0
DC	1.5
DD	1.0
FF	0.0

A 127 × 49 data matrix was thus constructed in which the rows show the students and the columns show the lesson scores for subsequent purposes of prediction. The GPA of a student was calculated with the weighted mean of scores of all 4 years.

Data Analysis

In this study, NN, SVM, and ELM classification methods were used separately to predict the student's GPA, and the methods were compared to one another. These prediction methods were chosen due to their superior capability in classification problems.

Neural networks (NN). NNs are biologically inspired mathematical methods capable of modeling extremely complex nonlinear functions (Haykin, 2008). Any NN is composed of an interconnected group of artificial neurons, the information of which is processed by using a connectionist approach (Guldemir & Sengur, 2007). NNs can be used for the purposes of both classification and regression. Moreover, NNs can model the nonlinear relationship of dependent variable with independent variables completely based on data without any statistical assumptions. A multilayer perceptron (MLP) is the most popular NN structure; it uses a monitored learning method.
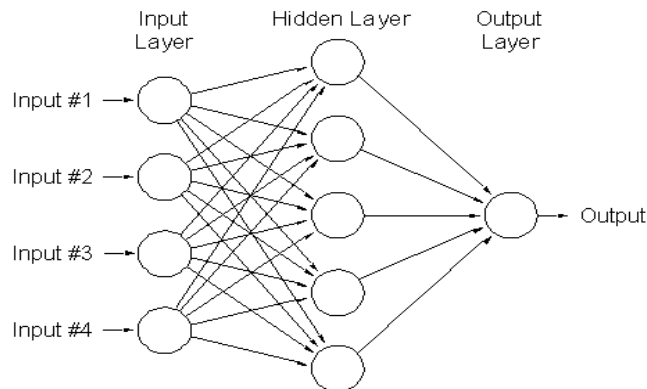
Figure 2. NN architecture.

The MLP structure was used in this study with back-propagation type supervised-learning algorithm. MLP is capable of modeling input–output relationships for the purposes of classification or regression. The NN architecture used in this study is shown in Figure 2, which shows the architecture's input layer, a hidden layer, and an output layer. All neurons were connected to each other from the input to output layer. The input layer neuron number was selected as the number of variables in the input dataset. During the iterative experimentation process, the number of the hidden layers and the number of neurons in each hidden layers were determined.

Support vector machines (SVMs). SVMs are in the family of generalized linear models, which perform the tasks of classification and regression by using the linear combination of features derived from the variables (Suykens & Vandewalle, 1999). In SVM methodology, input data are transformed to a high dimensional feature space, since after this transformation the input data become more manageable compared to the original input space (Esen, Ozgen, Esen, &Sengur, 2009). In addition, SVMs aim to separate training data into many classes by using the mathematical definition of a hyperplane. Figure 3 shows a two-class classification problem. Before classifying new data, SVMs identify the best hyperplane for modeling the training dataset.

(a)   (b)
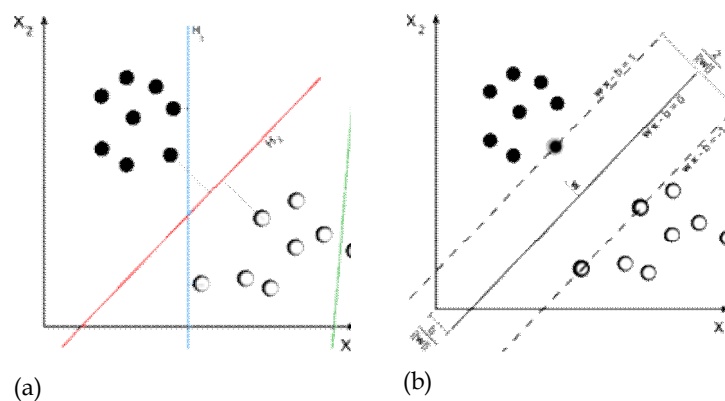
Figure 3. (a) A hyperplane separating bi-class data; (b) Best hyperplane and margins. (http://en.wikipedia.org/wiki/Support_vector_machine)

Extreme learning machine (ELM). In most applications, NNs are trained with finite datasets, and the input and hidden layer weights must be tuned during iterations. Huang, Zhu, and Siew (2006) recently proposed a single hidden layer feed for an NN model with extremely fast learning algorithms. This new method was called ELM.ELM does not have any tunable parameters and is a one-pass procedure. In other words, there are no iterations in the training of the network; once the input weights are assigned randomly, weights between the hidden and output layer are calculated with Moore–Penrose pseudo inverse. Once the input layer part of the ELM

is processed, the rest of the network can be considered a least squares problem, the solution of which facilitates training the network.

k-Fold Cross Validation. The *k*-fold cross validation test was used in this study. In the *k*-fold cross validation procedure, the input dataset was randomly divided into *k* subsets, each of which was considered to have approximately equal data points. *k*-fold cross validation method was repeated *k* times (Esen, Inalli, Sengur, & Esen, 2008a; Esen, Inalli, Sengur, and Esen, 2008b), and at each time, one of the *k* subsets was used as the test set while the other subsets (*k-1*) were used to form the training dataset. Thus, every data point appeared in a test set only once and in a training set *k-1* times.

Evaluation Criteria. For the objective evaluation of the investigated methods, several statistical methods—namely, the root-mean squared (RMS), the coefficient of multiple determinations (R^2), and the coefficient of variation (COV)—were used (Bulut & Kan, 2012; Esen et al., 2008a; Esen et al., 2008b). The RMS was defined as:

$$RMS = \sqrt{\frac{\sum_{m=1}^{n}(y_{pre,m} - t_{pre,m})^2}{n}} \,, \tag{1}$$

The correlation coefficient (R) and COV in percent were used in evaluating the methods. The related definitions were:

$$R = \frac{\sum_{m=1}^{n}((y_{pre,m} - y_{mea})(t_{pre,m} - t_{mea}))}{\sqrt{\sum_{m=1}^{n}(y_{pre,m} - y_{mea})^2 \sum_{m=1}^{n}(t_{pre,m} - t_{mea})^2}} \tag{2}$$

$$\mathrm{cov} = \frac{RMS}{|t_{mea}|}100 \tag{3}$$

In the above equations, *n* signifies the number of data points, y_{pre} signifies the predicted value, and t_{pre} signifies the actual dataset. t_{mea} and y_{mea} are the mean values of the measured and predicted data points, respectively.

Results

The main aim of this work was to predict well in advance the students' GPAs at graduation in order to reveal whether a student tends to have a GPA so that extra efforts can be made to improve the student's academic performance and, in turn, improve his or her GPA.

Two different scenarios were investigated in this study. The students' GPAs from the first 2 years scores (i.e., scores of 24 courses) comprised the first scenario. Students' GPAs from the first 3 years were used for prediction in the second scenario, the GPA of which includes a total of 38 course scores.

As aforementioned, several data mining prediction tools were applied in the study. All parameters for each prediction method were tuned according to these extensive experiments. For the NN prediction method, one hidden-layered NN model with tangent sigmoid activation function was constructed. The input layer had 24 and 38 neurons according to the two scenarios, while the output layer had one neuron. The hidden-layer neuron number was determined according to the neuron number of the input and output layers. For the hidden layers of the two different NN topologies, 25 and 39 neurons were used. The linear activation function was chosen for the output layer. The scaled conjugate gradient algorithm was also used to reveal the best performance in the experiments.

To find the optimal parameters for SVM, a search mechanism in the 2-D gamma versus sigma plane was examined to obtain optimal gamma and sigma values. The resultant gamma and sigma values were 75.1138 and 5.3491, respectively. The radial basis function kernel was selected, which yielded the best performance in the experiments.

For the ELM structure, the sigmoid activation function in the hidden layer was selected, and the number of neurons in the hidden layer was set to 25.

According to the 5-fold cross validation, the training dataset contained approximately 100 samples, while the test dataset contained about 25. These values were not fixed; when divided for 5-fold validation, the whole dataset (127 samples) included one fold containing 27 samples or two folds containing 26. The prediction results of the three modeling methods for the first scenario are presented in Table 2. The results presented in Table 2 are the 5-fold cross validation results.

Table 2.

Prediction Results for All Classification Methods.

Prediction Method	RMSE	Correlation coefficient	COV
NN	0.2068	0.8494	7.4005
SVM	0.1146	0.9306	4.0997
ELM	0.1200	0.9241	4.2939

As the results indicate, all three prediction methods performed reasonably well in predicting the student GPA at graduation. Among the three model types, SVM algorithms produced the most accurate prediction results, in which 93.06% correlation coefficient, 0.1146 RMSE, and 4.0997 COV values were obtained with the 5-fold cross validation test. The second most accurate results were obtained with the ELM method. The recorded correlation coefficient, RMSE, and COV values were 92.41%, 0.1200, and 4.2939, respectively.
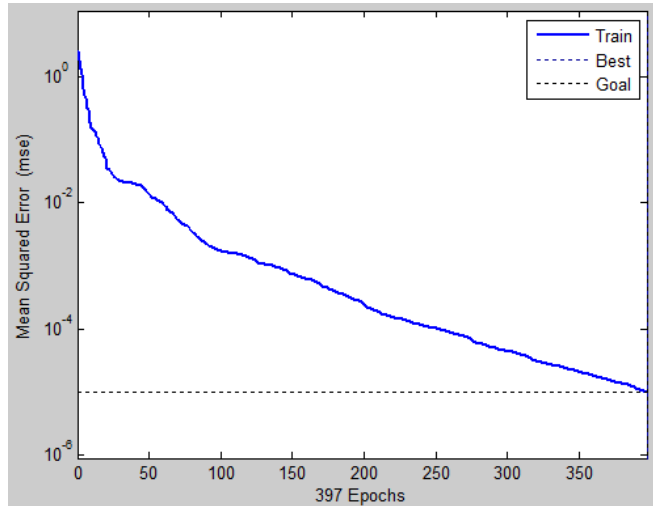
Figure 4. Training performance of the NN model.

The least accurate results were obtained by the NN method, in which the lowest correlation coefficient (84.94%) and highest RMSE (0.2068) and COV (7.4005) values were recorded. Other than these quantitative performance evaluation results, prediction results were qualitatively evaluated by plotting both the predicted and actual GPAs shown in Figures 5-11. The training performance of the NN model is illustrated in Figure 4. The NN model could learn the first scenario for 397 epochs.
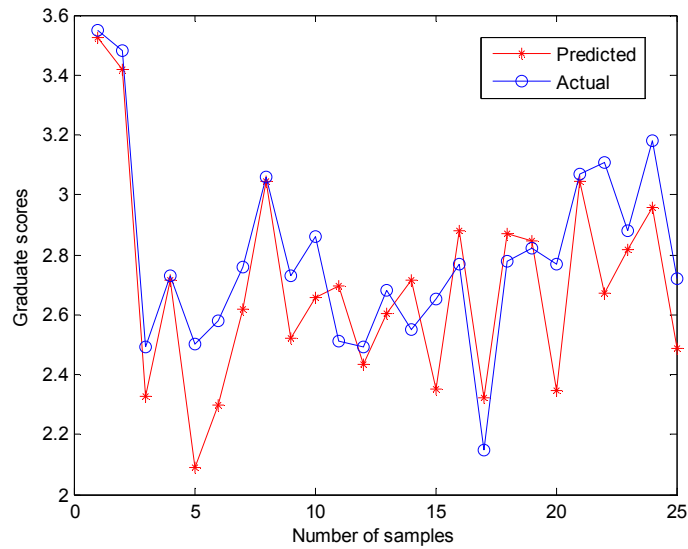

Figure 5. Prediction results of the NN method.

Figure 5 shows the NN predictions for 25 test samples. Except test samples 5, 6, 20, and 22, predictions were close to the actual samples.
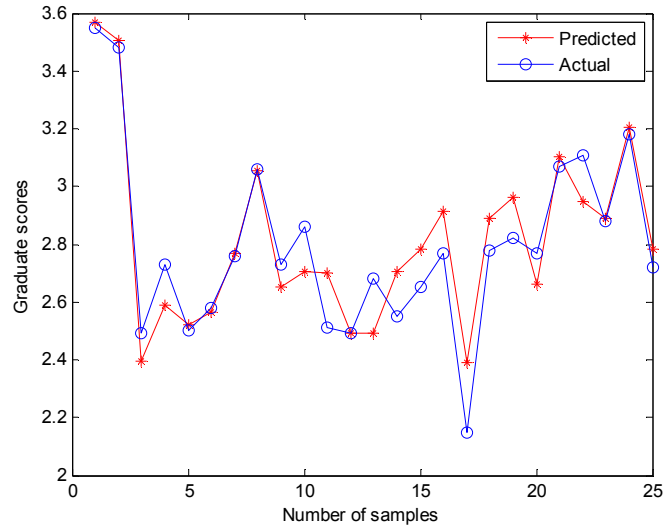
Figure 6. Prediction results of the SVM method.

Figure 6 illustrates the SWM predictions for the same test samples. Since only a few samples were not enough close to the actual samples, it was clear that SWM prediction was more reliable than NN predictions.
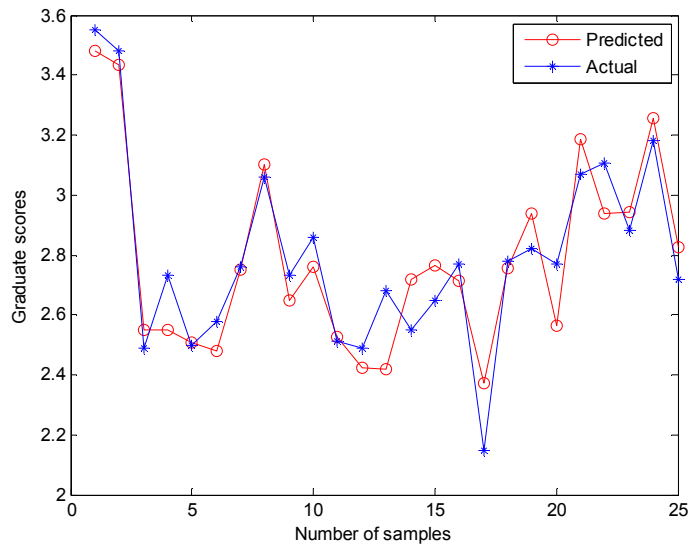
Figure 7. Prediction results of the ELM method.

Figure 7 illustrates the ELM results. Similar to the quantitative results, the ELM prediction illustration also indicates results close to the actual results.

The experiments were repeated for the second scenario, in which GPAs from the 3 years of coursework were used to predict the GPAs of students at graduation. As aforementioned, 38 course scores were used to predict the students' GPAs at graduation with the NN, SVM, and ELM methods, respectively. Similar to the first scenario, the model parameters were tuned with the experiments and the best results were obtained by using the same parameters of the first scenario. However, the hidden-layer neurons of the NN and ELM methods were changed.

The prediction results of the three modeling methods for second scenario are presented in Table 3. The results presented in Table 3 are the average performance results of the 5-fold cross validation results.

Table 3.

Prediction Results for All for Classification Methods for The Second Scenario.

Prediction method	RMSE	Correlation coefficient	COV
NN	0.1329	0.9376	4.7547
SVM	0.0708	0.9798	2.5334
ELM	0.1010	0.9492	3.6136

As the results indicate, all three prediction methods performed reasonably well in predicting student GPAs at graduation. Among the three model types, SVM algorithms again produced the most accurate prediction results with 97.98 % correlation coefficient, 0.0708 RMSE, and 2.5334 COV values were obtained with 5-fold cross validation test. The second most accurate results were obtained by the ELM method with correlation coefficient, RMSE, and COV values of 94.92%, 0.1010, and 3.6136, respectively.
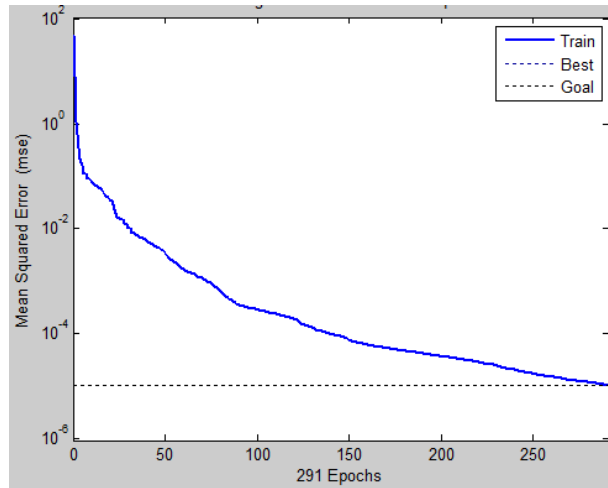
Figure 8. Training performance of the NN model for the second scenario.

The least accurate results were obtained by the NN method, for which the lowest correlation coefficient (93.76%) and highest RMSE (0.1329) and COV (4.7547) values were recorded.

Other than these quantitative performance evaluation results, the prediction results were qualitatively evaluated by plotting both the predicted and actual GPAs at graduation, as shown in Figures 9–11.
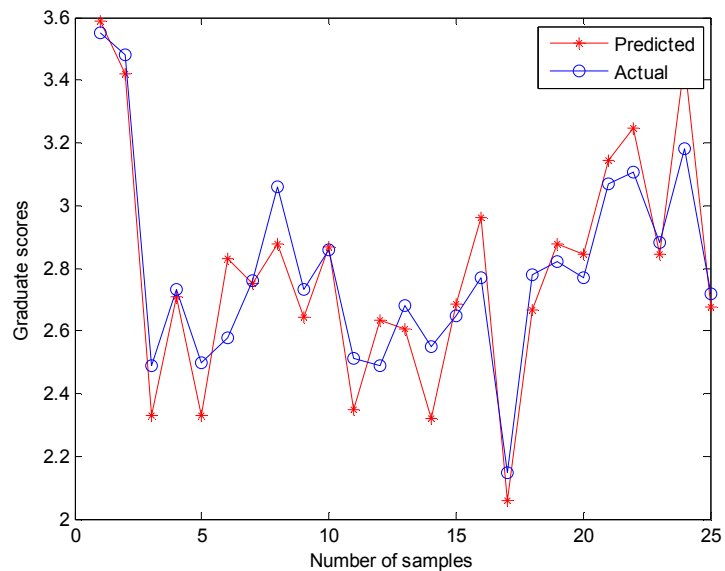

Figure 9. Prediction results of NN method for the second scenario.

Figures 9–11 show the predictions according to the NN, SVM, and ELM methods, respectively, while Figure 8 shows the training performance of the NN model.
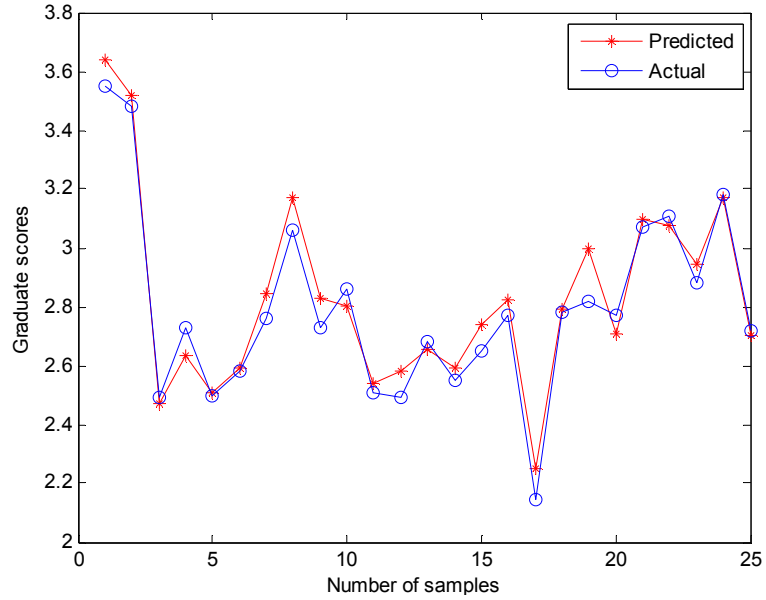
Figure 10. Prediction results of SVM method for the second scenario.
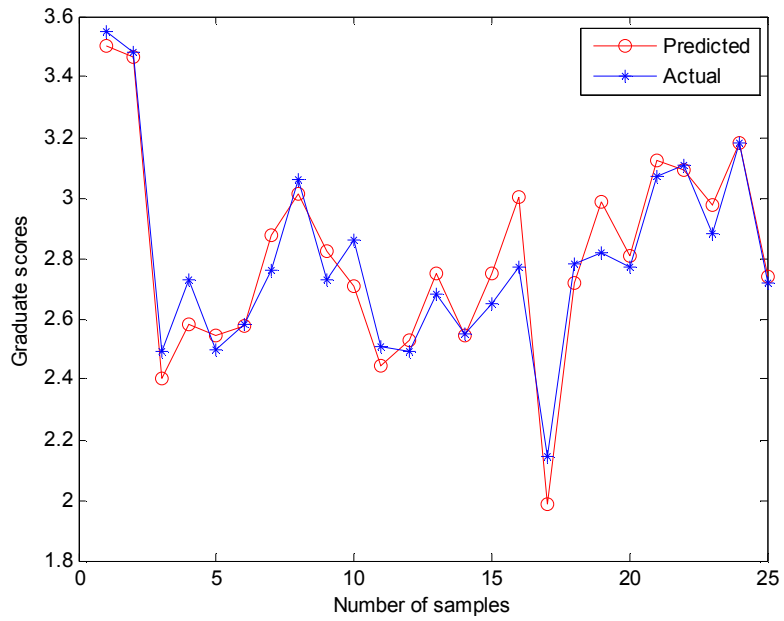
Figure 11. Prediction results of ELM method for the second scenario.

It is worth comparing the obtained results for the first and second scenarios. Upon examining the quantitative and qualitative results tabulated for all investigated methods, it is clear that there was improvement due to the augmentation of the number of course scores used as input for the prediction models.

Discussion and Conclusion

Educational research has taken advantage of data mining to a lesser extent than other domains, including banking, marketing, and healthcare. However, the current pace of applying data mining methods in the domain has increased for a variety of educational purposes. Assessing student need, detecting dropout rates, analyzing student academic performance, improving placement test scores are some of the important emerging data mining applications. As awareness of the capabilities of data mining increases in educational institutions, researchers will be able to identify as well as analyze and solve seemingly unsolvable domain-related problems.

As this study illustrated, several data mining prediction techniques can accurately predict student GPA at graduation well in advance, which can identify students needing extra help to improve their academic performance and, in turn, their GPAs at graduation. This study's sample consisted of 127 student GPAs that were measured and evaluated with tools assumed to be reliable and valid. In this context, three prediction methods—NN, SVM, and ELM—were employed to estimate student GPAs at graduation for the study of two scenarios. The first scenario was designed to estimate the GPAs at graduation of students according to their GPAs of coursework completed during their first 2 years of study. The results are as following; NN obtains 84.94%, SVM obtains 93.06% and ELM obtains 92.41% accuracy rates respectively. In the second scenario, the GPAs after the first 3 years of coursework were used as data. As cross validation results indicate, SVM techniques offered more accurate predictions than ELM and NN. The obtained results are 97.98%, 94.92% and 93.76 respectively. Moreover, for all methods, results indicated that GPAs after the first 3 years of coursework demonstrated improved predictions for all methods. ,

These results are in line with the previous results related to classifier algorithms. For example, Sen et al. (2012) used various data mining models to predict secondary education placement test results. The authors reached that C5 decision tree algorithm was the best predictor with 95% accuracy, SVM with an accuracy of 91% and NN with an accuracy of 89%. In addition, logistic regression models came out to be the least accurate with accuracy of 82%. In another study, Kotsiantis et al. (2010) developed an ensemble model for predicting student performance in a distance learning system for which an incremental version of Naive Bayes, 1-NN, and WINNOW algorithms were combined by way of voting. The obtained accuracy was 73% in the initial forecast. In addition, Minaei–Bidgoli et al. (2003) used combination of the multiple classifiers for predicting the final grade of the students. Without

genetic algorithm (GA), the authors reached the accuracy of 86.8% for 2-classes, 70.9% for 3-classes and 51.0% for 9-classes respectively. Moreover, with GA, the authors reached the accuracy of 94.09% for 2-classes, 72.13% for 3-classes and 62.25% for 9-classes respectively. Another study which was carried out by Kovacic (2010), used EDM to identify the extent to which enrollment data could be used to predict student academic performance. For this purpose, CHAID and CART algorithms were used and 59.4% and 60.5% accuracy rates were indicated.

In conclusion, as can be seen from the above comparisons, instead of choosing one classification method, researchers have proposed the use of ensemble models or combining multiple classifiers to achieve more robust prediction results. Moreover, feature selection algorithms have been employed to reduce the computational complexity of prediction methods.

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Öğrencinin Mezuniyet Notunun Erken Tahmini: Bir Veri Madenciliği Yaklaşımı

Atıf

Özet

Problem Durumu: Son zamanlarda, eğitim kurumlarının veri tabanlarında depolanan veriler giderek artmakta ve bu verilere büyük bir ilgi bulunmaktadır. Eğitim kurumlarındaki öğrenciler, dersler, akademik ve idari personel, yönetim sistemleri vb. veriler stratejik verilerdir. Stratejik verilerin çözümlenerek anlamlı bilgilerin ortaya çıkarılması, eğitim kurumlarının birtakım tedbirler alarak, eğitimdeki kaliteyi artırmasını sağlayacaktır. Eğitim kurumları daha çok öğrenci ve mezunların yol haritalarını tahmin etmeye odaklanmalıdır. Eğitimsel veri madenciliği, eğitim alanında mevcut verileri incelemek ve ondan gizli bilgiyi ortaya çıkarmak için kullanılır. Veriyi çözümlemek ve anlamlı bilgileri ortaya çıkarmada istatistiki yöntemler her zaman kullanışlı olmayabilmektedir. Bu durumlarda verileri işlemek ve çözümlemek için veri madenciliği yöntemleri kullanılmaktadır. Yapay Sinir Ağları, Destek Vektör Makineleri ve benzeri sınıflama ve regresyon yöntemleri, eğitim verilerinde tahmin amaçlı kullanılabilir. Bu tahmin, akademik başarısı zayıf öğrencilerin belirlemesinde ve onların başarılarının artırılmasında yardımcı olacaktır.

Araştırmanın Amacı: Bu çalışmanın amacı zamanında mezun olamayacak veya düşük bir ortalama ile mezun olabilecek başarısız öğrencilerin önceden tespit edilerek, mezun olabilecek bir seviyeye getirmek veya daha yüksek bir ortalama ile mezun olmalarına yardımcı olabilmektir. Bu amaçla, veri madenciliğinde kullanılan bazı tahmin teknikleri, eğitim kurumlarına yardımcı olmak üzere, öğrencilerin mezuniyet notlarının tahmininde kullanılmıştır. Bu tahmin, bir öğrencinin düşük bir lisans

ortalaması ile mezun olacağını bildirirse, o zaman öğrencinin başarısının artırılması için ekstra çaba gösterilecektir.

Araştırmanın Yöntemi: Veri madenciliğinde kümeleme, birliktelik kuralları ve sınıflandırma yöntemleri ile veriler analiz edilmektedir. Literatürde en çok kullanılan sınıflandırma yöntemleri arasında Yapay Sinir Ağları (YSA), Destek Vektör Makineleri (DVM) ve Ekstrem Öğrenme Makinesi (EÖM) algoritmaları bulunmaktadır. Bu çalışmada Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümü öğrencilerinin lisans mezuniyet notlarının tahmininde bu sınıflandırma yöntemleri kullanılmıştır. Öğrencilerin mezun olması için gerekli olan 49 adet mesleki ve kültürel ders, veri kümesinin özniteliklerini oluşturmaktadır. Veri kümesi oluşturulurken 127 öğrencinin ders notları göz önüne alınmıştır. Böylece 127x49'luk bir veri matrisi elde edilmiştir. Çalışmada iki farklı uygulama gerçekleştirilmiştir. Bunların ilkinde, öğrencilerin sadece ilk iki yılda aldıkları yılsonu notları göz önüne alınmıştır. Böylece toplam 24 adet dersin yılsonu notlarından, öğrencilerin mezuniyet notları YSA, DVM ve EÖM ile tahmin edilmiştir. İkinci uygulamada ise öğrencilerin ilk üç yılsonunda almış oldukları 38 adet dersin yılsonu notları kullanılarak, öğrencilerin mezuniyet notları YSA, DVM ve EÖM sınıflandırma yöntemleri ile tahmin edilmiştir. Gerçekleştirilen bilgisayar benzetimlerinde 5 katlı çapraz geçerlilik kullanılmıştır. Böylece, kullanılan sınıflandırma yöntemlerinde eğitim için yaklaşık 101 örnek ve test için de 26 örnek kullanılmıştır.

Araştırmanın Bulguları: Her iki uygulama için de gerçekleştirilen karşılaştırmalı analizler DVM tekniğinin en iyi sonuçları ürettiğini göstermiştir. DVM tekniğinin başarımı birinci uygulama için %93.06 ve ikinci uygulama için ise % 97.98'dir. Diğer taraftan EÖM ikinci en iyi tahmin başarımını göstermiştir. Korelasyon katsayısı değerlendirme kriterine göre birinci uygulama için %92.41 ve ikinci uygulama için ise % 94.92'lik bir başarım kaydedilmiştir. En kötü tahmin performansı YSA tarafından elde edilmiştir. Buradaki başarım birinci uygulama için %84.94 ve ikinci uygulama için ise % 93.76'dır.

Araştırmanın Sonuçları ve Önerileri: Günümüzde, veri madenciliği yöntemlerinin eğitim amaçlı kullanımı hızla artmaktadır. Öğrenci ihtiyaç değerlendirmesi, öğrencilerin okuldan ayrılma tahmini ve öğrencinin performans analizi, eğitim kurumları için önemli veri madenciliği uygulamalarından bazılarıdır. Eğitim kurumlarının çözülemeyecek gibi görülen bazı problemlerin analizinde ve çözümünde, veri madenciliği yetenekleri önemli rehberlik hizmeti verebilecektir. Gerçekleştirilmiş çalışmanın sonuçları incelendiğinde, kullanılan veri madenciliği yöntemlerinden elde edilen başarımlara göre, ikinci sınıf sonunda öğrencilerin mezuniyet notları en düşük %84.94 doğruluk ile tahmin edilmektedir. Böylece ikinci sınıfın sonundan itibaren, öğrencilere verilecek rehberlik hizmetleri ile öğrenci başarıları artırılabilecektir. Şöyle ki; öğrencilere etkili çalışma becerileri öğretilecek, derslerin teorik yapısı yanında uygulamalar yapmaya teşvik edilecek ve ders/ödev/projelerinin mutlaka zamanında yapılarak teslim edilmesi konusunda uyarılabilecektir. Bu ve benzeri yönlendirmeler ile öğrencinin lisans mezuniyet notunun yükseltilmesi sağlanabilecektir.

Son zamanlarda, veri madenciliği yöntemlerini kullanan tahmin uygulamalarında, tek bir tahmin yöntemi kullanmak yerine, daha iyi bir başarım için topluluk modelleri (ensemble model) veya birkaç farklı sınıflandırıcının kombinasyonu şeklindeki yapılar bir hayli dikkat çekmektedir. Diğer bir ifade ile çok sayıda sınıflandırma sonuçlarının çoğunluk oylaması (majority voting) ve ortalama gibi yöntemler ile birleştirilmesi dayanıklı tahmin yapıları oluşturabilmektedir. Bu gibi yapılar, ileriki çalışmalar da kullanılabilir. Diğer taraftan veri boyutlarının yüksek olması nedeniyle ortaya çıkan hesaplama yükü ağırlığı önemli bir problem olarak ortaya çıkmaktadır. Bu problemin çözümü için de özellik seçimi (feature selection) algoritmaları, yine ileriki çalışmalarda kullanılabilir.

Anahtar Sözcükler: Mezuniyet notu tahmini, eğitimsel veri madenciliği, tahmin metodları, yükseköğretim.

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		cated in the text. Example: Nothing seemed so certain as the results of the early studies (Tatt, 2001, p. 445). It was precisely this level of apparent certainty, however, which led to a number of subsequent challenges to the techniques used to process the data (Jones & Wayne, 2002, p. 879). There were a number of fairly obvious flaws in the data: consistencies and regularities that seemed most irregular, upon close scrutiny (Aarns, 2003; West, 2003, p. 457). With studies by two authors, always include both author names: (Anderson & Bjorn, 2003) As Anderson and Bjorn (2003) illustrated in their recent study As recently as 2003, a prominent study (Anderson & Bjorn) illustrated When a study has 3, 4, or 5 authors, include the names of all the authors the first time the work is cited: (Anderson, Myers, Wilkes, & Matthews, 2003) For all subsequent citations of this work, use "et al.": (Anderson et al., 2003) When a work has 6 or more authors, use et al.: (Bell et al., 2003) For unsigned works, include the title, enclosed in parentheses. Put quotation marks for short work titles, and italicize the titles of reports, books, and other significant works: ("Recent Developments," 2004) (Dictionary of Tetrathalocigistic Diseases, 2004) Metin içindeki atıfları üstte verilen örneklere uygundur.
21	☒	Three levels of headings are used: Level 1, Level 3 and Level 4. The headings are formatted as follows: Centered Uppercase and Lowercase Heading (Level 1) *Flush Left, Italicized, Uppercase and Lowercase Side Heading* (Level 3) *Indented, italicized, lowercase paragraph heading ending with a period.* Start writing after the period (Level 4). Aday makale içerisinde üç farklı düzey başlık kullanılmıştır. Düzey 1, Düzey 2, Düzey 3. Başlıklar bu düzeylere uygun olarak aşağıdaki şekilde biçimlendirilmiştir: Ortalı ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık (Düzey 1) *Tam Sola Dayalı, İtalik ve Her Sözcüğün İlk Harfi Büyük Yazılmış Başlık* (Düzey 3) *İçeriden, itatik, tamamı küçük harflerle yazılmış ve nokta ile biten başlık.* Noktadan sonra normal metin yazımına devam edilmeli (Düzey 4).
22	☒	References are listed in alphabetical order. Each listed reference is cited in text, and each text citation is listed in the References. Basic formats are as follows: Haag, L., & Stern, E. (2003). In search of the benefits of learning Latin. *Journal of Educational Psychology, 95,* 174–178. Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley. Johnson, D. W., & Johnson, R. T. (1990). Cooperative learning and achievement. In S. Sharan (Ed.), *Cooperative learning: Theory and research* (pp. 173–202). New York: Praeger. **Turkish References Only:** Çınkır, Ş., & Çetin, S. K. (2010). Öğretmenlerin okullarda mesleki çalışma ilişkileri hakkındaki görüşleri [Teachers' opinions about the professional working relationships in schools]. *Kuram ve Uygulamada Eğitim Yönetimi, 1 6*(3), 353-371. **Article in an Internet-only journal/Periodical, database** Fredrickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well being. *Prevention & Treatment, 3,* Article 0001a. Retrieved November 20, 2000, from http://journals.apa.org/prevention/volume3/pre0030001a.html More information is available from: http://citationonline.net/CitationHelp/csg04-manuscripts-apa.htm#references Kaynakçanın yazımı üstte verilen örneklere uygundur.

23	☒	*Order of the main parts in the manuscript is as follows:* *Main title in English (max. 12 words)* *Structured abstract (min. 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)* 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)

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		 Purpose of Study:…
		 Method:….
		 Findings and Results:….
		 Conclusions and Recommendations:…
		 Keywords:..
		   Introduction Method (sub-headings):
		 Research Design
		 Research Sample
		 ♦*Research Instrument and Procedure*
		 Data Analysis
		   Results, Discussion and Conclusion, References
		Extended Turkish Abstract (750-1000 words) Sub-headings:
		 Problem Durumu:….
		 Araştırmanın Amacı:….
		 Araştırmanın Yöntemi:…
		 Araştırmanın Bulguları:…
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♦ Reliability and the validity of the research instrument used or adapted in the work must be provided, and explained in detail.

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