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AYRI BASIM

Prof. Dr. Çetin SEMERCİ – Dr. Şenel ELALDI

The Roles of Metacognitive Beliefs in Developing Critical Thinking Skills
-
Eleştirel Düşünme Becerilerinin Gelişiminde Üstbilişsel İnançların Rolü

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The Roles of Metacognitive Beliefs in Developing Critical Thinking Skills

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Abstract: This study was conducted to examine the influence of metacognitive beliefs on critical thinking skills. It was also aimed at examining what types of metacognitive beliefs might affect increasing a student's critical thinking skills. It is hypothesized that critical thinking occurs when individuals use their metacognitive beliefs and, thereby, there is a connection between critical thinking and metacognitive beliefs. The study group of the study included 663 students, attending 3rd and 4th grades of Education Faculties of three universities in Turkey. The data were collected through Metacognitions Questionnaire and The California Critical Thinking Disposition Inventory scales. The results of the study indicated that there was a significant relationship which was lower than intermediate level between all of the sub-dimensions of metacognitive beliefs and students' critical thinking scores. To some extent, the results supported that prospective teachers did not obtain critical thinking skills at the desired level.

Key words: Metacognition, Critical thinking, Metacognitive beliefs, Prospective teachers

Eleştirel Düşünme Becerilerinin Gelişiminde Üstbilişsel İnançların Rolü

Özet: Bu çalışma üstbilişsel inançların eleştirel düşünme becerileri üzerindeki etkisini incelemek amacıyla yapılmıştır. Ayrıca hangi üstbilişsel inançların öğrencilerin eleştirel düşünme becerilerini artırmada etkili olduğunu incelemeyi de amaçlayan bu çalışmada, eleştirel düşünme becerileri ve üstbilişsel inançlar arasında bir bağlantı olduğu ve ayrıca cinsiyet açısından da hem eleştirel düşünme becerileri hem de üstbilişsel inançlar arasında bağlantı olduğu denenceleri üzerinde durulmuştur. Çalışma grubu, Türkiye'nin üç farklı ilinde yer alan üç farklı üniversitenin Eğitim Fakültelerinin 3. ve 4. sınıflarında öğrenim gören 663 öğrenciden oluşmuştur. Veriler Üstbiliş-30 ve California Eleştirel Düşünme Ölçeklerinin aynı anda kullanılmasıyla toplanmıştır. Öğretmen adaylarının üstbilişsel inançlarının tüm alt boyutları ve eleştirel düşünme puanları arasında orta düzeyden daha da düşük seviyede anlamlı farklılık ortaya çıktığı görülmüştür. Elde edilen sonuçlar öğretmen adaylarının istenilen seviyede eleştirel düşünme becerilerine sahip olmadığını; ancak kendi bilişsel becerilerinin ve düşünme süreçlerinin farkında olduklarını ve dolayısıyla da eleştirel düşünme eğilimlerinin olduğunu desteklemektedir.

Anahtar Kelimeler: Üstbiliş, Eeştirel düşünme, Üstbilişsel inançlar, Öğretmen adayları

1. INTRODUCTION

Critical thinking as higher order thinking (Halpern, 1993), entails "awareness of one's own thinking and reflection on the thinking of the self and others as an object of cognition" (Kuhn & Dean, 2004, 270). Therefore, critical thinking is related to the development of metacognitive understanding which is essential to lead to high levels of cognition (Lockwood, 2003). Thus, a fundamental aspect of critical thinking is the metacognitive activity which brings to reflect on the thinking itself, to evaluate one's own thinking practice and to learn from the same learning experience (Vezzosi, 2004). An individual uses critical thinking skills by means of critical thinking disposition which refers to human attributes that include "inquisitiveness, open-mindedness, systematicity, analyticity, truth-seeking, critical thinking self-confidence, and maturity" (Facione, 2007, 10). Therefore, Facione (2007) defines a good critical thinker as confident in reasoning, inquisitive, judicious, truth seeking, systematic, analytical and open minded. In addition, he also reports the criteria of an ideal critical thinker according to Delphi Report consensus as inquisitive, well informed, trustful of reason, open minded, flexible, and fair minded in evaluation, willing to reconsider, diligent in seeking relevant information.

The term metacognition refers to higher-order mental processes that are often involved in making plans for learning, monitoring learning rates, and predicting performance (Coutinho et al. 2005) and consists of two components which are "metacognitive knowledge" and "metacognitive experiences" (Livingston, 1997). Flavell (1979) emphasizes that "metacognitive knowledge consists primarily of knowledge or beliefs about what factors or variables act and interact in what ways to affect the course and outcome of cognitive enterprises" (p. 907). Therefore, metacognitive knowledge or beliefs involves knowledge about cognition in general, as well as awareness of and knowledge about one's own cognition (Pintrich, 2002) and plays an important role in student learning. In other words metacognitive knowledge is conscious and unconscious beliefs that one has about one's own cognitions and information stored about cognition (Yılmaz, 2007). Individuals have positive and negative beliefs about thinking that influences appraisals. They also have implicit procedural metacognitions forming plans or programs for guiding cognition and action (Wells and Cartwright-Hatton, 2004). Metacognitions are beliefs linked to the interpretation, selection, and execution of thought processes (Cartwright-Hatton & Wells, 1997). To illustrate, beliefs such as negative intrusive thoughts -worry, obsession, and rumination-, and beliefs in relation to the efficiency of memory and cognitive control can be regarded as metacognitive knowledge about cognitions

(Wells, 2000). Individuals' success or failure in controlling their thoughts influence their beliefs, expectations and judgments about their own mental processes and products (Wenzlaff and Wegner, 2000). Metacognitive beliefs may therefore refer to the information individuals hold about their own cognition and internal states, and about coping strategies impacting on both (Wells, 2000).

Kuhn & Dean (2004) addressed that metacognition originates early in life, when children first become aware of their own and others' minds. But like many other intellectual skills, metacognitive skills do not develop to a desired level. According to Veenman et al. (1996), metacognitive skills develop during preschool or early-school years at a very basic level, but become more sophisticated and academically oriented whenever formal education requires the explicit utilization of a metacognitive repertoire. Therefore, there is a significant connection between metacognition and learning strategies during the study process (Yeşilyurt; 2013 a; 2013 b). Kuhn (1999), in his study, found that simply teaching critical thinking to students through metacognition is not enough. Without appropriate cognitive skills, students can never be self-directed and independent in academic tasks (Patton & Kritsonis, 2007), since students' metacognitive development is crucial to academic success (Wang, 2010). "There is no perfect technique for fostering critical thinking, no ideal method for engaging the intellects of students" (Paul & Elder, 2008, 34). As a consequence, the awareness of knowing a person's metacognitive beliefs to learn their own cognition and internal states is of more importance to be implemented critical critical thinking teaching.

Research Hypotheses:

A question not yet addressed in the literature is how metacognitive beliefs are associated with critical thinking skills. Therefore, the study investigated the influence of metacognitive beliefs on critical thinking skills. Additionally, what types of metacognitive beliefs may affect increasing a student's critical thinking skills. Therefore, the hypothesis of the study:

1. Critical thinking occurs when individuals use their metacognitive beliefs that increase the probability of a desirable outcome and, thereby, there is a connection between critical thinking and metacognitive beliefs.

2. There is a connection between both metacognitive beliefs and critical thinking skills in terms of gender.

2. METHOD

Survey method was conducted in the research. Survey method is an approach which is used to describe the past and current situation as it is (Karasar, 2009). In this research, regression analysis was utilized for analyzing data gathered from the prospective teachers participating in the study.

2.1. Participants

A total of 663 prospective teachers [285 male (42.99%) and 378 female (57.01 %)], attending to 3rd and 4th grades of Education Faculties of three universities in Turkey took part in this study. The participants were asked to participate in this study voluntarily.

2. 2. Instruments and Procedure

Data were collected in the Fall Semester of the 2011- 2012 Academic Year. Two scales were applied to the students at the same time. One of them was the Metacognitions Questionnaire (MCQ-30) developed by Wells and Cartwright-Hatton (2004) and adapted for Turkish population by Tosun and Irak (2008) and the other scale used in the study was the California Critical Thinking Disposition Inventory (CCDTI) developed by Facione, Facione and Giancarlo (1998, cited in Ingle, 2007) and adapted to Turkish system with 51 items and 6 subscales by Kökdemir (2003).

Although Wells and Cartwright-Hatton's (2004) metacognitions questionnaire (MCQ-30) which operationally defines and measures an individual's metacognitive beliefs is considered important in the metacognitive model of psychological disorders, the use of MCQ-30 on normal samples is expected to lead to the acquisition of the important information (Tosun and Irak, 2008). Thus, it was aimed to use the MCQ-30 scale for this study. The questionnaire consists of 30 items divided into five subscales. Each item on MCQ-30 is rated on a 4-point Likert scale; the points on the scale are 1 (do not agree), 2 (agree slightly), 3 (agree moderately), and 4 (agree very much). MCQ-30 scores range from 30 to 120 points and higher scores indicate greater pathological metacognitive activity (Tosun and Irak , 2008). The subscales are: (1) positive beliefs about worry which consists of items relating to the belief that worrying helps to solve problems and to avoid unpleasant situations. It also includes items which suggest that worrying is a necessary feature of a pleasant and normal personality ; (2) negative beliefs about uncontrollability of thoughts and corresponding danger which incorporates items tapping the belief that it is necessary to control one's worrying in order to

function well as a person, beliefs about the mental and physical dangers of worrying; and the belief that one's worry is uncontrollable; (3) cognitive confidence which consists of items concerned with the efficacy of one's cognitive skills, in particular, memory and attentional functioning; (4) negative beliefs about thoughts in general, including themes of responsibility, punishment, and superstition, and need for control which includes items relating to negative outcomes that might result from having certain thoughts, and to a feeling of responsibility for preventing those outcomes. Many of these items are of a superstitious type, which imply that the individual could be punished for having, (or not having) certain thoughts; (5) cognitive self-consciousness which consists of items relating to the degree to which an individual focuses on their own thinking processes (Cartwright-Hatton & Wells, 1997). The MCQ-30 can be relatively easily applied and shows good internal consistency (Cronbach's alpha .93) and convergent validity, and an 'acceptable' to 'good' test–retest reliability (Wells & Cartwright-Hatton, 2004). Evaluating of the psychometric properties of the short form of the MCQ-30 in a population of Turkish university students were carried out by Tosun and Irak (2008). The Turkish MCQ-30 showed acceptable to good test-retest reliability, internal consistency, and convergent validity. Reliability coefficients of each subscale ranged from .70 to .85. The psychometric properties of the Turkish version of MCQ-30 showed that the instrument is a valuable additional tool for the assessment of metacognition in Turkey (Tosun and Irak, 2008).

The California Critical Thinking Disposition Inventory was developed based on the results of The Delphi Report in which critical thinking and disposition toward critical thinking were conceptualized by a group of critical thinking experts (Facione, 1990). The original CCTDI includes 75 items loaded on seven constructs including inquisitiveness, open-mindedness, systematicity, analyticity, truth-seeking, critical thinking self-confidence, and maturity. The inquisitiveness construct of the inventory including 10 items measures one's intellectual curiosity and one's desire for learning without considering any profit. The open-mindedness construct containing 12 items measures being tolerant of divergent views and sensitive to the possibility of one's own bias. The systematicity construct including 11 items measures how a person is organized, orderly, focused, and diligent in inquiry. The analyticity construct involving 11 items addresses the application of reasoning and the use of evidence to resolve problems. The truth-seeking construct including 12 items measures the disposition of being eager to seek the best knowledge in a given context, courageous about asking questions, and honest and objective about following inquiry. The critical thinking self-confidence construct consisting of

10 items measures the trust the soundness of one's own reasoning processes. Finally, the maturity construct involving 10 items measures cognitive maturity and the disposition to be judicious in one's decision-making (Kökdemir, 2003). An adaptation study to transform this inventory into Turkish version was carried out by Kökdemir (2003) because of cultural concerns. Fifty-one items with six constructs were kept in the scale. Reliability of the whole scale was found to be .88. Reliability coefficients of each subscale ranged from .61 to .78. In the evaluation of CCTDI, the students' level of agreement with the item is totaled for every item and the result evaluated out of the total possible of 306 points. In the scores a total score less than 240 is considered low, scores between 240 -300 are considered average and scores over 300 are considered to represent a high level of critical thinking skills (Kökdemir, 2003).

The participants were asked to complete the MCQ-30 and CCTDI in their regular classes in about fifty (50) minutes. The two scales were administered to the participants at the same time. They were instructed to mark the appropriate option for each item carefully. After the administration of the scales, the participants were debriefed about the purpose of the study and were thanked for their effort.

3. RESULTS

In this study, most of the correlations between sub dimensions of metacognitive beliefs and sub-dimensions of critical thinking skills were found positive. The highest positive correlation was found between Cognitive Self-Consciousness and critical thinking (general) ($r= .37$, $p< .01$). Another positive correlation was between critical thinking (general) and open-mindedness ($r= .36$, $p< .01$).

The correlations between all the sub-dimensions of metacognitive beliefs and sub-dimensions of critical thinking which are analyticity ($r=.02$, $p>.05$), open-mindedness ($r=.07$, $p>.05$), inquisitiveness ($r=.08$, $p>.05$), self-confidence ($r=.03$, $p>.05$), truth-seeking ($r=.02$, $p>.05$), systematicity ($r=.04$, $p>.05$) appeared to be low. However, the correlations between inquisitiveness, self-confidence, truth-seeking, and cognitive confidence were all found to be low ($r= -.04$, $p> .05$), ($r= -.07$, $p> .05$), ($r= -.07$, $p> .05$), respectively.

The correlations between gender and sub dimensions of critical thinking skills were generally found close to zero. This indicated that there were no significant differences between gender and sub dimensions of critical thinking skills, except for correlations between gender and analyticity ($r= .09$, $p< .05$). No correlations were also found between gender and

sub-dimensions of metacognitive beliefs; gender and positive beliefs about worry (r=-.04, p>.05), gender and uncontrollability (r= -.04, p> .05) and gender and cognitive confidence (r= -.02, p>.05), gender and need to control thoughts (r= .05, p>.05), gender and cognitive self-consciousness (r= .05, p>.05). The correlational results are presented in Table 1.

Table 1: The Correlations between Sub- Dimensions of Metacognitive Beliefs and Critical Thinking Skills

	Gender	PBAW	UNCON	CC	NCT	CSC
1. Gender	-	-.04	-.04	-.02	.05	.05
2. Analyticity	.09*	.09*	.08	-.16	.02	.29**
3. Open-mindedness	.05	.11*	.13*	.14*	.07	.36**
4. Inquisitiveness	.02	.16*	.14*	-.04	.08	.29**
5. Self-confidence	.03	.17**	.11*	-.07	.03	.29**
6. Truth-seeking	-.02	.14**	.14**	-.07	.02	.29**
7. Systematicity	.00	.10*	.10*	-.12**	.04	.12**
8. Critical thinking(General)	.04	.16**	.15**	-.14**	.06	.37**

p<.05* p<.01**
Notes: Positive Beliefs About Worry (PBAW), Uncontrollability (UNCON), Cognitive Confidence (CC), Need to Control Thoughts (NCT), Cognitive Self-Consciousness (CSC).

The sub dimensions of positive beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness are independent variables and positive (Table 1). In this research, the dependent variable is critical thinking skills. The results of regression analysis regarding the influence of metacognitive beliefs on critical thinking are given in Table 2.

Considering the positive beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness variables, the results of the regression analysis regarding the influence of metacognitive beliefs on critical thinking are given in Table 2.

Zero-order and partial correlations between interpreting variables and dependent (what is interpreted) variable indicated that there was a positive relationship between PBAW and critical thinking which was lower than intermediate level (r= 0.163), still the correlation

between the two variables was calculated as r= 0.075 upon checking values of the other variables.

Table 2: Results of Regression Analysis Regarding the Influence of Metacognitive Beliefs on Critical Thinking

Variable	B	Std Error$_B$	B	T	P	Zero-order r	Partial r
Constant	3.072	0.116	-	26.425	0.000	-	-
PBAW	0.077	0.040	0.079	1.929	0.054	0.163	0.075
UNCON	0.017	0.036	0.021	0.483	0.629	0.155	0.019
CC	-0.138	0.028	-0.196	-4.974	0.000	-0.135	-0.191
NCT	-0.035	0.033	-0.044	- 1.038	0.300	0.057	-0.040
CSC	0.329	0.039	0.366	8.457	0.000	0.366	0.313

R=0.417 R^2= 0.174 $F_{(5,657)}$= 27.736 p=0.000 Durbin-Watson (D.W.) Statistic=1.869

It was remarked that there was a positive relationship between UNCON and critical thinking which was lower than intermediate level (r= 0.155); however, the correlation between the two variables was calculated as r= 0.019 upon checking values of the other variables. There was a positive relationship between CC and critical thinking which was lower than intermediate level (r= -0.135); however, the correlation between the two variables was calculated as r= -0.191 upon checking values of the other variables. Moreover, there was also a positive relationship between NCT and critical thinking at a low level (r= 0.057); however, the correlation between the two variables was calculated as r= -0.040 upon checking values of the other variables. There was also a positive relationship between CSC and critical thinking at a lower level than intermediate level (r= 0.366); however, the correlation between the two variables was calculated as r= 0.313 upon checking values of the other variables.

According to Field (2009: 7), "R stands for the values of the multiple correlation coefficient between the predictors and the outcome". When only independent variables (positive beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness) are used as associated with critical thinking, this is the simple correlation between dependent and independent variables (R=0.417). R^2 is a measure of how much of the variability in the outcome is accounted for by the predictors. In this research, for the model, its value is 0.174, which means that independent variables account for 17.4% of the

variation in critical thinking. That is, the 5 variables mentioned above all together explain around 17.4 % of the total variance in critical thinking.

There was a significant relationship which was lower than intermediate level between all of the sub dimensions of metacognitive beliefs and students' critical thinking scores. ($R= 0.417$, $R^2= 0.174$, $p<0.01$). According to the standardized regression coefficients (β), the relative order of importance of interpreting variables was as follows: Positive beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness.

T- test results regarding the significance of the regression coefficients revealed that cognitive confidence and cognitive self-consciousness were meaningful instruments on critical thinking. The other three variables (positive beliefs about worry, uncontrollability and need to control thoughts) did not have significant effects**.** Besides, autocorrelation was examined in regression process. Autocorrelation violates the ordinary least squares (OLS) assumption that the error terms are uncorrelated (wikipedia.org/wiki/Autocorrelation). According to Field (2009), the autocorrelation test is the Durbin–Watson statistic. Durbin-Watson statistic informs us about whether the assumption of independent errors is tenable. The closer to 2 the value is, the better, for these data the value is 1.869, which is so close to 2 that the assumption has almost certainly been met. According to the results of multiple regression analysis held between sub-dimensions of metacognitive beliefs and critical thinking, regression equality regarding the influence of metacognitive beliefs on critical thinking (mathematical model) is as follows:

Critical thinking=3.072+ 0.077 PBAW + 0.017 UNCON – 0.138 CC – 0.035 NCT + 0.329 CSC

4. DISCUSSION and CONCLUSION

The findings of this study revealed positive but low correlations between all the sub-dimensions of metacognitive beliefs and of critical thinking. However, Halpern (1993) who is one of the most widely recognized researchers in the area of critical thinking acknowledged that there was a close relation between critical thinking and metacognition. To her, metacognition is related to critical thinking through its self-reflecting aspect. In fact, she outlines the characteristics of critical thinking as willingness to plan; a flexibility and open-mindedness on the part of the student; persistence; and the metacognitive skill of self-reflection and self-correction. That means it's not just what you know; it's about how, when,

and whether you use it (Schoenfeld, 1992). Similarly, according to the results of the study conducted by Magno (2010), the factors of metacognition were significantly related to the factors of critical thinking. In a study conducted by Schoenfeld (1985, cited in Chisholm, 1999), it was observed that despite the fact that participants had high mathematical skills, they were unable to solve familiar problems because of inadequate metacognitive skills

The highest positive correlation found between cognitive self-consciousness and critical thinking (general) ($r= .37$, $p< .01$) indicates a tendency to be aware of thinking critically. It is a desirable outcome for prospective teachers who are expected to have high level critical thinking attitudes in order to bring up individuals thinking, interpreting, investigating and inquiring critically. According to Hanley (1995), "to become a better critical thinker, students must develop expert thinking skills and become experts at choosing the best skills for the particular situation"(p.68). In parallel with the result, Şen (2009) examined Turkish prospective teachers' critical thinking attitudes in her study and revealed that Turkish prospective teachers were in a middle level. According to Bailin et al. (1999), critical thinking is not a definitive process that can be taught like the steps in the mathematical order of operations. They define critical thinking as a "multi-form enterprise" (p.279) and the steps required to engage in critical thinking are determined by the nature and context of the problem. In short, improving critical thinking by changing attitudes to thinking, if it is possible at all, is not easy.

A positive correlation ($r= .36$, $p< .01$) which was found between critical thinking (general) and open-mindedness, one of the subscales of CCTDI, indicates whether individuals pay close attention to their thoughts. Being tolerant of divergent views with sensitivity, open to new idea and a flexible thinking might be positive attitudes or dispositions toward critical thinking expected from a prospective teacher.

Except for correlations between gender and analyticity ($r= .09$, $p< .05$), no statistically significant differences were found between gender and sub dimensions of critical thinking skills. Facione et al. (1995) remarked that "Analyticity is a core disposition for the inquiring mind" (p. 5). Türnüklü and Yeşildere (2005) conducted a study to investigate critical thinking dispositions of elementary mathematics prospective teachers in Turkey and concluded that critical thinking dispositions of the prospective teachers were high at analyticity dimension which was an expected result because of the lessons conducted on rediscovery of the mathematical knowledge and reasoning.

As for correlations between gender and sub-dimensions of metacognitive beliefs, once again there were no statistically significant differences between both groups. There was a negative correlation between gender and positive beliefs about worry (r=-.04, p>.05), gender and uncontrollability (r= -.04, p> .05) and gender and cognitive confidence (r= -.02, p>.05) in this study. Although no gender differences emerged as significant in MCQ-30 according to Wells and Cartwright-Hatton (2004), in Turkish version, significant negative correlations were observed between age and the MCQ-30 subscales, and moreover the effect of gender was significant on some of the subscales (Tosun and Irak, 2008).Chisholm (1999) examined the contribution of gender, metacognition and critical thinking to a group of adolescents and reached the same result in her thesis. Gender was additionally not found to significantly affect the attainment of metacognition and critical thinking. Only critical thinking came out as a significant predictor of achievement. It was also found that students had more well developed critical thinking skills than metacognitive skills. Therefore, critical thinking was found to have a stronger correlation than the students' metacognitive skills. Despite some difficulty for students utilizing their metacognitive skills, there was a relationship between these skills and achievement. Students with higher metacognitive and critical thinking skills were more likely to have higher grades. Şen (2009) also concluded no statistically significant differences between critical thinking skills and gender.

There was no statistically significant but a positive low correlation between dependent (critical thinking skills) and independent variables (the sub dimensions of metacognitive beliefs which are beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness). Garcia and Pintrich (1992) conducted a study on college and university students to reveal positive correlates of critical thinking skills in terms of metacognition, too. In contrast to the findings of present study, however, they found that metacognitive self regulatory strategies which were defined as the "awareness, knowledge and control of cognition" by the researchers were significantly positive predictors of critical thinking ability. The findings which were revealed by Ingle (2007) were consistent with those taken place in Garcia and Pintrich's (1992) study. Ingle conducted a study in order to identify predictors of critical thinking ability among college students and the results of the study showed that metacognitive self regulation was the strongest predictor of critical thinking ability as measured by the California Critical Thinking Skills Test and the Ennis- Weir Critical Thinking Essay Test.

There was a significant relationship which was lower than intermediate level between all of the sub dimensions of metacognitive beliefs (positive beliefs about worry, uncontrollability, cognitive confidence, need to control thoughts and cognitive self-consciousness) and students' critical thinking scores ($R= 0.417$, $R^2= 0.174$, $p<0.01$). To some extent, these results supported that prospective teachers did not obtain critical thinking skills at the desired level.

Students seem to be coming to university lacking in critical thinking and metacognitive skills and abilities because of the educational system in Turkey which is heavily dominated by the standardized tests. There is a strict bound between standardized tests and Turkish citizens in order to succeed in the educational system. At the fourth grade of primary school students begin to gain the ability of solving tests for the preparation of a standardized test which is held once a year in order to be decided to the high school which the student is going to be attending. At high school, students are prepared for another standardized test, university entrance exam and must be good at solving tests in order to be accepted to any program based on their scores on this exam. And even to get a job or some steps of postgraduate education, a university graduate person has to take a standardized test in his life. This problem affects both teachers and students. Teachers find it difficult to do their jobs, and students feel overwhelmed and helpless when they are asked to do some tasks about critical thinking or metacognitive abilities. Students are unaware of how to approach problems and how to develop alternative approaches if their first try is not successful. Whereas "the main purpose of any meaningful educational system should be to enhance the thinking skills of students and moreover, governments, educational planners, employers, and educators should support this priority" (Owu-Ewie, 2008, 16).

5. RECOMMENDATIONS

Based on the findings obtained from the present study, teacher education programs and prospective teachers' critical thinking and metacognitive beliefs require questioning. It is recommended that studies be planned to investigate the reasons why prospective students' level of critical thinking and metacognitive beliefs is low. Educational strategies might be developed that will improve students' critical thinking and metacognitive abilities and that, instead of simple lecture format, teaching or applying methods and techniques in discussion format to gain prospective teachers the skills of listening, writing, reading, speaking critically be implemented in education programs.It is also recommended that teacher education

programs redesign their curricula based on research, observation, presentation, and/or other types of activities in order for prospective teachers to become agents of social change when they become teachers by providing their students an environment in which an integrated metacognitive and critical thinking skills are valued rather than giving them a multiple choice test or open-ended exams and by encouraging and supporting their students to think critically from the earliest years of their school lives. For this reason by training prospective teachers to use their metacognitive and critical thinking skills effectively in pre-service and in-service periods, it is expected that they will transfer the knowledge and the skills to their future classrooms.

REFERENCES

Autocorrelation. (2011). *In Wikipedia*. Accessed April 2014, at http://en.wikipedia.org/wiki/Autocorrelation

Bailin, S., Case, R., Coombes, J., & Daniels, L.B. (1999). Common Misconceptions of Critical Thinking. *Journal of Curriculum Studies*, 31(1), 268-284.

Cartwright-Hatton, S. & Wells, A. (1997) Beliefs about Worry and Intrusions: The Metacognitions Questionnaire and its Correlates. *Journal of Anxiety Disorders*, 11(3), 279–296.

Chisholm, J. M. (1999). *The Effects of Metacognition, Critical Thinking, Gender and Gender Role Identification on Academic Achievement in the Middle Years*. A master degree thesis, School of Psychology, Mount Saint Vincent University, Halifax, Nova Scotia, Canada. Available from ProQuest Dissertations and Thesis database. (Publication No. AAT MQ56801).

Coutinho, S., Wiemer- Hastings, K., Skowronski, J., & Britt, M. A. (2005). Metacognition, Need for Cognition and Use of Explanations During Ongoing Learning and Problem Solving. *Learning and Individual Differences,* 15, 321-337.

Facione, P. A. (1990). Critical thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Research Findings and Recommendations. *Millbrae, CA: The California Academic Press.* ERIC Doc. No. ED 315 423.

Facione, P., Giancarlo, C., Facione, N., & Gainen, J. (1995). The Disposition toward Critical Thinking. *Journal of General Education*, 44 (1), 1-25.

Facione, P. (2007). Critical Thinking: What It is and Why It Counts. In *Insight Assessment*.The California Academic Press, Millbrae, CA.

Field, A.P. (2009). *Discovering Statistics Using SPSS: And Sex and Drugs an Rock 'n'Roll*. (3rd edition). London: Sage publication.

Flavell, J. H. (1979). Metacognition and Cognitive Monitoring: A New Area of Psychological Inquiry. *American Psychologist*, 34, 906-911.

Garcia, T., & Pintrich, P. R. (1992). Critical Thinking and its Relationship to Motivation, Learning Strategies and Classroom Experience. ERIC Document Reproduction Service No. ED351 643.

Halpern, D.F. (1993). *Thought and Knowledge: An Introduction to Critical Thinking*. Hillsdale, NJ: Erlbaum Associates Publishers.

Hanley, G. L. (1995). Teaching Critical Thinking: Focusing on Metacognitive Skills and Problem Solving. *Teaching of Psychology*. 22, 68-72.

Ingle, C. O. (2007). *Predictors of Critical Thinking Ability Among College Students.* Doctoral

dissertation, College of Education, University of Kentucky, the U.S.A. Available from ProQuest Dissertations and Thesis database. (Publication No. AAT 3263681).

Karasar, N. (2009). *Bilimsel Araştırma Yöntemi* (20th. ed). İstanbul: Nobel Yayınları.

Kökdemir, D. (2003). *Decision Making and Problem Solving Under Uncertainty*. Doctoral dissertation, Ankara University, Institute of Social Sciences, Ankara.

Kuhn, D. (1999). A developmental Model for Critical Thinking. *Educational Researcher*. 28(2),

16-26.

Kuhn, D., & Dean, D. (2004). Metacognition: A Bridge Between Cognitive Psychology and Educational Practice. *Theory into Practice*, 43 (4), 268-273.

Livingston, J. A. (1997). Metacognition: An Overview. Retrieved on 29 May 2014, at URL: http://gse.buffalo.edu/fas/shuell/cep564/metacog.htm

Lockwood, F. (2003). Metacognition and Critical Thinking for Effective Learning.

Accessed 29 March 2013, at URL: http://members.shaw.ca/donlockwood/critical.htm

Magno, C. (2010). The Role of Metacognitive Skills in Developing Critical Thinking. *Metacognition and Learning* 5:137–156 DOI 10.1007/s11409-010-9054-4

Owu- Ewie, C. (2008). *Enhancing the Thinking Skills of Pre-Service Teachers: A Case Study of Komenda Teacher Training College*. Doctoral dissertation, the Faculty of the College of Education of Ohio University. Available from ProQuest Dissertations and Thesis database. (Publication No. AAT 3321114).

Patton, M. C., & Kritsonis, W. A. (2007). Great Minds Think Differently: Sustaining a System of Thinking. *Doctoral Forum National Journal for Publishing and Mentoring Doctoral Student Research*, 4 (1), 1-15.

Paul, R., & Elder, L. (2008). Critical Thinking: Strategies for Improving Student Learning. Part II. *Journal of Developmental Education*, 32 (2), 34-35.

Pintrich, P. R. (2002). The Role of Metacognitive Knowledge in Learning, Teaching, and Assessing. *Theory into Practice,* 41(4), 219-225. Accessed 29 May 2014, at URL: http://www.jstor.org/stable/1477406

Schoenfeld, A. H. (1992). *Learning to Think Mathematically: Problem Solving, Metacognition, and Sense Making in Mathematics*. In D. Grouws (Ed.), Handbook for Research on Mathematics Teaching and Learning. 334-370. New York: MacMillan.

Şen, Ü. (2009). An Evaluation about Turkish Teacher Candidates' Critical Thinking Attitudes in terms of Different Variables. *Zeitschrift für die Welt der Türken Journal of World of Turks.*1(2), 69-89.

Tosun, A., & Irak, M. (2008). Adaptation, Validity and Reliability of the Metacognitions

Questionnaire 30 in Turkish Culture; and its Relationships with Anxiety and Obsessive–Compulsive Symptoms. *Turkish Journal of Psychiatry*, 19 (1), 67-80.

Türnüklü, E.B., &Yeşildere, S. (2005). A Profile from Turkey: Critical Thinking Dispositions and Abilities of Pre Service Mathematics Teachers of 11-13 Year. *Journal of Ankara University Faculty of Education* 38(2), 167–185.

Veenman, M.V. J. ; Van Hout-Wolters, B.H.A.M. & Afflerbach, P. (2006). Metacognition and Learning: Conceptual and Methodological Considerations *Metacognition & Learning* 1 (3),14.

Vezzosi, M. (2004). *Critical Thinking and Reflective Practice: The Role of Information Literacy,* Literature Review, MODULE BP 100, University of Northumbria-Newcastle.

Wang, Z. (2010). *Mindful Learning: Children's Developing Theory of Mind and their Understanding of the Concept of Learning*. Doctoral dissertation, University of Pennsylvania. Available from ProQuest Dissertations and Thesis database. (Publication No. AAT 3431186).

Wells, A. (2000). *Emotional Disorders and Metacognition: Innovative Cognitive Therapy*. New York, NY: John Wiley & Sons Ltd.

Wells, A., & Cartwright-Hatton, S. (2004). A Short Form of the Metacognitions Questionnaire: Properties of the MCQ- 30. *Behaviour Research and Therapy*, 42, 385- 396.

Wenzlaff, E. M., & Wegner, D. M. (2000). Thought Suppression. *Annual Review of Psychology*, 51, 59–91.

Yeşilyurt, E. (2013 a). Metacognitive awareness and achievement focused motivation as the predictor of the study process, *International Journal of Social Sciences and Education, 3(4), 1013-1026. Education Index (EI).*

Yeşilyurt, E. (2013 b). An analysis of teacher candidates' usage level of metacognitive learning strategies: Sample *of a university in Turkey, Educational Research and Reviews, 8(6), 218-225. Journals Indexed in ERIC.*

Yılmaz, A. E. (2007). *Examination of Metacognitive Factors in Relation to Anxiety and Depressive Symptoms: A Cross-Cultural Study.* Doctoral dissertation. The Graduate School of Social Sciences of Middle East Technical University, Turkey.

GENİŞ ÖZET

Üstbiliş ve eleştirel düşünme becerileri arasındaki bağlantıya yönelik yapılan çalışmalarda ortaya çıkan önemli bulguların başında her ikisi arasında görülen yüksek korelasyon gelmektedir. Bu görülen korelasyonun en önemli nedenini bireyin kendi bilişinin farkındalığı, başka bir deyişle kendi düşünme süreçlerinin farkında olması ve bu süreçleri kontrol edebilmesinin üstdüzey düşünme becerilerinin gelişiminde de etkili olması oluşturmaktadır.

Üstbilişi oluşturan bileşenlerden biri olan ve insanların kendi ve diğer insanların bilişi ile ilgili sahip oldukları daha geniş fikirler ve teorileri kapsayan üstbilişsel inançlar, bireyin başarıya yönelik inançları üzerinde pozitif etki yaratırken yüksek seviyede üstbilişi kullanmayı gerektirir ve dolayısıyla bireyin karşılaşılan durumla başa çıkmasında önemli bir adımdır. Ancak karşılaşılan problemi çözmeye yönelik sergilenen inançlar her zaman olumlu olmayabilir. Sergilenen olumsuz inançlar ise sadece bilgi eksikliğinden kaynaklanmayabilir. Bilginin yanlış veya yetersiz yönetimi; olumsuz tutum ve hislere kapılma, yetersiz davranışlara sebep olan düşük inançlar sonucu da gelişebilir. Kişilerin bilişlerine dair sergilenen bu olumlu ve olumsuz üstbilişsel inançlar araştırmacılar tarafından boyutlara ayrılarak ele alınmıştır. Her ne kadar eleştirel düşünmenin öğretiminde ve geliştirilmesinde ideal bir teknik ya da metottan bahsetmek güç olsa da bireyin kendi bilişine yönelik özfarkındalığı, öğrenmeye yönelik sergilediği inançları bu öğretimde önemli yer tutar. Bu yüzden ileri düzey üstbilişsel bilgiyi içerisinde barındıran üstbilişsel inançların eleştirel düşünme becerilerinin gelişiminde önem arz ettiği düşünülmektedir. Dolayısıyla bu araştırmanın amacı üstbilişsel inançların eleştirel düşünme becerileri üzerindeki etkisini belirlemektir. Ayrıca hangi üstbilişsel inançların öğrencilerin eleştirel düşünme becerilerini artırmada etkili olduğunu incelemeyi de amaçlayan bu çalışmada aşağıdaki denenceler üzerinde durulmuştur;

1. Eleştirel düşünme becerileri ve üstbilişsel inançlar arasında bir bağlantı vardır.

2. Cinsiyet açısından hem eleştirel düşünme becerileri hem de üstbilişsel inançlar arasında bir bağlantı vardır.

Bu araştırmada, literatürde "Survey Method" olarak yer alan betimsel tarama modeli kullanılmıştır. Araştırmanın çalışma grubunu, Türkiye'nin üç farklı ilinde yer alan üç farklı üniversitenin Eğitim Fakültelerinin 3. ve 4. sınıflarında öğrenim gören ve gönüllülük ilkesine göre çalışmaya katılan 285 erkek (% 42.99) ve 378 (%57.01) kız öğrenciden oluşan 663 öğrenci oluşturmaktadır. Araştırmanın verileri 2011- 2012 Akademik yılının güz döneminde toplanmıştır. Veri toplama aracı olarak Wells ve Cartwright-Hatton (2004) tarafından geliştirilen ve Tosun ve Irak (2008) tarafından Türkçeye uyarlanan Üstbiliş Ölçeği (ÜBÖ-30) ve Facione, Facione ve Giancarlo (1998) tarafından geliştirilen ve Kökdemir (2003) tarafından Türkçeye uyarlanan California Eleştirel Düşünme Eğilimi Ölçeği (CCDTI) aynı anda uygulanmıştır. ÜBÖ-30 Ölçeği, birbiriyle ilişkili kavramsal olarak farklı üstbilişsel inanç boyutunun beş faktörünü içeren dörtlü Likert tipi bir ölçektir. Bu faktörler Olumlu inançlar, Kontrol edilemezlik ve tehlike, Bilişsel güven, Düşünceleri kontrol ihtiyacı ve Bilişsel farkındalık'tır. CCDTI ölçeği; Doğruyu

arama, Açık fikirlilik, Analitiklik, Sistematiklik, Kendine güven, Meraklılık olmak üzere altı alt boyutu olan ve 51 maddeden oluşan altılı Likert tipi bir ölçektir. Veri toplama araçları araştırmacı tarafından uygulanmıştır. Çalışmaya katılan öğretmen adaylarının toplanan verilerini analiz etmek için regresyon analizi kullanılmıştır.

Elde edilen bulgulara göre birinci denence doğrulanmış yani öğrencilerin eleştirel düşünme puanları ve üstbilişsel inançların tüm alt boyutları arasında anlamlı bir ilişki bulunmuştur. Ancak bu ilişkinin orta düzeyden daha düşük seviyede olduğu saptanmıştır. Cinsiyetle bağlantılı olarak ne eleştirel düşünme becerileri açısından ne de üstbiliş bileşenleri açısından anlamlı bir farklılık bulunmamıştır. Bu yüzden ikinci denence doğrulanmamıştır.

Bu çalışmada üstbilişsel inançlar alt bileşenleri ile eleştirel düşünme becerileri arasında olumlu ancak düşük bağlantı ortaya çıkmıştır. En yüksek korelasyon üstbilişsel inançlar alt bileşenlerinden bilişsel farkındalık bileşeni ile eleştirel düşünme becerileri genel puanları arasında bulunmuştur. Eleştirel düşünmeye yönelik eğilimi gösteren bu durum öğretmen adaylarında arzu edilen bir sonuçtur. Nitekim bu adaylar üst düzey eleştirel düşünme becerilerine sahip oldukları sürece yorumlayabilen, soruşturabilen, eleştirel olarak sorgulayabilen bireyler yetiştirebilmeleri mümkün olacaktır. Diğer pozitif korelasyon eleştirel düşünme genel puanlarıyla eleştirel düşünme ölçeğinin alt bileşenlerinden açık fikirlilik arasında ortaya çıkmıştır. Bu durum bireylerin kendi düşünceleriyle yakından ilgili olduklarını, farklı görüşlere, yeni fikirlere açık olduklarını dolayısıyla düşüncelerinde sergiledikleri esnekliği göstermektedir.

Bu çalışmada cinsiyet, üstbiliş ve eleştirel düşünme düzeyini etkilemede önemli bir etken olarak bulunmamıştır.

Öğretmen adaylarında eleştirel düşünme becerileri ve üstbilişsel inançlar açısından bağlantının orta düzeyden daha düşük seviyede olmasının sebebi öğrencilerin üniversiteye eleştirel düşünme ve üstbilişsel becerilere yönelik yeteneklerini tam geliştiremeden gelmelerinden kaynaklandığı düşünülmektedir. Bu durumun ise test çözme üzerine kurulu eğitim sisteminden kaynaklandığı öne sürülmektedir.

Çalışmadan elde edilen sonuçlara göre öğretmen adaylarının eleştirel düşünme ve üstbilişsel inançlar açısından seviyelerinin düşük olmasının nedeni sorgulanmalıdır. Öğrencilerin eleştirel düşünme becerilerini ve üstbilişsel inançlar açısından yeterliklerini sağlamak açısından basit ders formatından ziyade araştırma, gözlem, sunum gibi faaliyetlerin ağırlıkta olduğu; öğrencilerin eleştirel dinleme, yazma, okuma, konuşma becerilerini geliştirmeyi hedefleyen teknik ve uygulamalara eğitim programlarında yer verilmelidir. Ayrıca öğretmen adaylarının eğitiminde üst düzey düşünme becerilerini geliştirme tekniklerine yer verilmesi gelecekte bu adayların bilgi ve becerilerini kendi sınıflarına taşımalarında faydalı olacaktır.