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# Analysis of community college students' educational Internet use and metacognitive learning strategies

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## Abstract

In this study, community college students' educational Internet use and metacognitive learning strategies are analyzed. Results show all correlations between educational Internet use and each metacognitive learning strategy are statistically significant and positive. Also, the variables are analyzed, based on gender and computer ownership. Female students use metacognitive learning strategies significantly higher than male students, while it is reverse for educational Internet use. Observance of educational Internet use is significantly higher for students who own a computer than for those who do not own a computer. Computer ownership does not have an effect on metacognitive learning strategies.

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*Keywords:* Educational internet use; metacognitive strategies; community college student.

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## 1. Introduction

In recent years, information and communication technologies have been developing and improving very fast. As a result of this rapid development, prompt and easy access to information supports the adoption and diffusion of information technology. One of these technologies, the Internet, affects the daily lives of individuals and their study areas significantly (Akturk, Sahin, & Sunbul, 2008). The Internet is a communication tool accessible from anywhere and used increasingly to enable us to manage work quickly, efficiently, and effectively in our work (Weiser, 2001). Today, the Internet is used for many different purposes—gathering information, shopping, entertainment, social communication, and educational activities (Lavano et al., 2008). According to results from a research study, a majority of university students use the Internet for educational and social reasons at least once a week (Scherer, 1997). Particularly, the rapid development of the Internet all over the world leads to its use for educational purposes. Some new educational applications through the Internet provide individual training by supporting a shift from an instructor-centered teaching approach to student-centered learning approach.

One of the main objectives of education is to help students learn on their own. Students, who are able to learn individually, usually have the ability to learn in many different ways. Hence, an important issue is how to raise

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students' self-control levels. Research shows that metacognitive learning strategies are one of the key elements of self-learning on a regular basis, can be taught by construction, and have a positive impact on student success (Gilbert-Levin, 1999; Steinbach, 2008; Wen et al., 2003). Nowadays, metacognition is used to describe the surrounding structures related to one's own thinking processes and knowledge (Leader, 2008). Metacognition includes high-thinking skills that people use to plan their own learning activities and to monitor and evaluate their own learning processes (Livingston, 1996; cited by Thompson, 2007). Metacognition is usually related to one's knowledge with his or her own learning process, awareness, and ability to control this process (Thompson, 2007). The purpose of this study is to analyze the relationship between students' self-efficacy beliefs in educational Internet use and their awareness of metacognition strategies. These variables are also examined, based on information about gender and computer ownership.

## 2. Method

This study was conducted during fall semester 2009. A total of 195 students participated in this study. Participants were community college students at an Anatolian university in Turkey. Of the participants, 60% were male ( $n = 117$ ) and 40% were female ( $n = 78$ ). The students pursued degrees in accountancy, management, electric, and computer sciences.

### 2.1. Data analysis

In this study, descriptive statistics and correlation analysis are used. An independent t-test is used to test the relationship between male and female college students' metacognitive strategies and educational Internet use. Data are analyzed using SPSS 16.0 (Statistical Package for Social Sciences) software.

### 2.2. Instruments

To collect data for the study, the "Educational Internet Use Self-efficacy Beliefs Scale," the "Metacognitive Learning Strategies Scale," and the "Internal-External Locus of Control Scale" are used.

In this study, a scale regarding college students' self-efficacy beliefs in educational Internet use, originally developed by Sahin (2009), is used. The Educational Internet Use Self-efficacy Beliefs Scale includes 28 survey items. Higher scores for the scale indicate higher perceived self-efficacy beliefs in use of the Internet for instructional purposes. In the educational Internet use self-efficacy survey, the points a participant can obtain range from 28 to 140 points. The survey items are in a sentence structure. The survey items are answered by means of a five-point Likert-type scale with five response choices including "1=not qualified," "2=somewhat qualified," "3=qualified," "4=quite qualified," and "5=completely qualified." Findings from the current study show Cronbach's alpha reliability coefficient of this scale is 0.96.

The Metacognitive Learning Strategies Scale, developed by Namlu (2004), determines learning-based metacognitive learning strategies. This scale includes the following four subscales—planning, organizing, monitoring, and evaluation subscales. These subscales are evaluated with a total of 21 items. A four-point Likert-type set of alternatives ranging from "1=not at all" to "4=always" is used to assess college students' metacognitive learning strategies. Findings from the current study show Cronbach's alpha reliability coefficient for this scale is 0.85.

## 3. Findings and Discussion

All correlations between educational Internet use and metacognitive learning strategies are statistically significant and positive (see Table 1). These results show a higher level of educational Internet use indicates a higher level use of metacognitive learning strategies. Especially, subscales of metacognitive learning strategies are significantly related to each other. In fact, literature shows an unstructured academic environment (the Internet usually provides such a learning environment) use of metacognitive strategies becomes more importance (Smith, 1996). Designing Internet-based educational practices according to metacognitive learning skills may help students think more about their own learning processes (Cates, 1992; Park & Hannafin, 1993).

Table 1. Correlations between educational Internet use and metacognitive learning strategies

Variable	1	2	3	4	5
1. Educational Internet use	-				
2. Planning	0.14*	-			
3. Organizing	0.15*	0.54**	-		
4. Monitoring	0.23**	0.41**	0.45**	-	
5. Evaluation	0.18*	0.30**	0.38**	0.44**	-

\*: Correlation is significant at the 0.05 level (2-tailed).

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

Table 3 shows community college students' educational Internet use and metacognitive learning strategies analyzed according to gender.

Table 2. Community college students' educational Internet use and metacognitive learning strategies according to gender

Scale	Gender	N	Mean	Std. dev.	t	p	
Educational Internet Use	Male	117	89.85	21.572	4,603	<0.001	
	Female	78	75.40	21.355			
Planning	Male	117	15.70	3.346	-3,101	0.002	
	Female	78	17.18	3.132			
Metacognitive Learning Strategies	Organizing	Male	117	16.21	4,053	-2,393	0.018
	Female	78	17.60	3.842			
Monitoring	Male	117	14.69	3.139	-2,266	0.025	
	Female	78	15.68	2.723			
Evaluation	Male	117	10.68	2.445	-2,728	0.007	
	Female	78	11.56	1.856			

As seen in Table 2, results of the analysis indicate that female college students have significantly higher metacognitive learning strategies in the subscales of planning ( $t = -3,101$ ,  $p < 0.05$ ), organizing ( $t = -2.393$ ,  $p < 0.05$ ), monitoring ( $t = -2.266$ ,  $p < 0.05$ ), and evaluation ( $t = -2.728$ ,  $p < 0.05$ ) compared to male students. On the other hand, male college students have higher uses of the Internet for educational purposes ( $t = 4,603$ ,  $p < 0.001$ ) compared to female students. In a study of cognitive learning strategies, female college students have significantly higher cognitive learning strategies in the subscales of memorization, analytical, and explanation compared to male students (Kesici, Sahin, & Akturk, 2009).

Furthermore, community college students' educational Internet use and metacognitive learning strategies are analyzed according to computer ownership (see Table 3).

Table 3. Community college students' educational Internet use and metacognitive learning strategies according to computer ownership

Scale	Computer ownership	N	Mean	Std. dev.	t	p	
Educational Internet Use	Yes	115	89.72	21.949	4.382	<0.001	
	No	80	75.95	21.052			
Planning	Yes	115	15.97	3.271	-1.650	0.101	
	No	80	16.76	3.387			
Metacognitive Learning Strategies	Organizing	Yes	115	16.70	4.186	-0.270	0.788
	No	80	16.86	3.788			
Monitoring	Yes	115	15.16	3.025	0.385	0.701	
	No	80	14.99	3.008			
Evaluation	Yes	115	10.89	2.312	-1.063	0.289	
	No	80	11.24	2.195			

As seen in Table 3, the results of the analysis show that college students, who own a computer, have higher uses of the Internet for educational purposes ( $t = 4,382$ ,  $p < 0.001$ ) compared to those who do not own a computer. However, in the literature, significant differences are not found between students' attitudes toward using the Internet for educational purposes, and their computer ownership and connectivity to the Internet (Duggan et al., 2001). Also, there is no significant difference among students' metacognitive learning strategies, based on computer ownership.

#### 4. Conclusions

The Internet is used in most areas of human interaction. The Internet can be used to follow daily work, access information, provide searches, complete assignments, eliminate emotional pressures, and spend leisure time (Sahin, 2009). In these activities, it is essential the Internet should be used purposely and functionally. In fact, learning activities occurring in computer-mediated communications are helpful for teaching necessary enabling skills. Zhang (2005) suggests that encouragement of using computer-mediated communications and enhancement of capabilities of integrating computer-mediated communications positively affect students' attitudes toward the Internet.

Successful students are active learners, who are aware of their learning processes. Use of metacognitive strategies, and awareness and organization of cognitive activities are the characteristics of active learners, controlling their learning processes (Mayo, 1993). According to many researchers, active students with metacognitive skills are more aware of their strengths and weaknesses, and more willing to improve their self-learning skills compared to other students (Bransford, Brown, & Cocking, 1999). Students' use of the Internet for educational purposes helps them become more active in their own learning (Anderson & Reed, 1998) and supports them to learn through research studies (Duggan et al., 2001).

According to the results of a research study by Duggan et al. (2001), attitudes are more favorable for students who learn how to use the Internet on their own than those who do not. It is stated that using a number of instructional learning methods along with the Internet on one's own may lead to a more favorable attitude in the future (Duggan et al., 2001). It is clear that in the Internet environment, students need to determine their own learning processes and to manage these processes (Chen, 2008; Wen et al., 2003). As a result, it can be concluded that educational Internet use helps improve metacognitive skills, such as reflective thinking, self-regulation, self-evaluation, and transfer of knowledge. In the web-based learning environment, students can construct, monitor, and control knowledge from various information sources with the help of metacognitive knowledge (Schraw, 2000; Tsai, 2004; cited by Topcu & Ubuz, 2008). Findings from the current study support this statement that students who have a higher level use of the Internet for educational purposes also receive more benefits from metacognitive learning strategies.

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