The Effect of Teaching Using Blended Learning on the Achievement of 10th- Grade Students in the Computer Course

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Abstract

The study aims to explore the effect of teaching using blended learning on the achievement of 10th-grade students in the computer subject in Jordan. The study sample consists of two purposely selected sections: the experimental group with (26) male and female students and the control group with (26) male and female students. An achievement test consisting of (20) questions is prepared, and the validity and reliability of the instrument are verified. To answer the study questions, the arithmetic means, the standard deviations for the study sample, along with the analysis of covariance (ANCOVA) are calculated. The results show that there is a statistically significant difference among the means of the levels of academic achievement due to the variable of the teaching method and for the benefit of the experimental group taught using blended learning. The study recommends generalizing the experience of using the blended learning strategy applied to students of computer course on various subjects, taking advantage of the positive effect of using the strategy of blended learning in increasing the student's achievement.

Keywords: blended learning, academic achievement, 10th-grade students.

1.0 Introduction

The current era is witnessing many modern technological developments in all areas of scientific and practical life, which have expanded to include education to bring about many and enormous changes in the education systems that are the mainstay of the progress of peoples and nations. In view of education in general, it depends in many stages on regular education, which has the greatest burden on the teacher, and the role of the learner is largely negative, so many educational institutions seek to improve education through new ways of being active and positive, and the teacher is guided and mentored, in order to improve and develop education and achieve the best educational results of high quality.

As the usual methods no longer enrich the need of the knowledge society, universities have been updated to reassess their position for the 21st century, which means not only applying new software or developing e-learning models and courses, but also helping learners take advantage of technology, the Internet and sources of knowledge and further facilitating effective learning strategies (Colburn,2009).

One of the recent developments in education technology is the distance learning system in which the learner is physically and geographically separated from the learning source, to be learned in an interactive manner by transmitting information from its source to the learner where it is found, and distance learning is characterized by several characteristics as an educational system that gives the same qualifications as regular education to students who have not been able to go to educational institutions where planning, careful organization, preparation and design of educational and calendar courses are adopted and provides support and assistance services to learners outside the learning institution. Remotely. This is done through the introduction of a formal educational programme, consisting of several courses tailored to predetermined objectives and based mainly on self-learning with the possibility of face-to-face meetings or through the use of electronic audio-visual media between the teacher and the learner. Distance learning gives particular importance to communication and interaction between the teacher and the learner through the organization itself or using media and technology interaction such as e-mail (Khamis, 2013).

The current era is characterized by the explosion of knowledge and technical and fundamental progress that has brought about rapid and successive changes that have included development in several areas, the most important of which is education, one of the most notable of which was the emergence of e-learning, which al-Mannai knows (2016): a pattern of modern learning patterns in which the learner uses computers and electronic means of communication to search, access and interact with digital educational material within an asynchronous learning environment that is not limited to time and space.

With the use of modern technology within classrooms, the process of designing an integrative education called e-learning has begun by incorporating e-learning systems into its learning programmes (Amer, 2015).

In the light of this technological development, the existing standard learning cannot be dispensed with or ignored, and e-learning cannot be a substitute for regular learning or elimination of modern electronic technology. It was ignored, and as a result, the idea of combining regular learning with e-learning emerged, to emerge a new type of education known as Blended Learning.

Regular education alone is no longer enough to keep pace with modern thought. Therefore, the approach to implementing supportive educational mechanisms such as e-learning has the potential to improve, support and build a distinct generation to develop the educational level and rise to the highest levels to keep pace with technological development (Al-Ashhab, 2015).

Blended learning has emerged as a new method of education combining the usual method of face-to-face education, with its characteristics and characteristics, and e-learning in its virtual learning environment, combining the optimal learning between them to suit the characteristics of learners and the desired goal to be achieved at the end of the semester, the advantages in the methods of regular teaching and e-learning complement each other and hence came the word "Blended" by integrating and mixing the two ways of learning, and the tools and functions of learning, making the Blended learning a way of learning contribute to the facilitation of each other. Education, knowledge delivery and classroom management taking into account the knowledge and technical aspects of learners. Blended Learning can therefore be defined as a combination of useful areas of e-learning and a face-to-face learning environment where students and teachers interact together using different technology and learning patterns (Maestas, 2016).

The American Society for Training and Development has identified Blended learning as one of the best trends in the knowledge industry (Kiviniemi, 2014), where it plays an active role in the strengths of face-to-face classroom meetings and e-learning by containing the best two ways to facilitate learning outcomes for students (Vaughan & Garrison, 2005).

Blended learning can include many learning tools such as instant virtual collaborative learning software, online-based courses, self-learning courses, electronic performance systems, and education systems management, as well as Blended learning mixes multiple activity-based events, including classroom education where teachers meet students face-to-face (Al-Fiqi, 2011). Al-Kilani (2011) noted that the process of integrating e-learning with regular education needs to be established as a guide to the planning and development of Blended learning, combining classroom faculty, classroom ethics, content design and technology, evaluation, and information sources, and management.

Blended learning is the logical and scientific alternative to e-learning, and it is even more expensive, less expensive and more advanced modern learning. Blended learning is intended to mix or mix regular learning roles in regular classrooms with e-teacher roles in virtual classrooms, combining regular learning and e-learning (Al-Anzi, 2019). Blended learning has many advantages, including the real use of IT applications in teaching positions in terms of web browsing, working with e-mail, conversation, the use of various computer software, reducing learning expenses compared to e-learning, saving the effort and time of the learner and teacher compared to regular learning alone, enabling students to have the pleasure of dealing with teachers and their fellow students face-to-face, thereby enhancing social constraints and human ities between them, and raising the individual differences between learners so that every learner can walk according to his needs and abilities (aldershoy, 2011).

Blended learning expands the scope of learning to include the world and not just the classroom, and allows students to learn at the same time as their colleagues without being late if they are unable to attend the lesson for some reason, and the Blended learning includes several principles mentioned by Abdul Hamid (2010) namely:

1.   Focus on the goal of learning rather than the presentation method.

2.   Everyone acquires different knowledge in the learning experience.

3.   Many personal learning styles need support to reach a wide audience.

4.   In many cases, the most effective learning strategy is just what is needed, just in time.

(Ziegler& Woodside, 2006: 7) defined Blended learning as a new form of training and education input combining the advantages of face-to-face learning and e-learning. Al-Dosari and Al-Jazar (2017:18) defined it as "employing technological innovations in combining objectives, content, learning resources and activities, and ways to communicate information through face-to-face learning and e-learning to interact with faculty members as a teacher and mentor to learners through innovations that do not require specific electronic tools".

Studies have pointed to the benefits of Blended learning as follows: the learner can choose the information and experience he needs in a timely and timely manner, not linked to class schedules or schedules, and provides various forms of electronic interaction between students and teachers present to give guidance and guidance, prepare

student activities and focus on the skills that learners actually need (Ansu, 2017), in addition to learning in an environment of privacy in isolation from others, repeating and repeating learning as much as it needs without feeling the fear and embarrassment that it needs, and repeating learning as much as it needs without feeling the fear and embarrassment that it needs. The system provides an enormous amount of information without having to go to libraries. It also develops computer and Internet skills by dealing with the contents of the e-course, focusing on learner feedback to guide the right path of learning, saving printing, binding, storage, etc., reducing publishing costs compared to traditional publishing and delivery to learners anywhere, as well as quickly updating the educational material, providing learners with it and making mistakes at the moment of discovery (Students, 2010; Zamil, 2017).

In this regard, Rimawi (2014) conducted a study aimed at investigating the effect of the use of learning Blended in the direct and deferred achievement of students in the sixth grade in the basic english language subject, and the sample of the study consisted of (60) students, and the researcher used the semi-experimental curriculum It was distributed into two controlled and experimental groups, and an in-carat test was built, and the results of the study showed statistically significant differences between the average direct attainment in favor of the experimental group, and statistically significant differences in deferred attainment in favor of the experimental group, and that Blended education was It has a clear effect on students' achievement and development of critical thinking skills.

Abu Shuqir and Harb (2014) conducted a study aimed at identifying the effect of the use of Blended learning in teaching writing in English on the development of the trends of the 10th grade students in the governorates of Gaza, towards their use and to achieve the objectives of the research employed by the researchers the experimental method, and designed a trend scale consisting of 22 paragraphs, applied to a random sample of students of the tenth grade of the School of Martyrs of Rafah in Gaza, and the number (20) students, and the results of the study showed statistically significant differences between the average scoring of students in the tribal application and the dimension, towards the distance, towards Employing the Blended learning strategy in English writing skills in favor of the dimension application, due to the effective effect of the Blended learning strategy and recommended the study to employ Blended learning in different educational institutions, which enriches the educational process and helps to activate the role of the student in education.

1.1 The problem of study and its questions

Given the rapid progress of education technology and its effect on the teaching process, because technology has become indispensable to achieving comprehensive development, and because modernization of education should be based on the base of the development of teaching methods, methods and strategies, the use of technology in education has become an effective means of developing these methods, methods and strategies, as it can contribute to increasing students' understanding of the curriculum. In the field of education in order to achieve these trends, this requires knowledge of the most important features of e-learning technology and its various programs, where this technology is one of the modern applications of information technology, which requires identification of the possibility of using it in educational institutions in order to achieve the directions related to the preparation of an individual capable of dealing with the variables of this era.

Technology has broadened the concept of learning, no longer limited to a specific age or location, and specific sources and tools, with multiple patterns and forms such as e-learning, distance learning and Blended learning. The foundations for the individual privacy of the learner and self-responsibility and interaction have become fundamental principles that form the theoretical basis for these modern methods and methods of learning (Al-Qudsi, 2014).

In this context, the objectives of education policy in Jordan emphasize the introduction of the latest technologies and the provision of an internal information network in schools, and the Ministry of Education was interested in introducing Blended learning teaching as a result of the challenges witnessed by the world of political, economic, educational and social dimensions, which formed in its various dimensions. In order to meet these challenges, it is necessary to make the best use of modern techniques and techniques in the learning process, including Blended learning, which in turn may help the learner to increase hisorm, motivation for learning and increase his or her level of achievement.

This study therefore attempted to answer the following question:

1.   **What the Effect of Teaching Using Blended Learning on the Achievement of 10th- Grade Students in the Computer Course?**

1.2 Study objectives

This study generally aimed at:

Study the role and effect of Blended learning on the achievement of 10th graders in computer subjects.

1.3 The importance of study

The importance of this study has been highlighted by the fact that the educational process is present and future and is explicitly linked to aspects related to information technology and communications, as this study draws its importance from its findings and the extent of its usefulness. The importance of this study also highlighted the importance of using the Blended learning method in the teaching of computer material in Jordan and its role in raising the level of educational attainment and skills using this method, and its future role in expanding the use of this educational system in schools, as e-learning has become an integral part of the current education and even complementary, if not a substitute for traditional education.

The importance of the current study also stems from the importance of integrating ICT in general into the educational process, and the importance of using Blended learning to facilitate students' learning and increase their educational achievement.

1.4 Procedural definitions

For the purposes of the study, i knew the terms in it as follows:

•Blended Learning: Al Ghraib (2009) referred to Blended learning as employing technological innovations in combining goals, content, learning resources and activities, and ways to communicate information through face-to-face learning and e-learning to interact between faculty members as a teacher and mentor to students through innovations that do not require specific electronic tools. Researchers define it procedurally as this method of education that relies on the integration of the usual method (discussion and dialogue, collaborative learning, active learning, indoctrination, textbook) and e-learning (multimedia presentations, the Internet, etc.) in providing educational content to the students in question.

•Educational achievement: The different skills, knowledge and knowledge acquired by the learner as a result of various learning processes, indicating his or her cognitive mental activity, and measured to the degree to which he achieves in a legalized examination to which he or she is asked to do so (Jalali, 2011). It is defined procedurally as the amount of experience, knowledge, information and concepts of the content of the scientific material, and is measured by the sum of the marks received by the learner in the dimensional test prepared for this purpose.

1.5 The limits and determinants of the study

•Spatial boundaries: This study was limited to computer students at the University of Jordan school in Jordan.
•Temporal limits: This study was limited to the extended period of time during the first semester of the school year (2019/2020).
Human boundaries: 10th graders.
Objective limits: This study was limited to knowing the role and effect of Blended learning on the achievement of 10th graders in computer subjects. The results of the study determined the validity of the results, which were based on the sincerity, consistency and responses of the study members on the measuring instruments used.

2.0 Method and procedures:

2.1 Methodology of the Study:

The study aimed to address the role and effect of Blended learning on the achievement of students in the tenth grade in the computer subject, and to achieve the objectives of the study the researchers used the semi-experimental method, and the information was collected by the studies prepared by reference to previous studies and research.

2.2 Study Sample

The sample of the study members consisted of two divisions selected from the 10th grade of the University/University of Jordan school, in a deliberate manner and randomly distributed, so that one of the two divisions represents the experimental group (26) students, and studies the computer subject through (using the Blended learning strategy), and the other is the control group of 26 students and students, and studies the same subject in the usual way.

2.3 Study Insturments

This study aimed to identify the effect of the use of Blended learning on students' achievement, and to achieve these goals, the researchers developed the following tool:

The first tool: the attainment test. To achieve the objectives of the study, an educational test consisting of (20) objective questions of the type of choice of multiple, prepared according to the specification specs of the unit (computer culture) of the computer book scheduled to teach his basic tenth grade student, was built so that the student chooses the correct answer to the question from four alternatives, only one of which is correct. The test was allocated (20 degrees), and each paragraph had one score according to the grades allocated in the specification table. The student's achievement in computer subjects can be inferred through the overall mark he takes on the achievement test.

2.4 Believe the test.

To verify the authenticity of the test, it was presented in its initial form to a group of 10 arbitrators with specialties in curriculum and teaching, education technology, measurement and evaluation, a school from the Ministry of Education, and amended according to the arbitrators' observations.

2.5 Difficulty and discrimination coefficients for testing

Responses were analysed in a survey sample outside the study sample consisting of (20) students to calculate difficulty and discrimination coefficients for the test paragraphs, where the percentage of students who answered the paragraph correctly was adopted as a difficulty factor for each of the test paragraphs, while according to the coefficient of distinction for each paragraph by adopting pearson's association between the paragraph and the overall grade, and a table (1) showing difficulty and coefficients for each test paragraph.

Table (1) Difficulty and Discrimination Coefficients for test paragraphs

Paragraph Number	Difficulty Factor	Discrimination Coefficient	Paragraph Number	Difficulty Factor	Discrimination Coefficient
1	0.30	0.38	11	0.30	0.43
2	0.30	0.46	12	0.20	0.43
3	0.40	0.46	13	0.30	0.37
4	0.45	0.48	14	0.50	0.41
5	0.35	0.45	15	0.30	0.61
6	0.30	0.29	16	0.30	0.51
7	0.20	0.36	17	0.40	0.45
8	0.30	0.38	18	0.45	0.43
9	0.40	0.43	19	0.45	0.55
10	0.35	0.50	20	0.40	0.33

It is noted from a table (1) that the difficulty coefficients of the paragraphs ranged from (0.20-0.50) to the distinction coefficients (0.29-0.61) and all were statistically functioning.

2.6 The stability of the Study Insturments :

To ensure the stability of the study tool, the stability factor was calculated in the manner of internal consistency by the Kuder Richardson-20 equation, and was valued at 0.85 and these values were considered appropriate for the purposes of this study.

3.0 Results Discussion:

Question 1: What is the effect of teaching using Blended learning on the achievement of students in the basic tenth grade in computer subjects?

To answer this question, the mathematical averages and standard deviations of the basic 10th grade students' achievement in the computer subject were calculated for tribal and dimensional measurements depending on the teaching method (Blended learning strategy, routine), and table 2 illustrates this.

Table 2: Arithmetic averages and standard deviations for 10th grade students' achievement in computer subject for tribal and dimensional measurements
Depending on the teaching method

Teaching method	number	Tribal measurement		Dimension measurement	
		Arithmetic medium	Standard deviation	Arithmetic medium	Standard deviation
Experimental (Blended learning strategy)	26	12.27	4.359	18.23	1.531
Officer (usual)	26	11.42	3.313	14.12	3.064
Total	52	11.85	3.857	16.17	3.173

It is clear from table (5) that there are virtual differences between the mathematical averages in the tribal and dimensional levels of the achievement of the tenth grade students in the basic computer subject according to the teaching method (Blended learning strategy, usual) and to see if these apparent differences are statistically significant, the single-way ancova analysis was used for the distance measurement of the basic 10th grade student in the computer subject according to the teaching method (Blended learning strategy, usual) after determining the effect of their tribal measurement, table 3.

Table 3: Results of one way ANCOVA dimensional measurement of 10th grade students' achievement in computer subject according to teaching method (Blended learning strategy, usual)

Source of variance	Total squares	Degrees of freedom	Average total squares	Value f	Level of significance	η2
Tribal measurement	79.514	1	79.514	18.227	*.000	.271
Teaching method	189.319	1	189.319	43.398	*.000	.470
The error.	213.756	49	4.362			
Total	513.442	51				

 *Function at the level of indication (α = 0.05).

Table (3) shows that there are statistically significant differences at the level of significance (0.05 =α) in the achievement of students in the tenth grade in the computer subject according to the teaching method (Blended learning strategy, usual), the value of (P) (43.398) with a statistical significance of (0.000), which is a statistical function value, which means an effect of the teaching method.

To determine who the differences were attributed, adjusted arithmetic averages and standard errors were extracted according to the teaching method, as shown in table 4.

Table 4: Adjusted arithmetic averages and standard errors for 10th grade students in computer subject depending on the teaching method

Group	Adjusted dimensional arithmetic average	Standard error
Experimental (Blended learning strategy)	18.093	.411
Officer (usual)	14.253	.411

The results in Table 4 indicate that the differences were in favour of the experimental method who studied using Blended learning compared to members of the control group.

This may be due to the fact that the Blended learning system provides a variety of electronic sources that have facilitated access to data and topics to be identified from their political sources through the availability of videos, images, images and a discussion forum, which has facilitated the learning process.

The researchers also attribute this finding to the multiple advantages of Blended learning that are expected to serve students' learning and contribute to their improvement, including: this type of learning allows the learner to review and study his or her educational material once without getting bored, at the time he wants and in the place he wants, and this in its entirety increases his motivation for learning.

This result may be due to the fact that the use of the Blended learning system provides a suitable educational psychological environment for students, which encourages them to perform the tasks assigned to them comfortably, and the student learns basic behaviors, knowledge and skills through dialogue with his colleagues and teachers during discussion and dialogue. The Blended learning system provides communication between the elements of the learning process through discussion workshops and develops collaborative and interaction skills through activities used in teaching and self-planning; the student studies according to his or her abilities and their own. The result can also be attributed to the fact that the diversity in the forms of tasks given to students of duties and activities, and the freedom to work during their implementation, has contributed to the student's interaction with himself, and the responsibility of each student to learn from himself, and may lead the student to pay attention to what he does at work, as well as to continue to perform homework at home to achieve the best results.

During the study, the researchers noted that changing the classroom environment, the presence of students in the computer lab, and out of the ordinary in explaining lessons, showed enthusiasm among students, and a love of exploring and searching for information, rather than receiving and preserving it.

In addition to the questions, self-examinations and feedback provided by students during research, evaluation of their performance, recognition and review of their mistakes, they have contributed to the preservation of information and their mental structure, which has increased their academic achievement.

The Blended learning strategy may have contributed to meeting the needs of students and taking into account the individual differences between them. The United Nations is the only country in the world that has been able to achieve the desired development.

This can also be explained in the light of the many developments and changes in our times in various fields in light of the knowledge explosion and technological development, whose effects have emerged in all fields, which have contributed to the provision of flexibility and simplicity through our dealings with these modern technological innovations. Education has now witnessed many developments in the field of modern technological innovations, and the use of technology in education has contributed to the speed of knowledge transfer, increased enrichment of human experiences, made education more widely and more streamlined through the multiplicity of ways of viewing information, including sound, image, movement, different colors and multiple lines, as well as taking into account individual differences, breaking boredom and routine.

This finding is consistent with a number of previous studies that have indicated that teaching using the Blended learning strategy has a positive effect on students' learning in general and in academic achievement in particular, such as the Saqiya study (2018), al-Hazmi Study (2018), Al-Qahtani (2018), and Ansu Study (2017), whose results indicated that the use of the Blended learning strategy achieves a high degree of effectiveness in improving students' academic results, and the Rimawi Study (2014), whose results showed the effectiveness of using Blended learning in student achievement and in developing their thinking skills.

4.0 Recommendations:
In light of the results of the study, the researchers make the following recommendations.
•   Generalizing the experience of using the Blended learning strategy that has been applied to computer students to different subjects.
•   Take advantage of the positive effect of using the Blended learning strategy to increase student achievement.
•   Conducting other new studies with different designs and measuring tools to examine the effect of using the learning strategy Blended into a variety of subjects and different levels of study.

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