

The Effectiveness of Blackboard-Based Blended Teaching in the Development of Academic Achievement, Study Skills and Self-Confidence among Students of Princess Nourah bint Abdulrahman University

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Abstract

The present study aimed to investigate the effectiveness of blended teaching, based on the e-learning management system “Blackboard”, in the development of academic achievement, study skills and self-confidence among the students of Princess Nourah bint Abdulrahman University (PNU). The study sample consisted of (38) female students who were specialized in primary classroom at the University. The participants were randomly selected, where the experimental group was (21) female students who were taught the course of “Science Teaching Strategies” by blended teaching based on the e-learning management system “Blackboard”, and the control group was (17) ones who studied the course by the traditional method of teaching. Pre and post tests for academic achievement, the scale of study skills and the scale of self-confidence were applied to the participants. The results showed statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups in the academic achievement test in favor of the experimental group. Eta squared (η^2) was (0.75) rated very high effect. There were no statistically significant differences in both the degree of university study skills and self-confidence.

Keywords: blended teaching, blackboard, academic achievement, study skills, self-confidence

1. Introduction

Currently, communities have witnessed information revolution that affected all fields, particularly the educational one. The educational process radically modified; it turned from the learning based on transferring knowledge from the teacher, to learner-based learning due to utilizing new technology in teaching, such as the computer and the internet. Such techniques motivated educationalists to utilize this advancement in both processes of learning and education, especially in the institutions of higher education. At the present time, many educationalists and authors see that e-learning is one of the promising types of learning. It involves various applications which enhance learning and education and require handling more complicated technology to motivate learners to continue education (Al-Khaneen, 2017). It covers various and comprehensive media. In addition, its online content enables learners to actively interact with the content, teacher and peers and completion of such learning according to time, space and speed that appropriate his capabilities and conditions. It also develops their comprehension and experience and improves their feeling of responsibility for learning. Additionally, it develops their positive attitudes and provides them with trust and satisfaction with completing the course, either utilizing synchronous or asynchronous learning (Al-Giny & Al-Rahili, 2016).

Synchronous learning involves that the learner and teacher meet online at the same time to discuss learning tasks. Hence, the learner can listen, discuss and participate in the learning process anywhere. Whereas, asynchronous learning is based on using asynchronous means of communication, such as communication channel in which the learner and teacher communicate later. Thus, it isn't essential for the teacher and learner to be present at the same time or when presenting the educational material (Tolba, 2017).

Results of various studies showed the effectiveness of blended teaching in learning and education through improving the level of academic achievement, verbal communication and motivation to e-learning, persistence of

learning impact, research skills, interaction among learners, improving comprehension, and adjusting alternatives conceptions (Al-Kadi, 2011; Al-Khazem, 2012; Al-Kandri, 2013; Al-Agami, 2015; Sawafta & Al-Garewai, 2016; Al-Mohaidat & Al-Barakat, 2016).

One of such means is the courses management system “Blackboard”. It represents a comprehensive system that manages e-learning process across the internet through learning management and student follow-up. It enables students to handle the course anytime and anywhere. It also enables them to access and easily handle the content of the course and helps them communicate with the instructor and mates who are electronically enrolled in the same course (Al-Shahri & Mohamed, 2014). Such system is effective because it provides various options from which the user can choose what meets his needs. Additionally, it provides tools that help the user interact with his teacher and mates, do activities and implement tasks. It also enhances the various forms and exchange of files. In addition, it provides a test sample that helps the teacher design various forms of tests and a manual that shows how to use such tools (Sawafta & Al-Garewai, 2016). Blackboard system also helps educational institutions present e-courses online as a supplement to traditional learning courses and allows the universities to add e-learning sources, such as PowerPoint, video, audio and motion files and other applications, which Blackboard doesn't involve, to enhance courses, improve teaching and increase learning competence (Abdel Aziz, 2014). Accordingly, authors recommended providing the faculty with training on designing academic courses electronically and uploading them on “Blackboard” system which should be utilized to teach academic courses. They also recommended conducting additional studies on the effectiveness of Blackboard-based blended teaching (Al-Agami, 2015; Al-Giny & Al-Rahili, 2016; Sawafta & Al Garewai, 2016; Al-Motari, 2016).

Currently, learning traditional methods based on instruction, repetition, memorizing and retrieving information has turned to blended teaching, based on e-learning management system “Blackboard”, which motivates students to learn by themselves, search for and endeavor to develop information from various sources. Consequently, students have to acquire skills that facilitate their learning and help them pursue their university studies, keep up with such developments, and carry out their academic duties and tasks.

Results of various studies indicated that students training on study skills helped them succeed and improve their academic achievement because such skills develop their thinking skills and self-reliance to get much benefit from various educational activities (Al-Gurf, 2007). Moreover, developing and improving such skills result in effective time management through studying a lot in shorter time, facilitating learning process, keeping information for a long time and appreciating work value and significance (O'Donoghue, 2006). They also reduce students concerns for exams and help them have positive attitudes towards teacher and school. Consequently, they excel and feel self-satisfied. Moreover, study skills motive positive attitude towards various courses and raises self-confidence level (Ghanimat & Alimat, 2011), resulting in proper psychological growth that is reflected on the development of scientific thinking skills and higher academic achievement (Al-Washili, 2007).

1.1 Review of Literature

Al-Kandri (2013) aimed to identify the impact of using e-activities in Blackboard- based learning on the academic achievement and motivation in the Environmental Education Course, College of Education, Kuwait University. The study comprised two groups; the experimental group, of (102) students, that utilized e-learning strategy based on e-activities through Blackboard and the control group, of (50) students, that assumed e-learning through Blackboard without e-activities. Results showed statistically significant differences between the average scores of the two groups' students in the academic achievement test in favor of the experimental group. Whereas, results didn't enhance the impact of e-learning activities on the motivation of the experimental group students. Al-Kadri (2013) aimed to identify the effectiveness of teaching physics electronically utilizing Blackboard on the third-year student achievement of physics concepts. The study sample consisted of (52) students on two groups; where the experimental group of (24) students studied on the internet, the control group of (30) ones adopted the traditional method. Results showed statistically significant differences in the achievement test of physics concepts in favor of the experimental group.

Abdel Aziz (2014) aimed to investigate the impact of comprehensive, blended and supporting e-learning level in teaching courses based on the e-learning management system “Blackboard” on cognitive achievement and learning competence among the female students of the Colleges of Arts and Education, King Khalid University. The study sample consisted of (195) students on three groups: comprehensive e-learning system of (62) students, blended e-learning system of (66) students and supporting e-learning system of (67) students. It showed statistically significant differences in favor of supporting e-learning in academic achievement and learning competence. Al-Agami (2015) investigated the impact of e-courses on the development of information search skills among the College of Education's female students. The sample consisted of (80) Educational Diploma

female students. They were taught utilizing Blackboard system adopted in King Khalid University. Results showed statistically significant differences in the cognitive test and card of information search favoring the post-test.

Sawafta and Al-Garewai (2016) investigated the effectiveness of blended teaching, based on the e-learning management system “Blackboard”, in direct and delayed achievement of physics and learning retention among the students of Health Colleges, King Saud University. The study sample consisted of (53) students divided into two groups; where the experimental group of (25) students studied physics by Blackboard-based blended learning, the control group of (28) ones studied the same course traditionally. Results showed the effectiveness of blended teaching, based on the e-learning management system “Blackboard”, in the direct and delayed achievement among the students of Health Colleges, King Saud University. Al-Motari (2016) aimed to identify the impact of blended teaching on the development of motivation to learning and increasing academic achievement among the students of College of Education, King Saud University. The study sample comprised (34) students. Where the experimental group of (18) students studied the course by Blackboard-based blended teaching, the control group of (16) ones traditionally studied the same course. Differences were found between both groups in motivation to learning in favor of the experimental group, whereas no differences were found in academic achievement.

Ghanimat and Alimat (2011) aimed to identify the effectiveness of Collective Counseling Program in the improvement of achievement motivation and study skills among first year students at Princess Rahma University College. The study sample consisted of (28) students; the experimental group was (14) students and the control group was (14) ones. Results showed statistically significant differences in the scale of motivation and study skills of both groups in favor of the experimental group. Al-Washahy and Amaar (2015) investigated the impact of cooperative e-learning strategy on the development of study skills and attitude towards e-learning among the students of Sultan Qaboos University. The study sample comprised (66) students on two groups; the experimental group of (31) students and the control group of (35) ones. Results showed statistically significant differences in the tests of study skills favoring the experimental group, and no statistically significant differences in the attitude towards e-learning.

Kwasah (2011) aimed to investigate the impact of a training program on creative skills to develop self-confidence among university students. The study sample consisted of (40) students at College of Education, Qassim University. The experimental group comprised (20) students and the control group comprised (20) ones. Results showed statistically significant differences in self-confidence scale in favor of the experimental group. Sharab (2013) aimed to explore the effectiveness of a training program on improving self-confidence as a means of developing social responsibility among secondary stage students. The study sample consisted of (22) first grade secondary students, where the experimental group was (16) students and the control group was (16) ones. Results showed statistically significant differences in self-confidence and social responsibility in favor of the experimental group. Tuncel (2015) examined the connection between self-confidence and Turkish as a foreign language. The study sample consisted of (53) first grade students of Aristotle University in Greece. Results showed that students who were highly self-confident excelled less self-confident ones in learning Turkish. There was a direct correlation between self-confidence and learning. Al-Ghamdi and Afshi (2017) aimed to explore the effectiveness of collaborative e-learning strategy in the development of self-confidence and critical thinking skills among the College of Education’s students, PNU. The study sample consisted of (12) students, where the experimental group was (6) students and the control group was (6) ones. Results showed no statistically significant differences in self-confidence scale and critical thinking test.

To conclude, literature illustrates the interest in blended teaching, based on the e-learning management system “Blackboard”, and the development of study skills and self-confidence. The present study is compatible with the former studies in the objective; investigating the effectiveness of e-learning in the development of academic achievement (Al-Kandri, 2013; Al-Kadri, 2013; Abdel Aziz, 2014; Al-Materi, 2016; Sawafta & Al Garewai, 2016), study skills (Al-Washahy & Amaar, 2015), and self-confidence (Al-Ghamdi & Afshi, 2017). Previous studies aimed to investigate the effectiveness of blended teaching, based on the e-learning management system “Blackboard”, in the development of various variables, such as academic achievement (Al-Kandri, 2013; Al Kadri, 2013; Abdel Aziz, 2014; Al Matari, 2016; Sawafta & Al Garewai, 2016), motivation to e-learning (Al-Kandri, 2013), learning competence (Abdel Aziz, 2014), development of information search skills (Al-Agami, 2015), learning retention (Sawafta & Al Garewai, 2016) and motivation to learning (Al-Matari, 2016). The present study matches the former studies concerning the academic level of the participants; university students. However, it only handled the effectiveness of blended teaching, based on the e-learning management system “Blackboard”, in the development of academic achievement, study skills and self-confidence among the

students of PNU.

1.2 Statement of the Problem

University teaching is based on the traditional method. Since students focus on transferring the information and rote memorization, they have no role in gaining and developing it. However, this method proved inappropriate for the students of this stage who should gain and apply knowledge by themselves. It doesn't also match the prospects of learners who are preoccupied with modern technology, e.g. tablets and smart phones, which they handle efficiently and amusingly. Moreover, university classroom teaching faces some educational issues, such as the tremendous number of students in the classroom. Consequently, students cannot comprehend and follow-up the course easily and on time. Also, the instructor is unable to identify individual differences among students and apply the strategies of modern teaching (Al-Ghamdi & Afshi, 2017). Blended teaching, which solves the problem of the large number of students in classrooms, is one of the strategies which can be utilized and blended with classroom learning.

1.3 Study Questions

Since the present study aims to investigate the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement, study skills and self-confidence among students of PNU, its problem can be defined in asking the following main question: What is the effectiveness of Blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement, study skills and self-confidence among students of PNU? It is further subdivided into the following minor questions:

- 1) What is the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement among the students of PNU?
- 2) What is the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of study skills among the students of PNU?
- 3) What is the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of self-confidence among the students of PNU?

1.4 Significance

The present study is significant since it handles a new technology in university teaching through electronically processing, presenting, and organizing course content of "Science Teaching Strategies" and its evaluation on the e-learning management system "Blackboard", and teaching it through blended teaching strategies. Results of the study show to those in charge of the project of developing the digital content of courses in PNU the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement, study skills and self-confidence among the students. Moreover, the study handles two cognitive variables: study skills and self-confidence, that tremendously affect academic achievement and study tasks accomplishment. It motivates university students to use e-learning management system "Blackboard" in learning courses and achieving their objectives amazingly and attractively. It also provides a scale of the university study skills and self-confidence to assess them among learners. In addition, the study represents a response to the recommendations of relevant national and international studies which proved the effectiveness of blended teaching strategy in developing different variables among students with different educational levels.

1.5 Hypotheses

- 1) There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups in the academic achievement test.
- 2) There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups on scale of university study skills.
- 3) There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups on self-confidence scale.

1.6 Definition of Terms

Effectiveness is the impact size of experimental processing, represented in the independent variable in one of the dependent variables (Shahata & Al-Nagaar, 2003). It is defined procedurally as the impact size of blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement, study skills and self-confidence among the students of Curricula and Teaching Methods Department, PNU. Such impact is statistically estimated through estimating Eta squared (η^2).

Blended teaching is blending e-learning with traditional teaching to overcome its weaknesses (Al-Omari, 2013). It is defined procedurally as combining teaching based on the e-learning management system “Blackboard” and its technologies and traditional teaching in the classroom where the course of Science Teaching Strategies and its evaluation is presented.

Learning Management System “Blackboard”: According to the official site of Blackboard Company, it is a software that enhances virtual learning environments to keep pace with traditional learning and distance education programs. Thus, learners will be capable of managing courses efficiently, creating course content, making tests and enhancing collaborative learning. It also helps educational institutions accomplish objectives of learning, communication and assessment through providing course management facilities, discussion board, virtual classrooms, cooperative projects, questionnaires, assessment and other learning tools. It is defined procedurally as a learning management system that presents the course of Science Teaching Strategies and its evaluation and e-content using text, sound, image, movement and drawings to match student learning methods, cooperative learning through discussion forums, assessment through assignments, tests and questionnaires, following-up through student evaluation center, and virtual classrooms.

Academic Achievement is students’ comprehension of their experiences in courses. Its estimation is based on the student scores in achievement tests (Al-Laqqani & Al-Gamal, 1999). It is defined procedurally as the comprehension of the students of Curricula and Teaching Methods Department specialized in primary classroom teachers and enrolled in Science Teaching Strategies and their evaluation (Code 423) of the course content that the achievement test, prepared by the author, explores.

Study skills are strategies, mechanisms and methods that help students improve their performance, increase their effectiveness in academic achievement and upgrade their learning competence and productivity (Gaber et al., 2006). It is defined procedurally as strategies, mechanisms and methods that help students improve their performance, increase their effectiveness in academic achievement and upgrade their learning competence and productivity. They cover setting-up goals, future planning, self-motivation, effective time management, memorization, taking notes, reading courses, and readiness for exams. Their estimation is based on the student's total scores on the scale of study skills, prepared by the author for such purpose.

Self-Confidence is the individual’s ability to make decisions on one’s own using competence and academic, social and psychological skills. It enables a learner to effectively interact with various life situations (Sharab, 2013). It is defined procedurally as the individual’s ability to make decisions on one’s own using competence and academic, social and psychological skills. Its estimation is based on the student's total scores on self-confidence scale, prepared by the author for such purpose.

1.7 Limitations of the Study

Limitations of the present study are defined as follows:

- 1) Application is conducted in PNU in the second semester of the academic year 2016/2017.
- 2) A sample of the 7th level students, enrolled in the course of Science Teaching Strategies and their evaluation (Code 423), Curricula and Teaching Methods Department, who were specialized in primary classroom teachers, Faculty of Education.

2. Methodology

Quasi-experimental design “nonequivalent control group design” is based on selecting two groups: experimental and control.

2.1 Sampling and Population

Population of the study comprises the 7th level students at Curricula and Teaching Methods Department, who were specialized in primary classroom teachers, College of Education, PNU and enrolled in the course of Science Teaching Strategies and their evaluation (Code 423) in the second semester of the academic year 2016/2017. The study sample consisted of (38) female students. They were intentionally divided into two groups: the experimental group of (21) female students, whom the author taught the course of “Science Teaching Strategies” by blended teaching based on the e-learning management system “Blackboard” and the control group of (17) ones, whom another instructor taught.

3. Procedures

After reviewing literature, the experiment of the present study was designed and conducted according to the following stages:

3.1 Analysis

The first stage comprises three aspects.

- First: defining learning topics involves dividing the course topics into eight units over seven weeks, as follows: concept and nature of science, components of cognitive construction of science, learning processes, teaching scientific concepts, alternatives conceptions, investigation, fifth learning cycle, and other sciences and knowledge (integrated curriculum model).
- Second: defining the general objectives of the content includes mastering the cognitive aspects of the course of Science Teaching Strategies and their evaluation (Code 423), and learning skills of utilizing Blackboard system to be capable of investigating the course.
- Third, defining the procedural objectives of the course was phrased as, follows:

Table 1. The procedural objectives of the course

Aspect	procedural objectives
Concept and nature of science	The student explains the concept of science.
	She states the points of view of the concept of science.
	She explains the characteristics of science.
	She proposes ideas to utilize the characteristics of science in teaching Science.
Components of the cognitive construction of science	She describes the elements of science.
	She distinguishes between the elements of science (levels of cognition pyramid).
	She presents practical examples of science elements from Science course of the primary level.
Learning processes	She presents a comprehension of science substantial processes in Science course of the primary level.
	She presents a comprehension of science integrated processes in Science course of the primary level.
	She provides practical examples from Science course of the primary level.
Teaching scientific concepts	She presents a comprehension of the scientific concepts.
	She presents the characteristics of scientific concepts.
	She explains how to gain and upgrade scientific concepts among primary level students.
	She presents practical examples from Science course of the primary level on scientific concepts teaching according to their teaching strategies.
Alternatives conceptions	She describes the definition of conceptions.
	She explains causes of forming alternative concepts among primary level students.
	She explains some alternative conceptions among primary level students
Survey	She defines the survey.
	She describes the steps of survey.
	She distinguishes between survey types.
	She prepares science lesson utilizing survey strategy.
Fifth learning cycle	The student describes the stages of fifth learning cycle.
	She prepares Science lesson utilizing learning cycle.
	She explains teaching advantages using learning cycle.
	She deduces cases of teaching in which learning cycle should be used.
	She deduces cases of teaching in which learning cycle shouldn't be used.
Other sciences and knowledge (integrated curriculum)	She prepares Science lesson utilizing learning cycle.
	She presents a description of the integrated curve.
	She explains the concept of correlation in her own words.
	She states correlation types.
	She explains the most significant aspects of integration at the level of planning and designing educational curriculum.
	She clarifies strategies of integration at the level of curriculum teaching.

3.2 Design

The second stage involved two steps. First, designing teaching strategy applied in the experiment; educational files were uploaded in Word, PowerPoint, video and pdf files on learning management system "Blackboard". In

addition, e-assignments, e-tests, course mail and bulletin boards were used to teach the experimental group. Students also had to attend all lectures to communicate with the instructor. Second, designing measurement tools to evaluate academic achievement, university study skills and self-confidence among the students of Curricula and Teaching Methods Department, who were specialized in primary classroom teachers. They were designed as follows:

3.3 Academic Achievement Test

Academic achievement test aimed to assess academic achievement among 7th level students enrolled in the course of Science Teaching Strategies and their evaluation (Code 423) at Curricula and Teaching Methods Department, who were specialized in primary classroom teachers. It comprised (36) items; divided into two types: (29) multiple choice questions, where each item involved four choices that has only one correct answer, and (7) writing questions. Some experts and specialists in Curricula and Teaching Methods field reviewed the test to decide its appropriateness to students' level and course objectives. Test validity coefficients estimation was based on the responses of the pilot sample comprised (30) participants. Content validity was estimated through estimating the relation of each item to the total score of the exam. Then, (15) items, whose correlation coefficient was less than (0.3), were deleted. Cronbach Alpha was applied to estimate test reliability by estimating the responses of the same pilot sample. Reliability coefficient scored (0.72) which was appropriate to the objective of the study. Time of the test was (40) minutes and its final form comprised (21) items. Table 2 illustrates the specifications of academic achievement test.

Table 2. Specifications of academic achievement test

Question Level	Items figures	Items Number	Percentage
lower order thinking	1-11	11	52.4
higher order thinking	11-21	10	47.6
Total	-	21	100%

3.4 University Study Skills Scale

Study skill scale aims to evaluate university study skills among 7th level students, enrolled in the course of Science Teaching Strategies and their evaluation (Code 423) at Curricula and Teaching Methods Department, who were specialized in primary classroom teachers. Depending on previous studies, (McKelvie et al., 2004; Harboe et al., 2007; Gaber et al., 2006; O'Donoghue, 2006; Ghanimat & Alimat, 2011; Shabeb & Al-Nabahani, 2012), the scale items were phrased. In its preliminary form, it comprised (86) items on six substantial skills. Some experts and specialists in Curricula and Teaching Methods reviewed this form to decide to rate its appropriateness for the objective, clarity of item wording, connection between main and sub-skill, and validity of the item, either positive or negative. It was electronically designed on Google. Its internal validity was estimated based on the responses of the pilot sample which comprised (30) participants. Correlation coefficient of the items to the scale total score was also estimated. Then, (16) Items, whose correlation coefficient was less than (0.3), were deleted. Cronbach Alpha was applied to estimate its reliability by estimating the responses of the same pilot sample. It was found that its reliability coefficient scored (0.94) which was high and appropriate for the objective of the study. Finally, it was electronically provided in its final form which consisted of (52) items: (35) positive and (17) negative.

3.5 Self-Confidence Scale

Self-confidence scale aims to evaluate self-confidence among 7th level students enrolled in the course of Science Teaching Strategies and their evaluation (Code 423) at Curricula and Teaching Methods Department, who were specialized in primary classroom teachers. Depending on literature, including (Al-Khareng & Al-Moasab, 2011; Ragaia & Al-Shafai, 2012; Al-Ghamdi & Afshi, 2017), the scale items phrased. In its preliminary form, it comprised (55) items. Some experts and specialists in Curricula, Teaching Methods and Psychology reviewed the scale to decide to rate its appropriateness for the objective, clarity of item wording, connection between main and sub-skill, and validity of the item, either positive or negative. It was electronically designed on Google. Its internal validity was based on the responses of the (30) participants in the pilot sample. Correlation coefficient of the item to the scale total score was estimated. After that (3) items, whose correlation coefficient was less than (0.3), were deleted. Cronbach Alpha was applied to estimate its reliability through estimating the responses of the same pilot sample, scoring (0.94) that was high and appropriate for the objective of the study. Finally, its final form which consisted of (52) items: (30) positive and (22) negative was electronically provided.

Third, organizing educational content logically to accomplish the educational objectives. It consisted of eight educational units; each unit involves procedural and cognitive objectives. The content contains digital elements on Blackboard system.

3.6 Development

It involves combining and uploading the course content on learning management system “Blackboard” in pdf format, video files and e-assignments. Such stage involved designing the educational content using various applications and programs of e-learning.

3.7 Implementation

It aimed to apply and implement the teaching plan of the course content. It was applied at the beginning of the first semester of the academic year 2016/2017. *First*, tools of the study were applied to both groups to make sure of their equivalence. Results of pre-academic achievement test: means and standard deviations of performance in pre-achievement test are shown in the following table.

Table 3. Means and standard deviations of performance in pre-achievement test

Variable	Groups	Number	Arithmetic Mean	Standard deviation
Lower achievement levels	Experimental	21	5.62	1.86
	Control	17	5.12	2.09
Higher achievement levels	Experimental	21	2.67	1.74
	Control	17	1.12	0.99
Total achievement	Experimental	21	8.29	2.78
	Control	17	6.24	2.31

Table 3 indicates the differences between the means of both groups in the pre-achievement test. One-way Analysis of Variance (ANOVA) was estimated to decide if such differences had statistical significance as indicated in Table 4.

Table 4. ANOVA results of the differences between the means of pre-achievement test

Variable	Variance source	Sum of squares	Freedom degree	Mean squares	“F” value	Significance level
Lower achievement levels	Between groups	2.36	1	2.36	0.613	0.439
	Within Groups	138.72	36	3.85		
	Total	141.08	37			
Higher achievement levels	Between groups	22.54	1	22.54	10.62	0.002
	Within Groups	76.43	36	2.12		
	Total	98.97	37			
Total achievement	Between groups	39.5	1	39.50	5.94	0.020
	Within Groups	239.35	36	6.65		
	Total	278.84	37			

Table 4 indicates that (F) value is statistically insignificant for lower order thinking ($\alpha \leq 0.05$), but it is statistically significant for higher order thinking and total achievement. This indicates statistically significant differences between the average scores of the students of the two groups in the pre-academic achievement test. ANCOVA was utilized in the analysis of the results of post-academic achievement test to adjust the impact of pre-variable.

Results of study skills scale: means and standard deviations of performance of study skills pre-scale were estimated as follows:

Table 5. Means and standard deviations of the performance of study skills pre-scale

Variable	Variance source	Sum of squares	Freedom degree	Mean squares
Setting-up goals and future planning	Experimental	21	21.00	6.14
	Control	17	20.41	5.20
Self-motivation	Experimental	21	26.76	4.60
	Control	17	25.00	4.97
Effective time management	Experimental	21	23.05	5.93
	Control	17	19.53	4.73178
Memorization and taking notes	Experimental	21	21.33	2.78089
	Control	17	21.24	3.052
Reading courses	Experimental	21	24.10	6.29
	Control	17	24.41	6.87
Readiness for exams	Experimental	21	9.86	3.46
	Control	17	8.82	3.33
Total	Experimental	21	126.10	19.28
	Control	17	119.41	18.40

Table 5 indicates to the differences between means of both groups pre-scale of university study skills. ANOVA was estimated to decide if such differences have a statistical significance as indicated in Table 6.

Table 6. ANOVA results of differences between score means of university study skills pre-scale

Variable	Variance source	Sum of squares	Freedom degrees	Mean squares	F value	Significance level
Setting-up goals and future planning	Between groups	3.25	1	3.251	0.098	0.756
	Within Groups	1190.10	36	33.059		
	Total	1193.36	37			
Self-motivation	Between groups	29.16	1	29.164	1.28	0.265
	Within Groups	819.81	36	22.772		
	Total	848.97	37			
Effective time management	Between groups	116.28	1	116.286	3.94	0.061
	Within Groups	1063.18	36	29.533		
	Total	1179.47	37			
Memorization and taking notes	Between groups	.090	1	0.090	0.01	.918
	Within Groups	303.72	36	8.437		
	Total	303.81	37			
Reading courses	Between groups	0.94	1	0.941	0.02	0.883
	Within Groups	1547.92	36	42.998		
	Total	1548.86	37			
Readiness for exams	Between groups	10.03	1	10.037	0.86	0.359
	Within Groups	419.04	36	11.640		
	Total	429.0	37			
Total university study skills	Between groups	419.52	1	419.652	1.175	0.286
	Within Groups	12861.927	36	357.276		
	Total	13281.579	37			

Table 6 indicates that (F) value is statistically insignificant for total university study skills and its sub-levels at the level ($\alpha \leq 0.05$). This indicates statistically significant differences between the average scores of the students of the two groups in the pre-test of university study skills. Results of self-confidence scale: means and standard deviations of self-confidence pre-scale performance estimated as follows:

Table 7. Means and standard deviations of self-confidence pre-scale performance

Variable	Groups	Number	Arithmetic Mean	Standard deviation
Self-confidence	Experimental	21	169.38	22.07
	Control	17	158.94	26.719

Table 7 shows the differences between the means of both groups pre-scale of self-confidence. ANOVA was estimated to decide if such differences had statistical significance as indicated in Table 8.

Table 8. ANOVA results of differences between scores means of self-confidence pre-scale

Variable	Variance source	Sum of squares	Freedom degree	Mean squares	F value	Significance level
Self-confidence	Between groups	1023.922	1	1023.922	1.741	0.195
	Within Groups	21169.894	36	588.053		
	Total	22193.816	37			

Table 8 indicates that (F) value is statistically insignificant for self-confidence at the level ($\alpha \leq 0.05$). This shows statistically significant differences between the average scores of the students of the two groups in the pre-test of self-confidence scale.

Second: The experimental group was taught the course by blended teaching based on the e-learning management system “Blackboard”, and the control group studied the course by the traditional method of teaching.

3.8 Assessment

It verifies the role of blended teaching in achieving the objectives of the study. Such verification was conducted through the reapplication of the study tools to the participants of both groups. Then, data were collected to be statistically analyzed.

4. Results and Discussion

Means and standard deviations were utilized to test hypotheses validity. ANCOVA and ANOVA were utilized to identify the significance of differences between scores' means of both groups in the academic achievement test and scales of university study skills and self-confidence, where Eta squared (η^2) was utilized to evaluate the effectiveness of blended teaching.

The first hypothesis states that: There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the post-average scores of the students of the two groups in the academic achievement test. Table 9 indicates data essential for testing the hypothesis.

Table 9. Means and standard deviations of performance in the post-achievement test

Variable	Groups	Number	Mean	Standard deviation
Lower achievement levels	Experimental	21	9.10	1.92106
	Control	17	5.18	2.92052
Higher achievement levels	Experimental	21	7.86	1.65184
	Control	17	1.65	1.49755
Total achievement	Experimental	21	17.14	3.00476
	Control	17	6.82	3.14713

Table 9 shows the differences between the means of both groups in post-achievement test. ANCOVA were estimated to decide if such differences had a statistical significance as indicated in Table 10.

Table 10. ANCOVA results of the differences between the scores' means of post-achievement test

Domain	Variance source	Sum of squares	Freedom degree	Mean squares	F value	Significance level
Lower achievement levels	Lower achievement levels pre-test	58.924	1	58.924	13.626	0.001
	Group (experimental/ control)	119.185	1	119.185		
	Error	151.356	35	4.324	27.6	0.000
	Total	354.553	37			
Higher achievement levels	Higher achievement levels pre-test	0.992	1	0.992	0.388	0.537
	Group (experimental/ control)	264.117	1	264.117		
	Error	89.462	35	2.556	103.3	0.000
	Total	452.763	37			
Total Academic achievement	Pre-total achievement	64.085	1	64.085	8.158	0.007
	Group (experimental/ control)	691.219	1	691.219		
	Error	274.957	35	7.856	87.9	0.000
	Total	1339.474	37			

Table 10 shows statistically significant differences in the total academic achievement and its sub-levels. (F) Value of total academic achievement and its lower and higher levels rated (103.3, 27.6 and 87.9,) respectively. It is statistically significant at the level of ($\alpha \leq 0.05$). Table 9 illustrates that differences favored the experimental group; arithmetic means of its academic achievement and its lower and higher levels were (7.86, 9.10 and 17.14), respectively.

Value of the arithmetic means of the control group rated (5.18, 1.65 and 6.82), respectively. Accordingly, the first null hypothesis was refused, while the alternative one and its content were accepted.

To evaluate the effectiveness of the proposed design in the development of the academic achievement, eta squared (η^2) was estimated; it rated (0.75). It is the rate which the independent variable (blended teaching) represents the total variance of the dependent variable (academic achievement). It is a very high rate (Abo Hatab & Sadiq, 1996). Accordingly, blended teaching, based on the e-learning management system "Blackboard", greatly affected the development of academic achievement among the students of the experimental group. Consequently, the first question was answered. Such result is based on the concept that blended teaching, based on the e-learning management system "Blackboard", enabled students to interact with the course through various elements, such as PowerPoint, video and pdf files, daily assignments, course mail, discussion board and course bulletin boards. These elements motivate, draw the attention of and provide students with various activities. Accordingly, their academic achievement will be better because they are blessed with the environment of communication and interaction. Students' follow-up the course content through these activities either inside or outside the lecture through the e-learning management system "Blackboard" on the university website or its application installed on the cell phones of students and instructors to motivate them to have continuous communication with both the course and the instructor. Also, they effectively utilize this system. Thus, their academic achievement is positively influenced.

In addition, the student's ability to decide what to watch on the e-learning management system "Blackboard" enables them to rapidly proceed in the learning process, so their academic achievement is positively influenced. This result matches (Al-Kandri, 2013; Al-Kadri, 2013; Sawafta & Al-Garewai, 2016) which proved the effectiveness of blended teaching, based on the e-learning management system "Blackboard", in the development of academic achievement. Whereas, it is inconsistency with (Abdel Aziz, 2014; Al-Motari, 2016) which showed that blended teaching had no effect on the development of academic achievement.

The second hypothesis states that: There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups in scale of university study skills. Table 11 shows data essential for testing the hypothesis.

Table 11. Means and standard deviations of performance on university study skills post-scale

Variable	Variance source	Sum of squares	Freedom degree	Mean squares
Setting-up goals and future planning	Experimental	21	21.0000	5.28205
	Control	17	20.9412	5.84669
Self-motivation	Experimental	21	25.9524	5.04456
	Control	17	23.9412	6.83256
Effective time management	Experimental	21	21.7143	6.80546
	Control	17	21.4118	5.46648
Memorization and taking notes	Experimental	21	24.2857	6.20599
	Control	17	22.5882	6.31525
Reading courses	Experimental	21	22.3810	6.75630
	Control	17	21.7059	7.71982
Readiness for exams	Experimental	21	23.7143	5.89188
	Control	17	22.0000	4.97494
Total	Experimental	21	139.0476	29.54230
	Control	17	132.5882	31.81010

Table 11 shows differences between the means of both groups' post-scale of university study skills. ANOVA was estimated to decide if such differences had a statistical significance as indicated in Table 12.

Table 12. ANOVA results of differences between scores means in study skills post-scale

Variable	Variance source	Sum of squares	Freedom degree	Mean squares	F value	Significance level
Setting-up goals and future planning	Between groups	0.033	1	0.033	0.001	0.974
	Within Groups	1104.941	36	30.693		
	Total	1104.974	37			
Self-motivation	Between groups	38.001	1	38.001	1.09	0.304
	Within Groups	1255.894	36	34.886		
	Total	1293.895	37			
Effective time management	Between groups	0.860	1	.860	0.02	0.883
	Within Groups	1404.403	36	39.011		
	Total	1405.263	37			
Memorization and taking notes	Between groups	27.070	1	27.070	0.70	0.411
	Within Groups	1408.403	36	39.122		
	Total	1435.474	37			
Reading courses	Between groups	4.281	1	4.281	.08	0.775
	Within Groups	1866.482	36	51.847		
	Total	1870.763	37			
Readiness for exams	Between groups	27.609	1	27.609	.91	0.346
	Within Groups	1090.286	36	30.286		
	Total	1117.895	37			
Total	Between groups	391.983	1	391.983	.42	0.521
	Within Groups	33645.070	36	934.585		
	Total	34037.053	37			

Table 12 shows no statistically significant differences in the university study skills. (F) Value for university study skills scale and its sub-levels rated (0.001, 1.09, 0.02, 0.70, 0.08, 0.91 and 0.42), respectively, at the level of ($\alpha \leq 0.05$). Accordingly, blended teaching, based on the e-learning management system "Blackboard", doesn't affect the development of the university study skills. Consequently, the second null hypothesis was accepted and the second question was answered.

Such result is based on the concept that e-learning required much time and effort, so the students feel stressed and surprised when they discover that it demanded more interaction (Al-Nami, 2012). Consequently, eight-week

application can't indicate the impact of blended teaching, based on the e-learning management system "Blackboard", in the development of university study skills among students. Such result is inconsistency with (Ghanimat & Alimat, 2011) which showed the effectiveness of collective counseling program in the development of study skills among the participants of the experimental group. It is also inconsistency with (Al-Washahy and Amaar, 2015) which demonstrated the effectiveness of cooperative e-learning strategy in the development of study skills among the participants of the experimental group.

The third hypothesis states that: There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the two groups in self-confidence scale. Table 13 shows data essential for testing the hypothesis.

Table 13. Means and standard deviations of performance on self-confidence post-scale

Variable	Groups	Number	Arithmetic Mean	Standard deviation
self-confidence	Experimental	21	165.5	28.35951
	Control	17	161.4	26.24391

Table 13 illustrates differences between the means of both groups' performance on self- confidence post-scale. ANOVA was estimated to decide if such differences had a statistical significance as indicated in Table 14.

Table 14. ANOVA results of the differences between scores means on self-confidence post-scale

Variable	Variance source	Sum of squares	Freedom degrees	Mean squares	F value	Significance level
Self- confidence	Between groups	163.432	1	163.432	0.22	0.644
	Within Groups	27105.120	36	752.920		
	Total	27268.553	37			

Table 14 indicates no statistically significant differences in self- confidence scale, where (F) value scored (0.22) at the level of ($\alpha \leq 0.05$). Accordingly, blended teaching, based on the e-learning management system "Blackboard", doesn't affect the development of self- confidence. Consequently, the third null hypothesis was accepted and the third question was answered.

Such result is based on the concept that self-confidence develops early in man's life (Al-Saadi, 2014). Experiences of early childhood affect the individual self-confidence (Gouda, 2007). Consequently, eight-week application can't indicate the impact of blended teaching, based on the e-learning management system "Blackboard", on the development of self-confidence among the participants of the experimental group. This result matched Al-Ghamdi & Afshi, (2013) which indicated the ineffectiveness of collaborative e-learning strategy in the development of self-confidence among the students of College of Education, PNU. However, it is inconsistency with Kwasah (2011) which showed the impact of the training program on some skills of creation that develop self-confidence among a sample of university students. It is also inconsistency with Sharab (2013) which showed the effectiveness of training program in developing self-confidence as a means of developing social responsibility among a sample of secondary stage students.

5. Recommendations

The present study recommends the following: 1) Utilizing blended teaching, based on e-learning management system "Blackboard", in university teaching and creating supporting plans in universities; 2) Providing faculty members with various training courses to be capable of activating blended teaching, based on e-learning management system "Blackboard", in university teaching of various courses; 3) Providing classrooms equipped with the technologies essential for blended teaching.

6. Future Studies

The study suggests: 1) Conducting research on the impact of blended teaching, based on e-learning management system "Blackboard", on the development of the attitude towards the university learning environment; 2) Conducting research on the impact of blended teaching, based on e-learning management system "Blackboard", on the development of continuous learning and thinking skills among university students; 3) Conducting research on the obstacles that handicap the application of blended teaching, based on e-learning management

system “Blackboard”, in university education and how to overcome them.

7. Conclusion

To conclude, blended teaching, based on e-learning management system “Blackboard” proved effective in developing academic achievement, but it was ineffective in developing the study skills and self-confidence among the university female students. In other words, further studies are required to determine the role of this system in developing university study skills which is a significant tool of continuing education and self-confidence that is an important cause of psychological development. This, in turn, is reflected on developing scientific thinking skills and improving the students’ academic achievement.

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