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An investigation of teacher candidates' metacognitive skills

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Abstract

The aim of the study is to determine whether the metacognitive skill levels of the English language teacher candidates change depending on the gender, grade level and the graduated high school type and reveal the relationship between the metacognitive skills and the academic success. The study group of the research in relational screening model consists of 210 teacher candidates and "Metacognitive Skills Scale" developed by Altındağ (2008) has been used as the data collection tool. As a result of the study, it has been revealed that the metacognitive skills of the teacher candidates have been in middle level and it has shown a meaningful different for the advantage of the female students and it has not shown any difference depending on the type of the graduates school and the grade level. A positive and low-level relationship has been detected between the metacognitive skill levels and the academic success averages. The findings of this study have revealed the contribution of the metacognitive skills to the academic success and therefore, to the learning and it has been suggested that the activities improving these skills should be frequently applied in the learning environment.

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1. Introduction

It is necessary that the individuals living in the Information Era should know the ways of accessing to information, should be able to use the information they reach and should be able to generate new information. The individuals to have these qualifications is possible with their learning how they will learn, in other words, their

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learning to learn. Many cognitive psychologists have tried to explain why some individuals have learnt more than others and why they remember more out of what they have learnt when compared to the others. The answer of this question lies in the process of “*metacognition*”. In the literature, there are different definitions related to the metacognition (Lories, Dardenne & Yzerbyt, 1998) which is expressed as the basic characteristics of the human cognition. Some researchers define the metacognition as “*thinking over thinking*”. In addition to this, it is expressed that metacognition includes the knowledge and beliefs of the individual related to his/her own cognitive processes and the arrangement of these cognitive processes (Ormrod, 2006). Flavell (1979) who has brought this concept to the literature and started the basic studies related to this defines the “metacognition” as “the monitoring of understanding and the awareness of his/her own cognitive processes for an individual and being able to control them”. While according to Brown (1978), the metacognition is expressed as the awareness and arrangement of the thinking processes used by the students in the events of planned learning and problem solving, it has been considered as the structure expressing what the individual knows about his/her own cognitions and how s/he controls this by Forrester-Pressley & Waller (1984). While Marzano et. al. (1988) see the metacognition as the awareness of an individual for thinking while carrying out the certain tasks and his/her usage of this so as to control this later on. Hacker (1988) has expressed that it is the monitoring and arrangement of these situations in a purposeful way with the knowledge of the individual and the knowledge of the cognitive and emotional situations of the individual (as cited in Akın & Abacı 2011). The eye-catching points in these definitions related to metacognition are the monitoring and arranging functions of the cognitive processes. As a word, cognition taking place in metacognition is related to the metacognition and it is a concept showing difference. While cognition is expressed as the skills necessary to reveal a mission; metacognition includes the skills necessary to be able to understand how these skills have been revealed (Rivers 2001; Schraw 1998; cited in Imel, 2002).

Metacognition refers to a high level of thinking that involves active control over the cognitive processes engaged in learning and consists of two components: (a) knowledge of cognition and (b) regulation of cognition. Knowledge of cognition includes: (i) declarative, (ii) procedural, and (iii) conditional knowledge and refers to what individuals know about themselves as cognitive processors. Declarative knowledge relates to knowledge about oneself as a learner and the factors that influence his performance. Procedural knowledge is the knowledge of how to perform a specific task and conditional knowledge refers to knowing when and why to use a skill or strategy. Regulation of cognition refers to how well students can control their learning mechanism and includes three essential skills: (a) planning, that has to do with the appropriate selection of strategies for an effective performance, (b) monitoring, that concerns a person’s awareness of comprehension and task performance, and (c) evaluating, that is about the product appraisal of a student’s work and the efficiency of his own learning (Schraw, 2002; cited in Chatzipantelia, Grammatikopoulos & Gregoriadis, 2014).

Metacognition comes to the meaning of the high-level thinking including the active control in the cognitive processes related to learning. The planning, monitoring of understanding and assessment process of the completion of a task conducted for the purpose of reaching the task of learning given are related to the metacognition (Livingston, 2003). The individual to know how s/he will learn, thinking and working strategies are within the metacognitive skills (Slavin, 2006). According to Woolfolk (2010); metacognition regulating thinking and learning includes three significant skills. These are “planning, monitoring and assessment”. Planning includes the time determined for being able to realize a task, the strategies to be used, where to start, which sources will be used etc. Monitoring is the skill including the real-time awareness related to how the task has been realized. Assessment includes the justifications about the processes related to thinking and learning and the products. Some theorists examine the metacognitive skills by separating them into two as self-assessment (the skill of the individual to assess his/her own cognition) and self-control (the skill of an individual to control his/her own cognitive development) (Rivers 2001; cited in Imel, 2002).

The individuals having the metacognitive skills can monitor and direct their own learning processes (Sindhvani & Sharma, 2013). In addition to this, the metacognition includes the selection of the most suitable way to reach the learning task. For this reason, the learners whose metacognitive skills are developed can determine their targets, regulate their learning activities, can get benefit from the different learning ways and they can change the strategies

they need (Woolfolk, 2010). The learners having metacognitive skills are expected to be aware of themselves and their learning styles, to behave consciously, to control themselves, to conduct planning, to monitor how s/he learns, to regulate his/her own learning and to assess himself/herself (Doğanay, 1997; cited in Çakıroğlu 2007). According to Huitt (1997), the individuals with metacognitive skill are able to answer the following questions to themselves: What do I know about this subject, topic, issue?/ Do I know what do I need to know?/ Do I know where I can go to get some information, knowledge?/ How much time will I need to learn this?/ What are some strategies and tactics that I can use to learn this?/ Did I understand what I just heard, read or saw?/ How will I know if I am learning at an appropriate rate?/ How can I spot an error if I make one?/ How should I revise my plan if it is not working to my expectations/satisfaction?

1.1. Aim of the study

The aim of the study is to determine whether the metacognitive skill levels of the English language teacher candidates change depending on the gender, grade level and the graduated high school type and reveal the relationship between the metacognitive skills and the academic success. This study has been conducted on the first and fourth grade students so as to be able to make a comparison between the different education levels. The examination of the metacognitive skills of the teacher candidates is seen to be important in terms of having information about at which level it affects and controls their learning.

2. Method

In this study, relational survey model has been used because the determination of the metacognitive skills of the teacher candidates and its assessment in terms of some variables have been aimed. The survey model is the research approach aiming to describe a situation existent in the past and still existent in the way it exists (Karasar, 2000).

2.1. Study group

The study group of the research consists of the 1st and 4th grade students continuing their education in the department of English Language Teaching in a public state university in Ankara. 80 % of the study group consists of female (n=168), 20 % consists of male students (n=22), 47,6 % consists of first grade students (n=100) and 52,3 % consists of 4th grade students. In addition, 54,7 % of the teacher candidates participating in the study (n=115) graduated from Teacher/Anatolian Teacher Training High School, 30 % (n=63) graduated from Anatolian High School and 15,2 % (n=32) graduated from other high school types.

2.2. Instrument

The scale of metacognitive skills consisting of 30 items and developed by Altındağ (2008) has been used as the data collection instrument in the study. The content validity of the scale has been provided with the related literature review and the views of the experts. The items have been firstly submitted to the expert view and the items have been corrected again in direction of the feedbacks taken. The final version of the pretesting form prepared in the type of 5 point likert scale consists of 55 items. The pilot form of the scale has been applied to 239 students. The respondents have been requested to select the most suitable one from “Strongly Disagree”, “Disagree”, “Undecided”, “Agree” and “Strongly Agree” while answering these items. The construct validity of the scale has been tested with the explanatory factor analysis conducted with the use of the data attained from the trial application. The data attained has shown that the construct validity of the scale has been provided in the desired level. At the end of the factor analysis conducted, it has been determined that the scale is uni-dimensional and 30 items whose factor loads are above 0.44 have been selected so as to form the final scale. The criterion-related validity of the scale has been tested as based on the inner criterion. For this purpose, the differences between the scores taken from the final scale by the upper group of 27 % and the lower group of 27 % have been examined and a meaningful difference has been found between the scores of the lower group and upper group. The Cronbach Alpha

reliability coefficient of the scale has been calculated as 0.94 (Altındağ, 2008). The reliability of the scale has been calculated for this study and found as 0.80. Descriptive statistics, t-test for the independent groups, one way ANOVA and Pearson Product-Moment Correlation Coefficient have been used in the analysis of the research data.

3. Findings

3.1. The metacognitive skill levels of the teacher candidates

The first sub-problem of the study has been expressed as “At which level are the metacognitive skills of the English language teacher candidates?”. For the purpose of revealing the metacognitive skill levels of the teacher candidates, three levels have been determined as high, middle and low; the totals of the scores the students have taken have been transformed into percentages and their frequencies have been taken. According to this, those having taken 80 % and above have been deemed to be at high level, those between 60-79 % are at middle and those having taken 59 % and below are at low level. The descriptive statistics related to the metacognitive skills of the English language teacher candidates are given in Table 1.

Table 1. The descriptive statistics related to the metacognitive skills of the English language teacher candidates

Groups	High		Middle		Low	
	n	%	n	%	n	%
1 th Grade	5	5	88	88	7	7
4 th Grade	5	4,5	96	87,3	9	8,2
Total	10	4,76	184	87,62	16	7,62

It has been revealed that the teacher candidates have taken 125 points as the highest and 67 points as the lowest from the scale. The average of the scores taken from the scale is 103,58. When Table 1 is examined, it is seen that the metacognitive skill levels of the English language teachers candidates are in the middle level. This situation is valid for both the 1st and 4th grade students. When the total is considered, it is also seen that the metacognitive skill levels of the teacher candidates are in the middle level.

3.2. Metacognitive skills of the teacher candidates and gender

The second sub-problem of the study has been determined as “Do the metacognitive skill levels of the English language teacher candidates show a meaningful difference depending on the gender?”. The t-test results of the points taken by the English language teacher candidates from the scale are given in Table 2.

Table 2. The t-test results related to the comparison of the metacognitive skill levels of the teacher candidates depending on gender

Groups	n	\bar{X}	Ss	Sd	t	P
Female	168	104,38	8,89	208	2,35	0,020*
Male	42	100,41	12,93			

p<0,05

When Table 2 is examined, it is seen that there is a meaningful difference for the advantage of the female students between the metacognitive skills of the teacher candidates and their genders.

3.3. Metacognitive skills of the teacher candidates and the grade level

The third sub-problem of the study has been determined as “Do the metacognitive skill levels of the English language teacher candidates show a meaningful difference depending on the grade levels?”. The t-test results of the

points taken by the English language teacher candidates from the scale depending on the grade levels are given in Table 3.

Table 3. The t-test results related to the comparison of the metacognitive skill levels of the teacher candidates depending on grade levels

Groups	n	\bar{X}	Ss	Sd	t	p
1 th Grade	100	103,76	10,11	208	0,248	0,804
4 th Grade	110	103,41	9,79			

p>0,05

As it is seen in Table 3, there is no meaningful difference between the metacognitive skills of the teacher candidates and their grade levels.

3.4. Metacognitive skills of the teacher candidates and the type of the graduated high school

The fourth sub-problem of the study has been determined as “Do the metacognitive skill levels of the English language teacher candidates show a meaningful difference depending on the type of the graduated high school?”. The average and standard deviation of the points taken by the English language teacher candidates from the scale depending on the type of graduated high school are given in Table 5.

Table 5. The average and standard deviation of the scores taken by the teacher candidates from the scale depending on the type of graduated high school

Type of High School	n	\bar{X}	ss
Teacher/Anatolian Teacher Training High School	115	103,20	9,62
Anatolian High School	63	104,71	9,40
Other	32	102,72	11,94
Total	210	103,58	9,92

As a result of the analysis conducted so as to control the homogeneity of the variances, it can be said that the variances are homogenous because the p value in the Levene statistics (Sig.) is higher than 0,005 (0,333). The ANOVA results related to the comparison of the metacognitive skill levels of English language teacher candidates depending on the type of graduated high school are given in Table 6.

Table 6. ANOVA results related to the comparison of the metacognitive skill levels of teacher candidates depending on the type of graduated high school

	Squares Total	sd	Squares Average	F	p
Between Groups	121,40	2	60,70	0,615	0,542
Within Groups	20445,73	207	98,78		
Total	20567,12	209			

p>0,05

As it is seen in Table 6, there is no meaningful difference between the metacognitive skills of the English language teacher candidates and the type of graduated high school.

3.5. The relationship between the metacognitive skills and academic success

The fifth sub-problem of the study has been determined as “Is there a meaningful relationship between the metacognitive skill levels of the English language teacher candidates and their academic success averages?”. Pearson Product-Moment Correlation coefficient has been calculated so as to find an answer to this question and the result is given in Table 7.

Table 7. The relationship between the metacognitive scores of the teacher candidates and their academic success averages

	N	r	p
Metacognitive Skills	210	0,267*	0,000
Academic Success			

p<0,05

When Table 7 is examined, it is seen that the relationship level between the metacognitive skills and the academic success is .267. this is a positive and low-level relationship (Büyüköztürk, 2011). In this situation, it can be said that an increase in one of these structures which are mentioned within the scope of the study and the fact that both are in relation in the literature is theoretically supported causes to an increase also in the other one.

4. Conclusion and discussion

When the findings of the study are examined, it has been concluded that the metacognitive skills of the teacher candidates are in middle level. This result also shows consistency with the findings of other studies in which the metacognitive skill levels of the teachers and teacher candidates have been examined. In the study conducted by Altındağ (2008), it has been revealed that the teacher candidates being educated in the departments of Primary School Teaching and Secondary School Science and Mathematics have the metacognitive skills in middle level. Similarly, in the study conducted by Temel, Özgür, Şen and Yılmaz (2012), it has been determined that the metacognitive skills of the teacher candidates being educated in the department of Chemistry are dense in the middle level. Kiremitçi (2013) has used the inventory of metacognitive awareness for the purpose of revealing the metacognitive awareness levels of the students of the School of Physical Education and Sports and has set forth that the metacognitive awareness of the students are in middle level. In the study conducted by Jaafar and Ayub (2010), it has been seen that the metacognitive skills of the university students are in middle level. In the study conducted by Duran (2011), it has been concluded that the cognitive awareness skills of the primary school teachers are in middle level.

In the study, the metacognitive levels of the teacher candidates have been compared depending on gender and it has been revealed that there is a meaningful difference for the advantage of the female students. This finding shows consistency with the results of some studies. In the studies conducted by Altındağ (2008) and Tunca & Şahin (2014), meaningful differences have been attained for the advantage of female students in the metacognitive skill levels of the teacher candidates. The research findings conducted by Demir & Özmen (2011), Schleifer & Dull (2009), Sulaiman & Ali (2006) have revealed that there is a meaningful difference for the advantage of female students in the metacognitive levels of the university students. In the study conducted by Sheorey & Mokhtari (2001) to reveal the metacognitive reading strategies of the university students, it has been concluded that the female students have metacognitive reading strategies at higher levels and at meaningful levels when compared to those of the male students.

According to another result of this study, the metacognitive skill levels of the teacher candidates do not change depending on the grade level and the type of graduated high school. In the literature, there are studies which reach the conclusion that the metacognitive skills do not get different depending on the grade level and the type of graduated high school. In the study conducted by Deniz, Küçük, Cansız & İşleyen (2013), it has been revealed that there is no meaningful difference between the metacognitive awareness of Secondary School Mathematics Teacher candidates and their grade levels. Özsoy & Günindi (2011) have reached the conclusion that there is no meaningful

difference between the metacognitive awareness levels of the teacher candidates studying in the department of Preschool Teaching and the type of the high school they graduated.

It has been concluded that there is a positive and low-level meaningful relation between the metacognitive skill levels of the teacher candidates and their academic success averages. According to this, it can be said that an increase in one of the variables causes to an increase also in the other one of the variables. When the literature is examined, the results have been reached revealing that the metacognitive skills are closely related to the academic success. In the studies conducted by Romainville (1994), Schraw & Dennison (1994), Altındağ (2008), Turan & Demirel (2010), Nelson (2012), Hoseinzadeh & Shoghi (2013), Tunca & Aklın Şahin (2014), positive meaningful relationships have been found between the metacognitive skills of the university students and their academic success. In the study which reveals that there is a meaningful relationship between the academic success and the metacognitive skills an which has been conducted as based on the views of the university students by Vadhan & Stander (1993), as the scores the students get from the tests rise, it has been revealed that the scores they expect get close to each other. Ghonsooly, Khajavy & Mahjoobi (2014) have searched whether the metacognitive awareness of the teacher candidates and their academic performances can be predicted or not and they have reached the conclusion that the metacognitive awareness of the teacher candidates is a strong predictor of their academic performances.

The findings of this study have revealed the contribution of the metacognitive skills to the academic success and therefore, to the learning. Again, according to the findings attained from the study, it is seen that even the 4th grade students cannot gain the metacognitive skills at high levels. It is considered as beneficial that as of the primary education, the activities to develop the metacognitive skills of the students in the classroom environment should be integrated in the lessons and the environment and the opportunities necessary for the students to be learners with self-management should be provided to them.

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