

## **Effect of a Blended e-Learning Environment on Students' Achievement and Attitudes toward Using E-Learning in Teaching and Learning at the University Level**

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**Abstract:** The purpose of this research was to investigate the effect of a blended e-learning environment on students' achievement and attitudes toward using e-learning at the university level. A sample of 43 female students was randomly assigned to receive one of two instructional treatments (blended e-learning approach & traditional face-to-face teaching approach). Results showed insignificant difference between the instructional treatments in gain scores of the achievement test. However, the results in the attitudes scale showed a significant difference in gain scores in favor of blended e-learning approach.

**Keywords:** Blended e-learning, Students' achievement, Attitudes, Teaching & learning, Qatar.

### **Introduction**

The field of education, as noticed recently, has been affected by both revolutions of technology and communications. Therefore, many technological advancements (TAs) and communication tools or channels (CTC) such as computers, internet, multimedia, virtual reality, or virtual classroom and so on, up to the e-learning as the most recent TA, has been introduced to the field of education in the recent years. Accordingly, TAs have been used by educators in teaching situations in both classroom sitting and in online teaching cases as shown in the literature, in order to enhance learning process at the final stage (e.g. Becker, 1991; Sandholtz, Ringstaff & Dwyer, 1994; Bates, 1995; Baylor & Ritchie, 2002; Crow, Cheek & Hartman, 2003; Jhosta, 2005; Abrami, Bernard, Borokhoski, Tamin, Surkes, & Zhang, 2006; Chen, & Jones, 2007; Hickey & Mercer, 2008; Stiffler,

2008; and more). This means that these technologies have become a trend, and have been treated as a new trend that has affected teaching pedagogies.

E-Learning, as one of those TAs, has also been introduced to the field of education and has been used in a teaching/learning setting, and associated with teaching methods and pedagogies, so that, they come along each other, and were influenced by each other as well. Consequently, some expressions in question formats came out. For instance, should technology change pedagogy, or can pedagogy lead technology, or the other way around, (e.g. Webb, 2002; Webb, & Cox, 2004; and Jones, 2007). Accordingly, it is interesting to note that the focus of teaching / learning according to Saengsook (2006) has shifted from traditional methods to more dynamic ones with the assistance of new technologies which requires new theories and practices to be designed and developed in order to fit the new generation of technology in a digital e-world.

Qatar University (QU), in this sense, and under the academic planning which begun in the Fall 2005 (Tawasol, 2006), as a part of its institutional reform project which was initiated in 2003 (Moini, Bikson, Neu, DeSisto, Al-Hamadi and Al-Thani, 2009), adopted the use of the blackboard system as approach of implementing the e-learning environment at the university level. The academic planning focuses on the development of all academic processes of teaching and learning means, styles, and methods. The planning process adapted the integration of advanced information technologies to support academic functions and university operation (Al Thani, 2007). E-learning in reference to advanced information technologies, has been adopted by QU in order to enhance the academic planning goal. The e-learning environment and its infrastructure, consequently; have been established to ground the e-learning concept and practice in QU, so, the classrooms have been fully equipped with all instructional media and means needed. The faculty and staff members have been trained and familiarized with new e-learning environments. Therefore, they have gone through training programs dealing with e-learning environment systems; such as Blackboard and its applications in the teaching learning setting along with the modern teaching pedagogies. As a result, the Blackboard System as an e-learning environment has been used by the majority of QU faculty members since the academic planning launched in the university three years ago.

Based on this, many efforts by educators in improving the instructional situations or environments have taken place at QU. However, most of these efforts, as noticed by the researchers, were not experimentally research based. This is the reason the researchers in this study paid attention to this subject matter, and came out with this study proposal. This paper; therefore, focuses on this issue and investigating the effect of this technological advancement (TA) of the e-learning environment (ELE) on the students' achievement and their attitudes towards it.

### **Problem**

The research aims to examine the effect of the Blended E-Learning Environment (BELE) on the university students' achievement on a photography course at Qatar University (QU) It also measures the effect of the same factor (BELE) on the students' attitudes toward it. Accordingly, this research was conducted to answer the following questions:

1. What is the effect of the Blended E-Learning Environment (BELE) on the students' achievement in a digital photography course compared to a face-to-face teaching approach?
2. What is the effect of the Blended E-Learning Environment on students' attitudes toward using E-Learning Environment in teaching and learning at the university level compared to the face-to-face teaching approach?

### **Literature Review and Related Research**

E-learning as defined in the literature and according to Sulcic & Lesjak (2007), is learning through an electronic media and TAs such as computer programs, video-conference, virtual reality (virtual classroom), and internet. The term has been around for more than a decade now. E-learning as a new concept was used for the first time in October (1999) during a CBT Systems seminar in Los Angeles (History of e-Learning, Web, 2009). Since then, E-learning as a term and concept has been widely deployed among educators. Consequently, related notions, thoughts, terms, concepts, theories and practices of the e-learning applications came out from countries all over the world. This created an e-learning phenomena and new trend in the field of education. Thus, related concepts such as distance learning (DL), online learning (OL), blended learning (BL),

synchronous learning (SL) & an asynchronous learning (AL) have been used in education (teaching / learning) as a pedagogical techniques along with the information communicational technology (ICT). The focus in this sense has shifted from a traditional teaching and learning setting to an e-learning classroom setting (Saengsook, 2006). This actually gives the educational human power (learners, teachers, and instructional designers) a big challenge in terms of technological literacy and the way of dealing with it logically in which the learner is highly concerned and concentrated as a focal point of the learning process.

The role of these human factors in this type of teaching / learning setting, as a technological advancement (TA), has changed in favor of learning instead of teaching or instruction based on the principle of "Tech Less, Learn More" which was adopted by the Ministry of Education in Singapore in October (2005) under the motto of "Moulding the Future of Our Nation" (Ministry of Education Singapore: BlueSky, 2005). However; this would not happen easily. The instruction needs to be well prepared to meet the learner's characteristics, needs, and their learning styles which are referred to as individual differences in learning (Kolb, 1984). Otherwise, the learner role would be impeded, and learning would not take place. Shaughnessy (1998), and Cross (2001), categorize learning styles as the way the individual concentrates on, processes, internalizes, and remembers new and difficult academic information or skills. Learners approach learning differently as a result of their learning styles (Csapo & Hayen, 2006).

In light of the nature of e-learning, which is grounded on the principles of visualized instruction, and self paced learning, and was developed in means of internet technology based on the need of distance learning as noted by Saengsook, (2006), the instruction should be designed and developed in terms of learning theories and Skinner's programmed instruction principles, which is commonly referred to now as Computer Assisted Instruction CAI (Saengsook, 2006). This resulted from the notion of Skinner's (1956) programmed instruction in terms of the stimulus – response, as noted by Saengsook, (2006) that has served as a new technological mean in teaching and learning processes for individual learning as fundamental principles of CAI.

In learning theories, the individual processes the incoming information through two or three types of memories; short term memory (STM), working memory (WM), and long term memory (LTM) (Al-Saai, 1993). The incoming information travels through these three stages based on the interaction of this piece of information with individual prior knowledge (Miller, 1956; Johnston, 1993; Johnston, Sleet & Vianna 1994, & Nolen-Hoeksema, Fredrickson, Loftus, & Wagenaar, 2009). This fact or principle should be taken into account in designing any E-learning environment. This means that the information presented in this environment should meet the learner's needs and prior knowledge and be consistent with his or her instructional level and learning style to meet as many individual differences as possible (Kolb, 1984). By doing so, learner's interaction with the presented information can be assured and guaranteed, thereby learning outcomes can easily be achieved, and finally a higher level of learning can take place. Therefore, individual's characteristics, and learning styles in teaching / learning process, according to Caspo and Hayen (2006) is a key component to effective teaching. So, teaching cannot be effective and successful without taking into consideration students' learning styles (Sarasin, 1999). These individual learning styles can be matched in a well designed e-learning environment, whether in blended learning or any other type of E-learning setting. Consequently, the learner can easily build their own knowledge, information and learning based on the constructive theory in which the individuals build their own learning materials. The constructivism, in the learning process, emphasizes the setting-up of an appropriate learning environment which pushes learners to construct their own knowledge. This involves learning means such as instructional media, learning resources, classroom activities, and other means needed (Saengsook, 2006). This supportive e-learning environment provides a better chance for learners to not only receive knowledge and practice exercises and activities, but to discuss academic issues with their instructor and classmates, and interact with the instructional content and internet. An instructional designer in this case is in charge of designing this type of environments to activate the instructional materials and encourage the learners to interact with such an e-learning setting.

Traditional learning or e-learning formats alone may not be effective enough in achieving learning outcomes. However, it can be possible with blended learning in which traditional and e-learning settings are combined in one form, as cited by Singh and Reed (2001). In this paper, the authors

have pointed out in their citation that research from Stanford University and the University of Tennessee has provided a—concrete evidence of the effectiveness of blended learning, saying that the combination of e-learning and a traditional setting, , as described by Singh (2003), is better than both traditional methods and individual forms of e-learning technology alone. In the same context, Nagel (2009), referred to the US Department of Education report which has mentioned that there is some evidence showing that blended learning is more effective than either face-to-face or online learning alone. Furthermore, the report stated that 11 empirical studies out of 51 were significantly positive toward online or blended learning, and only two studies were positively significant in favor of a traditional face-to-face classroom setting. The rest of those 51 studies (38 studies) have shown no significant differences between traditional, online, and blended learning conditions (Nagel, 2009). As a result, blended learning according to the literature is more effective and efficient in delivering instruction to the target learners. This can be done through Programmed Instruction (PI) which is recently substituted with the well known technological advancement “Computer Assisted Instruction” (CAI) in which the instructional content is divided into small pieces of instruction in frames or dosages depending on the nature of the subject, in one hand, and on the human characteristics, and learning styles in the other hand.

In the advancement of blended e-learning, studies at the university of Tennessee provide important insight on how blended e-learning is a far more superior teaching method in comparison to traditional classroom teaching methods alone.

Research by the University of Tennessee’s Physician’s Executive MBA (PEMBA) program for mid-career doctors has verified that blended teaching methods demonstrate an overall 10% better learning outcome than using traditional classroom teaching methods alone. This study represents the first to show noteworthy improvement from blended learning methods rather than insignificant outcomes.

The research provides evidence that blended e-learning strategies provide a better equivalent for what a learner wants to learn, and for what the learning program offers, and thus it improves overall learning effectiveness. Singh and Reed (2001)

In reviewing the e-learning, distance learning, blended learning, online learning and related literature, it can be noted that the results of prior distance learning research, whether in e-learning format or any other formats did not show clear evidence that the online learning is always better than a traditional way of teaching, nor is more effective than traditional setting of learning. Some of those studies according to Sooner (1999), Dellana, Collins and west (2000), Grandzol (2004), Iverson, Colky, Cyboran, (2005), and Jones, Moeeni, & Ruby, (2005), indicated that distance learning in any format was at least as effective as a traditional classroom setting. Whereas, some other studies showed that students in traditional classroom settings performed better than those of online courses, as noted by Ponzurick (2000), and Terry, Owens, and Macy, (2001). Thus, educational research studies in this aspect need to be reviewed and discussed in order to build a scientific background for this investigation. Therefore, some related studies are listed as follows:

Dellana, et al (2000) conducted a study concerning the online education in a management science course measuring both effectiveness and performance factors of distance learning. It was concluded that distance learning was not more effective than traditional classroom learning. This means that there was no significant difference in performance between distance learning group students and traditional group students. The result was not expected by the researchers who thought that Online Education OE is more effective than Traditional Classroom Education TCE.

In the same context, and in comparison between traditional classroom setting and online learning mode, Ponzurick, France and Logar (2000), reported that graduate students in traditional classroom setting studying marketing performed better than those graduate students in website course.

In a survey by Gagne and Shepherd (2001), a comparison between students responses of both traditional classroom setting and online sections in financial accounting course, it was found out that there were no differences in final grades on one hand. And there were no significant differences in overall evaluation of the course and instructor on the other hand. The latter point indicates that there were no significant differences in attitudes between both group modes.

As far as a comparison between traditional classroom teaching and online learning was concerned, Terry, et al, (2001) conducted a research measuring the performance of student who had a chance to learn through a website course and those who did not have the opportunity, but studied in traditional face-to-face classroom setting. The results revealed that traditional face-to-face classroom setting students outperformed their peers of Online or website students. So, the effectiveness here was in favor of the traditional normal approach.

Grandzol (2004) conducted a study aiming at measuring students responses to blended learning compared to traditional classroom setting. The findings showed no significant differences between groups in performance.

Regarding preference, tendencies, desires, which in some way or another represent the students' attitudes toward instructional delivery modes, Vamosi, Pierce, & Slotkin, (2004), found out that no significant differences between distance learning and traditional learning setting. It was mentioned that distance learning session was less interesting and less efficient than traditional classroom setting, This represents the students' unsatisfactory of the online course and their negative attitudes toward it.

Iverson, et al, (2005), in their study of E-learning takes the lead: an empirical investigation of learner differences in online and classroom delivery, in which they have compared between students performance in traditional classroom and online (Distance Learning) sessions in terms of effectiveness, found out that distance learning session is at least as effective as traditional classroom session.

Chen and Jones (2007) conducted a survey study in order to assess the course effectiveness of accounting class. The result indicated that no significant differences were found in achievement between traditional education students and online education students. However, some interesting or differences between these two groups in terms of satisfaction were noted in favor of the traditional group students who showed positive attitudes toward traditional mode saying that they were more satisfied with the clarity of instruction than their peers in the online group. Regarding students' attitudes toward E-learning, online group students express their tendencies to take another accounting course in the same format. So, each group showed some support for their mode of instruction.



## Research Hypotheses

In light of the literature reviewed and previous research presented before, the researchers formulated the following predictive and null hypotheses:

*Predictive hypothesis 1:* There will be a significant difference at the 0.05 level between the mean gain scores for students using the Blended E-Learning Environment and their peers using the face-to-face teaching approach on the achievement test of the digital photography course in favor of students using the blended e-learning environment.

*Predictive hypothesis 2:* There will be a significant difference at the 0.05 level between the mean gain scores for students using the Blended E-Learning Environment and their peers using the face-to-face teaching approach on the attitudes toward using E-Learning Environment in teaching and learning at the university level in favor of students using the blended e-learning environment.

## Definition of Terms

***E-Learning:*** The term electronic learning (EL) which is known as e-learning, can be referred to as a teaching or learning process using instructional media technology such as computers, internet, and any other technological advancements.

***Blended Learning:*** This type of learning as seen by Whitelock and Jefts (2003); Alavi and Gallupe (2003); Peterson (2003); and Arbaugh (2005), is the integrated combination of traditional learning with web-based online approach which includes media and tools deployed in an e-learning environment. In addition, the combination concerns with the number of pedagogies and delivery methods as well. Singh and Reed (2001), on the other hand, referred to blended learning as combining two or more different forms or settings of learning or instruction (online & offline settings). In other words, blended learning focuses on optimizing achievement of learning objectives or outcomes by applying the right learning technologies to match the right personal learning style to transfer the right skills to the right person at the right time (Singh & Reed, 2001).

Blended learning is an important building block of new teaching and learning environment that offers students both flexibility and convenience. According to Colis and Moonen (2001), blended learning is a hybrid of traditional face-to-face and online learning so that instruction takes place both in the classroom and online, and where the online component becomes a natural extension of traditional classroom learning. Blended learning is thus a flexible approach to course design that supports the blending of different times and places for learning, offering some of the conveniences of fully online courses without the complete loss of face-to-face contact. The result is potentially a more robust educational experience than either traditional or fully online learning alone.

For the purpose of this study, the researchers decided to adopt Colis and Moonen (2001) definition which fits the right application of the blended learning environment and consistent with the nature of this study and its purpose.

**Attitude:** According to, the free encyclopedia, an attitude, is a hypothetical construct that reflects an individual's tendency of the degree of like or dislike for a conceptual item such as democracy, education, learning, technology, educational technology, e-learning concept and so on. Generally speaking, attitudes in this aspect can represent a positive or negative point of view of a person toward any of those concepts or issues.

**Attitudes toward E-learning:** Based on the definition of attitudes in general, E-Learning's Attitudes, can be defined as a degree of an individual tendency level (positive or negative tendencies) toward the usage of the electronic approach such as computers and internet.

## Limitations

This research was limited to the following limitations:

1. Female students who were enrolled in the digital photography course in the spring (2009) semester;
2. The research period was Spring (2009) semester (February-June 2009); and
3. The dependent variables of the research were limited to two measures (Achievement Test & Attitudes Scale).

## Method and Procedures

**Research Methodology:** The experimental method was used to answer the research questions taking into consideration that the research has one independent variable and two dependent variables. Such a research method is appropriate to investigate the effect of the independent variable on each dependent variable (Graziano & Raulin, 2010).

**Population and Sample:** The research population was all Mass Communication & Art Education students at QU that were required to take the photography course (INST 222 Digital Photography) and those students in other disciplines who are willing to take it as an elective. In addition, the course doesn't have any pre-requisites. It is open to students regardless of their major as a Core Curriculum course (General Education course). Accordingly, this course is offered by the Department of Educational Sciences/Instructional Technology sub-department, College of Education, Qatar University (QU), Doha, Qatar, in the Spring (2009) semester (February – June 2009). As a result, and for these mentioned reasons, the course was selected to be used in this experimental research.

The sample consisted of 43 female students enrolled in the course. The sample was divided into two study groups; the two groups were randomly assigned to be treated differently as a control group (traditional face-to-face teaching approach) and experimental group (blended e-learning environment). The sample was orally told that they would be participating in this experimental research and that they have the right to withdraw from the experiment if they feel uncomfortable with it. All students were willing to participate in the experiment.

**Experimental Design:** This research is considered to be an experimental field study in which one independent variable was examined to find out if it has an effect on the two dependent variables. The independent variable in this study is the delivery approach which has two levels; named Blended E-learning approach and the traditional face-to-face learning setting. Two dependent variables were focused on in this study, students' achievements and attitudes. The study adopted the Quasi Experimental design known as the pretest – posttest control group design. This design enclosed one treatment group.

The e-learning environment, as one level of the independent variable, was represented in the Blackboard System (BbS). The system has a lot of efficient features that can be used effectively in teaching pedagogy at the university level. Based on the enrichment and the capability of the system, the researchers used some of those features such as the Virtual Classroom, discussion board, and content page, etc, which provide great opportunities for students to interact online with the instructor, their peers, and the instructional materials.

The two dependent variables of the study as previously mentioned, were the achievement test and attitudes scale. Each one of these two tools has its own designed procedures. The test, for instant was designed and developed in lights of Bloom taxonomy. So, it was designed to measure many levels of cognition such as memorizing, understanding, applying facts and principles of the subject matters and solving problems. Those levels of the taxonomy can be effectively measured in the photography course because of its nature which includes a lot of facts, principles, theories and problem solving related to the theoretical part of the course.

As for the other dependent variable of the attitudes scale, which was grounded on the scholars thoughts and the literatures of the educational psychology, has been developed in accordance with several factors such as the importance of the e-learning in teaching at the university, the enjoyment of the e-learning environment, and the personal benefit of that new technological advancement. The 20 item attitudes scale focuses on these three dimensions in particular.

***The Control Group (Traditional Teaching Setting):*** The size of this group was 21 female students. Those students were in a traditional lecture setting, which is a two meeting face-to-face session. The students scheduled to meet with the instructor twice a week. The students in this type of lecture were taught orally and visually by listening, seeing and interacting with the instructor over the content material presented through a PowerPoint presentation in classroom settings. In addition, they have received the instructional content in handouts posted on the Blackboard System (BBS).

***The Experimental Group (blended learning Approach):*** The students in this group also meet twice a week. Students in this group, (22) female students, were instructed through a blended E- learning approach in which they had a chance to read their handouts before class in order to discuss the

content through the Blackboard System's (BBS) feature called "Virtual Classroom". So, the students of this group have to meet face-to-face with the instructor only once a week in the lecture room and have to be online in different sessions once a week at a different time. This online session is known as "Synchronous". Each student in this approach had to summarize the dialogue individually post on the BBS. So, students of this approach were taught differently than those of the control group. Thereby, each student in this group had a better chance to learn than any of her peers in the control group.

**Research Tools:** Since the study focuses on two factors, achievement of Blended E-Learning Environment (BELE) and students' attitudes toward that approach BELE, two research instruments were developed by the researchers. These two instruments were the achievement test, and an attitudes scale. In order to insure the instruments' reliability and validity, each one of them had gone through different stages as follows:

**Achievement Test Validity:** A forty-six multiple choice item achievement test was given to the specialists in the field of Educational Psychology and Instructional Technology to be professionally reviewed. Based on the reviewers' feedback and comments, the researchers had to evaluate and fix whatever needed to be fixed, and eliminate some items. So, as a final version, the researchers end up with a forty item achievement test. By doing so, the validity of the test can be insured.

**Achievement Test Reliability:** In order to estimate the reliability of the (40) item achievement test, a pilot study was conducted on a group of (39) students in the College of Education who were not enrolled in the photography course that was targeted in this research. The collected data were statistically analyzed in a split in half technique. The results indicated that the (40) item achievement test was reliable at the degree of 0.817 as a correlation ratio between the two separate halves (Odd & Even) of the achievement test items (Table 1).

**Attitudes Scale Validity:** Based on the review of the literature regarding students' attitudes toward e-learning, the researchers have designed and developed their own twenty five item attitudes scale. The scale was given to some specialists in the field of Instructional Technology to be reviewed and evaluated for internal validity. The reviewers suggested that some of the scale's items should be re-written or eliminated in order for the scale to be

reduced in terms of number of items. Accordingly, the researchers agreed with the reviewers' suggestions to modify, and eliminate some items. As a result, the scale ended up with a twenty item attitudes instrument.

**Attitudes Scale Reliability:** A statistical Alpha Cronbach calculation was done for the data collected from a pilot sample of 39 female students who responded to a 20 item attitudes scale. The finding showed a higher level of reliability of 0.870, which is acceptable by the researchers, (Table 1).

*Table 1:*

Instruments' Reliability

Research Tools	No. Items	No. Students	Reliability
Achievement Test	40	39	0.817
Attitudes Scale	20	39	0.870

**Treatments:** Two types of treatment approaches were involved in this research, normal and blended online approaches as previously mentioned above. All students in both approaches had to take the achievement test in the beginning of the course, which means that they had taken the test before they even get started studying the content of the course. They also had to respond to the attitudes scale before studying the course content. In the end of the course, both groups of students took the achievement post test and responded to the post attitudes scale.

In order to assure the similarity learning level of both group students, the pre-achievement test data were statistically analyzed. A t-test was conducted with this data. The result as shown in table 2 indicated that no significant differences between the means of both groups were found. This was an indication that both groups were similar in terms of learning background.

*Table 2:*

## The Homogeneity of the Research Groups

Research's Groups	N	Mean	Sd	Sig
Current Group	21	17.33	4.23	0.148
Online Group	22	14.50	7.78	

## Results

The research data were statistically analyzed through the SPSS statistical program. A t-test was conducted to all data collected from all research treatments such as pre and post achievement test, and pre and post students' attitudes toward blended learning (see Table 3).

*Table 3:*

## Means &amp; SD. on measurement scales for teaching approaches

T.Approach		Achievement Test			Attitudes			
	Test	N	M	Sd	Att. Q.	N	M	Sd
Current App	Pre	21	17.33	4.23	Pre	23	80.70	10.63
	Post	21	28.96	6.82	Post	25	79.60	11.47
	Gain	-	12.43	4.39	Gain	-	1.13	12.12
Online App	Pre	22	14.50	7.78	Pre	19	77.79	11.37
	Post	22	30.18	8.03	Post	26	83.80	9.37
	Gain	-	15.68	8.22	Gain	-	18.00	10.56

By looking at table 3, it can be noted that there were some differences between means of the research groups in terms of achievement and students attitudes. However, it is too early to make a decision about the significance of these differences. This means that further information in this regard is needed (table 4).

*Table 4:*

Results of Independent Sample t-Test on Achievement & Attitudes mean gain scores

Research Tools	Group	N	Mean	t-Value	DF	Sgi
Achievement Test	Current	21	12.43	1.61	41	0.116
	Online		22	15.68		
Attitudes	Current	21	1.13	2.94	41	0.000
	Online	22	10.56			

Table 4, showing that no significant difference between the online students group (Blended E-Learning Approach) and current/ normal group students in the achievement test scores. However, it shows a significant difference between the research groups in the attitudes scale.

### Discussion

The findings of this research will be discussed in light of the related literature and previous studies considering the research questions and its predictive hypotheses.

Regarding question 1, which states, "What is the effect of the Blended E-Learning Environment (BELE) on the students' achievement in a digital photography course compared to face-to-face teaching approach?"

The result as shown in table 4 indicated that there was no significant difference between blended E-learning group and traditional group in the achievement gain scores. This result was inconsistent with the researchers' expectations, who expected that the blended E-learning group will achieve better than those of traditional teaching approach who had no chance of interacting with the course content and their peers through the internet. Therefore, the predictive hypothesis is rejected.

The result may be attributed to the nature of the course which includes two inter-related parts; theoretical and practical parts. It seems that the E-learning environment focused more on the theoretical part compared



to the practical one. Some aspects of the practical part should have been integrated into the e-learning environment using some appropriate multimedia presentations, simulations and virtual reality when possible. Based on this interpretation, and according to what has been mentioned by Saengsook, (2006), that e-learning should be grounded on the principles of visualized instruction and self paced learning. Using such types of instructional media in the e-learning environment would enhance the achievement level. In addition, e-learning is also grounded on the individualized instruction approach in which individual's learning & cognitive styles are concerned. Therefore, the instructional environment, according to Kolb (1984), should be well prepared to meet the learner's characteristics, needs, and their learning styles, otherwise learning would not occur. The instructional environment in the other hand, should be designed and developed on learning theories (Miller, 1956; Johnston, 1993; Johnston et al, 1994; & Nolen-Hoeksema et al, 2009), and programmed instruction which is replaced lately by the computer assisted instruction CAI (Saengsook, 2006). As a result, it should be noted that the individual characteristics and needs and learning styles in instruction or teaching or learning process are the key components in any effective teaching or learning environment (Sarasin, 1999; and Caspo & Hayen, 2006).

Consequently, the course is probably more consistent with the learners' needs and interests since it is an elective course for some students and required for the others. Students who registered in the course might have the same needs and interests. This actually may have raised students' motivation and willingness to get better scores regardless of the teaching approach. Furthermore, the result can also be interpreted in light of the nature of the study sample which consisted of university students who are more motivated to learn and get better scores. The result in some way is consistent with the results of some other research (Iverson, et al, 2005; Gagne & Shepherd, 2001; Grandzol, 2004; Vamosi et al, 2004; and Chen & Jones, 2007). This study, based on its findings, can be added to those 38 out of 51 studies that were reported by Nagel (2009) which showed no significant differences between the E-learning (Online) and traditional classroom setting in terms of achievement. So this study in another word is consistent with those 38 studies of Nagel (2009) as well. However, the result in the other way is inconsistent with some other studies such as Ponzurick, France, & Logar (2000); Terry et al, (2001).

Concerning the research question # 2, which is related to the effect of the E-learning environment on the students' attitudes toward using E-learning at the university level, the result in table 4, showed that there was a significant difference between research groups (online & normal teaching approaches) in gain scores of the attitudes scale in favor of the students using the online/blended approach. Accordingly, the predictive hypothesis # 2 is retained. This result is consistent with the researchers' expectation who thought that the blended approach learners will gain higher level of positive attitudes on the post attitude scale. This means that the attitudes of online students improved compared to the students in the face-to-face teaching approach. Such a result might be due to the interaction of the students in this group with the e-learning environment which affected their attitudes toward the E-learning environment. In this regard, it can be noted that the E-learning environment was an interactive learning environment which created a high degree of interaction between students, students and course content, and students and instructor. It seems that this type of environment created a better chance for students and instructor involvement which provide the social context needed for learning in its relation to the emotional domain of learning. This result is inconsistent with the results reached by Gagne and Shepherd (2001); Vamosi et al, (2004); and Chen and Jones (2007).

## **Recommendations**

Based on the research findings, the following recommendations are made:

1. Since the present research didn't concentrate a lot on the practical part of the Digital Photography course as mentioned in the discussion section, it is recommended that the practical part be considered as an important component of the E-learning environment. Appropriate instructional media should be integrated within the theoretical part of the course to enhance the practical part and the overall course.
2. Based on the above, the integration between both parts of the photography course should be taken into account in any future research studies related to E-learning.
3. Conduct future research studies dealing with the comparison between different types of instructional design of E-learning environments to deliver courses that are practically-oriented courses.
4. Further experimental research concerning the use of blended E-learning environments based on pedagogical and psychological principles is needed to be conducted in the future.

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