المملكة العربية السعودية

وزارة التعليم

جامعة طيبة

مجلة جامعة طيبة

للعلوم التربوية

The Effectiveness Blended Learning in Developing the Skills of Producing the Augmented Reality Technology Among Students Of Saudi Universities

د. عائشة بليهش محمد العمري

مجلة علمية محكمة

الرقم المعياري الدولي ISSN 1658-3663

The Effectiveness Blended Learning in Developing the Skills of Producing the Augmented Reality Technology Among Students Of Saudi Universities

Aisha Bleyhesh AL-Amri,
Associate Professor in the Department of Educational Technology at Taiba University

Abstract

This study aims to Identify the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology among students Of Taibah University. The research tools included: List of skills of designing the augmented reality Technology, a cognitive achievement test, product evaluation card, Program based on Blended learning was used as educational material to teach students to design the augmented reality technology. The study sample consisted of (64) female students who was enrolled in the program of Innovation and Entrepreneurship Management projects at Taibah University; (33) representing the experimental group and another (31) representing the control group. The second term of the academic year 2018/2019. In this study, the researcher used the Constructive Approach to build program using Augmented reality. And the researcher used the experimental approach for studying the effect of using Augmented Reality On Developing The skills of producing the augmented reality technology based On " Blippar " tool. The study found significant differences between the mean scores of the students in the experimental group and the control group in the Cognitive exam in favor of the experimental group, And There were statistically significant differences, at the mean level of significance 0,05≥□, between the average scores of the experimental and control groups on indicators of evaluation of achievement projects in favor of the experimental group. The most important recommendations of the study: (augmented reality applications should be used to become the standardized version adopted for developing electronic content and preparing future teachers to meet the needs of the community, faculty members should be encourged to produce and integrate the augmented reality applications in their teaching in all the courses of the different majors in the university levels).

Key words: Augmented Reality, Blended Learning, the program of Innovation and Entrepreneurship Management projects , university study.

فعالية التعلم المختلط في تنمية مهارات إنتاج تقنية الواقع المعزز لدى طلاب الجامعات السعودية

د. عائشة بليهش محمد العمري

استاذ مشارك تكنولوجيا التعليم بكلية التربية بجامعة طيبة

الملخص:

تهدف الدراسة إلى التعرف على فاعلية برنامج قائم على التعلم المختلط في تنمية مهارات إنتاج تقنية الواقع المعزز لدى طلاب جامعة طيبة. وتضمنت أدوات البحث: قائمة بمهارات تصميم تقنية الواقع المعزز، اختبار التحصيلي المعرفي ، بطاقة تقييم المنتج ، تم استخدام برنامج قائم على التعلم الممزوج كمواد تعليمية لتعليم الطلاب كيفية تصميم تقنية الواقع المعزز. وتكونت عينة الدراسة من (٦٤) طالبة مسجلة في برنامج الابتكار وإدارة المشاريع الريادية بجامعة طيبة، (٣٣) يمثلون المجموعة التجريبية و (٣١) يمثلون المجموعة الضابطة، في الفصل الدراسي الثاني من العام الجامعي ٢٠١٨/٢٠١٩.

وتم اتباع المنهج البنائي لبناء برنامج باستخدام الواقع المعزز. و المنهج التجريبي لدراسة تأثير استخدام الواقع المعزز في تنمية مهارات إنتاج تقنية الواقع المعزز باستخدام أداة "Blippar" . وتم التوصل الى عدد من النتائج، من اهمها وجود فروق ذات دلالة إحصائية بين متوسطات درجات الطلاب في المجموعة التجريبية والمجموعة الضابطة في الاختبار التحصيلي المعرفي لصالح المجموعة التجريبية، وكانت هناك فروق ذات دلالة إحصائية عند مستوى الدلالة المتوسط. ٠،٠٥ ≥، بين متوسط درجات المجموعتين التجريبية والضابطة على مؤشرات تقييم مشاريع الإنجاز لصالح المجموعة التجريبية. واوصت الدراسة باستخدام تطبيقات الواقع المعزز لتطوير المحتوى الإلكتروني وإعداد المعلمين المستقبليين لتلبية احتياجات المجتمع، وكذلك تشجيع أعضاء هيئة التدريس على إنتاج ودمج تطبيقات الواقع المعزز في تدريسهم لمختلف التخصصات الجامعية.

الكلمات المفتاحية: برنامج الابتكار وإدارة المشاريع الريادية، التعلم المختلط ، الدراسة الجامعية ، الواقع المعزز.

Introduction

The rapid scientific and technical development of alternative forms of education, or in the sense of providing the service in a different and new way, has made education a basic function in human societies. It was normal for the forms of education to change in general and to evolve with the rise of technical development. Recent trends in education technology have contributed to the emergence of new and sophisticated teaching and learning techniques that have had a significant impact on positive changes and developments in the methods of communicating scientific information to students.

as well as the content and format of the curriculum, and the techniques produced by the modern trends of Augmented Reality (AR) technology, whose use generates the need for further development and adjustment in all areas, especially in education so that the individual can coexist and integrate with the modern lifestyle. Modern and current studies are studying these contemporary techniques in the field of education (Alokluk, & Al-Amri, 2019).

Augmented reality technology is an extension of virtual reality technology. Therefore, first-hand virtual reality technology is necessary to understand augmented reality technology better. Novell (2010) defines it as "a system that combines virtual reality environments with real environments through special techniques and methods." P. 60

One of the most important techniques used today is Augmented Reality, where teachers can use enhanced reality technology in classrooms to attract attention. Enhanced reality can be defined as the reality between the real world and digital data; enhanced reality now uses live images and videos; the system digitally processes them; the graphics created by the computer are added. (Siltanen, 2012, 16) in (Abu Rous, Shazly, 2018).

The concept of augmented reality: through the study of the literature of reinforced reality and given the modernity of the term, there were many names referring to this concept, such as reality (added, more, expanded, improved, compact reality, enhanced reality). Larsen, (Bogenes, Buchholz, & Brosda, 2011,7) Add, install and photograph digital data using digital views of the real reality of the environment surrounding the organism, and often from a technological perspective. What is associated with the augmented reality is that computers can be worn, or smart devices can be carried.

Virtual reality: Novell (2010) defined it as "an interactive, multi-user interactive environment, and the user actively participates in the activities offered through freedom of navigation, navigation and interaction. These environments provide real life experiences while providing different degrees of handling and performance for the task that is needed ". P. 17. As Ahmed (2017) defined it, "the technology that provides learners with real experiences within a virtual environment"

Chuah (2018) defined the combined reality as "a hybrid reality that integrates real reality with virtual reality to create a new environment."

Qualcomm (2018) defined the extended reality as "a set of techniques that can be represented on the axis of one end representing real reality " p. 3

Chuah (2018) defined the reality as "the reality that encompasses essentially all the environments created, which depend on the interaction between man and machine, and combine real and virtual reality, and usually include various forms of virtual reality, enhanced reality and compact reality, especially those associated with a sense of existence and knowledge acquisition. "

Al-Sharif (2017) and Rado (2012) mention the importance of augmented reality in education in that it achieves tangible results in cooperative and business learning processes.

As a result of some studies that confirm the effectiveness of augmented reality and its distinctive use in the field of education with many advantages and the efforts of the Ministry of Education in developing curricula that witnessed the first marriage between publication and publication. Technology (miscellaneous), many studies presented the idea of measuring the effect of using augmented reality and employing it in the field of educational process in many disciplines. such as Abu Rous and Shazly (2018), and the study of Saqqa, Madani, Al-Abadila, Ahmed, Abu Harb (2018)), and the study by Shami & Judge (2017), Abu Khater (2018) this study aims to Identify The Effectiveness Of A Program Using Augmented Reality On Developing The Constructed Electronic Robots Circuits Skills In Technology For The Female Tenth grade in Gaza. The study found significant differences between the mean scores of the students in the experimental group and the control group in the Cognitive exam in favor of the experimental group, And There are statistically significant differences between the mean scores of students in the pre-application and the post-application of the observation card in favor of the post-application.

However, no study was conducted to reveal the effectiveness of innovation in technological projects, nor did any study show the skills of the design of augmented reality and its relation to motivation towards achievement (only the study of Zein (2018) presented the idea of providing a proposed educational program to develop the technical design skills of the augmented reality of the students of Princess Nora University and measuring the impact on their learning motivation. To achieve the objectives of the study, a list of the skills of educational design for the augmented reality technology and the evaluation of the technological product was developed, and the motivation for learning from the point of view of the students as well. The findings resulted in the extent to which students benefited from the program and achieved the level of proficiency in technical design skills of augmented reality and increased their motivation to learn.

With the design of the e-learning environment in a holistic way, we must take into consideration the theme of motivation. Keller (2008) points out that most learning environments employ technology to help learners learn, some of which are self-directed, ie driven by learners. Hartnett, St George, and Dron (2011) report that motivation is the process directed at stimulating the learner, raising and increasing his activity, influencing what to learn, how to learn, when to learn, and how to choose learning and learning speed. Mekdad (2010) points out that the increase in motivation in e-learning is different from the traditional learning position, as this position includes one party from

both ends of the educational process, which is the learner, and this does not apply to the e-learning position.

Hartnett, St George and Dron (2011) argues that research on motivation in e-learning environments has taken two forms: a personality-based model, which sees motivation as an attribute or characteristic of the learner, and that learners in the e-learning environment in general have motivation The other approach is that it is necessary to design the electronic environment in order to support and increase the learner's motivation and speed of learning. Several studies have found that it is advantageous to use the augmented reality in education to develop achievement and motivation (Bacca.et.al, 2014), increase interaction and cooperation among learners (Mohammed, 2017), and improve their performance (Tan and Lee, 2017).

Blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace (Garrison & Vaughan, 2008).

The promotion of a culture of innovation in higher and tertiary education is by transforming universities into innovative and cultivated institutions, through the adoption of new ideas and cultural diversity, a system of incentives, decentralized decision-making mechanisms, entrepreneurship, financial support, technological innovation and modernisation. The scientific community has the responsibility and duty to start specific experiments to build on previous successes and failures and to formulate an Arab project to invest on science, technology and innovation for development and prosperity so that we can change the policies and trends of universities across the region and the revival of houses of wisdom and the settlement of reason and social peace in the Arab world.

This is what the Ministry of Higher Education has sought to develop in the University's Agency for Business and Cognitive Creativity and in response to developments and advances regarding the role of the university in consolidating the principles of the knowledge economy, building the knowledge society, increasing the role of the Agency and expanding its work to comply with the vision of the Kingdom 2030 and the National Transition Program 2020 to improve the educational environment that stimulates creativity and innovation and to enhance the capacity of the education system to meet the requirements of development and the needs of the labour market and to increase public and private sector participation in education in order to diversify innovative sources of financing and improve the financial efficiency of the education sector.

This study is the only one dealing with the aspect of augmented reality design. (within the knowledge of the researcher) and the need to develop the skills of technical design and augmented reality of students and measuring their motivation for innovation projects.

Taibah University benefited greatly from the changes. This has led them to adopt many methods and strategies for innovation and novelty, in addition to the large role of information technology in managing this process as a basis for a knowledge economy

capable of generating, employing and integrating knowledge into the production system. It is one of the most important goals of the national transformation program to achieve the Kingdom's 2030 vision. It was adopted by Taibah University in its strategic plan.

Research problem:

The reason of the research problem came from: Through the reading of the literature in the field of e-learning, the researcher found the scarcity of studies that addressed the skills of the design of the augmented reality for students in the tasks assigned to them to do, The scarcity of research related to the tools of augmented reality design, And the need to provide students with technical design skills for augmented reality.

Through the above can identify the problem of research in the following main question: What is the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology among students of Taibah University? This main question is divided into the following sub-questions:

1) What is the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology on the cognitive achievement among students of Taibah University?

2)What is the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology on the scale of the evaluation indicators of achievement projects among students of Taibah University?

Limits of the research:

- Objective Limits: The current studying is limited to blended learning in developing the skills of producing the augmented reality technology

- Space Limits: Taibah University is in the Western region of Saudi Arabia and it covers five governorates: Madinah, Al-`` Ula, Badr, Khaybar and Yanbu.

- Time Limits: The second term of the academic year 2018/2019.

- Other Limits: Developing The skills of producing the augmented reality technology based On " Blippar " tool users in the program of Innovation and Entrepreneurship Management projects in Taibah University.

Search procedures

First: Research Methodology:

To test the validity of the research questions and to answer its questions, the current research has followed the semi-experimental approach, which is best suited to the effectiveness of a Program based on Blended Learning in Developing the Skills of Producing the Augmented Reality Technology in innovation projects of students enrolled in the Innovation Management Program and the University of Taiba.

The research was based on semi-experimental design, where the sample was divided into two groups (experimental group and control group).

Second: The research community and its design: Where the research community of all students enrolled in the program of management innovation and entrepreneurship at the University of Taibah. The study sample consisted of female students enrolled in the program of Innovation and Entrepreneurship Management at Taibah University for

the year 2018. The total number of female students was 64, with 33 students as experimental group and 31 females as control group.

Third: Research tools and materials

The following is a description of the preparation of research tools and materials in detail:

First: The achievement test:

The collection test was prepared according to the following steps:

Objective of the achievement test:

The goal of the achievement test to measure achievement in innovation projects was designed using the Blippar tool for students enrolled in the Bloomberg Innovation and Entrepreneurship Management Program at the Bloom (recall, understanding, analysis) levels. The purpose of its application is to ensure that the two groups are equal in terms of prior knowledge. It is a comparison of the collection of experimental and control groups to determine the effect of the independent variable - a proposed electronic program based on the "Blippar" tool - that was experienced by the experimental group.

Determination and distribution of test scores:

The number of test paragraphs was determined by (15) paragraphs. The table shows the number of test subjects at each cognitive level (memory, comprehension, analysis).

The test paragraphs were distributed on each subject as follows:

Table (1): Table of specifications for the achievement test

م	Subject	Number of paragraphs in cognitive levels			Sum
		Memory	Understanding	Analysis	
1	Historical stages of the development of augmented reality	-	-	1	1
2	Defining the augmented reality	-	-	1	1
3	The difference between augmented reality and virtual reality	1	-	2	3
4	How augmented reality works using enhanced reality tools	1	3	1	5
5	Uses of augmented reality in their lives	1	2	2	5
Sum		**3**	**5**	**7**	**15**

Draft Vocabulary:

The test consisted of 15 multiple-choice questions. The test instructions were formulated in clear terms that included the purpose of the test and the specified time. It also took into account the conditions that must be taken into consideration when preparing multiple choice tests: (Alternatives are independent of each other - Number of Alternatives (4) - Order of Alternatives Descending - Correct answer position among randomized alternatives - all alternatives are fairly homogeneous).

Validity of the used test:

The validity of the test is confirmed by the use of honesty: the honesty of the arbitrators. This type of honesty is achieved by presenting the test to a number of specialists and experts in the field to measure the test, to judge the conformity of the test paragraphs with the content of the collection area and its objectives. The test was presented in its initial form to a group of experienced and specialized arbitrators from the teaching staff of the Department of Educational Technology, the Department of Computer Science, as well as from the Ministry of Education. The views agreed upon by most of the arbitrators were adopted, and the amendments were made, and the test was therefore finalized.

Reliability of the used test:

Alpha-Kronbach's stability was measured in order to calculate the stability of the test axes and its overall grade using the statistical package for social sciences (SPSS).

Third: Enhanced Reality Technology:

The enhanced reality technology based on the "Blippar" model according to the international model (ADDIE MODEL) is designed for its research. This model consists of five stages:

First: the analysis phase: the first stage of the educational design, and at this stage was analysed the needs of the design process according to the following steps:

1. Objective Analysis: The goal of the enhanced reality based on the Blippar tool was to provide the proposed electronic program in a way that facilitates understanding and understanding of the scientific and technical knowledge and concepts, and to create an atmosphere of enthusiasm and interaction between the students of Innovation and Entrepreneurship.

2. Analysis of the Characteristics of Learners: The students enrolled in the Innovation and Entrepreneurship Management Program in the first work plan for 2018 are between 19 and 22 years old.
3. Analysis of the educational environment: It was confirmed that students know the skills of dealing with computers and smart devices, and provide smart devices and tablets for each student of the experimental group, and make sure that it works correctly and provide the In Second: Design:

Second: This is the stage of the educational design, in which the following is done:

1. Formulate behavioural objectives to be comprehensive and measurable.
2. Scriptwriting A detailed and complete structure of the Blippar-based reality-based technology, including interfaces and timeframes, and how to present content, activities and the final evaluation in paper format has been developed.
3. Collecting resources, physical and software work requirements, images, sounds, video clips, etc.
4. Methods of evaluation, where the methods of evaluation of the following stages:

- Tribal evaluation: represented in the tribal application of the test of achievement .
- Structural evaluation: It is represented in the questions asked after each part of the proposed electronic program internet.
- The final evaluation: It is in the post-application of the achievement test and the momentum gauge.

Third: Development stage:

This is the third stage of educational design. At this stage, educational media is being prepared using a set of programs and applications to develop the enhanced reality based on the Blippar tool, namely powtoon / 3d max / Moovly / Audacity / Active Presenter

Fourth: Implementation:

Where at this stage was the following:

1. Registration and creating an account in Blippar
2. Create a project and choose a tag (Trigger Image)
3. Create digital content built-in image.
4. the inclusion of a three-dimensional and the creation of more than a scene and the link between the scenes, as shown in Figure (1).

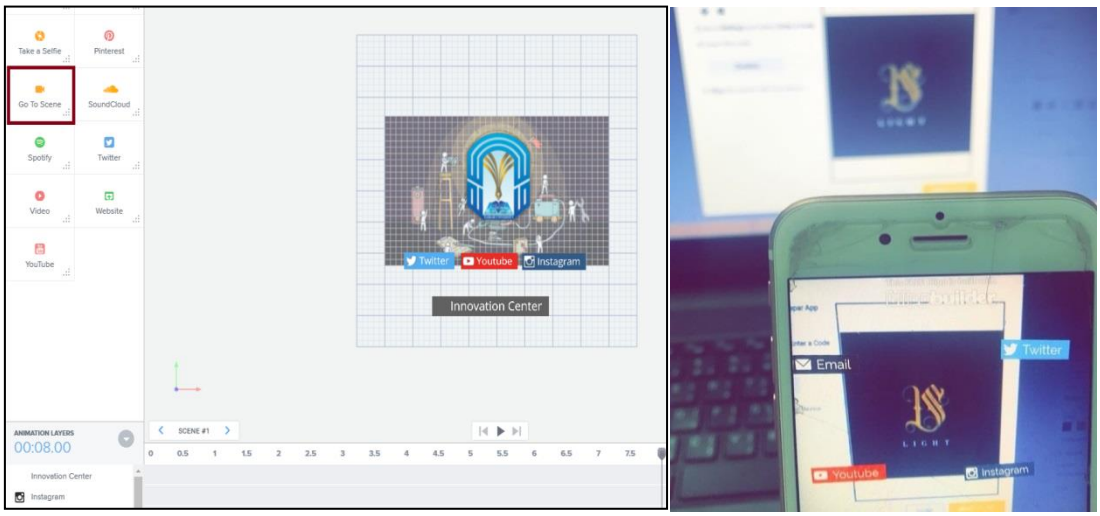

Figure (1): digital content built-in image

Fifth: Evaluation Stage:

After the completion of the enhanced reality technology, it was presented to a group of experienced and competent arbitrators to determine their suitability, suitability for their purpose, their observance of educational and technical standards, their suitability to the age group of the students and their suggestions of addition, modification or deletion. And their quality within the framework of their specific objectives.

Search results:

First: verifying the equivalence of the two groups:

1. Verification of the equivalence of the two groups in the pre-application of the test of achievement:

In order to verify the equivalence of the control and experimental groups, the statistical differences between them must be identified in the tribal application to test the cognitive achievement of the technical skills of the enhanced reality at all cognitive levels represented by the test (memory, comprehension, analysis) and the total test. For this purpose, the following has been used:

- Independent Samples T Test (T). Table (2) shows this.

Table (2)

T-test results for independent groups to identify differences between the control and experimental groups in the tribal application to test the cognitive achievement of technical

Cognitive levels	the group ...	the number	SMA	standard deviation	The difference between the two averages	Value t	Level of significance
memory	Control	31	2.71	0.783	0.04	.220	.826
	Experimental	33	2.67	0.777			
Understanding	Control	31	1.26	0.930	0.14	.601	.550
	Experimental	33	1.12	0.893			
Analysis	Control	31	1.13	0.341	0.07	.930	.356
	Experimental	33	1.06	0.242			
Total achievement test	Control	31	5.10	1.700	0.25	.609	.545
	Experimental	33	4.85	1.564			

Table (2) shows:

- The mean of the control group students in the tribal application to test the cognitive achievement of technical design skills. The enhanced reality at the memory level is 2.71 and the experimental group is 2.67.

- The mean of the control group students in the tribal application to test the cognitive achievement of technical design skills. The enhanced reality at the level of understanding is (1.26) and the experimental group is (1.12).

- The mean of the control group students in the tribal application to test the cognitive achievement of technical design skills at the level of analysis is (1.13) and the experimental group is (1.06).

The mean of the control group students in the tribal application to test the cognitive achievement of the technical design skills of the overall enhanced reality is (5.10), and the experimental group is 4.85

There are no statistically significant differences in the tribal application to test the cognitive achievement of technical design skills in the enhanced reality at all levels of Cognitive knowledge represented by the test (memory, comprehension, analysis) and total testing, where all levels of significance for T test are greater than (0.05).

The results above show equality between the control and experimental groups in the tribal application to test the cognitive achievement of the technical skills of the enhanced reality at all Cognitive levels represented by the test (remembering, understanding, analysing) and overall testing.

Second: Verification of the questions of the study:

• The first question: What is the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology on the cognitive achievement among students of Taibah University?

To validate this questions was used:

- Independent Samples T Test (T) to identify the statistical differences between the average scores of the students of the control and experimental groups in the post application to test the cognitive achievement of the technical skills of the enhanced reality design.

ETA box (□2) to identify the impact of teaching using a suggested program based on blended learning in the development of knowledge achievement of technical design skills enhanced reality, in the experimental group compared to the control group.

Black equation for the average gain, to verify the effectiveness of teaching using a suggested program based on blended learning in the development of knowledge achievement of technical design skills enhanced reality of students in the experimental group.

Table (3)

T-test results for independent groups to identify differences between the control and experimental groups in the post-application to test the cognitive achievement of technical design skills enhanced reality

Cognitive levels	the group	the number	SMA	standard deviation	The difference between the two averages	Value t	Level of significance
memory	Control	31	4.32	1.045	2.07	9.417	.000
	Experimental	33	6.39	0.659			
Understanding	Control	31	3.29	0.973	1.47	7.511	.000
	Experimental	33	4.76	0.502			
Analysis	Control	31	1.90	0.539	0.91	7.805	.000
	Experimental	33	2.82	0.392			
Total achievement test	Control	31	9.52	2.350	4.45	9.281	.000
	Experimental	33	13.97	1.311			

Table (3) shows:

- The mean score of the control group students in the post-application to test the cognitive achievement of technical design skills is enhanced at memory level (4.32), and the experimental group is (6.39).

- The mean score of the control group students in the post-application to test the cognitive achievement of technical design skills at the understanding level is (3.29), and the experimental group is (4.76).
- The mean score of the control group students in the post-application to test the cognitive achievement of technical design skills at the analysis level is (1.90), and the experimental group is (2.82).
- The arithmetical mean of the control group students in the post-application to test the cognitive achievement of technical design skills of the overall enhanced reality is (9.52), and the experimental group is (13.97).
- There are statistically significant differences in the post-application of the cognitive achievement test of the technical design skills of the enhanced reality at all cognitive levels represented by the test (memory, comprehension, analysis) and the total test. All of these differences were in the direction of the students of the experimental group with the highest mathematical averages.
- The above results indicate a positive effect of teaching using a suggested program based on blended learning in the development of the cognitive achievement of technical design skills in the experimental group compared to the control group students at all levels of knowledge represented by the test) and the overall test.

Table (4)

The result of ETA (2 η.) to measure the effect of teaching using a suggested program based on blended learning in the development of cognitive achievement of technical design skills in the experimental group compared to control group

Cognitive level	The average of the control group	The average of the experimental group	ETA box	Size of the effect
memory	4.32	6.39	.595	high
Understanding	3.29	4.76	.486	high
Analysis	1.90	2.82	.496	high
Total testing	9.52	13.97	.590	high

Table (4) shows that all ETA values for the levels of cognitive achievement testing for technical design skills are enhanced (0.14) identified by Cohen to determine the magnitude of the high impact. This result indicates that there is a strong positive effect of teaching using a suggested program based on blended learning in the development of knowledge acquisition of technical design skills enhanced reality among experimental group students compared to control group students.

Table (5)
The result of the average gain equation for verifying the effectiveness of teaching using a suggested program based on blended learning in the development of the cognitive achievement of technical design skills enhanced reality

Cognitive level	Tribal average	Post-average	The final grade	Average gain
memory	2.67	6.39	7	1.39
Understanding	1.12	4.76	5	1.67
Analysis	1.06	2.82	3	1.49
Total testing	4.85	13.97	15	1.51

It is clear from Table (5) that teaching using a suggested program based on blended learning has a high degree of effectiveness in the development of the knowledge achievement of the technical design skills of the experimental group students. All values of the average gain ratio were greater than (1.20) It is defined by Black to prove effectiveness.

Based on the results shown in Tables (4) to (5), the questions of the first study that confirmed the positive and effective effect of teaching using a suggested program based on blended learning in the development of the cognitive achievement of the technical design skills of the experimental group From the University of Taiba.

The result of the first questions can be explained by indicating that the present research - within the limits of the researcher knowledge - is unique in its variants (independent / a suggested program based on blended learning, the construct and product evaluation) and the Zein study (2018), the study of Fritas and Campos (2008), and the results of the present study were consistent with previous studies (Kose et al., 2013), Chen et al. That learning programs, environments and systems have contributed to the delivery of knowledge content, increased efficiency of educational outcomes and increased retention of information and there were differences between the groups in the cognitive side, and came different with the study and study of Abu Khater (2018), as the study did not show any effectiveness on the side of achievement attributed to the factor of memory of cognitive information, which has already been studied in the previous semester.

The researcher attribute the result of the questions of the study to:

- The use of the suggested program based on blended learning, gave the faculty member the opportunity to present the concepts of study in a different way from the traditional teaching, so that the student has a positive role and effective in obtaining information, and discuss with colleagues to get to the concept in a correct manner, Which enabled it to complete the planned projects in an innovative manner. In addition, the teaching through this program included tasks and interactive activities that helped in developing the students' abilities to understand and absorb the information and facts, and then develop their abilities to employ this information in the planned projects.

5. The second question: What is the effectiveness of a program based on blended learning in developing the skills of producing the augmented reality technology on the scale of the evaluation indicators of achievement projects among students of Taibah University?
6. To validate this question was used:

- The arithmetic mean, the standard deviation, the ranking and the estimation of the grades obtained by the students of the experimental group according to the standards and indicators of the quality of the educational product.
- Test (T) for each group with the default setting at (3.25).

Table (6)

Arithmetical mean, standard deviation, test value of one group, rank and grade of grades obtained by the experimental group according to educational product quality standards and indicators

Number	Product quality standards	SMA	standard deviation	Ranking	Class	Value (T)	Level of significance
1	Script writing	3.62	0.354	4	Excellent	6.005	.000
2	The content of the educational product	3.63	0.328	2	Excellent	6.702	.000
3	Product educational media	3.62	0.302	3	Excellent	7.038	.000
4	Use colors	3.60	0.330	5	Excellent	6.036	.000
5	Writing texts	3.47	0.391	7	Excellent	3.275	.003
6	Illustrations and hotos	3.48	0.379	6	Excellent	3.473	.001
7	sound effects	3.65	0.349	1	Excellent	6.528	.000
	Overall evaluation	3.58	0.300		Excellent	6.352	.000

Table (6) for the averages of the scores obtained by the experimental group students according to the product quality standards and indicators shows the following:

• All of the criteria are (excellent) where the means are in the category of estimation (3.25 to less than 4.00) and is arranged as follows:

- The quality of the sound effects in the educational product.
- Quality guaranteed product tutorial.
- The quality of the instructional product.
- Quality script writing product tutorial.
- Quality of use of colours in the educational product.
- The quality of illustrations and images in the educational product.
- The quality of writing the text of the educational product.

The criteria as a whole for the evaluation of the product of the experimental group students (studied using a suggested program based on blended learning) came in "excellent" and an average of (3.58) from (4.00).

• The results in Table (6) showed statistically significant differences at the level of α (0.05) between the average scores of the students of the experimental group (which were studied using a suggested program based on blended learning) And the mean (3.25) for the average grade of female students.

Based on the above results, it is possible to say that the results of the current study were agreed with the study of Zein (2018), which used a product assessment card to evaluate the products of the students of the program proposed in the present study. The researcher attribute this result to the nature of the proposed program and its content, In addition to allowing them to practice the skills and train them according to the self-step, which reflected their products from the enhanced reality.

Conclusion:

This study addressed two important topics at the global level, which measured the effectiveness of blended learning in the field of educational technology to develop skills of learners in general and also in the field of the augmented reality environment in particular, especially at universities at Saudi Arabia. The researchers faced a lot of difficulties during performing the experiment tools, due to the culture of the students, University environment and poor facilities.

The results of research indicates that there is a strong positive effect of teaching using a suggested program based on blended learning in the development of knowledge acquisition of technical design skills enhanced reality among experimental group students**.** The result of the research can be explained by indicating that the present research - within the limits of the researcher knowledge - is unique in its variants (independent / a suggested program based on blended learning, the construct and product evaluation)**.**

In this study, the students involved in the study had an opportunity to have a positive and effective role in gaining the information. They discussed with their colleagues in order to get the correct concept manner. Moreover, teaching Using this program included tasks and interactive activities that helped in developing the students' abilities to understand and absorb the information and facts, and then develop their abilities to employ this information in the planned projects. The researcher utilized the suggested program in presenting a diffrent way of study concepts rather than the traditional teaching concepts. Teaching through this program added environments and systems have contributed to the delivery of knowledge content, increased efficiency of educational outcomes and increased retention of information.

Study Recommendations:

Based on the results of the study, the researcher recommend the following:

1) augmented reality applications should be used to become the standardized version adopted for developing electronic content and preparing future teachers to meet the needs of the community.
2) Work on the processing of the university and the academic sections in educational halls equipped with all devices and screens and linked to the Internet service that enables the faculty member to use technology in teaching.
3) faculty members should be encourged to produce and integrate the augmented reality applications in their teaching in all the courses of the different majors in the university levels.
4) Stay away from traditional methods of teaching, because it is characterized by this method of limited interest and lack of element of suspense of female students.

References:

Abu Khater, S. (2018). Effectiveness of a program that employs enhanced reality technology in the development of some robotics skills in the technology curriculum of 10th grade students in Gaza, *unpublished master thesis*, Faculty of Education, Islamic University of Gaza. (IN Arabic)

Abu Rous, A. ,& Shazly, D. (2018). The Role of the Enhanced Reality in Teaching Arabic and the Arab-Islamic Culture to Non-Arabic Speakers, available on January 14, 2020, http://www.m-a-arabia.com/vb/showthread.php?t=31840 (IN Arabic)

Ahmed, H. (2017). Digital design of virtual reality technology in light of the quality of e-learning. *Palestinian Open Learning Magazine*, 6, pp. 65-80. (IN Arabic)

Alokluk,J. & Al-Amri, A. (2019).The Role of Learning Management Systems (LMS) in Developing Learning Skills: The Case of Blackboard. International Journal for Innovation Education and Research (IJIER), Vol 7 No 8 (2019). (IN Arabic)

Al-Sharif, B. & Al-Mas'ad, A. (2017). The effect of using the enhanced reality in the computer material on the achievement of third secondary students in the Jazan region. *International Specialized Educational Magazine*, Jordan, International Consulting and Training Group, pp. 220-233. (IN Arabic)

Bacca, J.; Baldiris, S.; Fabregat, R.; Graf, S. & Kinshuk. (2014). Augmented Reality Trends in Education: A Systematic Review of Research and Applications. *Educational Technology & Society*, 17(4), p. 133–149.

Chuah, S. (2018), 'Why and who will adopt extended reality technology? Literature review, synthesis, and future research agenda', *working paper*, Universiti Sains Malaysia, School of Management, Department of Operation Management.

Garrison, D. & Vaughan, N. (2008). Blended learning in higher education: Framework, principles, and guidelines. San Francisco, CA: John Wiley & Sons.

Hartnett, M. & Dronm, J. (2011). Being together - factors that unintentionally undermine motivation. *Journal of Open, Flexible and Distance Learning*, 15(1),1-16.

Keller, J. (2008). First Principles of motivation to learn and e-learning. *Distance Education*, 29(2), 175-185.

Kose, U.; Koc, D.& Yucesoy, S. (2013). An Augmented Reality Based Mobile Software to Support Learning Experiences in Computer Science Courses. *Procedia Computer Science*, Vol. (25), p. 370-374

Larsen, Y. ; Bogner, F. ; Buchholz, H. & Brosda, C. (2011). *Augmented Reality Learning System by Teachers and Students*, open classroom conference augmented reality in education Evaluation of A Portable and Interactive Ellinogermaniki Agogi, Athens, Greece, pp. 41-50 27– 29 October.

Mekdad, M. (2010). Motivation to Education for E-Learning Students, e-Learning *Conference in Promoting Knowledge Societies*, Bahrain. From 6 to 8 April 2010.

Mohammed, H.(2017). Augmented Reality and its applications in teaching and learning. *Studies in University Education Magazine*, Volume 36, Issue 36, Spring 2017, page 571-581. (IN Arabic)

Novell, K. (2010). *Production of virtual reality educational software*, Dar Al-Manakh for Publishing and Distribution, Amman. (IN Arabic)

Qualcomm Technologies, Inc. (2018). The Mobile Future of e-Xtended Reality (XR). Retrieved from: https://www.qualcomm.com/media/documents/files/the-mobile-future-of-extended-reality-xr.pdf

Radu, L. (2012). *Why Should My Students Use AR? A Comparative Review of the Educational Impact of Augmented Reality*, IEEE International Symposium on Mixed and Augmented Reality, Atlanta.

Saqqa, M. ; Madani, M. Al-Abadila, O. ; Ahmed, M.& Abu Harb, M. (2018). The Impact of Enhanced Reality Technology on the Development of Scientific Concepts among 10th Grade Students in Biology. *Director of Education Khan Younis* - Al Haj Mohammed Al Najjar Secondary School for Boys - Palestine. (IN Arabic)

Shami, I. & Judge, L. (2017). Effect of a training program on the use of enhanced reality techniques in the design and production of electronic lessons for the student at the Faculty of Home Economics, Al-Azhar University, *Journal of Faculty of Education*, Menoufia University. (IN Arabic)

Tan, K. & Lee, Y. (2017). *An Augmented Reality Learning System for Programming Concepts.* International Conference on Information Science and Applications, Springer, Singapore, p. 179-187.

Zein, H. (2018). A Proposed Educational Program for the Development of Technical Design Skills in the Students of Princess Noura Bint Abdul Rahman University and its Impact on Increasing their Learning Motivation, *Al-Fath Magazine*, June 74. (IN Arabic)