THE RELATIONSHIP BETWEEN SELF-EFFICACY AND ATTITUDES OF CHEMISTRY TEACHER CANDIDATES

Emine Erdem
Hacettepe University, Ankara, Turkey
E-mail: erdeme@hacettepe.edu.tr

Abstract

This study has been carried out with the aim of investigating the relationship between the attitudes of chemistry teacher candidates towards chemistry in laboratory classes and their self-efficacy beliefs. Teacher candidates composed of undergraduate students who have already taken or are currently taking laboratory classes and study Chemistry Teaching have participated in this study. Relational survey model has been used in this study. Chemistry Attitude Scale (CAS) developed by Geban, Ertepınar, Yılmaz, Altın & Şahbaz (1994) and Chemistry Self-efficacy Scale (CSS) were used as data collection tools. Simple correlation and one-way analysis of variance in independent groups have been used in order to analyse data. According to the results from study data, there is a meaningful linear relationship between self-efficacy scores and attitude scores of teacher candidates. An increase in self-efficacy scores and attitude scores of teacher candidates with regard to consecutive grade levels has also been observed. Self-efficacy and attitude scores of the students have been compared by using one-way analysis of variance (ANOVA). However, a meaningful difference in self-efficacy scores and attitude scores of students with regard to grade levels has not been observed.
Key words: *chemistry, self-efficacy, chemistry attitude, chemistry laboratory applications.*

Introduction

Self-efficacy, one of the fundamental principles of the social learning theory, is the set of events affecting an individual's life and the belief of having the capacity to do work (Bayrakçı, 2007). The term self-efficacy was first defined by Bandura. According to Bandura, self-efficacy is defined as self-judgment about his/her capacity to manage successfully by organising required activities in order to display his/her performance (Bandura 1997).

In the literature, when the studies about self-efficacy are examined, it is mostly encountered to the studies about self-efficacy beliefs, specific self-efficacy beliefs, validity and reliability of scale (Bıkmaz, 2002; Enochs, Riggs, 1990; Gün and Yıldız, 2014; Sarı, Yenigün, Altıncı & Öztürk, 2011). Moreover, the relationship of self-efficacy with various variables has also been studied (Akbaş & Çelikkaleli, 2006; Altun & Erden, 2013; Çoban & Sanalan, 2002; Phan, 2009; Riggs and Enochs, 1990; Schunk, 1991; Truxillo, Seitz, & Bauer, 2008). Qualitative survey / relational survey model has been commonly used in the studies. Some researchers have emphasized that self-efficacy is not related to the skills of an individual but to the belief of trusting his/her skills. It has been indicated that individuals who have higher self-efficacy beliefs are more ready to teach (Bandura & Adams, 1977).

According to Bandura, self-efficacy affects the way people think, feel and motivate (Bandura, Barbaranelli, Caprara & Pastorelli, 1996). As a result of these effects, self-efficacy is determinative of the levels of endeavouring and being persistant of a student under conditions. The high levels of the feeling of success, self-reliance and the skills of motivating increase the success, but the low levels of those features decrease the success. Moreover, they also help self-improvement and provide various personal skills. It has been defined that student's previ-

ous successes, positive reactions from her/his environment and the successes of people he/she knows are a source that nourishes the self-efficacy (Yıldırım, Ilhan, 2010). When students feel confident, they feel good about themselves during the learning processs and in this way, high level learning occurs (Altunçekiç, Yaman & Koray, 2005). Factors such as anxiety and failure will affect negatively the way student makes an effort to solve an issue he/she has thought that he/she cannot overcome or solve. Bandura (1977) has emphasized that individuals are not so eager to carry out the acvities other than the required ones in cases they do not believe themselves in being able to overcome such issues.

In teaching science, self-efficacy is one of the fundamental factors in learning in terms of attitudes. There are various definitions for "attitude" in the literature. According to Senemoğlu (2000), attitude is an acquired inner state which affects the choices of individual activities when the individual faces any group, individual, events and various situations. According to Gardner (1975), attitudes towards science field are suggestions about learning science in evaluating "objects, people, activities, situations" in a particular way. According to another definition, attitude is the tendancy of someone to an idea and is the sign of negative and positive feelings of individuals about some objects (Koballa, 1988).

Measuring the attitude provides benefits such as determining the attitudes towards the situations students face, changing their attitudes or creating new attitudes. Thus, student attitude can be defined scientifically and more positive guidance can be provided by determining the factors that affect the attitude.

In the literature, there are studies about attitudes that have a crucial role in learning at scientific education. In studies about attitudes towards science, teacher influence, parental involvement, peer influence, achievement motivation, perceptions of their ability in science, science self-concept, gender differences in attitudes toward science are represented as factors that affect the attitudes of students. It has been stated that the willingness of success, anxiety and science self-concept are the significant predictors of attitudes toward science in those studies. It has also been emphasized that the teacher estimates are the significant predictors of attitudes toward science in student's following grades (Talton & Simpson, 1986). However, according to some researchers, it has been stated that the willingness of success does not have an effect on attitude toward science (George, 2000).

Laboratory classes help improve the skills of students to think scientifically, observe, collect data, analyse, interpret the results of experimentation. Some researchers have suggested that learning environments built upon experimental methods in science education increase the success of students (Arı & Bayram, 2012; Ryser, Beeler & McKenzie, 1995). There is a positive effect of laboratory activities on the tendency of teacher candidates to critical thinking (Koray, Köksal, Ozdemir & Presley, 2007). However, these studies have shown that students cannot establish the relationship between theoretical and practical knowledge despite the laboratory activities in learning chemistry (Hofstein & Mamlok-Naaman, 2007). However, Bandura (1977) has emphasized that the success is not only related to the required skills of a student to do the work, but also to the need of self-compliance along with the skills.

Problem of Research

The aim of this research is to examine the relationship between the self-efficacy perceptions of the students who study Chemistry Teaching and their attitudes towards chemistry.

The measurements related to the self-efficacy and attitudes of teacher candidates will provide a better understanding of the attitudes of students in chemistry laboratory classes. Furthermore, this will make sure that the factors which affect the self-efficacy and attitudes of students during the learning process negatively are under control. Answers for the questions below have been sought according to the aim of this research.

Is there a relationship between the self-efficacy beliefs of teacher candidates and their attitudes towards chemistry?

64

Do the self-efficacy beliefs of teacher candidates and their attitudes towards chemistry differ according to their grade levels?

Methodology of Research

In this research, relational survey model which is one of the descriptive methods has been used. Relational survey model is defined as a research model that aims to determine the extent of change between two or more variables (Karasar, 2006).

Sample of Research

135 teacher candidates who continue studying the Chemistry Teaching have participated in this study. Sample is made up of undergraduate students who have just taken or already taken the laboratory class in chemistry. The period of this programme is 5 years (the period in which the study has been carried out).

Instruments

With the aim of collecting data in the study, Chemistry Self-efficacy Scale and Chemistry Attitudes Scale have been used. The low or high levels of total scores from both scales show the perceptions of students towards their attitudes and self-efficacy beliefs. In case total scores obtained from the scales have increased, it has been acknowledged that the perception of attitudes and self-efficacy beliefs of the student are positive.

Chemistry Self-efficacy Scale (CSS): In this study, Chemistry Self-efficacy Scale has been prepared by reorganizing properly the articles of Biology Self-efficacy Scale that Baldwin, Ebert-May & Burns (1999) developed for biology. The phrase "biology" has been changed into "chemistry" in the scale. The above-mentioned articles have been examined by chemistry experts. 5 point Likert scale is made up of 23 items. The highest score that can be achieved in the scale is 115 and the lowest score is 23. As Cronbach alpha reliability coefficient of the self-efficacy scale is found to be 0.93, it has been decided that it is proper to be used in this study.

Chemistry Attitude Scale (CAS): With the aim of determining the attitudes of students towards chemistry, attitude scale towards chemistry developed by Geban, Ertepınar, Yılmaz, Altın & Şahbaz (1994) has been used. There are 15 questions consisting of 10 positive and 5 negative items in the scale. The highest score that can be achieved in the scale is 75 while the lowest score is 15. The Cronbach alpha reliability coefficient of 5 point Likert scale is found to be 0, 83.

Data Analysis

In this research with the aim of determining the relationship between the self-efficacy and attitudes of chemistry teacher candidates, descriptive statistics for the obtained data analysis has been used. One-way analysis of variance ANOVA has been used for independent samples in order to determine if there is any difference between the levels according to the mean scores of self-efficacy and attitudes. Simple correlation analysis has been done to determine if there is any significant relationship statistically between the obtained scores from the attitude and self-efficacy scales of students. Statistically, the results of analysis have been presumed significant at a level of $p < 0.05$.

Results of Research

The results of descriptive statistics regarding the average scores of chemistry self-efficacy and attitudes according to the grade levels of teacher candidates have been shown in Table 1.

Table 1. The results of descriptive statistics regarding the average scores of chemistry self-efficacy and attitudes of teacher candidates.

	Grade level	N	X	SD	Minimum	Maximum
CSS	1	29	3.59	0.51	1.68	4.30
	2	20	3.70	0.62	2.26	5.00
	3	22	3,77	0.36	2.96	4.30
	4	31	3.81	0.36	3.09	5.00
	5	33	3.85	0.46	2.78	5.00
	Total	135	3.75	0.47	1.68	5.00
CAS	1	29	3.71	0.63	2.00	4.73
	2	20	3.88	0.52	2.47	4.67
	3	22	3.88	0.47	3.13	4.87
	4	31	3.99	0.54	2.93	5.00
	5	33	4.01	0.49	2.33	5.00
	Total	135	3.90	0.54	2.00	5.00

When Table 1 is examined, as the grade levels of teacher candidates increase the mean scores regarding attitudes and self-efficacy beliefs increase. It has been seen that the levels of self-efficacy (X=3.59) and attitudes (X=3.71) of the first graders are low, whereas the levels of self-efficacy (X=3.85) and attitudes (X=4.01) of the fifth graders are higher. It has been observed that the fifth graders have more positive attitudes towards chemistry than the first graders and their self-efficacy perceptions as well as their confidence in themselves, have also increased.

The results of one-way analysis of variance (ANOVA) that has been used to determine if there is any significant difference between the grade levels according the mean scores of the chemistry self-efficacy and attitudes towards chemistry of the teacher candidates have been shown in Table 2.

Table 2. The results of one-way analysis of variance (ANOVA) according to the grade levels of self-efficacy and attitudes.

		Sum of Squares	df	Mean Square	F	p
CSS	Between Groups	1.178	4	.294	1.361	.251
	Within Groups	28.136	130	.216		
	Total	29.314	134			
CAS	Between Groups	1.582	4	.396	1.380	.245
	Within Groups	37.279	130	.287		
	Total	38.861	134			

66

When Table 2 is examined, the self-efficacy beliefs ($F_{(4,130)}$=1.361; p>0.05) and attitudes ($F_{(4,130)}$=1.380; p>0.05) of teacher candidates have not shown any significant difference according to the grade levels. It has been determined that students' self-reliance in chemistry laboratory classes according to the grade levels, in other words, self-efficacy beliefs and attitudes towards chemistry of students are not significantly different. It can be said that grade levels do not have any significant effect on the chemistry self-efficacy and attitudes of teacher candidates according to these results.

The findings regarding the relationship between chemistry self-efficacy and attitudes towards chemistry of students have been shown in Table 3.

Table 3. The relationship between self-efficacy and attitude.

		CSS	CAS
CSS	Pearson Correlation	1	.427**
	Sig. (2-tailed)		.000
	N	135	135
CAS	Pearson Correlation	.427**	1
	Sig. (2-tailed)	.000	
	N	135	135

** Correlation is significant at the 0.01 level (2-tailed).

When Table 3 is examined, it has been observed that there is a positive and significant relationship at a low level between the self-efficacy and attitudes of teacher candidates (r=.427, p<0.01). According to this, it can be said that students who have higher self-efficacy have higher attitudes. According to the determination coefficient (r^2= .182), it can be said that 18.2% of the total variance in self-efficacy results from the attitudes of students. Accordingly, it can be said that 18.2% of the total variance in attitude results from the self-efficacy of students.

When the grade level is under control, the findings regarding the relationship between the self-efficacy and attitudes of students towards chemistry have been shown in Table 4.

Table 4. The relationship between self-efficacy and attitude when the grade level is control variable.

Control Variables			CSS	CAS
Grade level	CSS	Correlation	1.000	.405
		Significance (2-tailed)	.	.000
		df	0	132
	CAS	Correlation	.405	1.000
		Significance (2-tailed)	.000	.
		df	132	0

According to Table 4, when the grade level is presumed to be the control variable, a positive and significant relationship at a low level between the self-efficacy and attitudes of students has been found in partial correlation analysis that has been conducted (r= .405, p<0.01). The relationship between the self-efficacy and attitude is a little lower than the relationship founded regardless of the control variable (r^2= .164). According to this decrease in correlation coeffi-

cient, it can be said that the control variable, in other words, the grade levels have low effect on the self-efficacy and attitude variables.

Discussion

It has been found that there is an increase in the mean scores of self-efficacy beliefs and attitude from the first graders to the fifth graders and the self-efficacy beliefs and attitudes of teacher candidates are at good levels in this study. The increase observed from the first graders to the second graders is higher. But the increase in the fifth graders is lower. It has been presumed that this increase results from the teamworks in laboratory classes during the second and third grades. It has been presumed that well-built and well-organised learning environments based upon cooperative learning improve the self-reliance of students in performing process steps during the process of solving a problem and increase the attitudes towards chemistry. In the literature, it has been emphasized that cooperative learning has a positive effect on the self-efficacy beliefs and attitudes of students in teaching science (Scharmann & Hampton, 1995; Bilgin & Karaduman, 2005). Doing experiments in chemistry classes increases the success and attitudes of students towards chemistry and their interests in chemistry (Aycan, Arı & Türköğuz, 2001; Aydoğdu, 2000). In the studies conducted, it has been indicated that there is a significant relationship between the success in science classes and attitudes. In other words, it has been observed that students with higher attitudes have higher success.

An increase in the scores of self-efficacy and attitude according to grade levels has been observed. It can be said that attitudes of students towards chemistry and their chemistry self-efficacy are positive. However, any significant difference between the grade levels according to the mean scores of self-efficacy and attitude have not been observed. Students who have participated in this study have taken classes related to teaching practices as they progress. In fourth and fifth grades, professional teaching classes are preferred rather than classes related to chemistry field. It has been presumed that professional concerns of teacher candidates before graduation during which they perform teaching practices may have affected their self-efficacy and attitudes. Some researchers have suggested that professional competency of teacher candidates in field teaching affect their attitudes towards science (Enochs and Riggs, 1990). In the literature, there are studies that show significant difference in self-efficacy beliefs according to grade levels (Gürbüzoğlu-Yalmancı, 2014).

In the results related to the first sub problem of the study, a positive and significant relationship at a low level between the self-efficacy and attitudes of students has been found. According to these results, it can be said that students with high self-efficacy have high attitudes. When the grade level is presumed to be the control variable, correlation coefficient calculated for the relationship between self-efficacy and attitude approximates the correlation coefficient without the control variable. These results give rise to the thought that there are other variables that affect the relationship between self-efficacy and attitude. Due to the linear relationship between self-efficacy and attitude, it can be said that the activities affecting the attitudes of students positively have a positive effect on their self-efficacy beliefs. One of the factors that affects the self-efficacy is experience. The attitude and beliefs of individuals can change in the environments they attend as a result of the experiences they have had. The activities in laboratories will ensure the increase of the skills and self-efficacy of students. The self-efficacy of chemistry teacher candidates in laboratory classes affects the process of experimenting and reporting. In curriculum, teacher candidates should be provided with activities that will increase their self-reliance and positive attitudes and will help them improve their practical skills as well as theoretical classes.

68

Conclusions

The self-efficacy and attitudes of students have an effect on their performances in laboratory classes. In the studies conducted, it has been emphasized that the experiments carried out in the laboratories have an important effect on the increase of self-reliance of teacher candidates and the improvement of their critical thinking (Ryser, Beeler & McKenzie, 1995). The fears of students towards learning increase the anxiety. Anxiety at high levels decreases the success (Azizoğlu, & Uzuntiryaki, 2006; Uzuntiryaki-Kondakçı & Aydın, 2013).

It should be put excessive emphasis on the self-efficacy of teacher candidates and their attitudes towards chemistry. This case should not remain limited only to the self-efficacy and attitude. Various stimulants in laboratory classes may cause anxiety in students. As the anxiety of individuals will decrease their self-reliance, their efforts in classes may be affected negatively. Students, who have high self-efficacy and attitudes with no anxiety, have higher attendance to lessons and higher willingness to solve the problems they have faced and to success. Defining the source of anxiety and the removal of the anxiety are thought to change the attitudes of students. Therefore, examining the anxiety as well as self-efficacy and attitude towards chemistry by choosing the academic success of chemistry teacher candidates in laboratory classes as dependant variable will contribute to the literature.

The results of this study emphasize that the self-efficacy of chemistry teacher candidates is related to their attitudes and it is important to improve the self-efficacy and attitudes of students in teaching chemistry. Practices that will enhance the skills of self-efficacy of chemistry teacher candidates such as making generalisations, analysing the information, making use of the chemistry concepts and skills in chemistry classes and that will make the attitudes towards chemistry positive should be given. These practices will contribute to the literature in terms of emphasising the relationship between the self-efficacy and attitudes of chemistry teacher candidates towards chemistry.

References

Akbaş, A., & Çelikkaleli, Ö. (2006). Sınıf öğretmeni adaylarının fen öğretimi özyeterlilik inançlarının cinsiyet, öğrenim türü, ve üniversitelerine göre incelenmesi. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 2* (1), 98-110.

Altun, S., & Erden, M. (2013). Selfregulation based learning strategies and self-efficacy perception as predictors of male and female students mathematics achievement. *Procedia-Social and Behavioral Sciences, 106*, 2354-2364.

Altunçekiç, A., Yaman, S., & Koray, Ö. (2005). Öğretmen adaylarının öz-yeterlik inanç düzeyleri ve problem çözme becerileri üzerine bir araştırma (Kastamonu ili örneği). *Kastamonu Eğitim Dergisi, 13* (1), 93-102.

Arı, E., & Bayram, H. (2012). The impact of constructivism based general chemistry laboratory practices on students' the achievement, scientific process skills and laboratory performance. *Western Anatolia Journal of Educational Science, 3* (6), 1-18.

Aycan, Ş., Aycan, N., An, E. & Türkoğuz, S. (2001). Manisa Demirci Lisesi'nde kimya laboratuvar uygulamalarının kimya dersi başarısına etkisi üzerine bir çalışma. *IV. Fen Bilimleri Egitimi Kongresi 2000*, Bildiler Kitabı, 486-489. Ankara: Milli Egitim Basımevi.

Aydoğdu, C. (2000). A comparation of chemistry instruction enriched with experiments and traditional problem solving activities in term of chemistry lesson achievement. *Hacettepe University Journal of Education, 19*, 29-31.

Azizoğlu, N., & Uzuntiryaki, E. (2006). Chemistry laboratory anxiety scale. *Hacettepe University Journal of Education, 30*, 55-62.

Baldwin, J. A., Ebert-May, D., & Burns, D. J. (1999). The Development of a college biology self-efficacy instrument for nonmajors. *Science Education, 83* (4), 397-408.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive Therapy and Research, 1* (4), 287-310.

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Multifaceted impact of self-efficacy beliefs on academic functioning. *Child Development, 67* (3), 1206–1222.

Bayrakçı, M. (2007). Social learning theory and its educational applications. *Sakarya University Journal of Education Faculty, 14*, 198-210.

Bıkmaz, F. H. (2002). Self-efficacy Belief Instrument in science teaching. *Educational Sciences and Practice, 1* (2), 197-210.

Bilgin, I., & Karaduman, A. (2005). Investigating the effects of cooperative learning on 8 grade students' attitudes toward science. *Elemantary Education Online, 4* (2), 32-45, 2005.

Çoban, A., & Sanalan, A. (2002). The effect of experiment design process on self-efficacy belief of pre-service science teacher in elementary science education class. *Erzincan Journal of Education Faculty, 4* (2), 1-10.

Enochs, L. G., & Riggs, I. M. (1990). Further development of an elementary science teaching belief instrument: A pre-service elementary scale. *School Science and Mathematics, 90*, 694–706.

Gardner, P. L. (1975). The dimensionality of attitude scales: a widely misunderstood idea. *International Journal of Science Education, 18* (8), 913-919.

Geban, Ö., Ertepınar, H., Yılmaz, G, Altın, A., & Şahbaz, F. (1994). Bilgisayar destekli eğitimin öğrencilerin fen başarılarına ve fen bilgisi ilgilerine etkisi. Dokuz Eylül Üniversitesi, I. Ulusal Fen Bilimleri Eğitimi Sempozyumu Bildiri Özetleri Kitabı, İzmir.

George, R. (2000). Measuring change in students' attitudes toward science over time: an application of latent variable growth modeling. *Journal of Science Education and Technology, 9* (3), 213-225.

Gün, E., & Yıldız, G. (2014). Development of self-efficacy scale of piano performance towards the pre-service music teacher. *Turkish Studies- International Periodical for the Languages, Literature and History of Turkish or Turkic, 9* (5), 1053-1065.

Gürbüzoğlu-Yalmancı, S., & Aydın, S. (2014). Fen Bilgisi Öğretmen Adaylarının Akademik Öz-Yeterlik Algılarının İncelenmesi. *Kafkas Üniversitesi, e-Kafkas Eğitim Araştırmaları Dergisi, 1* (1), 60-66.

Hofstein, A., & Mamlok-Naaman, R. (2007). The laboratory in science education: The state of the art. *Chemistry Education Research and Practice, 8* (2), 105-107.

Karasar, N. (2006). *Scientific search methods*. Ankara: Nobel Publisher.

Koballa, T. R. (1988). Attitude and related concepts in science education. *Science Education*, *72* (2), 115-126.

Koray, O., Köksal, M. S., Özdemir, M., & Presley, A. I. (2007). The effect of creative and critical thinking based laboratory applications on academic achievement and science process skills. *Elementary Education Online, 6* (3), 377-389.

Phan, H. P. (2009). Relation between goals, self-efficacy, critical thinking and deep processing strategies: A path analysis. *Educational Psychology*, *29*, 777-799.

Riggs, I. M., & Enochs, L. G. (1990). Toward the development of an elementary teacher's science teaching efficacy belief instrument. *Science Education, 74* (6), 625-637.

Ryser , G., Beeler, J., & Mc Kenzie, C. (1995). Effects of a computer-supported international learning environment on students' self-concept, self-regulatory behavior and critical thinking ability. *Journal of Educational Computing Research, 13* (4), 375-385.

Sarı, I., Yenigün, O., Altıncı, E. E., & Oztürk, A. (2011). Effect of satisfaction of the basic psychological needes on general self-efficacy and trait anxiety (example of Sakarya University department of management). *Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi*, 9 (4), 149-156.

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist, 26*, 207-231.

Scharmann, L. C., & Hampton, C. M. O. (1995). Cooperative learning and pre-service elementary teacher science self-efficacy. *Journal of Science Teacher Education, 6* (3), 125-133.

Senemoğlu, N. (2000). *Gelişim, Öğrenme ve Öğretim: Kuramdan Uygulamaya*. Ankara: Gazi Kitabevi.

Talton, E. L., & Simpson, R. D. (1986). Relationships of attitude towards self, family, and school with attitude toward science among adolescents. *Science Education, 70*, 365–374.

Truxillo, D. M., Seitz, R., & Bauer, T. N. (2008). The role of cognitive ability in self-efficacay and self-assessed test performance. *Journal of Applied Social Psychology, 38* (4), 903-918.

Uzuntiryaki-Kondakçı, E., & Aydın, Y. Ç. (2013). Predicting critical thinking skills of university students through metacognitive self-regulation skills and chemistry self-efficacy. *Educational Sciences Theory & Practice, 13* (1), 666-670.

Yıldırım, F., & İlhan, I. Ö. (2010). Genel özyeterlilik ölçeği Türkçe formunun geçerlilik güvenirlik çalışması. *Türk Psikiyatri Dergisi, 21* (4), 301-318.

Advised by Laima Railienė, Šiauliai University, Lithuania

| **Emine Erdem** | PhD., Associate Professor, Department of Secondary School Science and Mathematics Education, Faculty of Education, Hacettepe University, Ankara, Turkey. E-mail: emine.erdem1@gmail.com |