

# **FACTORS INFLUENCING THE EFFECTIVENESS OF E-LEARNING SYSTEMS IN THE EDUCATIONAL PROCESS("ELECTRONIC LEARNING SYSTEM") (EDUWAVE): JORDAN CASE STUDY**

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## **Abstract**

This study aimed to reveal the factors effecting the effectiveness of e-learning education in the educational process, through a group of dimension that effect this effectiveness, to achieve the objective of this study the researchers prepare a questionnaire that include (29) paragraph, to collect the primary information from the study sample, and then collecting and analyzing the data and testing the hypotheses using SPSS, the study sample consisted of (111) individuals. Different statistical methods were used to achieve the objectives of the study. After processing the data and the hypotheses of the study, it found the following: The results show that there is an impact of the electronic learning system (Training the users, infrastructures, the system ability, the powers granted for the users,and technological acceptance form) on the effectiveness of the system, and there is an impact of training on the users on the effectiveness of e-leering. The results also show that there is an impact of technological acceptance form on the effectives of e-leaning system. The most important recommendation of the study was: The importance of reconsidering the training courses that are given by the ministry of education, improve it so that it is suitable to the vocational and professional needs for the trainers . Give more interest to the infrastructure technological and technical supplement in order to provide the best climate for the teachers to use the system of e-learning in teaching. And also perform more studies similar to this one to include a wider educational area and a larger study sample, in order to be able to circulate this study.

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**Keywords:** Effective e-learning systems, the Jordanian Ministry of education, infrastructure, technology acceptance model, EDUWAVE system, e-learning system, and Karak governorate

## **Introduction**

To catch up the accelerated technical progress is good and recognized, but in the application of advanced technology in the field of education, it is imposed by social interest economic feasibility and prevailing culture in the country, and is a push force towards a scientific and advanced technology future, because it helps in maximizing the ability to qualify human cadres in various disciplines required by society, achieving that by conventional methods exceeds the capacity of educational institutions, and the provision of these cadres is achieved- thanks to this technique- at significantly lower cost. And achieve equal opportunities for members of the society, as the use of this technique is not limited to the children of cities where educational institutions are available, but it can be supplied with the same efficiency and cost for rural and remote areas to raise the scientific level, and opens to them prospects for contributing in the scientific, productive, economic, agricultural and industrial activities in their communities.

Over the past decade there has been a huge revolution in learning and educational computer applications and the use of computers in education, is still in its first steps that increases day by day, but started to take several forms, from computer education to the use of the Internet in education, and finally the concept of e-Learning technical based to provide educational content to the learner in a good and effective way, "through sophisticated computer systems designed for this purpose." There are also a features and benefits of this type of education the most notably of them are the reduction of the time, effort and cost in addition to the improvement of the overall level of academic achievement, teacher-student assistance in providing an attractive learning environment, that does not depend on the place or time (Prof. Muheisen 2010).

There is a real challenge facing the Arabic countries "and Jordan is one of them" now, this challenge is the massive technological development and the information revolution, therefore, Jordan must determine the future vision for the educational process and to make e-learning one of the elements of this vision, and e-learning must be one of the policies that can be useful ,and it should choose what is suitable for it form the different matching multiple e-learning tools and study the experiences of other developing countries with the same

conditions and the use of experts. And to cooperate with each other to Exchange programmes broadcast which will reduce the cost of using eLearning.

### **Research problem**

This study attempts to identify the factors influencing the effectiveness of e-learning systems "EDUWAVE" in the educational process in schools the Ministry of education. The main reason for this is due to the great challenge facing our schools today, which is how to change schools to meet future requirements, including effectively employing different techniques, situated in the so-called "information highway", in general the overall public education schools in order to be equipped to employ technological innovations effectively, it must have good infrastructure, Flexible learning System, and effective management.

From there the idea of the study came to try to figure out the factors that influence the effectiveness of a system, of this type which came to efficiently and effectively serve e-learning objectives, the knowledge came based on the viewpoint of e-learning system users from teachers and school administrators on the grounds, that this category is targeted mainly to use the system to support the educational and learning process, in other words this category which is considered the main beneficiaries of the system.

The problem of study can be formulated through the following questions:

1. Is there a relationship between training users on using e-learning system and the effectiveness of e-learning systems in the educational process?

2. Is there a relationship between infrastructure available to use e-learning system and the effectiveness of e-learning systems in the educational process?

3. Is there a relationship between e-learning system's ability to support the needs of users and the effectiveness of e-learning systems in the educational process?

4. Is there a relationship between the powers granted to users of e-learning system and the effectiveness of e-learning systems in the educational process?

5. Are there a relationship between the technology acceptance model (TAM) and the effectiveness of e-learning systems in the educational process?

6. Is there a relationship between the following factors combined "user training, infrastructure, the ability of the system to meet the needs of users, the powers granted to users of the system and technology model acceptance in the "effective e-learning systems in the educational process?

## **Hypotheses**

This study adopted a set of hypotheses which aimed primarily to know factors influencing the effectiveness of e-learning systems in the educational process. According to the study problem these hypothesis has been formulated as follows:

H1: There is no relationship between the effectiveness of e-learning system in the educational process, and the combined factors influencing the effectiveness (user training, infrastructure, support the needs of users from the system, power granted to the system user, technology acceptance model).

H1.1 Training user of the system does not affect the effectiveness of e-learning systems "Edu-wave" in the educational process.

H1.2 Available Infrastructure does not affect the effectiveness of e-learning systems "Edu-wave" in the educational process.

H1.2 Support the needs of users do not affect the effectiveness of e-learning systems "Edu-wave" in the educational process.

H1.4 Powers granted to users do not affect the effectiveness of e-learning systems "Edu-wave" in the educational process.

H1.5 Technology acceptance model (TAM) does not affect the effectiveness of e-learning systems "Edu-wave" in the educational process.

## **Research objectives**

The main objective of this study is to know the factors influencing the effectiveness of e-learning systems, in the educational process in schools in Jordanian Ministry of education. In addition to trying to achieve the following goals:

- Explain the concept of e-learning and related concepts, and linking them to the Jordanian experience in "eLearning system/EDUWAVE".
- Clarify the impact of the contribution of the Ministry of education in training users on the system at the "effectiveness of e-learning system/EDUWAVE in the educational process."
- Illustrate the impact of infrastructure available to use the system to "effectiveness of e-learning system/EDUWAVE in the educational process."
- Clarify the impact of the system's ability to support the needs of the users on the "effectiveness of e-learning system/EDUWAVE in the educational process."
- Clarify the extent to which powers granted to the system's users on the "effectiveness of e-learning system/EDUWAVE in the educational process."
- Clarify the impact of technology acceptance model (TAM) on "the effectiveness of e-learning system/EDUWAVE in the educational process."

- Develop an appropriate framework that tries to cover all previous studies in the field of e-learning systems and factors influencing the effectiveness of such systems in the educational process and associated concepts and related topics of relevance and impact.
- Produce results and propose a set of recommendations based on study results help reducing the negative impact of some factors influencing the effectiveness of e-learning system/EDUWAVE in the educational process.

### **The importance of study**

The importance of the study is related to the idea that develop computerized e-learning systems users knowledge to the need, to take maximum advantage of the options provided by systems, to increase the effectiveness of the educational process in schools in the Ministry of education of Jordan. And illustrate the advantages and properties provided by the learning & education through these systems.

This study also reveals the actual factors which have a negative impact on the effectiveness of computerized electronic learning systems in the educational process in Jordan, and try to come up with recommendations for reducing the impact of those factors.

### **Study limitations**

Here is study summary of some difficulties and constraints:

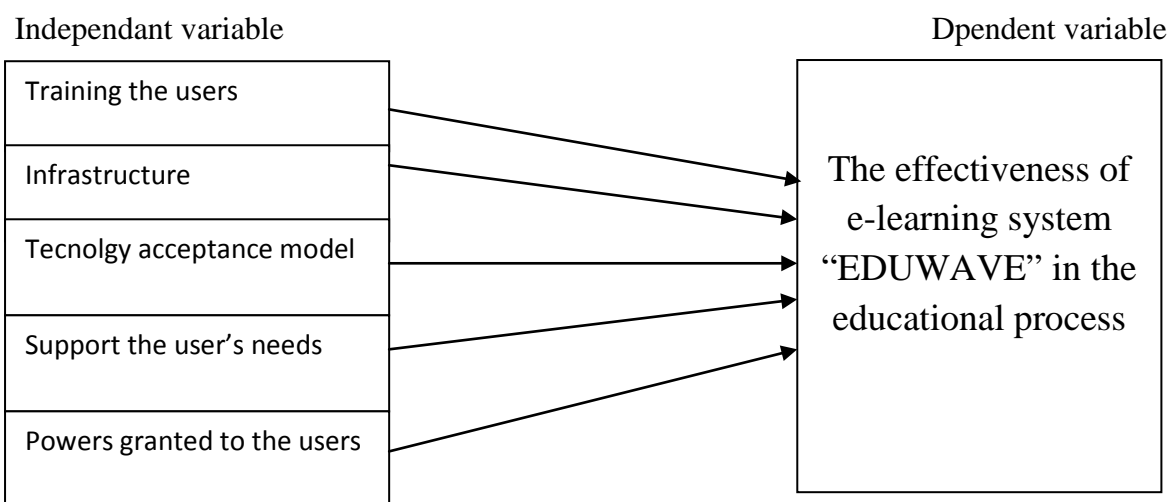
1. Application of the study was confined in schools of general education and there for the dissemination of results will be on these schools only.
2. It is generally accepted that reliance on questionnaire information may include some personal bias, and the answer of the people who fill out the questionnaire do not have high credibility.
3. The study was limited to major schools using e-learning system/EDUWAVE due to lack of time.

### **The study sample**

Study included a number of variables, as follows:

**First:** the independent variables related to the sub hypotheses (5-1): ( User training for the first hypothesis, infrastructure the second hypothesis, supporting the needs of the users of the system to the third hypothesis, power granted to system user for the fourth hypothesis, users technology acceptance model for the fifth premise), these variables are most important expected factors which may affect the effectiveness of e-learning systems in the educational process, which the researchers would be limited to in this study and determine the nature of its relationship with the dependent variable, this requires the study of e-learning system in an environment, where it was applied which are schools and how the previous factors affect it.

**Secondly:** the dependent variable "effectiveness of e-learning systems EDUWAVE" in educational process "which is one of the factors directly associated with academic performance, as the system is considered a technical tool and core that could not be replaced in the future in various educational functions of classroom management and even the department of students ' academic results and management decision-making in the educational institution. Figure (1.1) explain the following variables



**Study form Figure (1.1)**

**Litrature review**

**Litrature review**

This section briefly discusses a review of researches relevant to the present study.

Buck & Horton (1996), assessed the use of information technology by public school teachers (governmental), the results showed that the variables that distinguish technology users from non-users had positive attitude towards the benefits of information technology, and the willingness of teachers and their preferences for future training. The result also shows that used technology have an important relation to subject of the study variables such as: availability of computers in classrooms. Other factors such as: age, gender, years of experience in teaching did not give results as related to the use of technology, this agreed with the results of the current study.

Frydensberg (2002) in this study, the researcher had give result before his college Brown & Voltz, who did a similar effort to survey many literature in distance learning, open learning, analysis and integration of their results and their implications, but another goal is access to e-learning quality standards and classified in nine areas the most important ones are: institutional commitment (technical infrastructure and technical support, technical

training.....Etc.), funding for e-learning system and its management, this agrees with our study as key factors in the effectiveness of e-learning systems.

Brown & Voltz (2005), conducted a survey of the many literature in distance learning, open learning, analysis and integration of their results and their implications with a view to access factors of educational e-effective design, they can be summarized in six factors: provide a variety of learning experiences to meet the needs of learners, providing expertise in certain frames to motivate the learner, providing opportunities for self reflection and feedback on activities associated with learning process , the use of appropriate designs to the system and user interaction with the system, ensure the appropriate elements of the domain, and personal effects and social and environmental e-learning activity. This study agreed with the current study that it is looking at the factors influencing the effectiveness of e-learning instructional design and it is part of the effectiveness of e-learning system, in general so the researchers was guided by some of these factors in the current study.

Osman (2006), in his study addressed e-learning technology requirements in general education and technology challenges facing this kind of recruitment, and the impact of this recruitment on the quality of education, through a distributed questionnaire to general education schools in Damietta, on a random sample of students academic and administrative body. The results indicated that there is a provision of material resources, needed programs, technical components, manpower of designers and trainers and trained shared classes specialists, develop of the human element in terms of training supervisors, managers, teachers, students and the executive team at school, and the participation of the private sector in building the foundations of training and e-learning, recruitment of technology elements that we need to reduce the cost of e-learning and consolidate local experience to ensure the linking experience with the community culture and its needs, review and adoption plans and past experiences of the developed countries that have preceded us in e-learning to benefit from their experience in this area, the most important requirements for e-learning technology in public education, while resistance to change and lack of funding and the necessary infrastructure and lack of awareness, lack of trained manpower is one of the most important challenges in this area. This agreed with the results of the current study.

This study differs from the present study that it talked about e-learning technology achieving the quality of education and this has not touched the current study.

The study of Albakl (2007), sought to disclose the impact of the use and design of e-courses on academic achievement for students of Faculty of specific education, and its relationship to guide student learning through the Internet, results showed that the use of e-

courses is help to increase the academic achievement of students, compared to the usual way which increase the student attitude to change and his need to use e-learning, as results showed that using e-courses and e-content nature meets user requirements and easy access to educational content and assist the learner to perform its functions more increase the quality of electronic content and quality of education. This study has been used in the current study to identify some dimensions used in the questionnaire of the current study. This study differed from the present study that it turns to the impact of e-learning in student achievement and school was not touched in the current study.

Afaneh (2008/1429 ), his study was conducted at the Department of science information at Umm Al-Qura University in order to review a scientific experiment in the use of e-learning through the Department of information science at Umm Al-Qura University, which actually began in providing this service to the students section, as well as review the views of faculty members in the section about e-learning and what are the pros and cons facing them during their service. To achieve these goals questionnaire was distributed to a sample of faculty members and students in the section, which is designed to measure the factors influencing use of faculty, such kind of teaching and reflection on the impact of the use of this type of education, and the results showed that the most important benefits of this kind of education for faculty members were permanent development in using technology, and permanent development in teaching methods and update the article files with ease, confidence in using the technique, and the analysis showed a direct correlation between the faculty member level of experience and permanent development in teaching methods. As regards constraints, including the lack of a sufficient number of qualified persons who support this service, plus the difficulty in using the program. Study gives several recommendations: providing training courses as workshops for faculty and providing regularly working technicians in the laboratories.

Dr. Mahafdah (2008), in his search talked about the most important factors influencing the choice between e-learning and e-learning plus traditional learning. The search include the concept of e-learning and types of e-learning and what are the advantages of e-learning, the main obstacles facing e-learning and the requirements of a successful e-learning from the viewpoint of the researchers, and what are the most important stages of electronic material production and future of e-learning in higher education institutions.

The concept of e-learning education from the standpoint of Dr. Mahafdah: that it is an educational system and learning method using special electronic systems, communication techniques , modern technology: computer networks, multimedia and Internet, for the



delivery of information for learners in audio and synchronously or asynchronously in shorter and faster time, from anywhere, at lower cost, and high quality. The researcher summarizes his recommendations in : making workshops at the University for students and teachers to explain the concept of e-learning and its importance, and how to set up and development decisions, and to provide the infrastructure, represented in preparing trained human cadres, providing rapid communication lines and equipment with speed and high storage and benefit from Government initiatives and private companies "a computer for each student and faculty member", enter information technology evolution in the teaching process.

Dr. Al-fayoumi (2009) reviewed the research policies and steps taken by Jordan in the field of learning, not e-learning, and the challenges facing the process resources and environment required to achieve its objectives.

Systems and software developed locally by Jordanian companies to provide e-learning arabic language in schools in the Kingdom adopted by the ministry of education at the national level, where its features and specifications reviewed. The search also included the most important factors affecting the adoption of e-learning in Jordan, these factors can be summarized as follow: Stimulate the use of educational technology, specialized training sessions for users that any education, development of infrastructure for the use of e-learning.

Alenshar (2009), study aimed to identify the effectiveness of teaching and learning on student achievement, the study variables were tested based on identification of distributed to faculty members and a random sample of students of the University, the dimensions of the study are the factors affecting the use of the Internet in teaching, such as: availability of well-equipped computer laboratories, training in the use of the Internet. the results of the study referred to preferential use of the Internet in education on the traditional way of organizing and teaching content for educational materials, and educational technology division students.

Based on the results of this study the most important recommendations as follow: Faculty and training assistances from assistant teachers to use the internet in education, students should be trained to develop individual learning tools and how to proceed, through teaching, courses and training programmes for teacher education technology graduates from college of education quality on digital learning environments and how to education.

This study differed from the current study in it turning to the impact of using the Internet to teach, while the effect was discussed in the present study as one of the factors that influence the effectiveness of e-learning system (alaidioiv).

The study of Albesisi and Al-Khafaji (2010) was prepared for the Conference on quality assurance and accreditation II "of the University of Kufa, the study focused on factors

affecting the quality of the scientific method and techniques used to improve the quality of the output of the educational process, it can be summarized in: " efficiency and effectiveness of electronic curricula, provide electronic curriculum for all University and other disciplines ". This study aimed at several targets including our study: Learn about the reality of the internal efficiency of curricula for higher education in Iraqi universities, identify the constraints and address curriculum development and aligning development knowledge in various scientific disciplines, identifying the importance of using educational technology, to complement the scientific method to improve the quality of educational service. The researchers reaches several recommendations as follow : Solve the problem of e-learning curriculum development techniques and the application of TQM in education, based on academic accreditation of the arabic universities, and prepared educational programmes and curricula in line with technical developments current information, and current international environment based on knowledge, in addition to ensuring the availability of resources and equipment for higher education, and in support of research and development effort in higher education institutions to improve the material situation of research, teaching bodies, and development of cognitive abilities.

The difference between this study and the present study that it turn to the impact of using the Internet to teach while this impact was discussed in the present study as one of the factors that influence the effectiveness of e-learning system .

Dr. Al-Muhaisen (2010) study reviewed the nature and components of e-Learning systems ,also highlighted its technical effects on education, and learned the most important problems facing the system learning in the arab world. The study concluded that e-learning systems if properly used may participate to solve a large part of the problems faced by the educational system in the arabic region.

Study problem centering on the challenges and difficulties faced by the educational system in the arabic region, so the researcher focused in his recommendations on the importance of getting the appropriate training to targeted individuals on this technique, as well as the importance of developing the techniques used in this type of education, and motivating the target group to use this type of education.

Hammam (2011) study was conducted at the Faculty of Education/Department of educational technology (Sana'a University) ,with a view to the basic development of the training programme in the use of educational technology for the students of the Faculty of education, the importance of this study is due to the desire of researcher to reach to recommendations and proposals to improve teacher training, training in the use of

educational technology in particular, the study influenced the current study by illustrating the importance of training in the use of technology in education, and position influence the quality of training on the effectiveness and quality of the output of technology. One of the most important recommendations touched by the study was the attention to overall quality levels in teacher preparation in accordance with the requirements of globalization and openness of information.

#### 2-6 comparison of the current study and previous studies:

Comparison	Current year	previous year
Place of studying	Karak governorate	Different places distributed between Sudi Arabia Jordan and other different countries
Year	2011	2011/1996
Sample	The users of edu-wave system in governmental schools	Different samples form university faculty and students
Sector	Education	education
Study summary	Identify the factors affecting the effectiveness of edu-wave. Edu-wave in the educational process	Studies related to e-learning that affect its use and the obstacles in this sector and the importance of training in the use of educational tecnology

#### What distinguishes the current study from previous studies:

Many previous studies have addressed the topic of e-learning and systems designed for this purpose, and factors affecting the use of several aspects, for several purposes, numerous studies and researches has been conducted on the variables of this study and its various dimensions, it varied in its objectives, its variables, target groups and environments where it was conducted .previous studies revision on the subject of the study that there is no study looking directly in factors affecting the effectiveness of e-learning system in the educational process in Jordan , according to the researchers's knowledge, so this study came to use what came in the former studies in achieving the objectives of the study wherever possible.

#### Method and procedures

##### Introduction

The methodology is a link between what is materialized from the accumulation of theoretical applied and knowledge and the ability to reflect this accumulation in the lives of organizations current and future reality, identifying the paths of the methodological is depends on a few of this accumulation which should be subject to selection and testing in the organization with the aim of checking the possibility of using it in the work and activities of the organization within the present and future vision. This section describes the methodology, Community, sample study instrument, tools, honesty and persistence used in this study ,and the study procedures and variables and statistical treatments as shown below

**Methodology of the study**

The researchers used the "analytical descriptive" method, this method fits the objectives of the study and the nature of the variables in questions, using the questionnaire for this purpose using Likert scale.

**Population of the study**

The study consists of the Administrative Board and teaching faculty in the schools of AL kaser (Alrabbah region) 4 basic and secondary schools has been chosen for this purpose.

**Sample of the study**

The current study sample consisted of (111) member which is the whole community study, the questionnaire was distributed to all the sample study members and (107) was retrieved. The given table shows the distribution of the study sample.

Name of the school	Number of principles	Teachers number
Al Rabbah comprehensive secondary school for girls	1	32
Al Rabbah first essential school	1	19
Al Rabbah secondary comprehensive school for boys	1	35
Al Rabbah second essential school for boys	1	17

**Study tool**

Researchers develop study tool (questionnaire) after looking at the previous studies on the topic of study, it included 29 paragraph distributed in six major dimensions as follows:

1. User training: paragraphs (1-4)
2. Infrastructure: paragraphs (6-10)
3. E-learning system's ability to support the needs of users: paragraphs (11-14)
4. the powers granted to users of e-learning system/EDUWAVE: paragraphs (15-19)
5. Technology model accept: paragraphs (20-23)
6. The effectiveness of e-learning system/EDUWAVE: paragraphs (24-29)

**Tool validity**

Validity and persistence of the tool has been checked after displaying it to a number of arbitrators with expertise and jurisdiction they confirm the suitability of the tool to study, in the light of their suggestions and guidance some paragraphs in the questionnaire have been modified.

## Stability of the tool

**Table (1)**  
**Reliability coefficient for internal consistency for the questionnaire dimensions**  
**Alpha factor**

Variable	Dimension	reliability coefficient
E-learning system	user training	0.88
	Infrastructure	0.87
	The system's capacity	0.86
	Powers users	0.88
	Technology acceptance model	0.84
Total		0.91
system Effectiveness		0.88

Reliability coefficients indicate that the tool generally achieve the objectives of the study according to (Sekaran, 2003), where the table shows that the highest reliability factor of the questionnaire dimensions was given achieved by the powers granted to the users and the system effectiveness with (0.88), while the value of reliability for the questionnaire as a whole is (0.91), indicating the possibility of stable results that can be given by the questionnaire when applied.

### Statistical analysis methods used in the study

1. Arithmetic means and standard deviations
2. Unilateral variance analysis test (One Way Annova)
3. Cronbach's alpha
4. T-Test
5. Multiple regression analysis
6. Chaveh test

### The research findings and discussion.

#### Characteristics of the respondents:-

**Table (2)**  
**The study sample description**

		Number	Percentage
Gender	Male	43	40.2
	Female	64	59.8
Total		107	100%
career level	Principle	4	3.7
	Teacher	103	96.3
Total		107	100%
Qualification	diploma	4	3.7
	BA	96	89.7
	Higher studies	7	6.5
Total		107	100%
Experience	less than 5 years	42	39.3
	5-10 years	23	21.5
	More than 10 years	42	39.3
Total		107	100%

As shown in table (2), that the majority of the members of the study sample are females with only (59.2%) of the sample as a whole, shows that the Bachelor qualification campaign has formed a (89.7%) of the sample, the number of principles is few with (3.7%) This is due to the application of the study on a small number of schools.

### Testing hypotheses

H1: there is no statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) for e-learning system dimensions (training of users, the infrastructure, the capacity of the system, the powers granted to users, technology acceptance model) on the effectiveness of the system.

Before applying regression analysis to test the hypothesis of the study, some tests have been made to ensure that the used data are appropriate for regression analysis as follows: with regard to the assumption that there isn't a high link between independent variables " Multi-Co linearity" researchers conduct the "Variance Inflation Factor-VIF", and the "Tolerance" test for each of the independent variables; if the i (VIF) variation to variable excess (10) and the value of allowable variation less than (0.05), it can be said that this Variable has high correlation with other independent variables so it would cause a problem in regression analysis. It has been relied on this rule to test "Multicollinearity among the independent variables, table (3), built.

**Table (3)**  
**Testing Variant Inflation factor allowable contrast and variation convolution coefficient**

Variables	Allowable Tolerance	(VIF)	Skewness
user training	.322	3.105	0.093
infrastructure	.212	4.708	-0.140
system's ability	.308	3.246	-0.074
powers granted to users	.208	4.808	-0.300
technology sample accept	.346	2.891	-0.441

And for the investigation of presumed normal distribution for the data (Skewness) were calculating as a base of the variables, as indicated in the table (3) the value of the coefficient convolution of all study variables were lower than (1) it can therefore be argued that there is no real problem with normal distribution of data.

**Table (4)**  
**Results of the analysis of variance of the regression for verifying the validity of model test for the study hypotheses**

Dependant variable	Source	R <sup>2</sup>	squares sum	Freedom degrees	squares average	F value	level of significance
System Effective	regression	0.876	2011.270	5	402.254	142.688	.000
	error		284.730	101	2.819		

Table (4), indicated that the results of the analysis of variance of the regression (Analysis of Variance) to ensure the validity of the model to test hypotheses.

Table (4), shows the multiple regression analysis to test for the presence of impact of e-learning system dimensions combined on the effectiveness of the system, where all dimensions of system interpreted (87.6%) of the system effectiveness.

**Table (5)**  
**Results of multiple regression analysis to test the effect of e-learning system dimensions on the effectiveness of the system**

The dimensions of e-learning	B	Standard error	Beta	T value	level of significance
Consistence	2.058-	.706		2.915-	.004
user training	.241	.098	.152	2.457	.016
infrastructure	.365	.093	.298	3.921	.000
system's ability	.199	.097	.129	2.043	.044
powers granted to users	.265	.120	.170	2.209	.029
technology sample accept	.498	.101	.295	4.951	.000

Through the table (5), we notes the existence of statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) for e-learning system dimensions (knowledge sharing and application of knowledge) in the effectiveness of the system, where calculated t value for them reached (2.460) (3.907) (2.043) (2.209) (4.892) respectively.

H1.2: there are no significant differences at the level of significance ( $\alpha \leq 0.05$ ) on respondents ' perceptions of the effectiveness of e-learning system attributable to personal variables (gender, qualifications, career level, and years of experience)

To test the hypothesis the following was done:

**First: for gender**

(t) Has been tested for independent samples to test differences in respondents ' perceptions of the effectiveness of e-learning system by gender

**Table (6)**  
**Test results (t) for independent samples to test differences in respondents ' perceptions of the effectiveness of e-learning system by gender**

Gender	arithmetic mean	standard deviation	number	freedom degree	standard error	(t)value	indication level
Male	14.78	4.68	64	105	0.92	-0.591	0.556
Female	15.33	4.63	43				

As shown in table (6), the absence of significant differences when the level indication ( $\alpha \leq 0.05$ ) between the sexes in their perceptions of the effectiveness of e-learning system with (t) value =-0.591, and level of significance (0.556).

**Second: for qualification**

using Mono analysis of variance table (7), shows that.

**Table (7)**  
**Results of analysis of (One Way ANOVA) for significant differences in respondents ' perceptions of the effectiveness of e-learning system depending on qualifications**

Source of Contrast	Squares sum	degree of freedom Df	Square average	F value	indication level
Between groups	4485.242	1	4485.242	238.779	.000
qualification	342.452	2	171.226	9.115	.000
Error	1953.548	104	18.784		
Total	26371.000	107			

Table (7), clarifies the significant differences at the level of semantics ( $\alpha \leq 0.05$ ) in their perceptions of the effectiveness of e-learning system due to qualification, variable value (f) = 9.115, level of significance (000), to see in favor of who these differences are, shafeah test has been used for the afterward comparisons.

Table (8) indicates that the difference between medical science (diploma) from one side and their bachelor degree and higher studies in the other side, and for the favor of bachelor degree, also between their degree (bachelor degree) and their science degree (higher education) and for the favor of (higher education); which means that the differences are heading for the higher education.

**Table (8)**  
**Shafeah test results for afterward comparisons**

		The average difference	error	level indication
Diploma	Bachelor	-6.9583 *	2.21172	.009
	Postgraduate	-11.5714 *	2.71652	.000
Bachelor	Postgraduate	-4.6131 *	1.69679	.028

\* Means a function of the level indication ( $\alpha \leq 0.05$ )

### Third: experience

Mono analysis of variance has been used table (9) extension (2) shows that

**Table (9)**  
**Results of (One Way ANOVA) for indication of the differences in the perceptions of respondents ' perceptions of the effectiveness of e-learning system depending on experience**

Contrast	Squares averages	degree of freedom	Squares sums	F value	indication level
Between groups	21919.155	1	21919.155	1045	.000
Experience	114.940	2	57.470	2.740	.069
Error	2181.060	104	20 967		
Total	26371.000	107			

As shown in table (9), there is no significant differences at the level of semantics ( $\alpha \leq 0.05$ ) in their perceptions of the effectiveness of e-learning system due to experience, where (f) value was 2.74 and it significance was (0.069)

### Fourth: career level

T test was used for the independent samples to test differences in the difference in their perceptions effectiveness of e-learning system due to gender

**Table (10)**  
**(t) Test results for independent samples to test differences in respondents ' perceptions of the effectiveness of e-learning system depending on job level**

Job	arithmetic mean	standard deviation	Number	degree of freedom	standard error	T value	level of indication
teacher	14.83	4.60	103	105	2.34	-1.99	0.048
principle	19.5	4.20	4				

It clear from table (10) that there are significant differences at the level of semantics ( $\alpha \leq 0.05$ ) in their perceptions of the effectiveness of e-learning system due to career level and for the favor of principles where t value=1.99, and its significance was (0.048)



## **Results discussion and recommendations**

### **Results discussion**

Discussing results related to the hypotheses: the results indicated that there is an effect of dimensions of e-learning system (training of users, the infrastructure, the capacity of the system, the powers granted to users, technology acceptance model) on the effectiveness of the system . The following are the discussion of the subhypotheses

H1.1. Training in the use of e-learning system: the results indicated that there is an impact of training users in the effectiveness of e-learning system, this result can be explained that the Ministry of education give courses, educational workshops and provide necessary technical support, electronic and paper guides help to use the system.

"This result agreed with the results of all studies addressing this dimension as training must affect the effective use of e-learning systems"

H1.2 Infrastructure for e-learning system/EDUWAVE: the results indicated the presence of impact of the infrastructure of e-learning system in the effectiveness of e-learning system and the reason for this may be due to the importance of school laboratories equipped with the latest devices and equipment, and the availability of an efficient communication system with Internet access, and also the availability of specialized centres with a central reference databases and the availability of appropriate software ,all leads to the effectiveness of the system."This result agreed with the results of all studies addressing this dimension ,as availability of appropriate infrastructure must have an effect on the effective use of e-learning systems"

H1.3. E-learning system's ability to support the needs of users: the results indicated that the impact of the system's ability to support the needs of users of e-learning in the effectiveness of e-learning system, this is a logical consequence as providing educational curricula for various grades, disciplines, and provide an opportunity of interaction between users and the system, as well as containment of the system of teacher guides, student grades and their full information, facilitate it for the users to deal with and use them , thus is reflected by influencing the effectiveness of the system. "This result agreed with the results of all studies addressing this dimension as the support of the system must have an effect on e-learning systems"

H1.4. The powers granted to users of e-learning system: the results indicated the presence of an effect of the powers granted to users in the effectiveness of e-learning system, as enabling the users to access the system easily, facilitate obtaining a password , changing it, and to expand pages that the user can see influences the effectiveness of the system. "This

result agreed with the results of all studies addressing this dimension which indicates that power garnered to use electronic learning systems must have and effective in the use of e-learning systems"

H1.5. Technologies acceptance: results indicated that there is an impact of technology acceptance on the effectiveness of e-learning system model where the e-learning system meets the needs of teachers and managers of educational requirements. So they could benefit from it, and teachers and departments depending on it by reducing paper burden affect the effectiveness of e-learning system. "This result agreed with the results of all studies addressing this dimension as the acceptance of the users for the e-learning system as a substitute for the traditional teaching or as a complementary for it must have an effect on the effective use of e-learning systems"

### **Discussion the findings toward hypothesis concerning perceptions of respondents**

Firstly: gender: the results indicated the absence of gender differences in their perceptions of the effectiveness of the system, the reason for this may be attributed to that the Ministry of education does not discriminate between the sexes in the provision of training and technical support and the necessary infrastructure.

Secondly: qualifications: the results indicated differences between qualifications in their perceptions of the effectiveness of the system, and for graduate studies, this result can be explained that education and training play an active role in assisting teachers to hire and use of e-learning system in a high degree which commensurate with their scientific qualifications, which is reflected on their degree of appreciation to the using of e-learning system and overcome its difficulties, more than their colleagues with a Bachelor and diploma.

Thirdly experience: the results indicated no differences in respondents ' perceptions of the effectiveness of e-learning system due to years of experience, this could be due to other factors more important than experience as training and rehabilitation, and duration of use of the system and not teaching experience.

fourthly the career: the results indicated differences in the perceptions of the effectiveness of e-learning system attributable to career level for the favor of principles this can back to the fact that managers need access to lots of data and information concerning their teachers or students with speed and accuracy, more than the teachers, so the principles are more important in the effectiveness of system assessment.

### **Recommendations**

According to the results obtained from the statistical analysis the following recommendations have been reached:

1. The need to review the training courses given by the Ministry of education, and developed it to suit the functional requirements , professional trainees and meet their needs.
- 2.The need to pay greater attention to infrastructure technical and technological equipment in order to create the necessary conditions for teachers to use in teaching-learning system.
- 3.The need for further studies similar to this study to include broader educational areas and a larger sample; in order to disseminate the results of this study.
- 4.The need to motivate the target audience of e-learning system on the use of the system by reviewing the multiple benefits of using the system which is represented by flexibility, reducing time and effort in storing processing and retrieving information and comparing it without depending on the system to gain the information.
- 5.The importance of the continuous renewing of the system by the Ministry of education to suit the expected benefits from using it.
- 6.The importance of including all the curriculum of all classes and educational stages by Ministry of education to gain the best benefits from using the system.
- 7.The importance of providing an interactive mechanism through the e-learning system by Ministry of education where the user could introduce his need to the decision makers in the Ministry of education.

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