
Orijinal Makale Başlığı:

Effects of metacognitive guidance on critical thinking disposition

Makalenin Türkçe Başlığı:

Üstbilişsel rehberliğin eleştirel düşünme eğilimine etkisi

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Effects of Metacognitive Guidance on Critical Thinking Disposition

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Abstract

The present study investigated the effect of metacognitive guidance in an online learning environment on the students' critical thinking competency. The research was carried out using experimental design with pretest-posttest control groups. The research group of the study consisted of 60 students studying at Computer and Educational Teaching Department of Educational Sciences Faculty at Ankara University during the fall semester of 2011-2012. The 51 point California Critical Thinking Disposition Inventory was used to collect pretest-posttest data. In terms of total score of critical thinking tendency, the average score of the group that received critical guidance was found to be higher than the score of the control group. The metacognitive guidance offered to the students in the online learning environment has affected their critical thinking tendency in a positive way. Findings indicate that metacognitive guidance in online learning environments can be an effective tool in developing critical thinking among preservice teachers.

Üstbilişsel Rehberliğin Eleştirel Düşünme Eğilimine Etkisi

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Öz

Çalışmanın amacı, çevrimiçi öğrenme ortamında kullanılan üst bilişsel rehberliğin, öğrencilerin eleştirel düşünme eğilimine etkisini araştırmaktır. Araştırma deneysel desenlerden ön test, son test kontrol gruplu deneysel modele göre yürütülmüştür. Çalışma grubunu Ankara Üniversitesi Eğitim Bilimleri Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümünde 2011-2012 eğitim öğretim yılı bahar döneminde öğrenim görmekte olan öğrenciler oluşturmuştur. Araştırmanın başında ve sonunda 51 maddelik California Eleştirel Düşünme Eğilimi Ölçeği kullanılarak veriler toplanmıştır. Araştırmanın sonunda eleştirel düşünme eğilimi toplam skorları incelendiğinde, üst bilişsel rehberlik alan deney grubunun toplam puanlarının, almayan gruba göre anlamlı düzeyde yüksek olduğu ve kullanılan üst bilişsel rehberliğin pozitif yönde etki yaptığı gözlenmiştir. Elde edilen bulgular ışığında, çevrimiçi ortamlarda üst bilişsel rehberliğin, öğretmen adaylarının eleştirel düşünme becerilerini geliştirmek amacıyla kullanılabileceği görülmüştür.

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Introduction

In today's constantly changing and developing information age, people need to keep up in order not to fall behind and should be able to deal with the problems getting more complex each day. A change in the educational system has been inevitable to have individuals who are able to deal with these problems. Accordingly, the teacher-student roles in the learning process have changed. Students have taken over the responsibilities of the teacher by evolving from having a passive role into becoming active participants in learning contexts. Also, teachers, rather than transferring information, have adapted the role of a guide for the students. Since students have taken over the responsibility of their learning, it has become more important for the students to solve problems and think critically. Kraak (2000) states that critical thinking is the most important skill to possess in an education system (as cited in Varaki, 2006). Lang, McBeath, and Hebert (1995) also emphasize the importance of critical thinking and argue that the most important and secret aim of schools is to promote students with critical thinking ability (as cited in Astleitner, 2002). Astleitner (2002) states that this target could be achieved by investigating educational theories and research.

What is critical thinking?

According to Halpern (2014, p.3), thinking is the way to create new knowledge. All of the information existing and owned by everyone has been created by someone. In case of critical thinking, as defined by Paul and Elder (2002, p.167) as thinking about your own thoughts when you are thinking to make yourself think better, National Council for Excellence in Critical Thinking (NCECT) defines it intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action (The Critical Thinking Community, 2012). One of the most common definitions of critical thinking belongs to Ennis (1991); thinking reflectional and logically focused on what to do and what to believe. Lipman (2003, p.76) defines it as thinking skillfully and responsibly guiding to a good judgment and further states that critical thinking has a structure which corrects itself. According to Halpern (2014, p.4), critical thinking is the use of cognitive skills or strategies to increase the likelihood of a desired outcome. In other words, critical thinking is a kind of thinking that requires solving problems, formulating conclusions, calculating probabilities and making decisions when the thinkers use their skills carefully and effectively for a particular context and a kind of thinking task.

Cottrell (2005) defines critical thinking as a cognitive activity related to intelligence, and also states that many people have the potential to develop this activity. Apart from this, he states that critical thinking is made up of complex talents and manners such as benefitting from various viewpoints, discussing valid and justifiable results, revealing perceptible assumptions; and it provides individuals with great advantages such as deepening attention and observations, enhancing reading comprehension, focusing on important points of a text, and analysing people. According to Halpern (2014, p.4), all of these definitions comprise a mental activity thoughts that will be useful for a given cognitive task.

The "critical" part in the term "critical thinking" refers to an assessment item. When people think critically, they assess the results of their thought process. Additionally, critical thinking requires an assessment for thinking process about the factors for a decision or the reasons of the conclusions (Halpern, 2014). Therefore, critical thinking is a necessary skill for making proper decisions and educational success. Critical thinking skills can help people solve problems, reflect, and make a conclusive decision about the situation they face. A student with developed critical thinking asks questions, tries to solve a problem through grasping the sense of the question. In this way students that are autonomous and learn by questioning can be promoted. Türnüklü and Yeşildere (2005) state that critical thinking can be taught at any age in any level of education.

John Dewey states that the primary purpose of education is "learning to think" (Halpern, 2014, p.5). One way to teach critical thinking can be considered as adding critical thinking to the curriculum as one-hour separate lesson each week (Kökdemir, 2003; Wright, 2002). However, this can bring practicality problems. Since education is limited with a certain time at schools and the number of classrooms is not sufficient, critical thinking can be too difficult to handle it in one hour (Wright, 2002). The greatest drawback of this method is the difficulty of transferring critical thinking into other areas and real life (Kennedy, Fisher, & Ennis 1991 as cited in Wright, 2002). Wassermann, Jonas, and Rothstein (1986, p.17), supporting this idea, emphasize the fact that thinking shouldn't be separated from the context, rather, they consider thinking as a way of contextual learning.

Another approach is infusion, in which critical thinking is incorporated into the existing subject matter in different ways. The development of students' critical thinking skill can be provided with this method (Wright, 2002). Still, with critical thinking activities embedded in routine lessons, there happens to be restrictions for teaching the subjects in the curriculum, or it becomes necessary to extend the periods. In order to solve these problems, internet technology can be used to carry out such activities for developing critical thinking and, in this way, it can be possible to promote students' tendency for critical thinking. While organizing such an activity, a certain part of the class can be in a face-to-face education environment where students and the teacher are together, while the other part, including particularly critical thinking activities, can be in web environment.

Face-to-face learning environments can be improved by supporting online learning management systems, today's popular learning environments, especially by synchronous and asynchronous platforms. This method, not only provides the students with the opportunity of spending their free times efficiently, but also makes it possible to carry out discussions in online environments, which is otherwise difficult in the classroom due to time restrictions. These environments also help students share their ideas face to face through providing them with the opportunity of studying and discussing in groups. Apart from this, students are motivated better, learn independently, and transfer their learning to the real life easily (Deaudelin & Richer, 1999 as cited in Kramarski & Mizrachi, 2004).

The guidance offered to the students by their teachers or peers in online platforms provides better and permanent learning, and also skills such as critical thinking (AEU, 2012; Ascherman, 1997; Hmelo-Silver, 2004; Duran & Monereo, 2005). In this context, the platforms, one of the instruments used in online learning environments, offer students the environments in which they can work in cooperation and guide each other. Discussing with the other members of the same group and carrying out studies together are expected to increase the students' motivation. Successful students are supposed to make an effort to develop themselves while others, with lower success level, are supposed to be in an endeavour to perform better. In this way, by means of online platforms, all individuals will have the chance to observe the way the other members think and solve problems, which will likely lead to a more meaningful and attractive learning environment (AEU, 2012). On the other hand, teacher's attendance to the platforms is another important factor for improving students' motivation and guiding them for thinking widely. In this context, teacher's guidance by attending to the platforms will make positive contributions for improving students' viewpoint.

Based on this context, Abdul Rabu, Aris, and Tasir (2013) emphasized the effectiveness of tutorial support in their study on developing students' critical thinking skills through asynchronous online discussion. Similarly, Kong (2014) aimed to develop students' critical thinking skills and information literacy competency during domain knowledge learning process in discussion forums. To achieve this, he guided students' group sharing, to encourage students to reflect. At the end of his study, a significant change was observed in the students' critical thinking skills and information literacy competency. Leflay and Groves (2013) examined students' perceptions on the effectiveness of online discussion forums for developing students' higher-order thinking skills; and found that the presence of teachers in online forums was particularly important to reinforce learning and motivation.

Metacognitive Guidance

Metacognitive guidance is an important support system used in training for the development of metacognition skills, which is an essential feature for human cognition (Lories, Dardenne, & Yzerbyt, 1998). Metacognition is defined as a thinking activity related to constructivism since grasping information is a matter of thinking about and observing ideas (AEU, 2012). According to Winn and Snyder (1996), metacognition consists of the processes of observing the learning, making changes, adapting strategies for the better (as cited in AEU, 2012). Flavell (1979) defines metacognition as the individual's awareness about the way to learn, the amount of understanding and not being able to do so; being aware of how to make use of the information suitable for guiding to the target, having the ability of evaluating the cognitive requirements for a certain task, deciding on the strategies proper for each aim, and evaluating self-development during and after the performance (as cited in Gourgey, 2001, p.18). In this context, metacognitive guidance is a support provided for increasing an individual's awareness of and control over learning. Metacognitive support is used to improve learning skills of students through a systematic instruction (Bannert, Hildebrand, & Mengelkamp, 2009). During metacognitive guidance, students are encouraged to observe and explain their own performances through reflectional questions asked to develop metacognitive skills (Lin & Lehman, 1999). Demir and Doğanay (2009) define metacognitive guidance as conciliation between an individual and his thoughts in order to help realise what is in his mind. According to Dabarera, Renandya, and Zhang (2014), the support system is important to help students progress to the next level of mastery. James (2010) found that, "metacognitive guidance where metacognitive strategies were modelled led to a significant improvement in post-training literacy performance in a group of preservice teachers" (as cited in Dabarera, Renandya, & Zhang, 2014). Therefore, metacognitive actions should be embedded into the training process while designing teaching (Lin, 2001).

Research shows that problem solving and critical thinking abilities can be improved through developing students' metacognitive skills. Especially metacognitive questioning method enables students to figure out the tasks, follow a strategy, and develop relations between old and new information, which is then reflected to learning (Kramarski & Mevarech, 2003; Mevarech & Kramarski, 1997). This approach is basically named as "how will I learn". It helps students observe themselves and develop the strategies which are already possessed. When it comes to cognitive organizing, the reflection ability required for a student to complete a project, grasp the content and learn better, and develop critical thinking skill is emphasised (Loh, Reiser, Radinsky, Edelson, Gomez, & Marshall, 2001). For developing a student's cognitive structures, it is of great importance to increase student-student interaction during the classes and also to support it with metacognitive counselling (King, 1990; Kramarski, Mevarech, & Arami, 2002; Meloth & Deering, 1992; Mevarech & Kramarski, 1997). However, as it could be difficult to provide this within limited class time, providing student-student interaction through online instruments and allowing teachers to offer metacognitive guidance in order to support face-to-face learning can be considered as an alternative way.

Teacher's awareness of the effect of his attitudes and behaviours towards the students is important in teacher education (Fennema & Franke, 1992, p.153; Putnam & Borko, 2000). Thus, teachers should pay attention to the way they organize teaching activities and behave during these activities.

It is thought that a teacher who can make use of metacognitive questions could develop critical thinking skill, change own teaching strategy, and be motivated more for the classes. Metacognitive guidance has an important framework for developing strategies to be used for shaping ideas, improving problem solving capacity, and teacher training, especially for thinking training.

Metacognitive training is prepared on the basis of "IMPROVE" method offered by Mevarech and Kramarski (1997). The method uses 4 question types providing upper level thinking.

1. Comprehension questions (Comprehending the problem):

These questions are designed to prompt students to reason out the problems first before attempting to solve them.

Comprehension questions include questions similar to the examples below;

What is the problem generally about? What is the matter with the problem? Explain the meanings of the terms given.

2. Relation questions (Relating the new information with the previous ones):

These questions are designed to make the students focus on the similarities and differences between the problems they work on at that moment and those they have already done so before.

There is an example of relation questions below;

In what senses is this problem similar with or different from those you have solved before? Explain why?

3. Strategic questions (Following proper strategies to solve a problem):

These questions are designed to make students think about which strategy is proper, and why, in order to solve the mentioned problem.

When thinking about strategic questions, the students must consider “WHAT” (What kind of a strategy/method/principle could be followed to solve the problem?), “WHY” (Why is that strategy/method/principle is the most proper for solving the problem?) and “HOW” (How can I organize my information to solve this problem? How can the recommended plan be implemented?).

4. Reflection problems (Reflection over processes and solutions):

These questions are designed to make the students think about their understanding and feelings during the solving process.

Through reflection questions, students ask these questions to themselves: “What am I doing?; Is this logical?; What kind of problems do I face while solving the problem?; How can I confirm the solution?; Can I follow a different approach for solving?”.

Kramarski and Michalsky (2010) have defined two hyper environments, including and not including metacognitive education, in order to evaluate online reflections and self-regulatory learning processes. According to the results of the research carried out on preservice teachers, the metacognitive support offered to the preservice teachers through self-questioning method improves their organizing the learning processes and thinking deeply about them. The researchers state that technological pedagogic content knowledge, either as a learner (in terms of gaining cognitive skills) or as a teacher (in terms of gaining designing skills), could be developed through this support.

Kramarski and Michalsky (2009), in another study they carried out on preservice teachers, have considered career development in self-regulatory learning environment. The researchers, emphasizing using self-regulatory learning skill by the preservice teachers in their life to raise students who have this skill, have designed four learning environments consisting e-learning and face-to-face learning environments, which include or don't, self-regulatory learning process as metacognitive guidance. According to the results of the study, more success is achieved in the environments supported with self-regulatory learning and the best self-regulatory skill is developed within self-regulatory learning environments. Also, pedagogic information and student-centered learning perceptions (developing information oneself) are experienced better in this environment.

Wesiak et al. (2014) aimed to develop self-regulation skills and metacognition of students. For that purpose, they designed, developed and implemented an effective metacognitive support and made an assessment of this support system. The support system they designed was a special service to prompt

reflection on learning. Using this service, they tried to stimulate SRL activities in the performance phase and foster metacognition in terms of regulation of cognition. Three different sample groups were used in the three-year study. And in this process they carried out an iterative evaluation of an augmented training simulator for medical interviews. According to their findings, they saw that the metacognitive support system showed a positive effect on state motivation, positive perception of the thinking prompts, and consistently good usability.

Similarly, Küsting, Kempf, and Wirth (2013) stated that metacognitive support is an important factor for the discovery of scientific knowledge. They investigated the impact of metacognitive support on knowledge gain, strategy use, motivation, and emotions. Based on the findings of their study, they expressed the positive effects of metacognitive support on learning outcome, on actual cognitive strategy use, and on learning emotions. On the other hand, they didn't find any significant differences between metacognitive support and goal specificity on learning outcome.

Aim

This study aims to find out the effects of metacognitive guidance, used in the online learning environment, on students' critical thinking ability. The questions below are tried to be answered in parallel with the aim of the study;

1. Is there a significant difference between the average critical thinking pretest and posttest scores of the experimental group?
2. Is there a significant difference between the average critical thinking pretest and posttest scores of the control group?
3. Is there a significant difference between the average critical thinking posttest scores of experimental group and control group?
4. Is there a significant difference between the change in the experimental group's score from the pretest to posttest and the change in the control group's score from pretest to posttest?

Method

Experimental design with a pretest-posttest control group is used for this research. Experimental and control groups are formed in line with this model.

Research Design

The research has been carried out using experimental design with pretest-posttest control groups.

Participants

The study group consisted of 60 students studying at Computer and Educational Teaching Department in Educational Sciences Faculty at Ankara University during the fall semester of 2011-2012. 24 of the participants were male students and 36 of them were female students. The distribution of male and female students of the experimental and control groups are shown in Table 1.

Table 1.*The Numbers of Male and Female Students in the Experimental and Control Groups.*

| | Female | Male |
|--------------------|--------|------|
| Experimental Group | 12 | 18 |
| Control Group | 12 | 18 |
| Total | 24 | 36 |

Comparison of the average pretest scores of experimental and control groups obtained from Critical Thinking Disposition Inventory is shown in Table 2.

Table 2.*Comparison of Critical Thinking Disposition Inventory Pretest Scores.*

| | N | Average | SS | t | p |
|--------------------|----|---------|--------|-------|-------|
| Experimental Group | 30 | 191.03 | 23.338 | -.007 | 0.995 |
| Control Group | 30 | 191.07 | 14.369 | | |

The results in Table 2 indicate that there is no significant difference between the experimental and control groups in terms of the average scores from the California Critical Thinking Disposition Inventory scale ($t = -.007$, $p > .05$). This can imply that experimental and control groups were equal before starting the experimental process, in terms of gender and critical thinking disposition inventory.

Instrument

California Critical Thinking Disposition Inventory (CCTDI), adapted to Turkish by Kökdemir (2003), is used for the study. As Kökdemir states (2003), the assessment instrument consists of 6 subscales (being analytic, catholicity, curiosity, self-confidence, looking for the right one, being systematic) and 51 items. It is stated that the scale's internal consistency is .88, and total variance is 36.13%. The scale is a 6 point Likert scale (Kökdemir, 2003).

Application and Data Collection

California Critical Thinking Disposition Inventory is applied to the students studying at Ankara University Educational Sciences Faculty Computer and Educational Teaching Department during the fall semester of 2011-2012 academic year. At the beginning of the academic year, students were informed about that four hours of the class would be carried out face-to-face, while the rest would be done in an online environment. The students were distributed randomly into 10 groups. The first five groups were the experimental groups while the rest were the control groups. The students were asked to discuss in online platforms how the materials to be used during the semester should be designed, and how should the materials be adapted to the units. During the discussions for 6 weeks in total, the first five groups were offered metacognitive guidance, in order to guide students to upper level thinking, through Understanding Questions, Relation Questions, Strategic Questions, and Reflection Questions prepared on the basis of IMPROVE method developed by Mevarech and Kramarski (1997). The guidance offered by the researchers is supported with guiding questions during the discussions. An education process was designed, through which students could analyse and simplify the problems systematically, define the problem and look for different solutions in different ways, and confirm the solutions. In order to develop critical thinking skills, a model enabling the students to observe, organize and assess their own studies

was designed. The model was applied after dividing students into small groups. In this way, students were allowed to interact with each other in other groups, too. During these classes, the instructor, observing the process closely, took over a role as a metacognitive coach by interfering in, when necessary, with such questions as “What are you doing now?”, “Why?”, “Will this way work?”, “Could another way be used?” etc. This was done in order to remind self-control. When it comes to the control group, the instructor just watched the discussions without interference. At the end of the six weeks, the California Critical Thinking Disposition Inventory was applied to all the students online. The effectiveness of metacognitive guidance was investigated by analyzing the obtained scores with t-test for the independent groups and paired sample t-tests.

Data Analysis

For analyzing the data, the techniques of descriptive statistics, independent groups t-test and paired groups t-test were used. The statistics are interpreted at 0.05 significance level.

Results

Following the pretest, the students of the experimental and control groups were asked to discuss, in the online platforms for six weeks, about the materials they were planning to design. The students of the experimental group were offered guidance through metacognitive questions by the researcher during the discussions. The comparison of the average scores obtained from the experimental group students from the California Critical Thinking Disposition Inventory at the end of the six weeks and the average scores of the pretest with matched t-test is given in Table 3.

Table 3.
Comparison of the Experimental Group's Pretest-Posttest Average Scores.

| | N | Average | SS | t | p |
|----------|----|---------|--------|-------|-------|
| Pretest | 30 | 191.03 | 23.338 | 3.790 | .001* |
| Posttest | | 212.40 | 32.577 | | |

*p<0.05

As it can be seen from Table 3, there is a considerable increase in the average scores obtained by the students of the experimental group from the Critical Thinking Disposition Inventory at the end of the six weeks, and also this increase is significantly different from the average score they obtained from the pretest ($t= 3.790$, $p<.05$). This may indicate that metacognitive guidance has made a considerable increase in the critical thinking disposition of the students.

The comparison of the average scores obtained by the control group students from the California Critical Thinking Disposition Inventory at the end of the six weeks and the average scores of the pretest with matched t-test are displayed in Table 4.

Table 4.
Comparison of the Control Group's Pretest-Posttest Average Scores.

| | N | Average | SS | t | p |
|----------|----|---------|--------|--------|------|
| Pretest | 30 | 191.07 | 14.369 | -1.728 | .095 |
| Posttest | | 196.50 | 17.240 | | |

The results presented in Table 4 shows that the posttest average is higher than the pretest average. However, no statistically significant difference has been found between the pretest score average and posttest score average.

When Table 3 and Table 4 are analyzed, the difference in the experimental group's pretest-posttest average scores is significant, while the increase of the control group is not statistically significant. Although the post test scores increased for both groups, the increase of the experimental group is considerably higher. The t-test data of the independent samples, which was carried out to find out whether the difference of the two groups is statistically significant, is presented in Table 5.

Table 5.
Comparison of the Post Test Score Averages of the Experimental and the Control Groups.

| | N | Average | SS | t | p |
|--------------------|----|---------|--------|-------|------|
| Experimental Group | 30 | 212.40 | 32.577 | 2.363 | .022 |
| Control Group | | 196.50 | 17.240 | | |

When the California Critical Thinking Disposition Inventory posttest average scores of the experimental and the control groups are compared, it is clear that there is a statistically significant difference in favor of the experimental group ($t= 2,363$; $p<.05$). The average of the experimental group is higher than the average of the control group. According to the results, it is clear that metacognitive guidance offered in the online environment has significantly increased the critical thinking disposition of the students, that is to say, the experimental study carried out has made positive contributions to the students' critical thinking disposition.

The data obtained through comparing the average difference of the posttest and pretest scores of the experimental and control group students are given in the Table 6.

Table 6.
Comparing the Average Difference of the Posttest and Pretest Scores of the Experimental and Control Group Students.

| | N | Average of the Difference | SS | t | p |
|--------------------|----|---------------------------|--------|-------|-------|
| Experimental Group | 30 | 21.367 | 30.877 | 2.468 | .017* |
| Control Group | | 5.543 | 17.220 | | |

* $p<0.05$

When Table 6 is analyzed, the average difference of the posttest and pretest scores of the experimental and control group students is observed to be significant ($t= 2.468$, $p < .05$). The average difference of the posttest and pretest scores of the control group is 5.54, while it is 21.36 for the experimental group.

Discussion, Interpretation & Suggestions

The data obtained through this study has revealed that the metacognitive guidance offered to the students in the online learning environment during six weeks has increased the critical thinking disposition level of the experimental group students. In other words, the post test scores of the experimental group students who were offered metacognitive guidance in an online platform within the online learning environment are significantly higher when compared with those of the control group students.

This data supports the studies stating that education processes carried out in learning environments which are basically not online but combined with computer-based training and open learning environments (such as guidance and additional learning materials) can develop critical thinking skills of the students (Stenning, Cox, & Oberlander, 1995, Van der Pal & Eysing, 1999 as cited in Astleitner, 2002). The critical thinking training which is especially integrated into the classes is thought to make great contributions to students' real lives, at least to their careers. Teachers supporting critical thinking in their classrooms make considerable contributions to students' cognitive development and increase the positive disposition towards critical thinking. When critical thinking skills are regularly used in classes, the participation of the students into critical thinking process is on the increase (Seferoğlu & Akbıyık, 2006).

Embedding critical thinking with lesson contents, organizing classes in line with the principles of critical thinking, and supporting students in an online way can make it possible for students to acquire a critical viewpoint and develop these skills. Studies show that using online platforms alone doesn't help developing critical thinking at a sufficient level (Sloffer, Dueber, & Duffy, 1999). In contrast, it can be said that supporting platforms by teachers or guidance as a metacognitive coach could be beneficial for critical thinking training.

Research reveals that since learners have difficulty in learning in online learning environment and learning level varies among students, guidance should be offered through different supporting systems, (Azevedo & Hadwin, 2005; Jacobson & Azevedo, 2008). Likewise, Azevedo and Hadwin (2005) state that some students can develop their own learning without a supporter in online learning environments, while others have difficulties in learning in such environments.

In teaching environments free from memorizing where contemporary teaching approaches are followed, students can express their feelings, discuss their ideas freely, without fear. Therefore, teachers should be constantly trained during either in-service or preservice times for developing critical thinking knowledge and skills in order to able to create such an environment (Aybek, 2006). It is clear that these trainings can be carried out in online environments or online learning environments without requiring much time. Studies reveal that metacognitive guidance offered in online learning environments make positive contributions to preservice teachers' critical thinking dispositions. As a result, it can be suggested that more profitable adjustments can be made in teaching and learning processes by adapting metacognitive guidance in online environment and integrating this into class teaching to support classroom activities.

Critical thinking dispositions of preservice teachers should be investigated applying this study on preservice teachers of different branches, teaching different classes. It can be beneficial to replicate similar studies with relatively larger groups.

Geniş Özet

Giriş

Üst bilişsel Rehberlik, insan bilişi için temel bir özellik (Lories, Dardenne & Yzerbyt, 1998:1) olan üst biliş becerisinin gelişimi açısından eğitimde kullanılan önemli bir destek sistemi olarak alanyazında yerini almaktadır. Üst biliş kavramı ilk olarak 1979 yılında Flavell tarafından ortaya atılmıştır. Üst biliş en genel şekliyle, bireyin öğrenmesi üzerindeki farkındalığı ve kontrolü olarak tanımlanabilir (Boker & Brown, 1984; cite in: Gourgey, 2001:18). Bu bağlamda Üst bilişsel Rehberlik, bireyin öğrenmesi üzerindeki farkındalığını ve kontrolünü artırmaya yönelik sunulan destek olarak karşımıza çıkmaktadır. Üst bilişsel destek, sistemli bir şekilde gerçekleştirilen öğretim yoluyla öğrencilerin öğrenme becerilerini artırma amacıyla kullanılmaktadır (Bannert, Hildebrand & Mengelkamp, 2009). Bu açıdan bakıldığında, üst bilişsel eylemleri öğretimden bağımsız bir şekilde geliştirmeye yönelik değil, bu eylemlerin alan öğretimi boyunca öğrenme süreci içine gömülerek süreçle bütünleştirildiği öğretim tasarımlarına ihtiyaç vardır (Lin, 2001). Bu süreç içerisinde, üst biliş stratejilerinin nasıl uygulanacağı ve sahip olduğu avantajların öğrencilere açıklanması yoluyla, bu stratejilerin öğrenciler tarafından tanınmasının ve öğrenme eylemi boyunca öğreticiden bağımsız olarak öğrencilerin bu stratejileri kullanmalarının sağlanması gerekmektedir (Bannert, Hildebrand & Mengelkamp, 2009).

Alanyazın incelendiğinde, öğrenme eyleminin etkililiği açısından önemli görülen bilişsel öğelerden bir diğeri de eleştirel düşünme olarak karşımıza çıkmaktadır (Halpern, 2014:3, Cottrell, 2005). Eleştirel düşünmenin bir parçası olan düşünme eylemi, Halpern (2014:3) tarafından var olan bilgilerimiz üzerine yeni bilgiler yaratmamızın bir yolu olarak ifade edilirken, eleştirel düşünme kavramı, Paul ve Elder (2002:167) tarafından, düşünmeyi daha iyi hale getirmek amacıyla, kendi düşüncelerimiz hakkında düşünme şeklinde tanımlanmaktadır. Bunun yanında Halpern (2014:4) eleştirel düşünmeyi, arzulanan sonuçlara ulaşma olasılığını artıran bilişsel becerilerin veya stratejilerin kullanımı şeklinde tanımlamaktadır. Öğrenme sürecinin bir diğeri önemli kavramı olarak karşımıza çıkan eleştirel düşünme becerisinin geliştirilmesinde, destek sistemlerinden biri olan üst bilişsel desteğin kullanılması, bu çalışma kapsamında ele alınarak incelenmiştir.

Eleştirel düşünme eğitiminde önemli olan, ilgili eğitimin öğrenme süreci ile bütünleştirilerek gerçekleştirilmesidir (Wright, 2002). Ancak bu noktada, ders içeriğinin yoğunluğu ve ders saatlerinin yetersizliği gibi bazı sınırlamalar karşımıza çıkmaktadır. Bu kısıtların üstesinden gelmenin bir yolu internet teknolojilerinin işe koşulması olabilir. Bu bağlamda ders saatleri dışında internet teknolojisinin kullanılması yoluyla, eğitimin desteklenmesi ve kullanılan üst bilişsel rehberlik stratejileri ile eleştirel düşünme becerilerinin geliştirilmesi mümkün olabilmektedir. Günümüzde popüler öğrenme ortamları olan çevrimiçi öğrenme ortamları, özellikle eş zamanlı ve eş zamansız tartışma forumlarıyla desteklenmesi yoluyla, yüz yüze öğrenme ortamlarına katkı sağlamaktadır. Çevrimiçi öğrenme ortamlarında kullanılan araçlardan biri olan tartışma forumları öğrencilere birbirleri ile işbirliği içinde çalışabilecekleri ve birbirlerine rehberlik yapabilecekleri ortamlar sunmaktadır.

Bu noktadan hareketle, çalışmada çevrimiçi öğrenme ortamında kullanılan üst bilişsel rehberliğin, öğrencilerin eleştirel düşünme eğilimleri üzerindeki etkisi araştırılmıştır.

Amaç

Bu çalışmanın amacı çevrimiçi öğrenme ortamında yapılan üst bilişsel rehberliğin öğrencilerin eleştirel düşünme eğilimlerine etkisinin belirlenmesidir. Bu amaç doğrultusunda aşağıdaki sorulara cevap aranmıştır;

1. Deney grubunda eleştirel düşünme eğilimi son test ortalama puanları ile ön test ortalama puanları arasında anlamlı bir fark var mıdır?
2. Kontrol grubunda eleştirel düşünme eğilimi son test ortalama puanları ile ön test ortalama puanları arasında anlamlı bir fark var mıdır?
3. Deney ve kontrol gruplarının Eleştirel Düşünme Eğilimi son test ortalama puanları arasında anlamlı bir fark var mıdır?
4. Deney ve kontrol gruplarının son test puanları ile ön test puanlarındaki değişimleri arasında anlamlı bir fark var mıdır?

Yöntem

Araştırma Deseni

Araştırma öntest-sontest kontrol gruplu deneysel desende tasarlanmıştır.

Çalışma Grubu

Araştırmanın çalışma grubunu, 2011-2012 eğitim öğretim yılı güz döneminde Ankara Üniversitesi Eğitim Bilimleri Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümünde öğrenim gören, Eğitimde Materyal Tasarımı ve Kullanımı dersini alan 60 öğrenci oluşturmaktadır. Araştırmanın verileri, farklı gruplara atanan öğretmen adaylarına, üst bilişsel rehberlik yapılarak destek verilme durumuna göre, 6 hafta devam eden deneysel işlemler sonucu elde edilmiştir.

Veri Toplama Araçları

Araştırmada Kökdemir (2003) tarafından Türkçeye uyarlaması yapılmış olan California Eleştirel Düşünme Eğilimi Ölçeği (The California Critical Thinking Disposition Inventory: CCTDI) kullanılmıştır. Kökdemir'in (2003) belirttiğine göre ölçme aracı, analitiklik, açık fikirlilik, meraklılık, kendine güven, doğruyu arama, sistematiklik olmak üzere 6 alt ölçek ve 51 maddeden oluşmaktadır. Ölçeğin iç tutarlılık katsayısı .88, açıkladığı toplam varyans ise % 36.13 olarak belirtilmiştir. Ölçek 6'lı likert tipi bir ölçektir (Kökdemir, 2003). Ölçek, öğrencilere uygulamanın başında ve sonunda uygulanmıştır. Uygulama öncesinde elde edilen bulgulara göre, deney ve kontrol gruplarının deney öncesinde California Eleştirel Düşünme Eğilimi Ölçeğinden aldıkları puanların ortalamaları arasında anlamlı bir fark olmadığı görülmüştür. Böylece deneysel işleme başlamadan önce deney ve kontrol gruplarının cinsiyet ve eleştirel düşünme eğilimi ölçeği puan ortalamaları bakımından birbirine denk olduğu söylenebilir.

Uygulama

Uygulama süreci boyunca, dersin haftada 4 saati yüz yüze işlenmiş ve öğretim ders saatleri dışında öğrenme yönetim sisteminden çevrimiçi olarak desteklenmiştir. Çalışmaya katılan öğrenciler rastgele olarak 10 farklı gruba atanmıştır (Beş grup deney grubu-beş grup kontrol grubu). Toplam 6 hafta süren tartışmalarda, gruplardan ilk beşine dersin öğretim elemanları tarafından üstbilişsel rehberlik, öğrencileri üst düzey düşünmeye sevk etmek amacıyla, Mevarech ve Kramarski (1997) tarafından geliştirilen IMPROVE modeli temelinde hazırlanan Kavram Soruları, Bağlantı Soruları, Stratejik Sorular ve Yansıma

Soruları yardımı ile uygulanmıştır. Araştırmacılar tarafından uygulanan rehberlik, tartışma sırasında yönlendirici sorular ile sağlanmıştır. Eleştirel düşünme becerilerini geliştirmek için öğrencinin kendi çalışmalarını izlemesi, düzenlemesi ve değerlendirmesini öne çıkaran bir model tasarlanmıştır. Altı haftalık sürenin sonunda deney ve kontrol grubundaki tüm öğrencilere California Eleştirel Düşünme Eğilimi Ölçeği çevrimiçi olarak tekrar uygulanmıştır.

Verilerin Analizi

Çalışmada verilerin analizi aşamasında, betimsel istatistikler, bağımsız gruplar t-testi ve eşleştirilmiş gruplar t-testi tekniklerinden yararlanılmıştır. Yapılan analizler 0.05 anlamlılık düzeyinde yorumlanmıştır.

Bulgular

Araştırma sonucunda, deney grubunda yer alan öğrencilerin altı haftalık eğitimin sonunda, Eleştirel Düşünme Eğilimi Ölçeğinden aldıkları puanların ortalamalarında önemli artış olduğu ve bu artışın öntestten aldıkları puanların ortalamasından anlamlı düzeyde farklılık gösterdiği görülürken, kontrol grubunda, öntest puan ortalaması ile sontest puan ortalaması arasında istatistiksel olarak anlamlı bir fark bulunmamıştır. Bunun yanında deney ve kontrol grubunun Eleştirel Düşünme Eğilimi Ölçeği sontest puan ortalamaları karşılaştırıldığında, deney grubu lehine istatistiksel olarak anlamlı bir fark olduğu görülmüştür. Deney grubunun ortalaması kontrol grubunun ortalamasından yüksek bulunmuştur. Elde edilen bu sonuç, çevrimiçi ortamda verilen üst bilişsel rehberliğin, öğrencilerin eleştirel düşünme eğilimini anlamlı düzeyde artırdığını, bir diğer deyişle, yapılan deneysel çalışmanın öğrencilerin eleştirel düşünme eğilimine olumlu katkı getirdiğini göstermektedir. Deney ve kontrol grubundaki öğrencilerin sontest ve öntest puanları arasındaki farkın ortalamaları karşılaştırıldığında, farkın anlamlı olduğu görülmüştür. Kontrol grubunda sontest ve öntest puanları arasındaki farkların ortalaması 5.54 iken, deney grubunda 21.36 olarak elde edilmiştir.

Tartışma ve Yorumlar

Araştırma sonuçlarına genel olarak bakıldığında, çevrimiçi öğrenme ortamında öğrencilere sunulan üst bilişsel rehberliğin eleştirel düşünme becerisi eğilimine pozitif yönde etki yaptığı görülmüştür. Sonuç olarak, üst bilişsel rehberliğin bu olumlu etkisi bağlamında, farklı sınıf uygulamalarını destekler nitelikte, ders ile bütünleştirilerek, çevrimiçi ortamda sağlanan üst bilişsel rehberlik yoluyla, öğretme ve öğrenme süreçleri üzerinde daha verimli düzenlemeler yapılabileceği söylenebilir. Dolayısıyla öğretmen adaylarında eleştirel düşünme becerilerinin artırılması için çevrimiçi öğrenme ortamlarında üst bilişsel rehberlik yönteminden daha fazla yararlanılmalıdır

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