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RESEARCH ARTICLE

THE POSITIVE IMPACT OF UTILIZING UNIVERSITY BLENDED LEARNING ON STUDENTS' ACQUIRING AND MAINTAINING INFORMATION IN THE FIELD OF COMPUTERS AND INFORMATION NETWORK.

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Abstract

The current study informed us thoroughly about the students' acquiring and maintaining information when utilizing university blended learning in teaching both (computer network) in the departmentof computer and (information network) in the department of information and libraries technologies.The current study aims at identifying the impact of utilizing university blended learning in teaching both (computer network) in the departmentof computer and (information network) in the department of information and libraries technologies on students' acquiring and maintaining information and practical experience, since this is considered as the main goal of the technical education, in order to meet the needs of the private and public sectors. The specimen of the current research consisted of 34 female and male students from each department. These students studied in The Technical Institute of Mosul in the years 2012-2013. In each department, through the main semester, a certain subject was chosen for the practical part and the plans for teaching this subject were set. Also, both an independent and a multiple tests were prepared, then the true and false results were calculated.The study was continued in the second semester, and it was applied on two stages, where in the first stage the students in each department were given the certain subject by utilizing the ordinary traditional procedure, which obliges the students to attend the class, while in the second stage, the same students were taught the same subjects, in a similar period of time, by utilizing the traditional procedures as well as using the world web to obtain more practical and modern information to enhance their education. After each stage, a final test was conducted, then the results were analyzed by using certain programs and statistical methods. The final conclusion was that the students showed more mastery in acquiring and maintaining the information. This proves that using the educational aids, internet and the virtual library has a very positive effect in promoting the students marks in the two departments.

Introduction: -

Educators continuously search for the better methods and procedures to secure an interactive educational environment in order to attract the students' attention and urge them to exchange ideas and experiments. Information

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technology, represented by computers, internet and other multimedia and communication means, are considered the most successful ways to secure this educational environment, which combines both theoretical and applied aspects and offers the opportunity for the students to acquire more advanced skills in thinking, as well as setting curricula integrally and connecting them to the local environment and the needs of the society, and finally considering the individual differences between the students which is known as Blended Learning.[1,2,3].

University Blended Learning, which is utilized in the current study is defined as using the modern technology in teaching without abandoning the traditional education methods, which obliges the students to attend personally to the classroom where the direct interactive is conducted through utilizing modern communication technologies such as computers, networks and internet websites. This form of learning can be described as the method in which information, situations and educational experiences which are offered to the students are organized by different types of multimedia offered by the modern technology or information technology. This form of learning can reduce time, effort and cost by delivering information to the students in the shortest period of time. Of course, this procedure can control and adjust the educational operation, evaluate the students' performance, as well as improving the general level of learning and securing an attractive educational environment [4,5].

Traditional learning and Blended learning

Blended learning is considered complementary to the traditional learning methods which depends completely upon attending to the classroom, because information technology is not an aim or a goal in itself, but a mean to deliver knowledge and achieve the known purposes of learning and education. Also, combining both the traditional and blended learning makes the students ready to meet the needs of life which depends, in a way or another, upon the information technology. Thus, blended learning is merged with the traditional learning technique to support it easily, quickly and clearly. Blended learning cannot be considered successful if it lacks some major factors that are available in the current traditional learning [6,7,8,9].

Blended learning, or learning by utilizing modern technology may face some opposition which may hinder its success, in case blended learning violated the current learning procedure, or threatened one of its bases, meaning the educator and the student who represent the major conditions for the success of this type of learning which is meant to be complementary to the traditional learning techniques. Thus, the educator must be competent in using modern learning technologies and different means of communication. As well, the student must have certain skills for using computers, internet and e-mail. Moreover, an adequate infrastructure must be secured. This infrastructure is represented in preparing trained human resources and offering the communication lines required for transferring this kind of learning to classrooms, as well as offering hardware and software required for this kind of learning. Applying the curricula and methods of blended learning requires the following [10,11,12]:

1. Providing computer laboratories and enabling the student to use local and global networks.
2. Providing both the educator and the students with the necessary skills for using multimedia, through starting adequate training courses.
3. Providing the curricula necessary for this type of learning.
4. The educators must be leaders and instructors for the students by instructing them how to use computers and their applications, local and global networks and producing various and adequate subjects to teach.

Hence, blended learning depends totally upon both the multimedia and traditional learning, since all what have been said previously about the modern learning technologies lies under multimedia which is a must in blended learning.

Multimedia

A common term in the field of computers, referring to using different media means to deliver information such as (text, voice, drawings, animated photos, videos and interactive applications). Educational movement had passed a series of changes and developments since it is considered a continuous and progressive procedure which has many elements and approaches until it reached to what we call today (digital learning); a type of learning which the huge development in computers and software manufacturing helped to exist; consequently, hopes promoted that this stage of civilization that humanity lives will make the old dream of pushing education to the farthest limits of knowledge come true. Of course, this is possible only by offering knowledge to all the people no matter the social differences, places and economical dissimilarities between human societies. Experts in learning and education see in these accelerated jumps in technological development an easy way to education independence. Besides, these jumps allow the student to practice his/her moral responsibility towards the subjects he learns through exploring, expressing, trying and simulating by using the help which the computer software offer today. So, educators of different

backgrounds and philosophical believes agreed that using the modern computer technologies to organize the educational process is very necessary, and there is no way to leave these technologies and return to old times. These educators expressed this concept as the "Future School" at the beginnings of the electronic learning. Recognizing and imagining the new information depends on variating the methods of presenting and delivering these information to the student, as the desire for learning increases when audio-visual effects are added to the learning system (researches show that man receives more than 80% of knowledge through hearing and seeing senses together, and about 13%-20% through the hearing sense only and finally about 1%-5% of knowledge through the touch, taste and smell senses). Thus, selecting and utilizing multimedia technologies became very important to present information. Multimedia as a term is composed of two words: multi and media and is defined as a group of computer applications which can save information as various forms including texts, photos, animated photos and voices, then presenting this information interactively according to the user requirements. Thus, it is clear that multimedia is a merging process between computers and educational means to produce a subdivided interactive environment which contains voice, image and video software which are connected to each other by the graphics used in these software [13,14,15,16].

Electronic learning (e-learning)

E-learning refers to the integrated future learning system for all stages. This means that the term (e-learning) will become the basic and natural replacement for the current term (learning) and eventually the term (e-learning) will vanish gradually since it will be the only learning system [17,18,19].

1. When the color TV first appeared, we used to say that someone bought a (color) TV set. Now, the world (color) does not have any significance since the color TV is the most common type of TV sets, on the contrary, the exception is the black and white TV sets, and the sailor should tell you about this exception. The same will be applied to e-learning in the forthcoming future.
2. Utilizing (on line learning) is something useful and wished for, but it remains ineffective and incomplete if it is not attached with the basic integrated e-learning technologies. Many people do not distinguish between (distance learning) and (e-learning), where the latter is an integrated system of data, concepts, and interactive tools which are used in the learning environment. Thus, e-learning is much more than the distance learning.
3. Future e-learning has an integration in its elements and activities starting from designing the curricula and ending with setting the tests and the continuous evaluation systems. Future e-learning focuses on both the comprehensive and specialized knowledges at the same time. This aim is achieved through using the systems of communication and information technologies and adapting them to enrich the learning stages with sources, tools, and the required educational and technical solutions. In addition, the future e-learning applies the global educational standards and criteria. It also emphasizes on evaluating the outputs and quality of the learning continuously.
4. Future e-learning is a modern and sophisticated technique which depends on using management knowledge and on the wide participation of educators as a main part of learning tools to build the required specialized and comprehensive skills of the learners.

Rationale behind the Study

Depending on what have been mentioned earlier, and by utilizing the multimedia, e-learning technologies and blended learning technologies, the current study was conducted. The latter showed a full understanding about the positive impact on students' acquiring and maintaining information when utilizing the university blended learning in teaching (computer networks) in the computer department and (information networks) in the department of information and libraries.

Aims of the Study

The current study aims at identifying the impact of utilizing the university blended learning in teaching (computer networks) in the computer department and (information networks) in the department of information and libraries on students' acquiring and maintaining information as a main goal of the technical education to meet the requirements of the public and special work market.

The Study Specimen

The specimen consisted of 34 male and female students from each department (computer department and the department of information and libraries technologies) in the technical institute of Mosul from the year 2012-2013. A subject from each department was selected to teach through the semester. The plans for teaching the selected

subject in each department were set, and a final independent and multi-choice tests were prepared, and true and false values were calculated.

The research continued along the second semester and was conducted on two stages. On the first stage, students in each department were taught by using traditional learning techniques which urges the student to attend personally to the classroom. On the second stage, the subject was given to the students through the same time but by using the same traditional techniques in addition to using world web technologies to collect modern and real information to enhance and enrich the learning process. The final test was conducted after each stage, other tests to measure the information acquired by the students were conducted and analyzed.

By using certain software and statistical analyzers the current study showed that the students were excellent in acquiring and maintaining information during the second stage. This proved that using learning aids, internet and virtual library has a great effect in promoting the marks for both genders and departments.

Analysis and Discussion of Results

The results of the study were conducted on a specimen consisted of 34 students from the computer department and 34 students from the department of information and libraries technologies. Ordinary lectures were given to the students, then a pretest was conducted. Later, the same lectures were given by using learning aids, internet and Cisco Packet Tracer in the (computer networks) subject in the computer department, and also using internet and the virtual library (IVSL) in the (information networks) in the department of information and libraries technologies, then a post test was conducted.

The results of the T-Test which was conducted on individual subjects represented by the students of the computer department and the department of information and libraries are shown in table no.1. This table shows that the mean level of students' marks in the pre-test was 63.07, while after using the mentioned educational aids and the internet the mean level of marks after the post test was 74.59 meaning an increment of 15.8 %, a remarkable increment was (sig=. 000000083) as shown in table no.2, which is for the Independent Samples test Sig 2-tailed).

Table (1) Group Statistics

	TYPE	N	Mean	Std. Deviation	Std. Error Mean
EXAM	bef	64	63.0781	15.0442	1.8805
	aft	64	74.5938	12.8727	1.6091

Table (2) Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
EXAM	Equal variances assumed	.851	.358	-4.653	126	8.3E-06	-11.5156	2.4750	-16.4135	-6.6177
	Equal variances not assumed			-4.653	123.057	8.3E-06	-11.5156	2.4750	-16.4147	-6.6166

Also, it can be seen from table no.1 that the drop in the standard deviation for the results of the post test was 2.13 if compared to the standard deviation of the students' marks in the pre-test, which indicates the significant impact of using internet based learning aids on promoting the mean level of the students' marks as well as reducing the standard deviation and the contrast between the students' marks and general arithmetic mean for both departments leading to reducing the differences between the students' levels in understanding and comprehending lessons.

Concerning the results of the T-Test, and when a comparison between the students in the two departments was made, no remarkable differences were recorded in the mean level of marks of both the pre-test and the post-test as shown in table no.3, which shows that the mean level of the students of the computer department students' marks was 69.42, while the mean level of the information and libraries technologies department students' marks was 68.25,

moreover, there were no significant differences between the mean level of the students' marks in both departments and for both the pre-test and post-test, i.e. (sig=.66) as shown in table no. 4.

Table (3) Group Statistics

	SPEC	N	Mean	Std. Deviation	Std. Error Mean
EXAM	comp	64	69.4219	14.5349	1.8169
	librar	64	68.2500	15.7299	1.9662

Table (4) Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
EXAM	Equal variances assumed	.260	.611	.438	126	.662	1.1719	2.6771	-4.1261	6.4699
	Equal variances not assumed			.438	125.222	.662	1.1719	2.6771	-4.1264	6.4702

Concerning the effect of students' gender in both departments on the mean level of marks of the pre-test and the post-test, the results showed that the mean level of the male students' marks was 70.46, while the mean level of the female students' marks for both departments and tests was dropped to 67.43 as shown in table no.5. This drop was not significant (sig=0.234), table no.6.

Table (5) Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
EXAM	m	56	70.6429	15.9127	2.1264
	f	72	67.4306	14.3839	1.6952

Table (6) Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
EXAM	Equal variances assumed	1.167	.282	1.196	126	.234	3.2123	2.6851	-2.1015	8.5261
	Equal variances not assumed			1.181	112.060	.240	3.2123	2.7194	-2.1759	8.6005

Using Univariate Analysis of Variance to identify the effect of Type, Spec. and Gender as shown in table no.7 which represents the Test Between-subject Effect, no remarkable effect regarding Spec. and Gender on the mean level of the students' marks was recorded, i.e. sig. was 0.193, 0.439 for both Spec. and Gender respectively. The effect of the test Type (pre-test or post-test) on the mean level of marks for both departments was significant (sig=.00001).

Table (7) Tests of Between-Subjects Effects

Dependent Variable: EXAM

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6153.277[a]	7	879.040	4.629	.000
Intercept	600524.420	1	600524.420	3162.281	.000
SPEC	114.524	1	114.524	.603	.439
GENDER	325.045	1	325.045	1.712	.193
TYPE	4181.703	1	4181.703	22.020	.000
SPEC * GENDER	1088.711	1	1088.711	5.733	.018
SPEC * TYPE	451.920	1	451.920	2.380	.126
GENDER * TYPE	7.750E-02	1	7.750E-02	.000	.984
SPEC * GENDER * TYPE	5.732	1	5.732	.030	.862
Error	22788.278	120	189.902		
Total	635455.000	128			
Corrected Total	28941.555	127			

a. R Squared = .213 (Adjusted R Squared = .167)

Regarding the effect of the interference between the three factors, (Type), (spec.), and (Gender) on the mean level of students' marks, table no.8 which represents the interference between the gender and type shows data related to Dunken's test for the mean level of students' marks can indicates the following:

The mean level of the male students' marks in the post-test was 76.428, leading to an increment of 17.84 % if compared to the mean level of the male students' marks in the pre-test, with significant differences at a probability of 5% sig=0.05. the mean level of female students' marks for both departments was 73.166 in the post-test, 61.694 in the pre-test, with an increment of 18.59 for the post-test and significant differences at a probability of 5%, sig=0.05. Also, it can be seen that the percentage of using internet-based learning aids was convergent for both genders regardless of the scientific department but with a slight increment of 0.7% for the female students.

Table (8) Interaction between type of exam and gender

		GENTYP	N	Subset 1	Subset 2
Duncan	a,b,c	f-bef	36	61.6944	
		m-bef	28	64.8571	
		f-aft	36		73.1667
		m-aft	28		76.4286
		Sig.		.371	.356

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 196.556.

a. Uses Harmonic Mean Sample Size = 31.500.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

c. Alpha = .05.

Concerning the interference between (Spec.) and (Type), table no. 9 indicates that the mean level of the students' marks, for both genders in the post-test was 75.87 when teaching (information networks and internet) in the department of information and libraries technologies, while the value for the pre-test for the same department and subject was 60.62, an increment of 25.15% for the post-test. This increment was significant at a probability of 5% (sig=0.05) according to Dunken's test of means.

Table (9) Interaction between type of exam and spec.

	TYP_SPEC	N	Subset 1	Subset 2
Duncan[a,l]	bef-librar	32	60.6250	
	bef-comp	32	65.5313	
	aft-comp	32		73.3125
	aft-librar	32		75.8750
	Sig.		.160	.463

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 195.225.

a. Uses Harmonic Mean Sample Size = 32.000.

b. Alpha = .050.

For the computer department, the mean level of the students' marks for both genders in the post-test (after using learning aids and internet) was 73.31, while in the pre-test it was 65.53, and the percentage of increment in the post-test compared to the pre-test 11.87%. This increment was significant at a probability of 5% (sig=0.05) table no.9. A comparison between the students of the two departments show that the students of the department of information and libraries technologies benefited from using internet and IVSL more than the students of the computer department with an increment of 13.28 %.

Concerning the interference between (Spec.) and (Gender), the data in table no.10 showed that the mean level of the male students' marks in the computer department was 74.533 for both pre-test and post-test, while the mean level of the female students' marks in the same department for both tests was 65.44. This indicates that the mean level of the male students' marks in the computer department was 13.89% more than the mean level of the female students' marks in the same departmentfor both pre-test and post-test. In the department of information and libraries technologies, the mean level of the female students' marks for both pre-test and post-test was 69.416 and with an increment of 3.99% over mean level of the male students' marks for both pre-test and post-test, though this increment was slight and insignificant according to Dunkin's test of means.

Table (9) Interaction between Spec. and gender of students.

	GEN_SPEC	N	Subset 1	Subset 2
Duncan [a,b]	comp-f	36	65.4444	
	librar-m	28	66.7500	
	librar-f	36	69.4167	69.4167
	comp-m	28		74.5357
	Sig.		.322	.172

Means for groups in homogeneous subsets are displayed.
Based on Type III Sum of Squares
The error term is Mean Square(Error) = 221.644.

a. Uses Harmonic Mean Sample Size = 31.500.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

c. Alpha = .05.

Conclusions and Recommendations: -

The current study aimed at investigating the effect of utilizing the internet-based learning aids as compared to the traditional learning techniques in both the computer department and information and libraries technologies. The study clarified the significance of using multimedia, internet and IVSL on promoting the mean level of the students of both genders and in both departments. This value was 74.59 when using multimedia, while it was 63.07 in both departments when multimedia was neglected. The results also indicated that gender had no significant effect on the mean levels of both genders, where the male students scored 76.428 and the female students scored 73.166 when using multimedia. In case of not using multimedia, the male students scored 64.85 while female students scored 61.69. in addition, the difference in specialization had no significant effect on the mean level of marks for both genders and tests, before and after using internet-based multimedia. The following conclusions were recorded:

1. Utilizing sophisticated learning strategies compatible with the nature of the blended learning, since the latter is considered as a modern development which will take traditional learning into new horizons.
2. Producing multimedia-based learning materials which take into consideration the individual differences between the students.
3. Interest in the training of students on the use of different educational techniques and the requirement of student success in the practical aspect of success in the article.
4. The allocation of specific dates published on the website of the university on the Internet where the college supervises the training of students on the skilled side of the courses to enable them to go out to the group in preparation suited to the nature of the age.
5. It is necessary to hold training courses and seminars and workshops ongoing to train faculty members on the latest techniques of education.
6. Designing various Internet sites that provide continuous training programs for teachers during the study as well as during service in different areas.

In a study to demonstrate the use of Internet-supported tutorials comparison to the normal learning method in the Computer Systems Department and the Information Technology and Libraries Department at the Mosul Technical Institute.

Results of the study: -

The high impact of the use of the means of illustration and the use of the Internet and the virtual library in raising the average grades of students and both sexes and sections, where the average grades of students by 74.59 in the case of the use of illustrators, while the average grade of students to 63.07 in both sections in the absence of the use of illustrators. The results also indicate that sex did not have a significant effect on the average grade of students. The average scores for males were 76.428 and females were 73.166 when using the means of clarification. In case of non-use of means of clarification, the average score was 64.85 for males and 61.69 for females. The difference in specialization did not have a significant effect on the scores of students, both sexes, and both tests before and after the use of Internet-supported demonstration tools.

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