

The effect of webBlog based instruction on the metacognition levels of preservice teachers

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ABSTRACT

The aim of this study is to determine the effect of webBlog based instruction on the metacognition levels of preservice student teachers. The study was carried out on 152 (76 being the experimental group, 76 control group) student teacher candidates having pedagogical formation education at Fırat University Faculty of Education in 2010-2011 academic year. The pretest posttest control group design was used in the study, which was carried out using experimental method. Experimental and control groups were formed without bias prior to the experiment. The experiment lasted for four weeks. Throughout the experiment, the experimental group was taught using webBlog-based instruction and control group was taught using traditional method (explanation, question-answer). The data for the study were obtained via "Metacognitive Awareness Inventory" developed by Schraw and Dennison (1994). As a result of the analysis of the data, it was found that webBlog based instruction had a significant effect on the metacognition levels of student teacher candidates.

Keywords: *WebBlog based instruction; Web-based instruction; WebBlog and metacognition; Metacognition and internet; Preservice teachers.*

INTRODUCTION

The roles and responsibilities of teachers change along with the changes and developments in science and technology. This change makes it obligatory for teachers to acquire skills and qualities in addition to previously existing ones. One of these qualities is metacognitive ability (skill), which has been discussed frequently in recent years. This ability has gained more importance especially at present time at which "student centered instruction" and "learning to learn" has come to the fore. The reason of this is the acceptance that metacognitive ability has a critical importance for self-learning. This acceptance is based on the hypothesis that metacognitive ability has an effect on self-regulation and self-instruction skills, which are also influential in self-learning. It is pointed out in the literature regarding this issue that metacognitive ability affects cognitive processes such as "communication, comprehension, language learning, social cognition, attention, memory and problem solving" (Parham et al., 2010; Balci, 2007; Yurdakul, 2004). Moreover, it is stated that metacognitive ability contributes a lot to individualized instruction, which is given great importance due to individual differences. As a matter of fact, the studies concerned support these ideas and hypotheses. The fact that metacognitive ability is an ability that can be taught and developed (Özcan, 2000) increases the significance of this concept in terms of education. So, the concept of metacognition has increasingly attracted attention in education especially in recent years.

The term metacognition, which originated from psychology, was involved in education literature with an article written by Flavell in 1976 (Kayashima, et. al, 2004). Metacognition was defined by Flavell (1985) as "an individual's knowledge about his cognitive processes and the use of this knowledge to control cognitive processes". Schwartz and Perfect (as cited in Uzman, 2007) defined metacognition as "an individual's knowledge about his cognition and his ability to influence his cognition". Similarly, according to Welton & Mallan (1999) metacognition is "the conscious control and guiding of an individual's own processes of thought". Huitt (1997), Hacker and Dunlosky (2003) state that metacognition is "individuals' being aware of their mental activities regarding perception, remembering and thought and controlling them" (as cited in: Özsoy, 2006). Departing from these definitions, the examples of

which can be increased, metacognitive ability can be defined as a second or upper cognition or thought involving the regulation of the individual's knowledge and cognition (Flavell, 1985).

Metacognition, due to its effect on individual's self-regulation and self-instruction skills, has a critical importance especially in the process of student centered instruction-learning. The factor that makes metacognition so important in this process is that this ability "includes the strategic knowledge of one's regulating self-learning processes" (Santrock 2003 as cited in: Kabasakal, 2007; Snowman 2003 as cited in: Senemoğlu, 2004). The individual who is aware of his learning properties and knows how to use them acquires the ability to plan, monitor and evaluate his learning without other people's help (Flavell, 1985). This ability is a key to being a successful student and academic achievement. Ülgen (2001), states that what makes metacognition so important in academic achievement is that "this ability makes the student to be aware of what he knows or doesn't know". The studies on this matter (Flavell, 1985; Clements & Nastasi, 1999; Kayashima, et al., 2004; Carr et al., 1989; Horzum & Balta, 2008; Puntambekar, 1995; Van Zile-Tamsen, 1996; Anderson, 1999) also assert that there is a linear correlation between metacognitive ability and academic achievement.

Although it is generally accepted that cognitive ability contributes to individual's self learning and academic development, it is unclear, though partly, how this ability will be acquired. In literature, various strategies, method-techniques and learning environments are mentioned regarding the acquisition of cognitive ability. One of them is web based virtual learning environment which is a digital technology on the internet. At present, specifically the role of information technology and that of technology in general has been discussed widely in education. These discussions go on in two lanes. In the first lane are the ones who advocate that information technology has a positive contribution to learning-teaching process. In the second lane are the ones who state that such teaching practices are not efficient in personality development and acquiring social skills and thus robotise the individual. Despite the studies claiming the opposite (Wellman, 1996 as cited in Sirmali, 2011), it is a fact that there is a strong perception in the society concerning this issue. The evidence of the use of information technology in education, studies on the effect of web based instruction on having the individual acquire personal abilities and social skills are needed. Indeed, when the literature is scanned, it is observed that although there are a number of studies regarding the effect of web based instruction practices on academic achievement, it is seen that the studies on the effect of such practices on acquiring personal abilities or skills such as metacognition are relatively new and inadequate (Gay, 2001).

It is important for teachers, instruction designers, educational policy makers as well as faculties of education to determine whether there is a difference between face to face and web based virtual teaching practices in terms of acquiring metacognitive ability. Because, if the efficiency of web based instruction in acquiring metacognitive ability is proven, the curricula of the faculties of education will have to be revised. As a result of this, faculties of education will have to incorporate new courses concerning information technologies into their curricula. Through such courses, it is important to equip teacher candidates with web based instruction skills and metacognitive ability prior to the services. Because, in today's world in which education has increasingly gained a technological facet and the information technology is playing an active role in every aspect of education, it is expectable that the kind of education in which any individual can learn on his own by use of the information technology will rapidly be widespread. The critical variable for the individual in learning by himself with the support of information technology will undoubtedly be metacognitive ability. In this case, the need to have students acquire metacognitive ability will arise and therefore it is quite important to teach soon the teachers of the future the strategies of how to make students acquire information technology and metacognitive ability. So as to make their students acquire metacognitive ability in the future, teacher candidates should be aware of their own metacognitive ability first.

Aim of the Study

The aim of this study is to determine the effect of WebBlog based instruction on the metacognitive ability levels of teacher candidates in accordance with pretest-posttest control group experimental design.

METHOD

Research Design

This study was carried out in pretest-posttest control group design within experimental model. Experimental model "is a model in which the data to be observed is produced under the direct control of the researcher so as to determine cause-effect relations" (Karasar, 1995: 87). Within the framework of this model, experimental and control groups were formed by unbiased appointment taking into account three criteria. Pretest prior to the experiment and posttest following the experiment were applied to both groups. The visual explanation of the model used in the study is seen in Table 1.

Table 1: Pretest-posttest control group model

R	G ₁	t ₁	D	t ₂
R	G ₂	t ₃	----	t ₄

R= Unbiased formation of groups

G₁= Experimental group; G₂= Control group

D= Independent Variable (WebBlog Based Instruction).

T₁= Pretest (Experimental group), T₂= Posttest (Experimental group),

T₃= Pretest (Control group), T₄= Posttest (Control group).

Population and Sample

The population of the study consists of a sum of 1370 students having pedagogical formation education in the province of Elazığ at Fırat University Faculty of Education in 2010-2011 academic year. The sample group consists of 152 (76 experimental, 76 control) students having Curriculum and Instruction course and with similar characteristics chosen from the population according to three objectivity criteria.

Ensuring the objectivity of the sample group

In this study, the following criteria were used to ensure the objectivity in forming experimental and control groups: a) Students' mean academic achievement in the first semester ($\bar{X}_{\text{experimental}}=47.49$, $\bar{X}_{\text{control}}= 47.53$; $p=0,982$), b) presence of computer-internet ($\bar{X}_{\text{experimental}}= 1,21$, $\bar{X}_{\text{control}}= 1,23$; $p=0,842$) and c) pretest scores of metacognition ($\bar{X}_{\text{experimental}}= 3,96$, $\bar{X}_{\text{control}}= 3,99$; $p=0,689$). Prior to the experiment, based on the data demonstrating that there is not a significant difference between the groups in terms of the three criteria, it can be said that experimental and control groups are formed without any bias when the three criteria are considered.

Experiment and Application

A webBlog page was opened to be used by the students in the experimental group. Then, course notes prepared by the lecturer based on the coursebooks were loaded to this page via ftp files and a guest book was formed on this page for students. While designing the page,

experts in the Department of Computer and Instructional Technologies at the same faculty also helped. Before the experiment started, some explanations were made regarding the introduction and operation of webBlog page and how the course would be taught. Next, the students in the experimental group were given the address of the web page and they were requested to visit the guest book on the page for ten minutes everyday. At the end of each day, the lecturer inspected the participation by checking the student writings. The interaction of students on webBlog continued for ten minutes everyday throughout the experiment. The control group was taught by Traditional Instruction Method (TIM) using “explanation and question-answer” techniques. The courses of both groups were carried out by the same lecturer during the experiment, which lasted for four weeks.

Data Collection Tool

The data in this study were obtained via metacognitive inventory scale. For this purpose, Metacognitive Awareness Inventory (MAI) developed by Schraw and Dennison (1994) and adapted to Turkish by Abacı et al (2006) was used. The items involved in this inventory were graded as 5 likert scale in the following order; 1) Never, 2) Rarely, 3) Often, 4) Usually, 5) Always. The internal consistency reliability coefficient was calculated using test-retest method and was found to be 0.95.

Analysis of Data

The data collected in the study were analyzed on computer using SPSS statistics package programme. In this study, which is based on pretest-posttest control group model, independent samples “t” test was used while comparing the MAI scores of the students included in experimental and control groups; paired samples t test was used while comparing the MAI scores within each group. For these analyses, $p=0,05$ was accepted for significance.

FINDINGS

The Effect of WebBlog Based Instruction on MAI Score Levels of Students

Table 2: Comparison of MAI posttest scores of the students in experimental and control groups

Groups	N	\bar{x}	s	sd	t	p
Experimental	76	4.21	0.50	150	2.073	0.040
Control	76	4.04	0.49			

When Table 2 is examined, it is observed that there is a significant difference ($t=2.073$; $p<0.05$) in favour of experimental group students between the MAI posttest scores of experimental group students ($\bar{x}=4.21$) whom webBlog based instruction was applied and those of control group students ($\bar{x}=4.04$) who were taught by TIM.

Comparison of MAI Scores of Experimental Group Students

Table 3: Comparison of MAI pretest-posttest scores of experimental group students

Experimental group	N	\bar{x}	ss	sd	t	p
Pretest	76	3.96	0.44	150	- 4. 853	0.000
Posttest	76	4.21	0.50			

In Table 3, the data concerning the comparison of experimental group within itself in terms of pretest and posttest are seen. According to the table, the mean of pretest MAI score of the experimental group is $\bar{X}=3.96$ and the mean of posttest MAI score is $\bar{X}=4.21$, and the difference between MAI scores is significant ($t=-4.853$; $p<0.05$).

Comparison of MAI Scores of Control Group Students

Table 4: Comparison of pretest-posttest MAI scores of control group students

Control group	N	\bar{X}	s	sd	t	p
Pretest	76	3.99	0.41	150	-0.727	0.470
Posttest	76	4.04	0.49			

In Table 4, the data concerning the comparison of control group within itself in terms of pretest and posttest are seen. According to the table, the mean pretest MAI score of the control group is $\bar{X}=3.99$ and mean posttest MAI score is $\bar{X}=4.04$, and the difference between MAI scores is not significant ($t=-0.727$; $p>0.05$).

DISCUSSION AND CONCLUSION

Discussion and Results on the Effect of WebBlog Based Instruction on the Metacognition Levels of Students

When Table 2 is examined, it is observed that there is a significant difference ($t=2.073$; $p<0.05$) in favour of experimental group students between the MAI posttest scores of experimental group students ($\bar{X}=4.21$) whom webBlog based instruction was applied and those of control group students ($\bar{X}=4.04$) who were taught by TIM. The increase in MAI scores of experimental group can be attributed to webBlog based instruction if the effect of other variables is ignored. In this case, this finding can be interpreted in such a way that webBlog based instruction is effective in developing the metacognitive skill of students. Furthermore, the finding obtained in the study is parallel to those obtained by Kayashima et al (2011), Gibson & Herrera (1999 as cited in: Şen, 1999), Dijkstra et al, (1999 as cited in: Baltacı, 2009), Sanders ve Morrison-Shetlar, (2001) and Carr et al (1989). The finding that webBlog based instruction is more effective than face to face education in developing metacognitive ability can be related to group interaction realized in the framework of webBlog based instruction. Because, it is known that communication and interaction elements such as thinking aloud as a group, mutual conversation, asking questions each other and sharing ideas and reading the diaries in the guest book are very useful in developing metacognitive ability (Chalmers & Rodney, 2005; Tishman et al., 1992; Senemoğlu, 2004; Akdoğan, 2008).

Discussion and Results Regarding the Comparison of MAI Pretest-Posttest Scores of Experimental Group Students

As seen in Table 3, paired samples t test was applied to determine the increase in MAI scores within the experimental group during the experiment and the result was found to be significant in favour of the posttest ($t=-4.853$; $p<0.05$). This finding supports the results attained in Table 2. The fact that the students in experimental group increased their MAI scores significantly throughout the experiment can be attributed to opportunities provided by webBlog based instruction such as self expression and reading and evaluating the ideas or interpretations written by other students. These opportunities may have expanded the strategy repertoire of the students in experimental group by providing them with information and inspiration on

metacognition. Besides, the fact that the students in experimental group raised their MAI scores significantly can be ascribed to “expansion of students’ social environment through internet” (Wellman 1996 as cited in: Sirmalı, 2011) provided by webBlog based instruction. Another reason of experimental group students’ increasing their MAI scores may be related to the property of web technology that brings together effectively teacher-course notes-student (Erkunt & Akpınar, 2002). Another possibility is that webBlog based instruction, which presents information in different ways, made the courses more enjoyable and meaningful and thus student motivation increased. Motivation increasing in this way enhanced student performance (Horzum & Balta, 2008) and this may have supported metacognitive ability. Furthermore, webBlog based instruction, which is a digital technology, may have contributed to metacognitive ability, which is a mental way of meta cognition by “enriching the mental dynamics” (Eti, 2009).

Discussion and Results Regarding the Comparison of MAI Pretest-Posttest Scores of the Students in Control Group

As seen in Table 4, paired samples “t” test was applied to determine the increase in MAI scores of the students in control group during the experiment and a significant difference couldn’t be found between pretest and posttest ($t=-0.727$; $p>0.05$). This finding demonstrates that students in control group who were taught with traditional instruction couldn’t increase their MAI scores significantly during the experiment. Such a result can be attributed to limited communication and interaction opportunities provided by traditional face to face instruction applied to control group. Because, there are a number of factors restricting the teacher-student and student-student interaction in traditional face to face instruction, which condemns students to teacher-board-book triad (Şen, 1999) in the classroom. In this atmosphere which is under the pressure of time and discipline, teachers and students can’t step out of routine framework. What is more, students can hardly express themselves, observe and evaluate their friends in such an atmosphere. In traditional face to face instruction, in which the courses are generally realized as presentations with an autocratic approach and all the planning and evaluation are made by the teacher, students are not usually allowed to observe themselves, plan their learning and evaluate themselves and this is not really welcomed. Because, in this approach adults (teachers, administrators and parents) know the best for students and they make the final decision. It can be claimed that traditional face to face instruction during which student is a passive recipient, instruction is planned and implemented independent of students, prevented or at least didn’t support the development of metacognitive ability of students in control group. When all these are considered, it is not surprising that students in control group to whom traditional face to face instruction is applied couldn’t increase their MAI scores significantly throughout the experiment.

As the final result of the study, it has been determined that webBlog based instruction has positive effects on students’ metacognition levels. More comprehensive studies are needed to determine how much of this positive effect is caused particularly by webBlog based instruction. What is clear here is that instruction applications that are based on group interaction and allow free communication and interaction among students support the development of metacognitive ability of students.

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