

# The Relationship between Elementary Teacher Candidates' Attitudes towards Problem Based Learning and Problem Solving Skills

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## ABSTRACT

The purpose of this research is to determine the relation between elementary teacher candidates' problem solving skills and attitudes towards problem based learning. Furthermore this research intend to determine if there is a significant difference in elementary teacher candidates' problem solving skills and the attitudes towards problem based learning according to the variables of gender and their education program, or not. The research was carried out with a total of 199 third and fourth grade teacher candidates (100 female, 99 male) from Elementary Department of Faculty of Education at Siirt University in Turkey. It was used the "Problem Solving Inventory" which was developed by Heppner and Peterson (1982) and translated into Turkish by Şahin, Şahin and Heppner (1993) to determine the problem-solving skills of the teacher candidates' and the "Problem-Based Learning Attitude Scale" which was developed by Turan and Demirel (2010) was used to determine their attitudes towards problem-based learning. In our research, it was calculated that the Cronbach alpha reliability coefficient of problem solving skills as .78 and the scale of attitudes towards problem based learning as .93. As a result of this research, the problem solving skills ( $M=87.91$ ) and the attitudes towards problem based learning mean score ( $M=68.15$ ) of elementary teacher candidates' were found as medium level. It was found that there is no significant and negative relation between the elementary teacher candidates' problem solving skills and attitudes towards problem based learning ( $r= -.54$ ;  $p>0.05$ ).

**Keywords:** *Attitudes, problem, problem-solving skills, problem based learning;*

## INTRODUCTION

In our day individuals are spending their energy and most of their time on problem solving and decision making progresses because of even more complicating social structure, technological developments, political, social and economical problems. D'Zurilla (1971) determines the term problem as a situation, where the individual experiences difficulties on answering internal and external missions. According to King (1981) the term problem is a situation that leads to doubt uncertainty. Morgan (1999) claims that the problem is a conflicting situation, where the individual encounters some obstacles on the way to his target. Semerci (2001) defines the problem as a situation, which the individual is unable to solve with his present reactions. According to Karasar (2004) every situation, that disturbs the individual physically and mentally and where indecision and more than one solution exists. Accordingly, a solution requires the use of the most complicated mental skills. In other words. Problem solution is an activity made for revealing the "unknown" in a systematic and analytic way, where the start point is the "known". Heppner (1982) uses problem solving as a synonym of dealing with problems. Aksu (1998) describes problem solution as a progress of winning the difficulties encountered in the way of a purpose. Problem solution is a quite complicated progress, that

covers the cognitive skills, but also affective and behavioral features. Saygılı (2000) approaches the affective factors on problem solving as; individual factors (intelligence, motivation, foreknowledge-installation, function hesitation) and sociological factors (socio-economic, level and sociological development of child, child raising applications and manners of families, physical conditions of school and class size). Problem solving is closely related to psychological harmony (Bepner & Anderson 1985), confidence (Erden & Akman, 1995), communication skills and decision making styles (Hunsakler and Alessandra 1980), academical and social self-respect (McCobe, Balnkstein & Mills, 1999) of the individual. The lack in problem solving skills may cause in young people to results like aggression (Dodge & Feldman 1990), behavior disorders (Joffe et. al. 1990) drug use (Platt, Scura & Hannon, 1973; Korkut, 2002). Problem solving depends on the type and complication of problem. While some problems can be solved logically, some requires emotional maturity. In order for a situation to be considered as a problem, the individual must ponder upon it and perceive it as a problem (Morgan, 1995). According to Gagne, the purpose of training programs should be to teach to students own to solve the possible problems both on their branch and on real life (Yapıcı & Yapıcı, 2006; Karataş & Güven, 2003; Çalıřkan, Selçuk & Erol, 2006; Polat & Tümkaya, 2010). The education mentality of today expects from students to extract distinctive meanings from their experiences and to structure what they learned with distinctive strategies by proceeding them (Açıkgöz, 2007). Problem Based Education is an approach, that aims to have students gain the skills of learning with self-governance, independent studying, questioning and problem solving, is an approach that provides the students to self-research and learn whenever they encounter similar situations during their lifetime. This approach is based upon from real situations forming problem situations and scenarios. Learners, under the guidance and management of the teacher, learn to discover, analyze, solve the problem and to gather the required data to learn both individually and in groups. Problem Based Education plays an effective role in revealing the before learned dates of student, providing the learning to happen and obtaining the permanent data by organizing and giving meaning to the data. Teacher are the main source t help the students to improve their problem solving skills. This situation provides the students with opportunities of problem solving, and helps them to raise as good problem solvers in future. In this situation teachers' understanding, belief and approaches problem solving is important. Therefore it is believed that revealing teacher candidates' skills of problem solving and approaches problem solving is important.

Purpose of these studies is to determine teacher candidates' problem solving skills and problem based learning oriented approaches. In pursuance of this purpose answers for following questions were sought:

1. What kind of relation is there between teacher candidates' problem solving skills and problem based learning oriented approaches?
2. Is there any difference between teacher candidates' problem solving skills and problem based learning oriented approaches, based upon gender and the program they study in?

## METHOD

### Participants

The study was conducted in the spring of 2009-2010 academic year at Siirt University in Turkey. Participants were 199 candidates of teachers who were attending at primary class and sciences education departments in faculty of education.

### Data Collection

A descriptive survey research design was used in this study. As a mean of data collection; person information forms developed by the researcher and problem solving inventory which is developed by Heppner & Petersen (1982) and adapted to Turkish by Sahin, Sahin & Heppner (1993) and the attitude scale towards problem based learning which is developed by Turan & Demirel (2010) are used. Problem solving inventory aims to measure the reactions against the problems, individuals face in lifetime how they perceive their own problem solving skills. From 35 items, attained by positive and negative formulas in the scale 32 of them are taken into evaluation. Items have answers suitable for six point gradation. Confidence in problem solving skill, self control and approach avoidance subscale take place. High points indicate how low isperception of problem solving skill (Şahin, Şahin & Heppner, 1993). The results obtained from the studies of adaptation, validity and reliability show that the scale can be used for research in spite of some restrictions (Taylan, 1990, Savaşır & Şahin 1997). Content of the inventory is consisting of 35 items as a six pints Likert scale. Some of the items are positive while some are negative. Scale shows the scores relating to the total scores of problem solving skill perception and subscales. Given answers are scored from 1 to 6. During the scoring 9<sup>th</sup>, 22<sup>nd</sup>,

29<sup>th</sup> items are excluded; therefore scoring is made out of 32 items. Items numbers 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30 and 34 are scored adversely. The range of the inventory scores is between 32 and 192. Highest scores obtained from the scale indicated that individuals perceive themselves inadequate in problem solving. Oppositely if the scores are low then it is the sign of positive perception of problem solving skill. The Cronbach alpha coefficient of reliability of the original scale was calculated as .88. In this study made by us the Cronbach alpha coefficient of reliability of the scale was calculated as .78. The attitude scale towards problem based learning was developed by Turan & Özdemir (2010) and consists of 20 items in 5 points likert type. Cronbach alpha coefficient of the scale was indicated as .95. In our study, the Cronbach alpha coefficient of reliability of problem based learning attitude scale was found as .93.

### Data Analysis

SPSS 16.00 statistic program is used for the analysis during the analysis arithmetic means and standard deviations of the problem solving skills and attitudes towards problem based learning level scores are calculated. t-test are applied in order to find whether the differences between the arithmetic means are relevant or not and Pearson Moment Correlation Coefficient was used. The significance levels for the statistical analyses is accepted as  $p < .05$ .

### RESULTS

Findings of the study that aims to determine of relationship between the problem solving skills and the attitude towards problem based learning are given below.

**Table 1.** Pearson Moment Correlation Coefficient results about the problem solving skills and the attitude towards problem based learning of elementary teacher candidates.

		Problem solving skills	
The attitudes towards problem based learning	r	-.054	
	p	.448*	
	N	199	

As seen in Table-1, it is determined that there is a no meaningful relation in negative direction between the problem solving skills and the attitudes towards problem based learning of the teacher candidates ( $r = -.054$ ;  $p > .05$ ),

**Table 2.** Arithmetic mean and standard deviation of teacher candidates' problem solving skills and the attitudes towards problem based learning

	N	Minimum	Maksimum	$\bar{x}$	SS
Problem solving skills	199	55.00	128.00	87.91	15.65
The attitudes towards problem based learning	199	20.00	100.00	68.15	20.64

As seen in Table-1, the mean of the teacher candidates' problem solving skills 87.91; mean of the attitudes towards problem based learning 68.15. Accordingly, it is seen that the mean of the teacher candidates' problem solving skills and the attitudes towards problem based learning are the medium level.

**Table3.** t-test results of teacher candidates' problem solving skills and the attitude towards problem based learning according to gender

		Gender	N	$\bar{x}$	SS	t	p
Problem solving skills	Female		100	85.99	15.11	-1.75	.081*
	Male		99	89.85	16.02		
The attitudes towards problem based learning	Female		100	69.73	20.65	1.08	.281*
	Male		99	66.56	20.62		

\*  $p > .05$

As seen in Table-3, the mean of male teacher candidates' problem solving skills (89.85) was higher than female teacher candidates (85.99). This means female teacher candidates' problem solving skills are higher than male ones. The mean of female teacher candidates' attitudes towards problem based learning (69.73) was higher than male teacher candidates (66.56). This means of female teacher candidates' attitudes towards problem based learning was positive than male teacher candidates. It was determined that problem solving skills and attitudes towards problem based learning of the teacher candidates show no meaningful difference in the dimension of gender ( $p > .05$ ).

**Table 4.** t-test results of teacher candidates' problem solving skills and the attitude towards problem based learning according to department

	Department	N	$\bar{x}$	SS	t	p
Problem solving skills	Elementary class	123	89.91	16.11	.862	.390*
	Elementary science	76	87.73	14.39		
The attitudes towards problem based learning	Elementary class	123	68.22	18.69	.280	.780*
	Elementary science	76	67.27	22.15		

\*  $p > .05$

As seen in Table-3, the mean of elementary class teacher candidates' problem solving skills (89.91) was higher than elementary science teacher candidates (87.73). This means elementary science teacher candidates' problem solving skills are higher than elementary class teacher candidates. The mean of elementary class teacher candidates' attitudes towards problem based learning (68.22) was higher than elementary science teacher candidates (67.27). This means of elementary class teacher candidates' attitudes towards problem based learning was positive than the elementary science teacher candidates. It was determined that problem solving skills and the attitudes towards problem based learning of the elementary teacher candidates show no meaningful difference in the dimension of department ( $p > .05$ ).

## CONCLUSION AND DISCUSSION

In the study, no statistically meaningful relation in negative direction between teacher candidates' problem solving skills and problem based learning oriented approaches was found. In a similar study made by Serin (2004) it is indicated that there is a meaningful relation in negative direction between the problem solving skills and the approaches for the sciences of the students of Faculty of Education, while there is a statistically meaningless relation in negative direction between problem solving skills and sciences successes of the students. Kocabaş et. al. (2006) stated in a study, that there is a highly meaningful relation between the problem solving skills and the approaches for the program of Class Teaching Master Students, while there was no meaningful relation found for Doctorate Students. In our study, teachers' s and teacher candidates' skills of problem solving and their approaches to problem based education was determined as mid-level. Saracaloğlu, Yenice & Karasakaloğlu (2010) have indicated that class teacher candidates' skill level of problem solving is sufficient. İnel, Evrekli & Türkmen (2011) have stated that class teacher candidates' skill level of problem solving is high. Aslan (2007) stated that Turkish lesson teacher candidates' skill level of problem solving is sufficient. It was determined that teacher candidates' problem solving skills and problem based learning oriented approaches do not differ in regard to gender variables, that female teacher candidates' problem solving skills and problem based learning oriented approaches are higher than male ones. In similar studies, besides the studies that show there is no meaningful difference for teacher candidates' skills of problem solving in regards to the gender (Çam, 1995; Kasap, 1997; Erdem, 2001; Güven & Akyüz, 2001; Serin, 2001; Özkütük et.al., 2003), there is also some studies that contradict (Korkut, 2002). Study of different subjects might have caused to current situation. There is no statistical meaningful difference confirmed between teacher candidates' study program, problem solving skills and problem based learning oriented approaches. As conclusion, problem solving skills and approaches for problem based education of teacher candidates must be determined and time must be taken for improving the problem solving skills and problem based education oriented approaches of low level teacher candidates. If needed, training programs should be prepared in a fitting way with the purpose of improvement of problem solving skills and problem based education activities.

## REFERENCES

- Açıkgöz, K.Ü. (2007). *Başarmak Elimizde*, İzmir: Biliş.
- Aksu, M. (1998). Problem çözme becerilerinin geliştirilmesi. *Problem Çözme Yöntemleri Sempozyumu Kitabı*, Ankara: O.D.T.Ü.
- Aslan, C. (2007). Research on self-perceptions of pre-service turkish language teachers in turkey with regard to problem solving skills. *International Journal of Human and Social Sciences*, 2:4 249-255.

- Çalışkan, S., Selçuk, G.S., & Erol, M. (2006). Fizik öğretmen adaylarının problem çözme davranışlarının değerlendirilmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 30 73-81
- Çam, S. (1995). Öğretmen adaylarının ego durumları ile problem çözme becerisi algısı ilişkisinin incelenmesi, *Psikolojik Danışma ve Rehberlik Dergisi*, 6 (2), 37-42.
- Dodge, K.A., & Feldman (1990). Issues in social cognition and sosiometric statüs. In S.A. Asher & J.D.Coide (Eds) *Peer Rejection in childhood*. New York Cambridge University Press.
- D’Zurilla, T.J., & Goldfried, M.R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology*, 18, 407-426.
- Erdem, Y. (2001). Yüksekokul ve sağlık meslek lisesi mezunu hemşirelerin problem çözme becerileri. *Yeni Tıp Dergisi*, 18(1): 11-13.
- Erden, M., Akman, Y. (1995). *Eğitim Psikolojisi Gelişim-Öğrenme- Öğretme*. Ankara: Arkadaş Yayınevi.
- Güven, A., & Akyüz, M.Y. (2001). Öğretmen adaylarının iletişim ve problem çözme becerilerine ilişkin görüşleri. *Ege Eğitim Dergisi*, 1: 13-22.
- Heppner, P.P., & Petersen, C.H. (1982). The development and implications of a personal problem-solving inventory, *Journal of Counselling Psychology*, 29 (1), 66-75.
- Hunsaker, P.L., & Alessandra A.J. (1980). *The art of meaning people*. Prentice Hall Inc. Englewood Cliffs New Jersey.
- Inel, D., Evrekli, E., Türkmen, L. (2011). Sınıf öğretmen adaylarının problem çözme becerilerinin araştırılması, *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi* 29 (1): 167-178.
- Joffe, R.D., Dobson, K.S., Fine, S., Marriage, K., & Glenn, H. (1990). Social problem-solving in depressed, conduct-disordered and normal adolescents. *Journal of Abnormal Child Psychology*, 18(5): 565-575.
- Kasap, Z. (1997). *İlköğretim 4. Sınıf Öğrencilerinin Sosyo-Ekonomik Düzeye Göre Problem Çözme Başarısı İle Problem Çözme Tutumu Arasındaki İlişki*. Yayımlanmamış Yüksek Lisans Tezi. Marmara Üniversitesi Eğitim Bilimleri Enstitüsü. İstanbul.
- Karasar, N. (2004). *Araştırmalarda Rapor Hazırlama*. Nobel Yayın Dağıtım. 12. Baskı. Ankara.
- Karataş, İ., & Güven., B. (2003). Problem çözme davranışlarının değerlendirilmesinde kullanılan yöntemler: klinik mülakatın potansiyeli. *İlköğretim-Online* 2(2), 2-9.
- King, L.T. (1981). *Problem Solving In a Project Environment*. A Wily- Interscience Publication. Toronto.
- Kocabaş, A., Selçinoğlu, E., & Kırmızı F.S. (2006). Sınıf öğretmenliği lisansüstü öğrencilerinin programa yönelik tutumlarına ve problem çözme becerilerine ilişkin görüşlerinin karşılaştırılması. *Eğitim ve Bilim*, 31 (142) 26-34.
- Korkut, F. (2002). Lise öğrencilerinin problem çözme becerileri. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 22, 177-184.
- McCabe R., Balnkstcin K.R., & Mills LS. (1999). Interpersonal sensity and social problem solving: relations with academic and social self esteem depressive symptoms and academic performance, *Cognitive Therapy and Research* 23(6) 587-604
- Morgan, C.T. (1999), *Psikolojiye Giriş*, (Çev. H. Arıcı ve Ark.), Ankara: Meteksan Yayınları.
- Plucker, J.A. (1999). How to use problem based learning in the classroom (Book Plucker 1999). *Roeper Plucker*, 22(1), 69-70.
- Polat, R. H., & Tümkaya, S. (2010). An investigation of the students of primary school problem solving abilities depending on need for cognition. *Elementary Education Online*, 9(1), 346- 360.
- Özkütük, N., Silkü, H.A., Orgun, F., & Yalçınkaya, M., (2003). Öğretmen Adaylarının Problem Çözme Becerileri. *Ege Eğitim Dergisi*, 2: 1-9.
- Özdemir, S.T. (2003). Tıp eğitimi ve yetişkin öğrenmesi. *Uludağ Üniversitesi Tıp Fakültesi Dergisi*, 29 (2), 25-28.
- Saygılı, H. (2000). *Problem Çözme Becerileri ile Sosyal ve Kişisel Uyum Arasındaki İlişkinin İncelenmesi*. Yayımlanmamış Yüksek Lisans Tezi. Atatürk Üniversitesi Sosyal Bilimler enstitüsü. Erzurum.

Semerci, N. (2001) Yaratıcılık, kritik düşünme ve problem çözme, *Çağdaş Eğitim*, 271.

Serin, O. (2001). Lisans ve Lisansüstü düzeyindeki Fen grubu öğrencilerinin problemçözme becerileri, fene ve bilgisayara yönelik tutumları ile başarı arasındaki ilişki. Dokuz Eylül Üniversitesi Eğitim Bilimleri Doktora tezi, İzmir.

Serin, O. (2004). Öğretmen Adaylarının Problem Çözme Becerisi ve Fene Yönelik Tutum İle Başarıları Arasındaki İlişki, XIII. Ulusal Eğitim Bilimleri Kurultayı (6-9 Temmuz 2004), İnönü Üniversitesi, Eğitim Fakültesi, Malatya.

Şahin, N. H., Şahin, N., & Heppner P. (1993). Psychometric properties of the problem solving inventory in A Group of Turkish University Students, *Cognitive Therapy and Research*, 17 (3), 379-385.

Turan S., & Demirel Ö. (2010). Probleme Dayalı Öğrenmeye İlişkin Tutum Ölçeği Geçerlik ve Güvenirlik Çalışması. *Eğitim ve Bilim* 1-12.

Yapıcı, Ş., & Yapıcı, M. (2006). Çocukta Bilişsel Gelişim. *Bilim, Eğitim ve Düşünce Dergisi*, 6(1), 1-3.