International Journal of Instruction *January 2008 ● Vol.1, No.1*
ISSN: 1694-609X ● www.e-iji.net

FACTORS THAT INFLUENCE ACADEMIC ACHIEVEMENT AND ATTITUDES IN WEB BASED EDUCATION

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In web based instruction, students' interests and needs vary greatly when compared with the traditional learning approaches. Therefore, trying to find solutions to the students' problems that are similar to the traditional learning approaches would yield poor results. Apart from that researches are needed to examine the various aspects of this new way of learning. In the light of this perspective, the current study investigates the factors that affect learners' academic achievement and attitudes in web based education. 127 students enrolled in the e-MBA Masters Degree of Bilgi University constituted the study group of the research. A survey method was used for the study and the data were collected by a Demographic Information Questionnaire and Web Based Education Attitudes Scale. Initially, Demographic Information Questionnaire and Web Based Education Attitudes Scale were administered to the e-MBA students. Then, the e-MBA Degree average course grades (GPA) were obtained from the department to determine academic achievement of the students. At the end of the study, it was revealed that web based education have positive effects on the improvement of academic achievement. The effect of web based education on attitude toward learning suggested that web use had positive effects mainly on motivation for learning and interested in the lessons.

Key Words: *web, web based education, academic achievement, attitude towards web based education*

INTRODUCTION

The most important development of the last few years in the world is the rapid growth and spread of information technology in numerous areas. It is generally accepted that information technology increases materialistic and moral value, and is widely used in areas of education, economy, health, agriculture, social life, and entertainment (Uzunboylu, 2004). Today, the web is on the way of being an important learning environment which provides students with a new and rich style of learning. The web is able to offer a world-wide democratic learning context to students, who are from different cultures, speak different languages without gender discrimination (Kurubacak, 1999). This web based environment offers access to a wide variety of resources, including libraries, museums, archives, and databases.

Developments in web based education have provided students with a wide variety of teaching/learning alternatives that have expanded the educational process beyond the traditional classroom. In addition to the face-to-face mode of instruction students now receive instruction through teleconferencing, online and/or web-based instruction, e-learning, and other advancements currently taking place via telecommunications technologies (Bennet et al. 2002; Hooper, 2001). The advancements have been rapid and will continue to expand and impact our educational process (Kearsley, 2000; Schreiber & Berge, 1998; Trent, 2001).

The web technologies' penetration of our lives and of both formal and informal education has created a need to examine the various aspects of this new way of learning and to explore how it fits in with different learners' needs (Shany & Nachmias, 2002). Which students can be expected to benefit more from this new learning environment? To what extent is this environment accessible to students with particular styles of thinking, and compatible with their needs? Learner interests, expectations and needs in such a system differ quite a lot from the traditional educational approaches (Frith & Kee, 2003; Glenn, 2001). That is why adverse effects may result for the future of the system if solutions similar to traditional educational approaches are sought in response to learner issues in this new environment. For achieving the targeted success levels depends on understanding the learners. For instance, a shy and inhibited learner in the traditional educational system may become a more active and social student owing to the lack of face-to-face interaction in the virtual environment (Smith, Ferguson & Caris, 2001). The reason is that a more individualized teaching takes place in the virtual environment where learner involvement is a fundamental element. There is consensus on the position that learning reaches its climax via active learner participation (Collins, 1998; Horton, 2000).

Positive or negative learner expectations towards web based education significantly affect learning outcomes (Sanders & Morrison-Shetlar, 2001; Alomyan & Au, 2004). Therefore, it is necessary for institutions that provide web based education to consider learner expectation and attitudes (Daniels, Tyler, & Christie, 2000). Currently, while there is a great tendency to use web technologies for teaching purposes, research into learner expectations in this new environment is scarce (Berge, 1997; Stocks & Freddolino, 1998; Kurubacak, 2000; Manzanares, 2004). Success in web based education depends mainly on learner attitudes, because they determine training programmes for the learning environment, learning and teaching methods and learner and teacher roles. Accordingly, learners will benefit from establishing positive attitudes towards this new electronic medium and, thus, making it a part of their own learning culture (Kurubacak, 2000). Understanding learner attitudes towards web based teaching would assist learners in an effective organization and adoption of web based learning environments. Therefore, it is essential to identify affective characteristics such as learner interests, expectations and attitudes in order to obtain positive results from web based education (Erdogan, 2005).

Subsequently, this study investigates factors that affect learners' academic achievement and attitudes towards web based education in web based education. Within this general framework the following questions are tendered:

Do academic achievement and attitudes of learners in web based education significantly differ in terms of gender?

Do academic achievement and attitudes of learners in web based education significantly differ in terms of marital status?

Do academic achievement and attitudes of learners in web based education significantly differ in terms of the type of faculty they are graduates of?

Do academic achievement and attitudes of learners in web based education significantly differ in terms of work experience?

Do academic achievement and attitudes of learners in web based education significantly differ in terms of age?

Do academic achievement and attitudes of learners in web based education significantly differ in terms of average daily internet use?

METHOD

Research Model

Survey was adopted as the research method for this study which investigated the factors that affect learner academic achievement and attitudes towards web based education in a web based education setting. Learner academic achievement and attitudes were dependent variables, while gender, marital status, type of faculty of graduation, work experience, age, socio-economic status and average daily internet use were independent variables.

Participants

Learners enrolled in the e-MBA Masters Degree of Bilgi University constituted the study group of the research. 127 learners (out of 570) were chosen randomly to take part in the study.

The e-MBA Degree

Bilgi University e-MBA Masters Degree is a web based masters degree in business approved by the Turkish Council of Higher Education and is a web based distance learning system. A total of 570 students are enrolled in the Bilgi University e-MBA Degree, who live in 35 different cities and hold bachelor degrees from 63 different universities (Bilgi Online, 2007). The degree was designed to equip learners with information on subjects such as finance, human resources, marketing and entrepreneurship and to supply strategic demands of the business world. The e-MBA degree offers a Turkish and an English alternative and consists of three sections. Eight required and two optional courses as well as a graduation project should be achieved in order to graduate. The passing grade is 63 out of 100. The final examination, which takes place "under supervision" accounts for 50% of the passing grade. A minimum of 70% success rate is required in the final examination.

The length of study in the programme is one and a half years and is composed of three half terms. This period can be extended to at most six half terms if one needs to sign up again for the failed courses or in case of a delay in finalizing the graduation project. Course materials prepared by the academic staff are published weekly on the web page of the course on the e-MBA degree website and remain accessible until the end of term. Thus, while the students study the recently added course notes each week, it is also possible to revise previous notes until the end of the term. Students can also study the course books listed in the programme. Quizzes presented at the end of the covered material each week and the interactive questions on the course website allow learners to improve and question their own learning (Bilgi Online, 2007).

Data Collection Instruments

Data collection took place on the weeks the e-MBA Degree students came to the campus for purposes of final examination or retaking the failed courses. Initially, a Demographic Information Questionnaire and a Web Based Education Attitudes Scale were administered to the e-MBA degree students. Then, the e-MBA Degree average course grades (GPA) were obtained from the department to determine academic achievement of the students. Details pertaining to the data collection instruments are presented below.

Demographic Information Questionnaire (DIQ)

A Demographic Information Questionnaire (DIQ) was developed by the researcher in order to specify demographic information for the students. DIQ consists of 8 questions that uncover students' gender, marital status, type of faculty of graduation, work experience, age, socio-economic status and average daily internet use.

Web Based Education Attitudes Scale (WBE-AS)

A 5-point likert scale consisting of 58 questions was developed based on expert opinions and literature review in order to reveal students' attitudes towards web based education. The 5-point scale was as follows: (5) totally agree, (4) agree, (3) undecided, (2) disagree and (1) totally disagree. 28 items on the scale were cognitive, 18 were affective and 12 were behavioural statements. 35 items were positively and 23 were negatively worded in order to offset the respondents' tendency to "approve" the statements (Tavsancıl & Keser, 2002). The statements were listed randomly.

Content validity was ensured at the initial phase of validity and reliability studies of the scale. Item representativeness was evaluated by expert reviews from the areas of Computer and Instructional Technologies, Testing and Evaluation, Psychological Counselling and Guidance and Turkish Language and Literature. 90-100% expert agreement on the validity of each item was adopted as the criteria; items that did not comply with the criteria were removed from the WBE-AS. Construct validity of the scale was ensured by factor analysis and item analysis. As part of the item analysis, item total, item residual and index of discrimination were calculated respectively. At the end of the validity studies, 32 items were eliminated from the scale leaving a 26-item WBE attitudes scale to be administered. Cronbach Alpha internal consistency coefficient of the WBE attitudes scale was .917. Ozdamar (1999) states that a scale is highly reliable if the Cronbach Alpha internal consistency coefficient is

between .80 and 1.00 (.80≤ α <1.00). Accordingly, WBE attitudes scale can be accepted as a reliable measurement tool.

Data Analysis

Independent samples t-test and one-way analysis of variance (ANOVA) were conducted to compare students' academic achievement and attitudes towards web based education in terms of the specified variables. When a significant difference was obtained, a post hoc test, Scheffe test, was used in order to define the source of difference. The significance level for all statistical analysis was accepted as 0.05 and all the results were tested two-ways.

RESULTS AND DISCUSSION

Table 1. Descriptive statistics for GPA and WBE attitudes

Dependent variables	*Mean*	*St. Dev.*
GPA	3.091	0.713
WBE Attitudes Scale	97.212	13.586

As illustrated in Table 1, the average academic achievement of web based education students was 3.091 out of 4.00 with a standard deviation of 0.713. This result indicated that the students were successful in the web based education context. In web based education, achievement levels similar to traditional education can be attained if sufficient support is provided. The results of several national and international studies point to this idea. Leonard and Smita (2001) reported that students in web based education had an achievement level of 4.14 out of 5.00, while Johnson stated a level of 3.00 out of 4.00 (Johnson, 2001). Obtaining achievement levels, in web based education, akin to traditional educational settings raises the demand for web based education. In developed countries such as the USA and EU countries investment into web based education gradually increases each year. There has even been a preference over web based education for many graduate programmes. It is acknowledged that the number of institutions providing web based education are on a steep rise and increase by 100% annually worldwide (Horton, 1998).

The average of students' attitudes towards web based education was 97.212 out of 135 with a standard deviation of 13.586. The arithmetical average of the items in the attitudes scale was 3.738 out of 5.00. The average point between 3.00 and 4.00 is considered within the category of "I agree"; therefore, it is possible to conclude that students expressed positive opinions in favour of web based education. This is even more prominent when student answers to some of the web based education attitudes scale items are reviewed. For example the

arithmetical average points for the following scale items were: "WBE is an alternative solution to educational issues": 4.23/5.00; "I trust the WBE I receive": 4.34/5.00; "The prevalence of WBE would benefit the society": 4.14/5.00; "WBE is as efficient as traditional education": 3.69/5.00. It will not be feasible to test the success of web based education only by means of students' cognitive achievement. Affective learning is as equally important as cognitive learning in the context of education, because a student, who has attained sufficient academic success, cannot be considered to have achieved educational goals completely if s/he is not satisfied with the training. The findings of the current study indicate that the students were satisfied with the training they received and trust such an educational setting.

A review of relevant literature reveals several similar research findings. Konuka and Nocente (2003) asserted that 97% of the students that took part in their study were satisfied with the web based training they received. Leonard and Smita (2001) investigated student perspectives in online education. They contended that 90% of the students who were in web based education expressed that they received the training they required in the online environment and 75% that the education met their expectations and would like to register for another online training. In a study conducted at Michigan University public relations department (Michigan School Public Relation Service, 2002), 399 participants were questioned on the web based education they received. The results pointed out that 79% of the students believed web based education was a satisfactory means in attaining educational goals and would like to register to online courses in the future. While 57% thought web based education was as efficient as traditional education, 14% claimed the opposite. In a study by Chin and Chang (2002) a sample of 157 participants, who received online education, from 14 different countries was used. In their study, 97% of the participants stated their belief that web based education was beneficial. Cooper (1997) expressed that students generally displayed positive attitudes towards web based education when sufficient support is provided. In a study on the importance of individual differences in web based education by Mira (2004), the participants generally voiced positive opinions of web based education. In several other studies as such (Anderson, 2000; Lesh, Guffey & Rampp, 1999; Sheard & Lynch, 2003), students of web based education responded positively about the education system they were a part of. These results provide support for the findings of the current study.

Table 2. A comparison of the students' GPA scores and WBE attitudes in terms of gender

Variable	*Gender*	*N*	*Mean*	*St. Dev.*	*df*	*t*	*p*
GPA	Male	94	3.031	0.712	125	2.233	0.028
	Female	33	3.399	0.650			
Attitudes towards WBE	Male	94	95.964	13.747	125	1.139	0.257
	Female	33	101.870	12.193			

Independent samples t-test results in relation to gender showed that female students' academic achievement were higher than male students ($t=2.233$, $p<0.05$). Gender has been an important factor in the use of computer and internet technologies. Researchers believe that there is a male dominance in the area which should be altered (Gregory, 1997). Nonetheless, female students were observed to be more successful in the current study. These results indicated that female students can be more successful than male students when appropriate conditions are met. Based on these findings, it is important to emphasize that females should not be discriminated in web based educational contexts and the fact that they can be more successful than males should be considered. In web based educational settings, the effect of gender on educational efficiency should be specified. Several studies on this issue have investigated gender as a variable (Chirieac, Burns & Case, 2000; Jackson & Ervin, 2001; Jazwinski, 2001).

On the other hand, students' WBE attitudes were also compared in terms of gender, but a statistically significant difference was not observed ($t=1.139$, $p>0.05$). These findings are in parallel to previous research results. Paris (2004) investigated students cognitive, affective and behavioural attitudes towards web based education in terms of gender where significant relationships were not detected. Similarly, Huang (2002) studied factors affecting learner attitudes towards web based education and found that students' web based education attitudes did not differ in relation to gender.

Table 3. A comparison of the students' GPA scores and WBE attitudes in terms of marital status

Variable	*Marital status*	*N*	*Mean*	*St.Dev.*	*df*	*t*	*p*
GPA	Married	58	3.359	0.481	125	2.870	0.005
	Single	69	2.992	0.772			
Attitudes towards WBE	Married	58	98.125	13.595	125	0.961	0.339
	Single	69	95.612	13.345			

Students academic achievement levels were compared against marital status and married students were observed to be more successful (t=2.870, p<0.05). This finding is in line with the results of Feng (2001). He examined 55 factors on students' achievement and observed that family encouragement for success was an important factor. Glickman (2003), in a distant veterinary technologies course, questioned factors that result in student dropout and confirmed that being single was one of the factors. For the current study, students' attitudes towards web based education were also compared in terms of marital status. The results were not statistically significant (t=0.961, p>0.05).

Table 4. A comparison of the students' GPA scores and WBE attitudes in terms of the faculty of graduation

Variable	*Faculty*	*N*	*Mean*	*St.Dev.*	*F*	*p*
GPA	Economics and Administrative Sciences	34	2.996	0.838	0.393	0. 813
	Engineering	49	3.145	0.705		
	Science and Letters	15	3.081	0.542		
	Military Schools	13	2.957	0.495		
	Other	16	3.237	0.729		
Attitudes towards WBE	Economics and Administrative Sciences	34	98.566	13.294	3.061	0.020
	Engineering	49	90.977	13.158		
	Science and Letters	15	97.545	11.219		
	Military Schools	13	103.888	14.321		
	Other	16	100.000	13.239		

Students' academic achievement levels were compared in terms of the type of faculty they graduated from by using one-way variance analysis and the results did not indicate statistically significant differences (F=0.393, p>0.05). However, students' WBE attitudes did significantly differ in terms of the faculty of graduation (3.061, p<0.05). The Scheffe test, that was run to determine the source of difference, indicated that the attitudes of students who were graduates of Military Schools were significantly higher than that of Engineering Faculties (p<0.05). The graduates of Engineering Faculties were observed to have more resistance to web based education. This could be a result of engineering faculty graduates receiving a more applied training as part of their bachelor degree. A lack of applied information in web based education contexts could result in a lower level of attitudes for the graduates of engineering faculties.

Table 5. A comparison of the students' GPA scores and WBE attitudes in terms of work experience

Variable	*Work experience*	*N*	*Mean*	*St.Dev.*	*F*	*p*
GPA	≤ 5 years	56	2.985	0.750	4.629	0.012
	6-10 years	43	3.156	0.651		
	≥ 11 years	28	3.491	0.373		
Attitudes towards WBE	≤ 5 years	56	95.653	13.923	0.296	0.744
	6-10 years	43	97.500	12.600		
	≥ 11 years	28	97.909	14.165		

Academic achievement levels of the students in the study group differed in relation to their work experience. The analysis revealed that the students who had 11 and above years of work experience were more successful than the ones who had a work experience of 1-5 years. Bakioglu (2000) states that the first 5 years of work experience are accepted as the career entry phase, and a "reality shock" is experienced during this process. The discrepancy between the ideals of the employees and the working conditions provokes feelings of failure and inadequacy. In constrast, the phase for employees with 11-15 years of work experience is defined as empiricism/activitism phase. High levels of physical and cognitive competency are achieved in this phase; employees attain peak levels in their careers. In this context, the fact that the students who had 11-15 years of work experience were more successful could be explained by the empiricism/activitism phase. On the other hand, students' web based education attitudes were not significantly different in relation to work experience ($F=0.296$, $p>0.05$).

Table 6. A comparison of the students' GPA scores and WBE attitudes in terms of age

Variable	*Age*	*N*	*Mean*	*St.Dev.*	*F*	*p*
GPA	≤ 26 years	27	2.951	0.840	3.726	0.027
	26-30 years	55	3.065	0.709		
	≥ 30 years	45	3.385	0.465		
Attitudes towards WBE	≤ 26 years	27	95.428	15.939	0.381	0.684
	26-30 years	55	96.125	11.199		
	≥ 30 years	45	98.236	14.767		

Table 6 illustrates the one-way variance analysis test results administered to determine whether students' academic achievement in web based education

differed in terms of age. The results indicated significant differences among the groups on .05 level ($F=3.726$, $p<0.05$). In order to specify the source of difference a Scheffe test was run, the results of which showed that students in the 31 and above age group were more successful than the ones in 25 and below age group ($p<0.05$). The students in the 25 and below age group were recent graduates of a bachelor degree and who were experiencing greater ambiguity in their career choice and private life. These ambiguities affect their performance negatively. In contrast, the students aged 31 and over experienced these ambiguities less and thus could have been more motivated for the training they received. It can be argued that this motivation positively affects their satisfaction and consequently their success. In a study at Maryland-Montgomery College, Muse (2003) found that age was a discriminator of success in web based education. Likewise, Sankaran and Bui (1999) investigated the factors that affect student achievement in web based distance education and observed that students' age had an effect on their success. However, the analysis of the effects of age on students' web based education attitudes did not yield statistically significant differences ($F=0.381$, $p>0.05$).

The average age of the students in the current study was 28.75. Students' average age in web based education is higher than that of the ones in traditional education. This finding complies with the results of previous research. In a descriptive survey by Wisan et.al (2001) student profiles in the University of Maryland College, one of the world's biggest virtual universities, were examined. Demographic data were collected from a total of 55.323 students: 16.092 in the 1999 academic year, 18.311 in 2000 and 20.920 in 2001. The results of the study showed that 44% of the students were aged 26-30 as the average of 3 years. Tucker's (2000) study also displayed that the average age in web based distance education was 27.79.

Table 7. A comparison of the students' GPA scores and WBE attitudes in terms of average daily internet use

Variable	*Internet use*	*N*	*Mean*	*St.Dev.*	*F*	*p*
GPA	≤ 2 hours	38	2.996	0.668	0.508	0.603
	3-4 hours	48	3.167	0.729		
	≥ 5 hours	41	3.089	0.745		
Attitudes towards WBE	≤ 2 hours	38	96.531	13.190	3.311	0.040
	3-4 hours	48	94.975	14.407		
	≥ 5 hours	41	99.058	12.523		

Students' academic achievement levels were compared in relation to their average daily internet use with a one-way analysis of variance, the results of which were not significantly different ($F=0.508$, $p>0.05$). The amount of daily internet use did not represent more study time. Therefore, significant results were not obtained for students' academic achievement levels in web based education in relation to their daily amount of internet use.

In contrast students' attitudes towards web based education did differ according to their average daily internet use ($F=3.311$, $p<0.05$). The Scheffe test run in order to identify the source of difference suggested that attitude levels of students who used internet for more than 5 hours a day were significantly higher than the ones who used the internet for less than 2 hours ($p<0.05$). This finding indicated that positive attitudes towards web based education increased as did the amount of internet use. Likewise, the decrease in the amount of internet use implied an increase in the resistance towards web based education. So, it is feasible to claim anxiety towards web based education may diminish with regards to the amount of internet use; therefore, resistance to such learning contexts may also diminish accordingly. A similar finding was obtained in a study in secondary education by Paris (2004) who investigated students' cognitive, affective and behavioural attitudes towards web based education in terms of a number of factors. Paris (2004) concluded that internet use affected student attitudes positively. Similarly, Ando et.al (2004) ascertained that students' daily internet use increased their motivation for learning, interest in learning and self-confidence. Findings of Huang (2002) and Summary (1998) also support the results.

CONCLUSİON

The result of this study has indicated that web based education have positive effects on the improvement of academic achievement. The effect of web based education on attitude toward learning suggested that web use had positive effects mainly on motivation for learning and interested in the lessons. In web based instruction, it is a fact that students' interests and needs vary greatly when compared with the traditional learning approaches (Glenn, 2001). Therefore, trying to find solutions to the students' problems that are similar to the traditional learning approaches would yield poor results. Apart from that many studies until recently have concluded that web based instruction could be as efficient as the classical instruction (Buchanan, 2000; Tucker, 2000; Partrich, 2003; Gordon, 2003). If sufficient support is provided, similar success levels can be achieved in web based instruction as in classical instruction (Partrich, 2003; Tucker, 2000; Gordon, 2003). This kind of interpretation would not mean that web based instruction is an alternative to classical instruction, but web

based instruction is an alternative solution to the education problem and the number of the institutions that provide web based instruction around the world has been rising rapidly.

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