A STUDY ON INFORMATION SEARCH AND COMMITMENT STRATEGIES ON WEB ENVIRONMENT AND INTERNET USAGE SELF-EFFICACY BELIEFS OF UNIVERSITY STUDENTS'

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ABSTRACT
This study addresses university students' information search and commitment strategies on web environment and internet usage self-efficacy beliefs in terms of such variables as gender, department, grade level and frequency of internet use; and whether there is a significant relation between these beliefs. Descriptive method was used in the study. Study group is composed of students attending the first and fourth degrees in several departments at Kocaeli University. Data collected regarding university students' information search and commitment strategies on web environment and internet usage self-efficacy beliefs were analyzed using descriptive statistics, t test and pearson correlation coefficient. The research results indicate that students' scores on "elaboration" strategy in the Web environment and scores of self-efficacy regarding Internet use were at the intermediate level. Students' educational Internet use self-efficacy beliefs are moderate according to the highest and lowest points of the survey. The analyses found that there was a relation between Internet use self-efficacy beliefs and information search and commitments strategies within the Web environment. A positive, although low-level, relationship was found between the "elaboration" factor, which is one of the one sub-factors of search and commitment among the information strategies in a Web environment, and self-efficacy with respect to Internet use.
Keywords: evaluative standards, information commitment, information searching strategy, self-efficacy beliefs in Internet use

1. INTRODUCTION

The Internet has recently become one of the most important tools in our lives with rapid developments in the field of information and communication technologies. The Internet is now used extensively in many areas, especially in the field of education. Owing to Internet the computer assisted education, web based training, online learning, blended learning some think like that, today these applications frequently heard and these applications that are on web environments alternative to traditional education, and are applied to various institutions and organizations as a supplementary. According to Boldt, Gustafson and Johnson (1995), the Internet is a great tool that can be used to enrich students' learning habits and experiences. When analyzed in terms of students' learning, the Internet provides a host of advantages such as a rich and flexible learning environment, inexpensive and easy access to information, a variety of different animations, videos, and hypertexts. While technology, however, has increased the ease by which one can gain access to information, it has also created certain problems. One of those problems revolves around the validity, reliability, and accuracy of the information accessed on the Internet. While scientific organizations, business associations and institutions are often known for their publicly available published print, such as professional and scientific journals, there is no overarching mechanism that controls the information that is published on the Internet. In other words, while most journals and books that are published by commercial institutions are first evaluated for the accuracy and validity of their content, information posted in the Internet undergoes no such evaluation – no editor or jury reviews the print before it is posted and made public. As everyone who wants to publish on the Internet and because there are numerous technology stations that allow people to post or "publish" their information, it is virtually impossible to control or monitor what is posted. These technology stations cause serious problems because, while the information is easily accessible on the Web, issues regarding accuracy, neutrality, and timeliness are many (Cebeci & Bek, 2003; cited by Tavsanci, 2004; Kurulgan & Argan, 2007). Most scientific knowledge is still, for the most part, published through traditional methods such as scientific journals, books, etc. It is exceptionally challenging, on an individual basis, for the user of the Internet to monitor all texts, images, and data due to the uncontrolled flow of information. As a result, when creating or using a world-wide Internet library, the user is faced with "information pollution" overload. (Yolal & Kozak, 2008).

According to the research, students of the 21st century perceive the Internet as a unique main source of information (Akdag & Karahan, 2004; Akkoyunlu & Yilmaz, 2005; Kurbanoglu, 2002; Oliver & Goerke, 2007; Tsai, 2008; Yalcinalp & Askar, 2003). These students do, however, express doubt about the reliability and validity of the information on the Internet, especially that which is free (Jean-Francois 2003; Kuechler 1999; McDowell 2002; Yolal & Kozak, 2008). Because most students who are accessing the Internet generally research a subject for information without using any form of filter to evaluate the credibility of the information, the student is left to evaluate the reliability of the information. Accordingly, some of the information taken from

a Web environment may be inaccurate or biased (Brandt 1996; Flanagin & Metzger, 2000). Therefore, students need to develop a strategy that will facilitate their ability to evaluate and determine the accuracy and usefulness of the information. Researchers, as a consequence, are interested in assessing student thoughs and feelings about the process of searching for information on the Web (Bilal, 2001; Hess, 1999; Lazonder et al., 2000; Rouet, 2003; Whitmire, 2003, 2004) and interested in determine the factors that influence their thoughts and feelings (Beaufils 2000; Hill 1999; Tsai & Tsai 2003). To date, however, information about the nature of students' search strategies on the Internet have not been fully revealed. Strategies for students to interpret the literature on web-based information search and commitment that more research is needed (Wu & Tsai, 2005). Study results show that the Internet cannot be used effectively during the teaching and learning process (Akkoyunlu, 2002; Olkun & Cakiroglu, 2000). Students should be instructed about how they effectively benefits from the knowledge for educational purpose on the Web, what kind of knowledge is reliable etc. (Olkun & Cakiroglu, 2000).

Students use different search strategies as they look for appropriate and relevant information on the Internet needed to complete a task (obtain information about a topic, prepare homework, create a project, etc.). Wu and Tsai (2005) found that as students search for knowledge and resources within the Web environment, they basically applied two different strategies. In the first strategy, they search for information that they need, while the second strategy involves searching for comments about the research and the information they obtained from the Web. Wu and Tsai (2005) posit that information search strategies in the Web environment that are associated with students learning is one of the most important factors affecting student performance. Tsai (2004) has developed a theoretical framework about the knowledge search on the Web and commitment strategies of students. It is explained in the following section comprehensively.

1.1. Theoretical Framework

According to Tsai, students who have individual differentials and different levels of commitment to learning use different standards to commitment the information they have accessed through the Web environment. Standards in Web-based learning environments include the usefulness of the information and the degree of student commitment. At the same time, the standards that guide a student's search strategy are impacted by the student's current knowledge of the researched topic. While the standards guiding a student's commitments of Web-based materials are implicit, their information search strategies are, for the most part, explicit. Accordingly, students' research strategies and their commitments of information cover two different components. While the former involves more intrinsic behaviors such as evaluating the information and being committed to enhancing one's knowledge as a result of the research, the latter involves identifying the strategies used by students to obtain information from the Web. To understand the commitment of Web users who are seeking information, Tsai (2004) developed a theoretical framework. According to this theoretical framework, students are categorized or defined according to three aspects with respect to their search strategies for and their commitment to accessing valid information in the Web environment.

1. Standards for Accuracy: These are the standards used to evaluate the reliability and accuracy of the Web information. The possible orientation of the standard is "multiple sources". In this strategy, when the students see information about the researched topic on the Web, they can discuss with their teacher or friends or they can research using books and other printed materials to determine the accuracy of the information. "Multiple sources" of the opposite opinion constitute "authority". Using this strategy, students can assess the accuracy and validity of the information based on the actual resource. That is, if the source is a site that is well-known for publishing valid information, if the source is an official institution (government agency, educational institutions, etc.), if the source is an occupational Web site, or if the source is one that was recommended by experts, the information can be considered reliable (Tsai, 2004).
2. Standards for Usefulness: These are the standards students apply to evaluate the relevancy of the information accessed on the Web. The possible orientation of this standard is "content". "Content" means that the Web site has information that is appropriate and applicable to the research aim. When applying this strategy, students may consider the Web site more to be suitable if the information content addresses the specific aim of their search, provides information links to other sites, promotes their learning and research of the topic, provides a high level of information, offers animations or visuals to help students better comprehend and examine the information in the Web environment. "Content" of the opposite opinion constitute "technical". With respect to this component, one must consider the ease with which one can navigate the site as well as the functional aspects and physical aesthetics of the Web site. For example, ease of access is determined by how quickly one can access the site and have access to the required information. Those sites that require passwords or registration are not considered as user-friendly as those that can be accessed with one or two clicks of the mouse. (Tsai, 2004).

3. Search Strategy: Students use research strategies when searching for an appropriate Web environment. One possible orientation of this strategy is “elaboration”. This strategy allows students to quickly summarize found information and to easily conduct a more advanced search through different search engines to find more suitable information for their purpose based on information gained from an initial search. This strategy also involves the integration of information derived from various Web sites, thus facilitating their intended purpose during their research in the Web environment. The opposite of the elaboration strategy is the match strategy, where students usually use only one search engine to find the most suitable Web site. İf they find a suitable Web site that meets their research needs in the first stage, they may not search the other sites or access other search engines (Tsai, 2004).

Within the aforementioned three aspects of Tsai’s framework, the first two items contain standards for student commitment to obtaining reliable and readily available information (“multiple sources”, “authority”, “content”, “technical”) when using the Web environment for their research. These standards are referred to as implicit components. The third item contains searching strategies (elaboration, match), which are considered explicit components.

Wu and Tsai (2005) ascribe specific names to three factors, “content”, “elaboration” and “multiple sources,” and consider these to be “advanced sophisticated” that contribute to and facilitate the students’ access to reliable and valid information.

On the other hand, they ascribe specific names to three other factors, “authority”, “technical” and “match”, and consider these to be “simple information search strategies”, that is, they are less sophisticated, because they do not require that the student put forth much effort when searching for information. A scale was developed by Wu and Tsai (2005) based on Tsai’s (2004) theoretical framework and used to evaluate college students when they were searching for information on the Web. The visual information related to the scale is displayed in Figure 1.

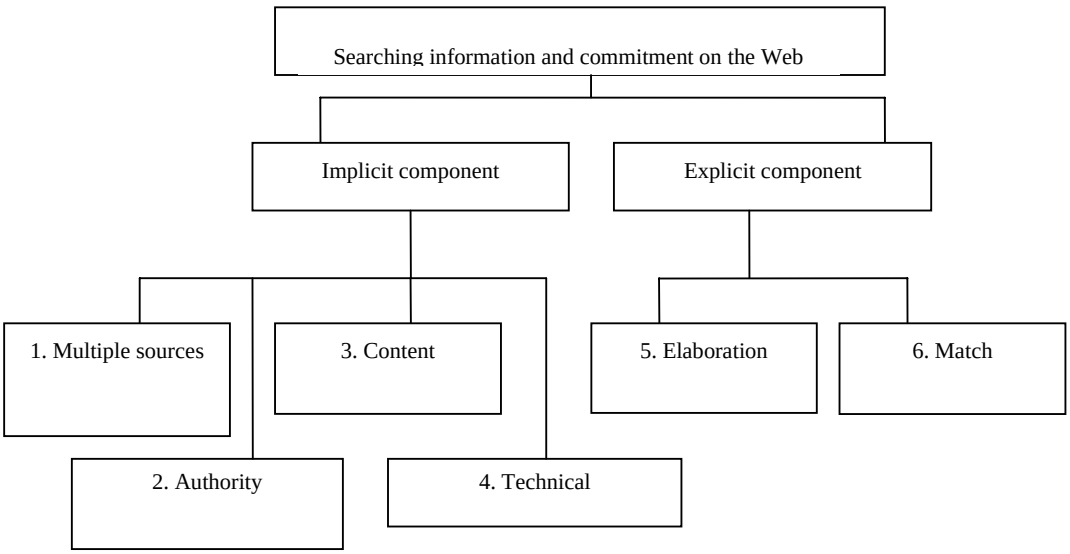

Figure 1. The scale and its sub factors as developed by Wu and Tsai(2005)

The causal relationship between explicit and implicit components in the scale developed by Wu and Tsai (2005) with respect to students' information search and commitment strategies is examined. Reliability and validity studies are conducted, and the scale is used to analyze 610 students in Taiwan. The results of the studies indicate that students' standards of evaluation of Web materials have a significant impact on their information searches in the Web-based learning environments.

Moon (2004) who stated one of the factors that affects students' information search strategies is the specific features of the Web site. Web sites that offer users more detailed, useful, accurate, reliable, current and timely information induce users to use the site and to stay longer on the site (Moon, 2004). Opening speed, design, and ease of use are technical features of the site that may influence student attitudes about the site and their inclination to use the site. Many studies have been conducted regarding the evaluation of the information

obtained on the Internet (e.g., Brandt 1996; Flanagin & Metzger, 2000). Few of these studies, however, relate to the feasibility and usefulness of materials found in a specific Web environment. Thus, this is an area where research needs to be conducted. Studies on this subject are summarized below.

1.2. Related Research

Wu and Tsai (2007) conducted a study of 1220 university and graduate students who use online environments in Taiwan. Using the scope and scale developed in their previous studies, they found that students' information search and commitments strategies on the Web differ significantly according to gender and grade level. Male students use the "match" strategy, which is the less sophisticated strategy, more often than do girls. It was also determined that university graduate students are more oriented to multiple sources than are university undergraduate students when evaluating the accuracy of information accessed on the Web.

Kurulgan and Argan (2007) examined the behavior of students' information searches on the Web. The results of the research indicate that gender, academic department and competency level regarding Internet use were found to have statistically significant effects on Web information seeking behavior. The results also show that students' gender, their average spending level and the status of their academic department all have a significant impact on the frequency with which they use the Internet.

Yalcinalp and Askar (2003) examined student usage of the Internet as an information search tool and as a communication environment in terms of specific student characteristics. The results suggest that there is a relationship between student information search style and information search strategy. The students preferred the Internet to the library or other sources when specific conditions were met.

Additional research findings support (Usluel, 2006) the conclusion that students encounter difficulties accessing information and indicate that there should be emphasis placed on Web-based information search strategies.

As previously mentioned, information overload on Web-based environments often leads to problems related to reliability and impartiality of information. Therefore, students must be awareness of this problem and must be able to evaluate the accuracy of the information they access. Debowski (2001), in his research on college students, found that students who lack experience using the Internet and navigating Web environments may put for the tremendous effort in their studies but they lack effective search strategies to conduct the necessary research. As a result of Debowski's (2001) study, emphasis was placed on the need for educational programs that facilitate students' development of effective search strategy skills.

The use of Internet-based technologies requires that students be familiar with the Internet. Moon (2004) found that students who increased their level of knowledge regarding the use of Internet information search strategies consciously increased the importance they ascribe to this environment. Similarly, as the student's ability to use the Internet evolves, the student will search for more detailed information on the Internet (Yolal & Kozak, 2008). Students' knowledge, skills and attitudes related to Internet technologies are based on their belief that the Internet provides valuable research resources and that they, as users, possess the requisite skills to access the information on the Internet. In other words, student self-efficacy or confidence in their ability to successfully access information on the Internet is essential for student success. For the first time the concept of self-efficacy, Bandura (1997) used by the. Bandura (1997) addressed the concept of self-efficacy in relation to behavioral, environmental, and individual factors and identified three basic levels. The concept of self-efficacy regarding an individual's capacity to perform a task is expressed in the form of Internet self-efficacy beliefs. While today's students have numerous opportunities to benefit from Web-based learning environments, learning in these environments is thought to influence their level of self-efficacy and their competence regarding their use of the Internet, an important area of interest to many researchers. Tsai and Tsai (2003) further define Internet self-efficacy beliefs as the students' perceptions and beliefs about their abilities and skills to efficiently navigate the Internet. Internet self-efficacy beliefs is based on the basic computer skills that are required to effectively and efficiently access the Internet, thereby creating a different set of behaviors (Eastin & LaRose, 2000). A high level of self-efficacy suggests that the individual believes he/she can succeed and accomplish something (Tsai & Tsai, 2003). Thus, Internet self-efficacy beliefs suggests that the individual possesses not only computer skills, but the skills necessary to efficiently use e-mail, access Web addresses, scan information, etc. No doubt hear the performance capabilities of individuals against the negative influence and that the more trust, more performances for doing a job that leads to (Bandura, 1989, cited by: Montcalm, 1999). Similarly, students' level of self-efficacy and Internet competence is necessary for those with low Internet self-efficacy beliefs as they strive to increase confidence their Internet self-efficacy beliefs.

In addition to effective strategies to search and commitments for information, a high level of Internet access competencies can be beneficial as students search for the appropriate information within the environment. Tsai

and Tsai (2003), for example, posited that having a strong sense of self-efficacy when using the Internet facilitates students as they seek to identify effective information searching and commitment strategies for science lessons within Web-based learning environments.

Similarly, there is a positive relation between information search strategies based on Web-based learning and the level of the student Internet self-efficacy beliefs (Hill & Hannafin, 1997; Joo, Bong & Choi, 2000). Wu and Tsai (2006) noted the importance of research regarding the relationship between students' Internet self efficacy and their ability to navigate within the Web environment. It is important that students be able to effectively evaluate the information they obtain from the Web environment and that they develop effective information research strategies when accessing Web-based learning environments. There are few researches about the determination of students' knowledge search strategies on web-based learning environments in the literature.

In the process of information searching, the searching strategies students employ may guide their searching behavior on the Internet. However, when searching information in web-based learning environments, students with expert Internet experience demonstrate better searching strategies than those with novice Internet experience (Tsai & Tsai, 2003). The different searching strategies used by expert and novice users may lead to different search results, which can be viewed as an important indicator of learners' performance and outcomes derived from web-based learning environments (Wu&Tsai, 2007). Tsai and Tsai (2003) have concluded that Internet self-efficacy can foster better information searching strategies and learning outcomes in Internet-based environments. To research of students' information searching and commitments strategy on web environment and their Internet self efficacy may be illuminate studies which will be organized in the future in this subject. In addition, is there a significant relationship between information search and commitments strategies within the Web environment and Internet self-efficacy beliefs? Can a student who has a high degree of competence in using the Internet self-efficacy beliefs regarding the Web environment determine effective information search and commitments strategies to gain access to appropriate, valid information? A research is needed to be done for the answers and it is covered in the study thoroughly.

1.3. Purpose

The purpose of this research is to investigate the student's information search and commitments strategy on the web environments and to determine the relationship between their Internet self-efficacy beliefs beliefs. The sub-objectives developed for this purpose are as follows:

1. What is the level of the students' information search and commitments strategy on the Web and the students' Internet self-efficacy beliefs?
2. Is there a significant difference between a students' information search and commitments strategies in a Web environment and their Internet self-efficacy beliefs when considering other variables such as department, grade, gender, frequency of Internet use?
3. Is there a relationship between the students' information search and commitments strategies on the Web and Internet self-efficacy beliefs?

2. METHODS

2.1. Model of research

A descriptive model was used in this study.

2.2. Participants

Participants in the study included 565 formal education students in either 1st or 4th grade at Kocaeli University in the academic year 2011-2012. As some surveys were eliminated because of incomplete information, the final number of valid surveys used for data collection was 557. Three verbal and three numeric department were selected for the study because the numerical and verbal departments indicated whether students employed different information search and commitments strategies. Whitmire (2002) has determined that students demonstrate different information search behaviors according to their various education disciplines.

2.3. Tools of Data Collection

Data were collected and processed as either "Information Search and Commitments Strategies on the Web Environment Scale" or "Internet self-efficacy beliefs Scale".

2.3.1. Information Search and Commitments Scale in the Web Environment: This scale was developed in 2005 by Wu and Tsai, and the students were assessed using confirmatory factor analysis and structural alignment (Wu & Tsai, 2005). Necessary permission for use of the scale was obtained from Wu and Tsai by e-mail. The scale consists of 24 items and six sub-factors. The first sub-factor of the scale is "multiple sources", which

consists of affirmation commitment strategy information. (İtem 3 in the scale adaptation of this was factor eliminated). The second sub-factor is "authority", which consists of information related to information commitment strategies on the Web environment. The third sub-factor is "content", which consists of information related to the utility of the information accessed on the Web as related to the purpose of the research. The fourth sub-factor is "technical", which refers to the ease of accessing information and navigating Web sites on the Internet. The fifth sub-factor of the scale is "elaboration", which contains research about information search strategies within the Web-based learning environment. The sixth sub-factor is "match", which consists of information related to student search strategies. These first four elements of each of these dimensions comprise the sub-dimension referred to as the implicit component factor and the last two elements comprise the sub-dimension referred to as the explicit component factor.

2.3.2.

Responses to statements range on a six-point Likert scale from "Strongly Agree(1)" to "Strongly Disagree(6)". In the final version of the scale, however, the statements are evaluated using a five-point Likert scale (Hsieh & Tsai, 2011). The adaptation of the scale to a five-point Likert scale for our culture was performed by Gecer and İra (2012). A factor analysis is obtained for the six sub-factors, and the eigenvalue is over 1.00, thus explaining 53.80% of the total variance. Because item (3)'s factor loading value is below .40, the scale's analysis required the elimination of 23 items. The factor loading of items ranges between .544 and .799. The alpha internal consistency of the coefficients of all scale points is α=.75. Scale items in the study were analyzed using a five point Likert form. Taking into account the scale's breadth of range calculations with "series width/number of groups to be performed" formulation (Tekin, 1996), the width of arithmetic average is basic for evaluating research findings. Accordingly, "1.00 to 1.80 = Strongly disagree", "1.81 to 2.60 = Disagree", "2.61 to 3.40 = Somewhat agree", "3, 41 to 4.20 = Agree" and "4.21 to 5.00 = Strongly agree".

2.3.3. Internet self-efficacy beliefs Scale: The scale is taken from the research of Sahin (2009) titled "Validity and Reliability of Educational Internet Use Self-Efficacy Beliefs". The scale is used to measure university students' self-efficacy regarding Internet usage. Response expressions were as follows: "İnsufficient (1)", "Partially had enough", "Had enough", "Enough", "Completely had enough (5)". There are 28 items in the scale. Considering the scale's breadth of range calculations with "series width/number of groups to be performed" formulation (Tekin, 1996), the width of arithmetic average applied is basic for evaluating research findings. Accordingly, "1.00 to 1.80 = İnsufficient", "1.81 to 2.60 = Partially had enough", "2.61 to 3.40 = Had enough", "3, 41 to 4.20 = Enough" and "4.21 to 5.00 = Completely had enough". Scores range between 1.00 and 5.00. İt is assumed that students have a high level of Internet use self-efficacy when their points approach 5.00 and students have a low level of Internet use self-efficacy as their points approach 1.00. The necessary permission to use the scale was obtained from Sahin (2009) via e-mail. The scale was developed as a one-factor scale with item factor loadings of the 28-items ranging between 0.52 and 0.81. The Cronbach's alpha reliability coefficient is α= 0.96.

2.4. Analysis of Data

The SPSS 17.0 program was used to analyze the data, and an acceptable significance level of 0.5 was achieved. Furthermore, methods of frequency (f), percentage (%), arithmetic average ($\bar{X}$), t-test, variance analysis with a single factor, multiplying of Pearson moments and technique of correlation were used in the study.

3. RESULTS

The data were analyzed in accordance with purpose and sub-purpose, and the data were supported by related results.

3.1. Results related to students' demographic features

Findings related to students' demographic features are displayed in Table 1.

Table 1. Findings related with demographic features of students

Department	**N**	**%**
Verbal (Turkish Language and Letter, Philosophy, Psychological Counseling and Guidance)	269	48.3
Numeric (Physics, Metallurgical Engineering, Science Teacher)	288	51.7
Grade	**n**	**%**
1st grade	278	49.9

4th grade	279	50.1
Gender	**n**	**%**
Female	341	61.2
Male	216	38.8
Frequency of using Internet everyday	**n**	**%**
Less than 1 hour	124	22.3
1 hour	116	20.8
2 hours	123	22.1
3 hours	92	16.5
4 hours or more	102	18.3

According to the results displayed in Table 1, students who participated in the survey included 48.3% from the verbal department, 51.7% from the numeric department. Students enrolled in the 1st grade account for 49.9% of the participant population, while the remaining 50.1% are in their 4th year of study. Females (61.2%) outnumber the males (38.8%). With respect to student Internet frequency use, 22.3% of the students use the Internet less than 1 hour a day, 22.1% access the Internet two hours a day, and 18.3% are on the Internet four or more hours a day.

3.1.1. The level of the students' information search and commitments strategy on the Web environments and the student's Internet self-efficacy beliefs beliefs

The values related to students' information search and commitments strategy on the Web environments and the student's Internet self-efficacy beliefs are provided in Table 2.

Table 2. The level of the students' information search and commitments strategies within the Web environment and their Internet use self-efficacy beliefs

Strategies for information searches and commitments within the Web environment	**N**	$\bar{x}$	**Ss**
1. factor: multiple sources	557	3.76	1.58
2. factor: authority		3.89	2.39
3. factors: content		3.87	3.19
4. factors: technical		2.68	2.48
5. factor: elaboration		3.92	2.57
6. factor: match		2.93	2.75
Internet use self-efficacy beliefs	**N**	$\bar{x}$	**ss**
	557	3.33	2.92

When Table 2 is examined, it is seen that highest value strategy is the fifth factor which is "elaboration" ($\bar{x}$=3.92) related with students' information search and commitments strategies on the web environment. This is followed by "authority" ($\bar{x}$=3.89), "content" ($\bar{x}$=3.87), and multiple sources ($\bar{x}$=3.76). Students expressed that they "agree" substances in this category. Students expressed that they "somewhat agree" about the sixth factor, "match" ($\bar{x}$=2.93), and the fourth factor, "technical" ($\bar{x}$=2.68). When assessing students self-efficacy as related to Internet use, students feel that they possess adequate Internet self-efficacy beliefs ($\bar{x}$=3.33).

3.1.2. Is there a significant difference students' information search and commitments strategies on a Web environment and Internet use self-efficacy beliefs according to their department, grade, gender, frequency of using Internet everyday?

The impact of various demographic variables, such as department, grade, gender, frequency of using Internet everyday on information search and commitments strategies on a Web environment and on Internet use self-efficacy beliefs as well as findings are presented in below.

Table 3. The difference between students' information search and commitments strategies within the Web environment according to their academic department

The scale of information search and commitments strategies within the Web environment	Department	$\bar{x}$	Ss	t	p
multiple sources	Verbal department	3.86	1.45	3.01	.003
	Numeric department	3.66	1.67		
authority	Verbal department	3.90	2.48	0.56	.574
	Numeric department	3.87	2.30		
content	Verbal department	3.88	3.24	0.37	.709
	Numeric department	3.87	3.14		
technical	Verbal department	2.56	2.48	3.44	.001
	Numeric department	2.80	2.43		
elaboration	Verbal department	3.92	2.46	0.03	.974
	Numeric department	3.92	2.67		
match	Verbal department	2.84	2.71	2.11	.035
	Numeric department	3.01	2.77		

An independent t-test was applied to determine the difference between students' information search strategies within the Web environment according to their academic department. A significant difference was found between departments with respect to the “multiple sources” factor [$t(557) = 3.01$, $p < .01$]. The arithmetic average of the verbal departments with respect to “multiple sources” strategies on the Web is higher than that of the numeric departments. A significant difference was found between departments regarding strategies [$t(557) = 3.44$; $p < .001$]. The arithmetic average for the factor “technical” regarding Web environment strategies is higher for those students in the numeric departments than for those in the verbal departments. A significant difference was also found between departments with respect to the “match” factor [$t(557) = 2.11$; $p < .05$]. The arithmetic average of regarding the “match” factor as a strategy is higher for those students enrolled in numeric departments than for those in verbal departments.

Table 4. The relationship between grade level and students' information search and commitments strategies within the Web environment.

The scale of information search and commitments strategies within the Web environment	Grade	$\bar{x}$	Ss	t	p
multiple sources	1st grade	3.76	1.52	0.03	.969
	4th grade	3.76	1.64		
authority	1st grade	3.87	2.19	0.50	.615
	4th grade	3.90	2.57		
content	1st grade	3.81	3.48	2.85	.005
	4th grade	3.94	2.81		
technical	1st grade	2.67	2.49	0.35	.721
	4th grade	2.69	2.47		
elaboration	1st grade	3.91	2.47	0.45	.652
	4th grade	3.93	2.66		
match	1st grade	2.95	2.65	0.47	.636
	4th grade	2.91	2.85		

An independent t-test was applied to determine the difference between students' information search and commitments strategies within the Web environment according to their grade level. No significant difference was found for any factor other than "content" strategy with respect to grade level [t(557)=2.85; p<.01]. The arithmetic average of "content" strategy when using the Web to access information is higher for students who are studying at grade 4 than for students studying at grade 1.

Table 5. The relationship between gender and students' information search and commitments strategies within the Web environment

The scale of information search and commitments strategies within the Web environment	Gender	$\bar{x}$	Ss	t	p
multiple sources	Female	3.81	1.52	1.81	.070
	Male	3.68	1.67		
authority	Female	3.89	2.28	0.18	.852
	Male	3.88	2.55		
content	Female	3.85	3.12	1.13	.259
	Male	3.91	3.29		
technical	Female	2.61	2.40	2.35	.019
	Male	2.78	2.57		
elaboration	Female	3.96	2.32	1.98	.048
	Male	3.87	2.90		
match	Female	2.87	2.62	1.74	.082
	Male	3.01	2.94		

An independent t-test was applied to determine the difference between students' information search and commitments strategies within the Web environment and their gender. A significant difference was found between their gender and strategies related to "technical" factor [t(557)=2.35; p<.01]. The arithmetic average with respect to "technical" strategies within the Web environment was higher among males than among females. A significant difference was also found between the genders with respect to "elaboration"[t(557)=1.98; p<.05]. The arithmetic average for female students with respect to elaboration within the Web environment is higher than that for male students.

Table 6. The relationship between the frequency of using the Internet and students' information search and commitments strategies within the Web environment.

The scale of information search strategies within the Web environment	The frequency of using the Internet	$\bar{x}$	Ss	F	p
multiple sources	Less than a hour	3.76	1.64		
	1 hour	3.81	1.59	0.71	.580
	2 hours	3.82	1.25		
	3 hours	3.67	1.76		
	4 hours or more	3.71	1.69		
authority	Less than a hour	3.73	2.59		
	1 hour	3.92	2.09	4.15	.003
	2 hours	3.84	2.44		
	3 hours	3.95	2.44		
	4 hours or more	4.07	2.18		
content	Less than a hour	3.82	3.31		
	1 hour	3.85	3.03	0.83	.506
	2 hours	3.91	3.07		
	3 hours	3.86	3.29		
	4 hours or more	3.93	3.24		
technical	Less than a hour	2.51	2.40		
	1 hour	2.57	2.43	3.64	.006
	2 hours	1.72	2.59		
	3 hours	2.71	2.41		
	4 hours or more	2.78	2.43		
elaboration	Less than a hour	3.83	2.78		
	1 hour	3.90	2.39	2.01	.091
	2 hours	3.95	2.36		
	3 hours	3.94	2.86		
	4 hours or more	4.01	2.39		
match	Less than a hour	2.79	2.64		
	1 hour	2.91	2.73	1.34	.251
	2 hours	2.98	2.70		
	3 hours	2.92	2.82		
	4 hours or more	3.06	2.88		

A one-way analysis of variance and an LSD test were applied to determine the difference between of students' information search and commitment strategies within the Web environment according to their daily Internet frequency use. A significant difference was found between daily Internet use and the "authority" factor [$F(557)=4.15$; $p<.01$]. The arithmetic average for those students who use the Internet for 4 hours or more with respect to the "authority" factor is higher than it is for students who use the Internet "for less than 4 hours a day. A significant difference was also found between daily Internet use and the strategies related to the "technical" factor [$F(557)=3.64$; $p<.01$]. The arithmetic average for students who use the Internet 4 hours or more per day with respect to the "technical" factor is higher than it is for students who use the Internet less than 4 hours per day. No significant differences were found for other factors regarding the daily frequency of student Internet use. Findings related to significant differences between students' levels of Internet self-efficacy beliefs according to students' department, grade, gender, frequency of daily Internet use are displayed in Table 7.

Table 7. The relationship between various variables and students' levels of Internet self-efficacy beliefs

The students' Internet self-efficacy beliefs		$\bar{x}$	Ss	t	p
Department	Verbal	3.15	21.70	5.28	.000
	Numeric	3.49	21.39		
The students' Internet self-efficacy beliefs		$\bar{x}$	**Ss**	**t**	**p**
Grade	1st grade	3.18	21.21	4.38	.000
	4th grade	3.47	22.19		
The students' Internet self-efficacy beliefs		$\bar{x}$	**Ss**	**t**	**p**
Gender	Female	3.18	21.77	5.67	.000
	Male	3.56	20.98		
The students' Internet self-efficacy beliefs		$\bar{x}$	**Ss**	**F**	**p**
Frequency of daily Internet use	Less than 1 hour	2.95	19.84	17.17	.000
	1 hour	3.14	19.32		
	2 hours	3.43	21.52		
	3 hours	3.60	20.66		
	4 hours or more	3.61	23.12		

An independent t-test was applied to determine differentiation between students' level of Internet self-efficacy beliefs and their department of study. As a result of the t-test, there were significant differences between the verbal and numeric departments with respect to students' levels of Internet self-efficacy beliefs [t(513)=5.28; p<.001]. The arithmetic average of those students who are studying in numeric departments is higher than it is for students who are studying in verbal departments with respect to students' levels of Internet self-efficacy beliefs.

An independent t-test was applied to determine differentiation between students' levels of Internet self efficacy and their grade. As a result of the t-test, significant differences were found between the two grade levels (1st grade and 4th grade) with respect to students' level of Internet self-efficacy beliefs [t(513)=4.38; p<.001]. The arithmetic average of those students who are studying at grade of 4 is higher than it is for students at the 1st grade with respect to the students' levels of Internet self-efficacy beliefs.

An independent t-test was applied to determine the degree of differentiation between students' levels of Internet self efficacy and student gender. As a result of the t-test, there were significant difference as between females and males with respect to to students' levels of Internet self-efficacy beliefs [t(513)=5.67; p<.001]. The arithmetic average of the male students is higher than that of the female students with respect to students' levels of Internet self-efficacy beliefs.

A one-way analysis of variance and LSD test were applied to determine differentiation between students' level of Internet self-efficacy beliefs according and their daily frequency of Internet use. A significant difference was found between students' level of Internet self-efficacy beliefs and their daily frequency of Internet use [F(557)=17.17; p<.001]. The arithmetic average of those students who are using the Internet 4 hours or more per day is higher than it is for students who use the Internet less than 4 hours per day with respect to to students' levels of Internet self-efficacy beliefs.

3.1.3. The relationship between students' information search and commitments strategies and Internet use self-efficacy beliefs

A correlation analysis was performed to determine whether there is a significant relationship between students' information search and commitments strategies within the Web environment and their educational Internet use self-efficacy beliefs. The results of the analysis were displayed in Table 8.

Table 8. The relationship between students' information search and commitment strategies and their educational Internet use self-efficacy beliefs

Variables	N	r	p
multiple sources educational Internet use self-efficacy beliefs	557	.004	.928
authority educational Internet use self-efficacy beliefs		.003	.942
content educational Internet use self-efficacy beliefs		- .019	.652
Technical educational Internet use self-efficacy beliefs		.017	.695
elaboration educational Internet use self-efficacy beliefs		.181**	.000
match educational Internet use self-efficacy beliefs		- .071	.096

**p<.01

The absolute value of the correlation coefficient is at its highest between 1.00 and .70; it is medium between .70 and .30; and it is low between .30 and .00 (Buyukozturk, 2002). As shown in Table 8, there is a low-level positive and significant correlation (r = 0.18) between students' level of educational Internet use self-efficacy beliefs and "elaboration", which is sub factor of students information search and commitment strategies within the Web environment. The relationship is significant at the p<.001 level. There were no other significant relationships between other factors and students' level of Internet use self-efficacy beliefs and their information search and commitment strategies.

4. DISCUSSION AND CONCLUSIONS

In this study, university students' information search and commitments strategies and Internet use self-efficacy beliefs were examined in terms of variables such as department, grade, gender, and daily frequency of Internet use. The analyses found that there was a relation between Internet use self-efficacy beliefs and information search and commitments strategies within the Web environment. It was determined that 22.3% of the students use the Internet less than 1 hour per day, 20.8% use it 1 hour per day, 22.1% use it 2 hours per day, 16.5% use it three hours per day and 18.3% use the Internet 4 hours or more per day. This finding shows that all of students use the Internet daily for at least some period of time. This result is similar to conclusions presented in the literature with respect to this issue. In a survey administered to the student participants, the students replied to the question, "How much do you use the Internet on a daily basis?" The responses to this question indicate that 21.87% of the students use the Internet two hours per day, while 7.72% of the students use the Internet for 4 or more hours per day (Dursun, 2004). According to Unal's study (2012), the students enrolled in the Department of Computer Education and Instructional Technology spend between 1 and 4 hours on the Internet per day (67.3%). Asemi (2005) stated that the 40% of the students who study on the Internet spend 2 hours per day, 29% spend 1 hour per day on the Internet and 15% spend 4 hours per day on the Internet.

When examining factors related to students' information search and commitment strategies within the Web environment, it is noted that fifth factor is the highest value, and it is, accordingly, attached to the factor "elaboration" ($\bar{x}$=3.92). This factor appears in "advanced sophisticated" (Wu & Tsai, 2005). Students have stated that when they need to search for information, they summarize the information they have accessed and then use "advanced sophisticated" options to find the most relevant information, thus elaborating on information accessed from various sites, while focusing on their purpose when engaging in the information search and commitments process. They then compare information from various sites, a process which is known as the "elaboration" factor. Also the students included in a study by Wu and Tsai (2007) had the same strategy (elaboration), one of the information searching and commitment strategies.

"Authority" receives the second the highest value after "elaboration" factor. This factor occurs in "less information search strategy" (Wu & Tsai, 2005). According to the "authority" factor, students who attended to the survey believe the accuracy and reliability of the information is high if the information was published on a

well-known Web site, on the site of an official institutions', a professional Web site or a Web site that is recommended by experts in the context of “authority”.

It appears to be a contradiction when considering students' views related to their information search and commitments strategies, that “elaboration” had the highest value and “authority” had the second highest value with respect to searching the Web environment. Strategies in a web environment for students to search for information and commitment of researches are needed to generalize the results can be expressed as more healthy. The highest value within the scope of this research area is the third factor, “content”, while the highest value was the fourth factor “multiple sources”. When considering which of the first four factors has the maximum value, it can be concluded that students who participated in the survey used an “advanced information search strategy” when searching for information and when verifying the actuality of the information within the Web environment. İt is important to note that in this survey, “match”($\bar{x}$ =2.93), which is sixth factor, and “technical” ($\bar{x}$ =2.68), which is the fourth factor have lower arithmetic averages. When considering that they occur as part of a “less-advanced information search strategy”, it is possible to say that this situation is pleasing. Liang and Tsai (2009) examined students' information search and commitment strategies in Taiwan. As a result of their study, it was found that “content”, which is the third factor ($\bar{x}$ =4.96), has the highest value. “Content” was then followed by the fifth factor, “elaboration”($\bar{x}$ =4.78). The first factor is “multiple sources” ($\bar{x}$ =4.65); the second factor is “authority”($\bar{x}$ =4.62); the fourth factor is “technical” ($\bar{x}$ =4.36) and the sixth factor is “match”($\bar{x}$ =2.93). According to conducted this researches' results “elaboration” strategy is the most participated factor and in Liang and Tsai's study (2009) found that “content” is the most participated in factor among university students. İn the conducted this study, “technical” received the lowest score, while in Liang and Tsai's study (2009), “match” is the lowest score factor.

Students’ educational Internet use self-efficacy is moderate according to the highest and lowest points of the survey. Students see themselves as adequate ($\bar{x}$ =3.33) with respect to Internet use self-efficacy. Throughout this study, the increased opportunities for students to access the Internet, to explore the Internet network and to increase their use of the educational databases can be expressed through the increase in the rate of use of the Internet and the self-efficacy regarding educational use of the Internet. Similar results are found in the literature. In studies, Kilic and Coskun (2010) and Yenilmez et al. (2011) consider the teacher candidate’s educational self-efficacy regarding Internet use and find it to be only moderate. On the other hand, in a study by Bozkurt et al. (2010) self-efficacy regarding Internet use is higher among physics prospective teachers. Wu and Tsai (2006) demonstrate in their research that the university students’ level of self-efficacy about the educational use of the Internet is high. Bas (2011) also finds that the primary school teacher’s educational self-efficacy Internet use levels are high. Similarly, Abbitt and Klett (2007), Albion (2001); Chao (2003); Eroglu, Unlu, Eroglu and Yilmaz (2011); Gurol and Akti (2010); Oskay (2011) and Liang and Tsai (2009) find that the prospective teachers’ Internet self-efficacy beliefs levels are high.

A significant difference between students’ information search and commitments strategies and the department in which they study is found. The arithmetic average for “multiple sources” strategy is higher for students’ enrolled in verbal departments than it is for students’ enrolled in the numeric department. The arithmetic averages regarding the strategies “technical” and “match” on the Web are higher for the numeric students than it is for the verbal students.

A significant difference is found when differences between students' search and commitments information strategies within the Web environment and their grades related “content” factor. The arithmetic average of 4th grade students' "content" strategy is higher than 1st grade students' arithmetic average. Wu and Tsai (2007) examined the information search strategy of students who graduated from university and university students, and they found that 4th grade university student scores correlated with the "multiple sources" factor is higher than that for other groups, that is, 1st, 2nd and 3rd year students.

A meaningful difference is found between the students gender average scores related to “technical” advancements and to "elaboration". According to the students' Internet search and commitments strategies within the Web environment, as the arithmetic average of male students' “technical” strategy is higher than that of female students, but female students scored higher with respect to “elaboration” than did male students. The scale used in this study was the Wu and Tsai (2007)’s survey, which found that in comparison to male students regarding “match”, the female students had higher scores. Liang and Tsai (2009)'s survey found that the arithmetic mean of the strategies for male students with respect to “multiple sources”, “elaboration”, “authority” and “technical” was higher than those of female students. When frequency use of the Internet was examined, students who accessed the Internet for 4 or more hours per day scored higher with respect to “authority” and “technical” than did those students who failed catastrophically. İt is expressed that frequency of access to the

Internet is an important predictor of the student's inclination to use the "elaboration" strategy as dictated in Wu and Tsai (2007). "Elaboration" strategies are being developed for university students who use the Internet and who increase frequency of use. Liang and Tsai (2009)'s survey medical students' knowledge of research strategies in a Web environment, which is one of the sub-factors, "match", that uses the Internet to access students' scores and other outside factors. A relationship was found between the frequency with which one accesses the Internet and the scores obtained as students continued their engagement in the study.

Participants enrolled in programs within the numeric department demonstrated stronger and higher levels of Internet self-efficacy beliefs than did students enrolled in programs within the verbal department. The arithmetic mean of the Internet, indicates that students from one department scored much better than did those in the verbal department for verbal acquisition. Based on the previous findings, and on the verbal department's respect for the learning environments, students more frequently use the technological environments, as they are familiar with this environment, an opinion that can be expressed in these environments. More research, however, is needed to support this finding.

This research found that 4th grade level university student arithmetic means of educational Internet use self-efficacy is higher than it is for 1st grade level students. Similar findings found among the literature (Peng, Tsai & Wu, 2006; Tuncer & Ozut, 2012).

One's level of education may increase students' self-efficacy, especially when using using the Internet for educational purposes. This finding, however, is not consistent with the findings presented in the literature (Bozkurt et al., 2010; Wu & Tsai, 2006; Yenilmez et al., 2011). In Yenilmez et al.(2011), primary school mathematics teachers' educational use of the Internet to study their beliefs in conjunction with the study of self-efficacy. Furthermore, Yenilmez et al.(2011) conclude that there is no significant difference according to grade level.

It was found that the arithmetic mean of the students' level of Internet self-efficacy beliefs was found higher for those who engage on the Internet for or more hours per that is was for those who spend less than 4 hours per day on the Internet. These results are similar to those reached by other researchers (Bozkurt et al., 2010; Eastin & LaRose, 2000; Yenilmez et al., 2011). For example, Yenilmez et al. (2011), posits that there is a positive relationship between educational self-efficacy and students' Internet use, which can be assessed according to the duration of their time online, a factor that demonstrates a significant difference. Internet users who access the Web daily compared to those who access it only a few days per month and educational Internet use self-efficacy as it pertains to accessing the Internet was considered to be at a higher level.

Wu and Tsai (2006) found that Internet frequency and duration of use positively affect educational Internet use in their study of self-efficacy. According to these findings, Internet use frequency increases students' educational Internet, and it increases students' self-efficacy.

Male students' level of Internet self-efficacy beliefs, according to the arithmetic mean, is higher than that of female students. This result is consistent with conclusions presented in the literature. The gender variable identified in the studies is meaningful and tends to be in favor of male students (Durndeel & Haag, 2002; Li & Kirkup, 2007; Liaw, 2002; Torkzadeh et al., 2002; Wu & Tsai, 2006; Yenilmez et al., 2011). However, there are studies that have reached different conclusions regarding the role that gender plays. The studies of Bozkurt et al. (2010), Eroglu et al. (2011), Kilic and Coskun (2010), Tsai and Tsai (2010), and Tuncer and Ozut (2012) indicate that Internet use self-efficacy of teacher did not differ significantly by gender, while Bas's (2011) research regarding Internet use self-efficacy of primary school teacher found that female teachers' Internet use self-efficacy was higher than that of their male counterparts.

A positive and significant relationship was found between students' information search and commitment strategies within the Web environment and the sub-factors "elaboration" and level of Internet self-efficacy beliefs. There has been no significant association identified between the level of self-efficacy, information search and commitments strategies within the Web environment and other factors (except for "elaboration") with respect to students' commitment strategies to the Internet. Future research in this area may be useful for students at different educational levels. More research is needed in this area to better understand the complexities of students' information search strategies and their commitments in Web environments. Clearly we must improve our understanding of the skills required for information search strategies and their commitments on the Web environment and of the processes involved to help adequately prepare our students for life in the 21st century.
As a result, it would be more beneficial to generalize the results of this study than to conduct another study related to students' information search strategies and their commitments to the Web environment. In addition, it

is thought that it is important to provide students with training related to research activities and research strategies so they can more effectively and efficiently interact within the Web environment, more critically evaluate information found on various Web sites and employ more advanced information search strategies ("multiple sources", "content", "elaboration"). Future research should also examine the factors influencing students' information search strategies and their commitments.

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