




USING STRUCTURAL EQUATION MODEL TO REVEAL FACTORS AFFECTING FACULTY MEMBERS IN UNIVERSITY COLLEGES IN THE USE OF MOODLE

 **Omar. M. Mahasneh^{1*}**
Haroon. M. Tawarah²
Hussein. A. Al-lawama³

^{1,2}Department of Basic and Applied Science, Faculty of Shobak University College, AL-Balqa Applied University, Jordan.

¹Email: omar_mahasne@bau.edu.jo Tel: 00962772060857

²Email: Haroon.tawarah@bau.edu.jo Tel: 0096277774520

³Department of Curriculum and Teaching, Faculty of Educational Sciences, AL-Hussein Bin Talal University, Jordan.

¹Email: Lawama_2000@yahoo.com Tel: 00962779215115



(+ Corresponding author)

ABSTRACT

Article History

Received: 12 August 2020

Revised: 6 January 2021

Accepted: 15 February 2021

Published: 9 March 2021

Keywords

AL-Balqa Applied University
Faculty members
Higher education institutions
Moodle
Structural equation model
Technological curriculum
University college.

The current study aimed at using the Structural Equation Modeling (SEM) to detect the factors affecting the role of faculty members in university colleges for e-learning system (Moodle). The study has used the descriptive approach through the questionnaire tool which consisted in its final form of (33) items distributed on (10) factors. The study sample consisted of (487) faculty members in university colleges. The AMOS program was used to analyze the data using the Structural Equation Modeling (SEM) through the path analysis method and (goodness-of-fit) tests to test the validity of the proposed model. The results of the study identified (6) factors that affect the use of faculty members for the e-learning system (model) in the teaching process viz., the competence of faculty members, the efficiency of the e-learning system, training benefits, the influence of others, and facilities, in addition (3) factors were identified as outputs for the use of the faculty E-learning system namely quality of teaching, faculty satisfaction, and faculty confidence in the e-learning system. The study recommends educational policy makers in the Ministry of Higher Education, Scientific Research and University Administration to adopt these factors identified in this study and implement the effect of these factors on the use of faculty members for the e-learning system (Moodle) in order to achieve learning outcomes for academic programs.

Contribution/Originality: This study is one of very few studies which have investigated Structural Equation Model (SEM) to reveal the factors affecting the use of faculty members in university colleges for the e-learning system (Moodle). This study represents a guide for universities on providing all facilities for faculty to improve their efficiency in using the e-learning system (Moodle).

1. INTRODUCTION

Scientific developments in statistics have led to the emergence of the so-called structural equation (SEM) modeling, as it has emerged at the hands of researchers like Joreskog, Ward Keesling and David Wily. SEM modeling is the input for estimating, analyzing, and testing models that define relationships between variables, and aims to determine the extent to which the theoretical model matches field data in order to assume more complex theoretical models (Al-Mahdi, 2007; Mahasneh, Al-tawarah, & Al-Msadeen, 2013).

Modeling with a structural equation (SEM) is used in all disciplines and fields as a more effective method in data processing and multivariate applied analyses, where the problem under study is viewed as a variable that can be measured and quantified by building a model to measure it that includes a set of indicators indicating it and testing the validity of the model through a set of sophisticated statistical methods such as confirmatory factor analysis. Several computerized programs have emerged that assist in performing structural formula (SEM) modeling such as LISREL and AMOS. Modeling with the structural equation (SEM) is one of the innovations that can be used in educational problems and phenomena, especially with the tremendous development in communications and information technology that has caused a huge qualitative shift in the educational field and has become the main pillar of any educational institution characterized by development and modernity (Al-Ajrash, 2018; Almseidein & Mahasneh, 2020; Tawarah, 2013).

Based on the theoretical literature and previous studies, Tawarah (2013) proposed a research model in a structural modeling (SEM) model as shown in Figure 1 which shows the factors affecting the use of faculty members for the e-learning system (Moodle) and the results of such a use.

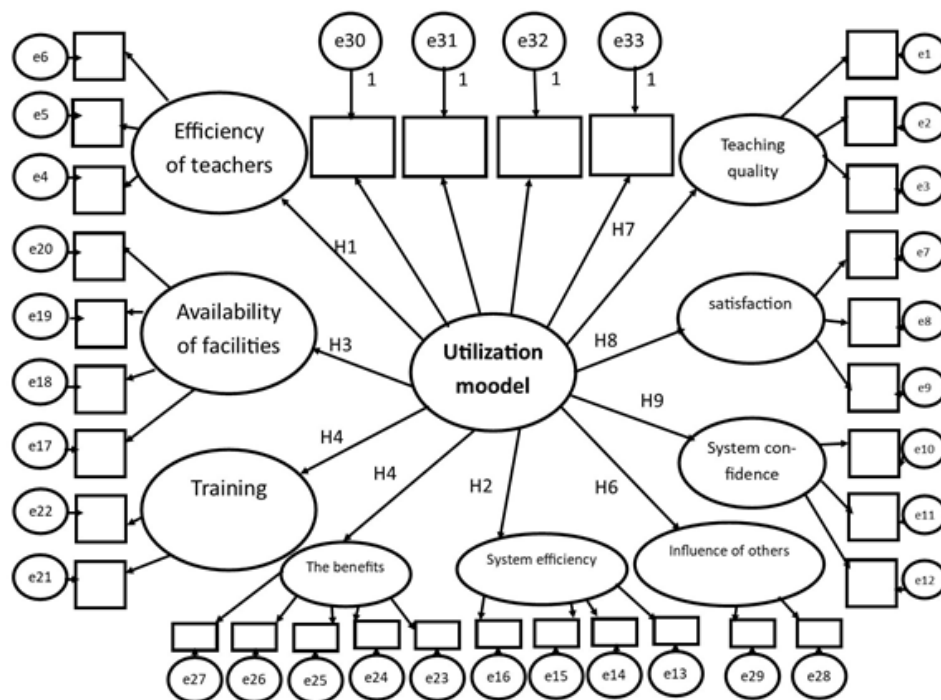


Figure-1. Modeling with the structural equation of the proposed model.

1.1. Theoretical Background

Many educational institutions seek to employ information technology to achieve their vision and mission, which makes it easier to distinguish it from other institutions, as many universities have integrated the use of information and communications technology in the teaching process. E-learning is considered one of the innovations of information and communications technology, which is concerned with the use of computers, Internet and multimedia in the educational process simultaneously or asynchronously. Moodle is an open source e-learning platform developed by Martin and Dahmas in 2002 (Abou El-Seoud, Taj-Eddin, Seddiek, El-Khouly, & Nosseir, 2014; Babu & Sridevi, 2018; Mahasneh & Murad, 2014). Mahasneh (2013) emphasized that the combination of the use of traditional teaching methods and electronic learning methods contributes to achieving effective learning and makes the student a focus of the educational process in line with the principles of constructive theory in the learning process.

The use of the e-learning system in the teaching process in the corridors of universities is considered one of the important things to achieve quality in academic programs, so it makes it easier for students to obtain information

and knowledge at any time, and provides their physical effort compared to traditional learning (El-Seoud, Seddiek, Taj-Eddin, Ghenghesh, & ElKhouly, 2013; FitzPatrick, 2012; Mahasneh, 2020a; Mahasneh, 2020b; Mahasneh, 2020c; Means, Toyama, Murphy, & Baki, 2013). Sheikh and Rachna (2018) reported that the use of e-learning systems in universities contributes to students' easy access to experiences and benefit from them anytime and anywhere, Develop thinking skills, research and interact with others, and achieve the maximum effectiveness of a process to teach in a flexible way, students and stimulate them to have a significant role in the learning process through the use of modern technology applications which will reflect positively on the academic achievement in university courses.

The researchers emphasized (Al-Mahasneh, Ayasrah, Yahyaa, Al-Kriemeen, & Al-Swalha, 2020; Noesgaard, 2014; Patterson, Krouse, & Roy, 2012; Prensky, 2009; Smedley, 2010; Tawarah & Mahasneh, 2020). that information technology systems need acceptance from users, because lack of acceptance is a barrier to the success of these systems, as people choose to accept Technology is one of the biggest challenges for researchers in the field of information systems, Davis, Bagozzi, and Warshaw (1989) presented a model for technology acceptance in which it was assumed that any technology will be accepted and work on it due to two main factors, which are the expected benefit and expected ease of use that affect the behavioral tendency to use it.

Since 2013, Al-Balqa Applied University has focused on introducing the Moodle system into the teaching process in all its spreading colleges, so that e-learning becomes a synonym for and support for traditional education. Course plans, presentations, pictures, drawings, and activities to be available to all students for viewing at any time. The faculty member can also talk to students directly and indirectly, and take exams for students electronically, in addition to registering assignments and activities and electronic correction in addition to many services. As for the students, they can download the files set by the faculty member through the electronic education program (Moodle) at any time, solve the duties and activities and deliver them electronically, and participate in direct and indirect talks, in addition to implementing electronic exams in addition to many services.

Despite the interest of Al-Balqa Applied University administration in introducing the e-learning system and holding training courses and workshops for faculty members, there is a weakness in use in addition to many obstacles that hinder their use of it, and there are many studies that dealt with this. Hawamdeh (2011) conducted a study aimed at knowing the obstacles to using e-learning from the viewpoint of the faculty members at Al-Balqa Applied University. The study sample consisted of (96) faculty members in the university colleges affiliated with Al-Balqa Applied University in the northern region. The results of the study showed that the faculty members in Al-Balqa Applied Luminaries face many obstacles during the use of e-learning, where the obstacles related to the administrative and financial aspect were the biggest obstacles, followed by the obstacles related to e-learning itself and then the obstacles related to the teacher and the student.

Al-Assaf and Al-Sarayrah (2012) conducted another study about the concept of e-learning and its use in teaching by the faculty members at Al-Balqa Applied University. The sample of the study consisted of (130) faculty members of the University. The results of the study revealed an increase in the average levels of awareness among the faculty members at Al-Balqa Applied University on the concept of e-learning on the overall scale, and on all five sub-dimensions, namely: the features of e-learning, end the role of the school and the learner, the importance of e-learning, the basics of using e-learning, obstacles in applying e-learning, the high average levels of computer use, the use of networks, and the use of the Internet in the e-learning process for faculty members.

Al-Rawashda, Al-Arab, and Al-Jawad (2012) conducted a study entitled Information Technology and its role in education and training. The study sample consisted of (110) faculty members at Al-Balqa Applied University. The results of the study revealed a positive view of the faculty members towards the use of information technology in the process of education and preparation of scientific research. There were also statistically significant differences at the level of alpha significance = 0.05 in the positions of faculty members of the culture of information technology due to the variable of experience and for the benefit of highly experienced.

Al-Husban (2013) conducted a study aimed at knowing the effect of faculty members' use of the Princess Alia University College for e-learning technologies in the educational process. The results of the study showed that the general use rate of information and communication technologies among faculty members in the educational process is relatively low. A few of them have previously attended training courses in this field, and it has been found that there are a number of difficulties that hinder them from using these techniques in education. Salim (2013) carried out a study titled "The Effectiveness of Integrated Education in Al-Balqa 'Electronic Academy from the viewpoint of members of the teaching faculty at Al-Balqa Applied University. The study sample consisted of (55) faculty members studying the subjects prescribed in four colleges affiliated to Al-Balqa Applied University. The results of the study showed that the arithmetic mean of the responses of the study sample on the effectiveness of combined education ranged between medium and high.

Al-Hamran, Hamidat, and Badarneh (2016) conducted another study aimed at revealing the degree of the faculty members in Al-Balqa Applied University owning the e-learning competencies from their point of view. This study sample consisted of (100) faculty members in the colleges of the Al-Balqa Applied University in Northern Territory. The results showed that the degree of possession of faculty members at Al-Balqa Applied University to the competencies of e-learning (computer use competencies, network and Internet use competencies, and the competencies of e-learning culture) came with a medium degree. The results also showed that there were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the degree to which the faculty members at Al-Balqa Applied University possessed the competencies of e-learning due to the variables (college, higher years of education, educational qualification).

Ababneh and Zaabi (2018) conducted a study with the aim of identifying the factors affecting the behavioral intention to use the e-learning system by testing the technology acceptance model in addition to the organizational culture. The sample consisted of an AMOS study program of 180 faculty members at Al-Bayt University. This study confirmed that the model proposed and modified the TAM model as a theoretical tool to help in understanding and explaining the behavioral intention to use e-learning.

Budu, Yinping, and Mireku (2018) conducted a study with the aim of identifying the effect of behavioral intention on e-learning systems usage. It was an empirical study on tertiary education institutions in Ghana. The study sample consisted of 237 members of the board of directors and faculty members. The study showed that intent to use and self-efficacy are among the factors most influencing the use of e-learning systems.

It is clear from previous studies that some studies focused on the obstacles faced by faculty members at Al-Balqa Applied University while using e-learning as a study. These studies have focused on diverse domains such as measuring the degree of awareness of faculty members at Al-Balqa Applied University to the concept of e-learning (Hawamdeh (2011); or the effectiveness and impact of using e-learning in the educational process (Al-Assaf and Al-Sarayrah (2012); Al-Husban (2013); or studies like Al-Rawashda et al. (2012), Al-Hamran et al. (2016) and Salim (2013) have discussed the extent to which the Faculty members at Al-Balqa Applied University own competencies of e-learning. What distinguishes the current study from previous studies is that it is the only study that tried to search for factors that affect use of faculty members at Al-Balqa Applied University for e-learning system (Moodle) through modeling with a structural equation (SEM).

2. RESEARCH PROBLEM

This study was inspired when a weakness was detected in the use of the electronic education system (Moodle) by faculty members in the educational process, though the university administration had been holding workshops and training courses abundantly. Al-Husban (2013) emphasizes on the use of e-learning system to achieve general goals and learning outcomes for academic programs, and to make the student a focus of the educational process in line with modern educational theories. This study came to reveal the factors affecting use of faculty members for the e-learning system (Moodle) using modeling with the equation to constructivism (SEM).

3. RESEARCH MODEL AND STUDY HYPOTHESES

3.1. Teaching Faculty Members Use the Moodle System

This research aimed to define the correct use of the e-learning system (Moodle) to the faculty members who spend a good amount of time on e-learning while teaching their courses. This study highlights the factors that affect the use of the e-learning system in teaching courses and what consequences result of this use.

3.2. Efficiency of Faculty Members

The researchers define the proficiency of the faculty members as the set of knowledge, skills, and abilities that the faculty members have and which help them to use the Moodle system. The French Association defined competency as the use of capabilities in the professional field with the aim of arriving at the optimal performance of the job or activity (Elkhoully, 2010). Accordingly, the researchers suggested the following hypothesis:

(H1): The efficiency of faculty members affects their use of the Moodle system.

3.3. Efficiency of the E-Learning System

The researchers define the efficiency of the e-learning system as the ability of the system to achieve the desired goals in less time, effort and in the easiest way. Past studies indicate that there is a significant impact between the efficiency of information and the effectiveness of the decision-making process (Mahasneh, 2005). Accordingly, the researchers suggested the following hypothesis:

(H2): The efficiency of the Moodle system affects the use of faculty members.

3.4. Availability of Facilities

The researchers define facilities as a set of services that includes materials, tools and devices that help faculty use the e-learning system in the teaching process. Accordingly, the researchers suggested the following hypothesis:

(H3): The availability of facilities affects the use of the Moodle faculty.

3.5. Training

This research defines the training of faculty members on the use of the e-learning system as a set of courses, educational workshops and lectures attended by the faculty member on activating the e-learning system in the teaching process. Accordingly, the researchers suggested the following hypothesis:

(H4): The training of faculty members affects their use of the Moodle system.

3.6. Benefits

Benefits are defined in this study as the degree to which faculty members believe that their use of the e-learning system contributes to achieving many benefits for them and students. Accordingly, the researchers suggested the following hypothesis:

(H5): The benefits affect the use of the Moodle by the faculty.

3.7. The Influence of Others

The influence of others is judged here as the set of roles that others play in influencing the use of faculty members to use the e-learning system. Accordingly, the researchers suggested the following hypothesis:

(H6): Others affect the use of faculty members for the E-Learning system (Moodle).

3.8. Quality of Teaching

The quality of teaching is defined in this study as the extent of achieving the use of the e-learning system by the faculty members for learning outcomes of educational courses in accordance with educational theories. Accordingly, the researchers suggested the following hypothesis:

(H7): *Teaching staff members use the Moodle system to improve the quality of teaching.*

3.9. Satisfaction

Satisfaction is believed to be a trend shown by the faculty members after they use the e-learning system. Accordingly, the researchers suggested the following hypothesis:

(H8): *The use of the Moodle faculty increases the satisfaction with their performance.*

3.10. Confidence in Performance

Trust or confidence in performance is known as the degree to which the goals of the faculty members demonstrate after having used the e-learning system. Accordingly, the researchers suggested the following hypothesis:

(H9): *Teaching staff members use the Moodle system to increase their confidence in it.*

4. THE IMPORTANCE OF STUDYING

The importance of the current study lies in it being the first study, within the limits of the researchers' knowledge, conducted on the detection of factors that affect the use of faculty members for the e-learning system. The practical implications of the study would help educational policy makers in the Ministry of Higher Education and Scientific Research identifying the most important factors that affect the use of faculty members for the e-learning system. This will help them take necessary measures to address the deficiencies in the infrastructure, administrative and human infrastructure to achieve the desired results from the use of E-learning system.

5. PROCEDURAL DEFINITIONS

1. *Modeling with the structural equation*: It is a statistical method that is used to process data for performing multivariate applied analyzes and is considered the entrance to test models that determine the relationships between variables.
2. *Members of the teaching staff*: People who take on the teaching process for university courses of various academic ranks and are appointed at Al-Balqa Applied University.
3. *E-learning system*: It is a program that allows faculty members to manage the teaching process of the courses in a classroom.

6. STUDY LIMITS AND LIMITATIONS

- Spatial limits: The study tool has been applied by faculty members only in governmental university colleges affiliated with Al-Balqa Applied University.
- Time limits: The study findings are confined to the first semester of the academic year 2019/2020.
- The determinants of the study. The results of the study are determined by the degree of validity and consistency of the study tool used in this study.

7. STUDY METHODOLOGY

The researchers used the descriptive approach for data and information collection, and administering the questionnaire, after confirming its psychometric properties.

8. THE STUDY SAMPLE

The sample of the study consisted of (487) faculty members at university colleges at Al-Balqa Applied University, and they were chosen by the available sample. Table 1 shows that respondents (487) are distributed among (310) males and (177) females, in addition to (250) of them having scientific specializations and (237) specializing in humanities.

Table-1. Demographic data of the sample of the study

Variable		Frequency	Percentage
Gender	Male	310	64%
	Female	177	36%
	Total	487	100%
Specialization	Scientific	250	52%
	Humanitarian	237	48%
	Total	487	100%

9. STUDY TOOL

After the researchers reviewed the theoretical literature and previous studies, the questionnaire tool was built for collecting data and information appropriate for this study. The study included in its final form two main parts, the first part relates to demographic data for respondents (gender and specialization), while the second part comprised (9) subsidiary factors, out of which (6) factors affected the use of faculty members for the e-learning system (Moodle) and (3) factors represented the results of the use of faculty members for the e-learning system. The questionnaire consisted of (33) items distributed across these factors:

- The first factor: It included four items showing the extent to which faculty members use the electronic education system (Moodle).
- The second factor: It included three items showing the extent of proficiency of teachers to use the Moodle system.
- The third factor: It included four items on the availability of facilities for faculty members to use the Moodle system.
- The fourth factor: It included two items on the effect of training for members of the teaching body on their use of the Moodle system.
- The fifth factor: It included five items on the benefits achieved as a result of the use by members of the teaching system of the e-learning system (Moodle).
- The sixth factor: It included four items on the efficiency of the e-learning system and its effect on the use of faculty members for the e-learning system (Moodle).
- The seventh factor: It included two items about the extent of the influence of others on the use of members of the teaching body for the electronic education system (Moodle).
- The eighth factor: It included three items on the quality of teaching, as a result of the teaching staff using the Moodle system.
- The ninth factor: It included three items on the satisfaction of faculty members as a result of their use of the Moodle system.
- The tenth factor: It included three items on the confidence of faculty members in the system as a result of their use of the Moodle system.

The researchers also used a Likert scale for the seven-step gradient of the study sample responses, where respondents chose one of the following options (Strongly agree, somewhat agree, neutral, somewhat disagree, disagree, strongly disagree). They were given values from (1-7) where the number (7) expressed the highest degree of approval (strongly agree), while the number (1) expressed the lowest degree of approval (strongly disagree).

10. VALIDITY OF THE TOOL

A. Virtual Validity

To verify the apparent sincerity of the study tool, it was presented in its preliminary form to (5) arbitrators from the faculty members of various Jordanian universities with relevant specialization, to express their views on the affiliation of the items to their fields, clarity, and the safety of their language. Based on the suggestions made by the arbitrators, some of the items were reformulated, and modified in the final form, finally to be composed of (33) items, distributed among (10) factors. The study relied on the consensus of all the arbitrators.

B. The Validity of the Structure

To verify the significance of the validity of the hypothetical construction of the questionnaire, it was applied to an exploratory sample of (20) individuals from the study community and from outside the sample. The correlation coefficients were extracted between each item and the total score on the one hand; secondly, the correlation was also measured between each item and its connection to the field to which it belongs to. The correlation coefficients were measured with the range between (0.79 - 0.95), and with the instrument as a whole between (0.70 - 0.96). [Table 2](#) exhibits the value of these correlation coefficients.

Table-2. The values of the correlation coefficients between the vertebrae and the dimension to which they belong and the overall score of each of the study instrument.

N	Correlation coefficient With the domain	Correlation coefficient With the instrument	N	Correlation coefficient With the domain	Correlation coefficient With the instrument
1	0.79	0.70	18	0.84	0.73
2	0.81	0.71	19	0.93	0.79
3	0.83	0.72	20	0.95	0.78
4	0.84	0.76	21	0.89	0.88
5	0.80	0.75	22	0.48	0.87
6	0.79	0.79	23	0.86	0.82
7	0.85	0.90	24	0.79	0.83
8	0.83	0.75	25	0.91	0.84
9	0.89	0.85	26	0.95	0.87
10	0.90	0.84	27	0.94	0.77
11	0.86	0.83	28	0.93	0.91
12	0.94	0.89	29	0.94	0.90
13	0.87	0.96	30	0.92	0.96
14	0.88	0.95	31	0.89	0.93
15	0.93	0.93	32	0.87	0.87
16	0.94	0.92	33	0.89	0.84
17	0.95	0.91			

Note: The value is statistically significant at the significance level ($\alpha \leq 0.05$).

[Table 2](#) shows that all correlation coefficients were of acceptable and statistically significant degrees, and therefore none of these items were deleted. The stability of the study instrument was verified by the method of internal consistency using the Cronbach-Alpha equation, as the total stability (0.78, 0.95). [Table 3](#) shows the coefficients of the stability of the study tool, as they were high, and they met the purposes of the current study.

11. STATISTICAL TREATMENT

Statistical analysis software SPSS and AMOS were used to analyze the study data. Having found the frequencies and percentages of the studied variables and also the validity and reliability coefficients for the measures, it was important to find the causal relationships between the study variables. The following is an illustration of some statistics related to the proposed model:

- (1) Analysis of the measuring instrument used: To know the conformity of the measurement model with the data collected in this study, a goodness-of-fit test was performed, which shows the following indicators (CMIN / DF, RMSEA, NFI, NNFI, AIC, CAIC). Table 4 shows the results of a good test that matches the measurement model with the collected data.

Table-3. The results of the global analysis using the analysis of the main components.

Factors / Loading Factor	1	2	3	4	5	6	7	8	9	10	11
Use a Moodle1	0.78										
Use a Moodle2	0.82										
Use a Moodle3	0.84										
Use a Moodle4	0.85										
Efficient members1		0.91									
Efficient members2		0.92									
Efficient members3		0.90									
Facilities 1			0.87								
Facilities 2			0.90								
Facilities 3			0.84								
Facilities 4			0.87								
Training 1				0.90							
Training 2				0.91							
Benefits1					0.80						
Benefits2					0.82						
Benefits3					0.83						
Benefits4					0.84						
Benefits5					0.87						
Efficient Moodle1						0.88					
Efficient Moodle2						0.87					
Efficient Moodle3							0.86				
Efficient Moodle4							0.83				
Influence of others 1								0.89			
Influence of others 2								0.93			
Teaching Quality 1									0.81		
Teaching Quality 2									0.82		
Teaching Quality 3									0.86		
Satisfaction1										0.91	
Satisfaction2										0.92	
Satisfaction3										0.94	
Confidence1											0.89
Confidence2											0.85
Confidence3											0.84
											0.85

Table-4. Results of good conformity test for conformity of the measurement model with the collected data.

Criterion	Estimated Value	Standard Value
X ² /DI	1.56	2>
Root Mean Square Error of Approximation (RMSEA).	0.06	0.08>
Normed fit Index (NFI)	0.93	0.9>
Non-Normed Fit Index (NNFI)	0.97	0.9>
Comparative Fit Index (CFI)	0.98	0.9>

Table 4 shows that all indicators of good conformity test were within the acceptable limit according to the standard values, and this means that the measurement model matches with the data collected in this study.

- (2) Analysis of the structural model. This shows the causal relationships between the variables: To know the conformity of the structural model with the data collected in this study, a goodness-of-fit test was

performed, which shows the following indicators (CMIN / DF, RMSEA, NFI, NNFI. Table 5 shows the results of the good conformity test for conformity of the structural model with the data collected in this study.

Table-5. Results of good conformity test for conformity of the structural model with the collected data.

critierion	Estimated value	Standard value
X ² /DI	1.62	2>
Root Mean Square Error of Approximation (RMSEA).	0.05	0.08>
Normed fit Index (NFI)	0.91	0.9>
Non-Normed Fit Index (NNFI)	0.96	0.9>
Comparative Fit Index (CFI)	0.97	0.9>

Table 5 shows that all indicators of good conformity testing were within the acceptable limit according to standard values, and this means good conformity of the structural model with the data collected in this study.

12. RESULTS AND DISCUSSION

Figure 2 shows the empirical factor analysis of factors affecting the use of faculty members' use of the electronic education system (Moodle) and the results of the use.

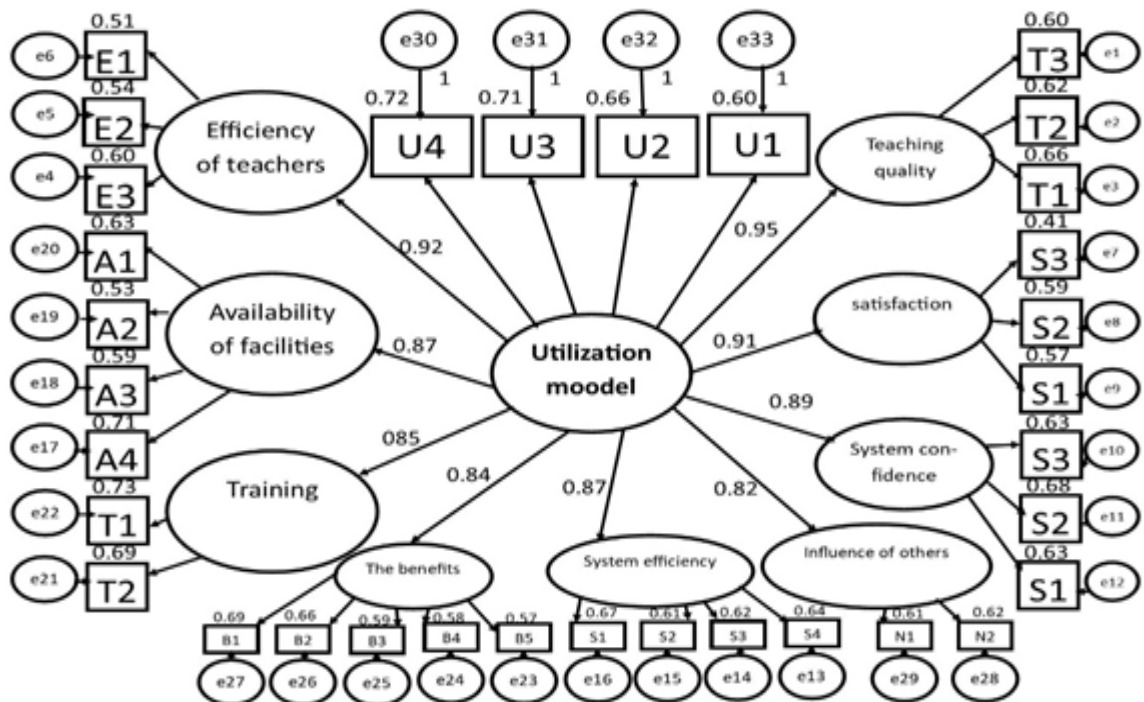


Figure-2. Confirmatory factor analysis.

Figure 2 shows that there are six factors that have a direct and positive impact on the use of faculty members for e-learning (Moodle) and three factors that represent the results of the use. The results of the hypothesis test are as follows:

12.1. Assumptions Affecting Factors of Use

The first hypothesis (The efficiency of faculty members affects their use of the e-learning system (Moodle)). The results show that the faculty competency factor is the most influencing factor in the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.92$; $p < 0.01$) and is statistically significant. The Hawamdeh (2011) study confirmed that one of the most prominent obstacles facing faculty

members at Al-Balqa Applied University while using the e-learning system is obstacles related to the teacher, as was also confirmed by the study of Al-Hamran et al. (2016) regarding the degree of ownership of faculty members. The application of the e-learning competencies (the competencies of using the computer, the competencies of using the network and the Internet, and the competencies of the e-learning culture) came in a medium degree. Based on this finding, it is emphasized that the efficiency of the faculty members is vested in their ability to use computers and applications related to the electronic education system which is one of the factors influencing their use of the Moodle system.

The second hypothesis (The efficiency of the e-learning system (Moodle) affects the use of faculty members). The results show that the efficiency factor of the e-learning system is one of the factors affecting the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.87$; $p < 0.01$), which is considered statistically significant. Salim (2013) confirmed that the effectiveness of the integrated education in Al-Balqa Electronic Academy from the viewpoint of members of the teaching profession at Al-Balqa Applied University. This was of varying degrees between medium and high, and the researchers confirm that the efficiency of the e-learning system represented by ease of use and contains all applications that serve the educational process factors that affect the use of faculty members.

The third hypothesis states (the availability of facilities affects the use of faculty members for the e-learning system (Moodle)). The results show that the availability of facilities is one of the factors affecting the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.87$; $p < 0.01$). It is considered statistically significant, and the researchers assure that the necessary requirements for faculty members, including computers, the Internet, and other requirements, help faculty members to use their e-learning system.

The fourth hypothesis (The training of faculty members affects their use of the e-learning system (Moodle)). The results show that the training factor is one of the factors affecting the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.85$; $p < 0.01$) It is statistically significant. Al-Husban (2013) confirmed this finding that the average use of information and communication technologies among faculty members in the educational process is relatively low, and a few of them have previously attended training courses in this field. The researchers confirm that faculty members' enrollment in courses and training workshops in the field of e-learning is one of the factors that affect their use of it.

The fifth hypothesis (Benefits affect the use of faculty members for the e-learning system (Moodle)). The results show that the benefits factor is one of the factors affecting the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.84$; $p < 0.01$) It is statistically significant. The study of Al-Rawashda et al. (2012) confirmed that the view of the faculty members towards an information technology culture is highly positive in the process of education and preparation of scientific research. The researchers confirm that faculty members achieve benefits that in fulfilling the general objectives of the courses.

The sixth hypothesis (Others affect the use of faculty members for the e-learning system (Moodle)). The results show that the influence of others is one of the factors affecting the use of faculty members for the e-learning system as the results of the pathway analysis of the worker is ($\beta = 0.82$; $p < 0.01$) It is statistically significant.

13. ASSUMPTIONS OF THE CONSEQUENCES OF USE

The seventh hypothesis (The use of faculty members to the e-learning system (Moodle) improves the quality of teaching). The results show that one of the consequences of the use of faculty for the e-learning system is to improve the quality of teaching as the results of the pathway analysis of the worker is ($\beta = 0.95$; $p < 0.01$) and is statistically significant. Mahasneh (2020) emphasized that the use of e-learning in teaching helps the learner to use more than one sense in the learning process, which helps to achieve the general objectives of the courses, which contribute to meeting the quality requirements in the teaching process.

The eighth hypothesis states (the use of faculty members to use the electronic education system (Moodle) increases satisfaction with their performance). The results show that one of the consequences of the use of faculty for the electronic education system is an increase in their satisfaction with their performance as the results of the pathway analysis of the worker is ($\beta = 0.91$; $p < 0.01$) and is statistically significant. The study of Al-Rawashda et al. (2012) confirmed that the view of faculty members towards an information technology culture is highly positive in the process of education and preparation of scientific research. This study also confirms that the satisfaction of faculty members with the use of the e-learning system is one of the factors affecting their use of it.

The ninth hypothesis states (the use of faculty members to use the electronic education system (Moodle) increases their confidence in it). The results show that one of the consequences of the use of faculty members of the electronic education system is to increase their confidence in the system as the results of the pathway analysis of the worker is ($\beta = 0.89$; $p < 0.01$) and is statistically significant. The researchers confirm that the use of faculty members for the e-learning system helps to determine the degree of confidence in the system.

14. RECOMMENDATIONS

According to the results, the researchers recommend educational policy makers in the Ministry of Higher Education, Scientific Research and University Administration to adopt the model that the study has adopted. This model introduces the factors that affect the use of faculty members for the e-learning system in order to achieve learning outcomes for academic programs and improve the use of information and communications technology in the teaching process.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Acknowledgement: All authors contributed equally to the conception and design of the study.

REFERENCES

- Ababneh, H., & Zaabi, M. (2018). The factors affecting the intention to use E-learning through testing the technology acceptance model (TAM) by inclusion of organizational culture. *Al-Manara Journal for Research and Studies*, 2(24), 395-432.
- Abou El-Seoud, M., Taj-Eddin, I., Seddiek, N., El-Khouly, M., & Nosseir, A. (2014). E-learning and students' motivation: A research study on the effect of e-learning on higher education. *International Journal of Emerging Technologies in Learning (iJET)*, 9(4), 20-26.
- Al-Ajrash, H. (2018). *E-learning in educational institutions*. Amman, Jordan: Dar Al-Safaa for Publishing and Distribution.
- Al-Assaf, J., & Al-Sarayrah, M. (2012). The extent of awareness of the faculty members at Al-Balqa Applied University about the concept of e-learning and the reality of their use in teaching. *Journal of Education*, 26(102), 191-235.
- Al-Hamran, M., Hamidat, M., & Badarneh, M. (2016). The degree of possession of faculty members at Al-Balqa Applied University to the competencies of e-learning from their point of view. *Al-Manara Journal*, 22(4), 253-279.
- Al-Husban, D. (2013). *The effect of the use of faculty members in "Princess Alia University College" for e-learning techniques in the educational process: A case study, the first international conference, libraries and information centers in a changing digital environment*. Jordan: Jordanian Library and Information Association, 10-29 / 29.
- Al-Mahasneh, O., Ayasrah, M., Yahyaa, S., Al-Kriemeem, R., & Al-Swalha, A. (2020). Favorite methods of teaching and evaluation among students in university colleges. *International Journal of Education and Practice*, 8(2), 365-378.
- Al-Mahdi, Y. (2007). Modeling methodology with the structural equation and its applications in educational management research. *Journal of Education and Development*, 15(40), 2-33.
- Al-Rawashda, A., Al-Arab, A., & Al-Jawad, B. (2012). *With a study entitled Information Technology and its role in education and training in Jordan*. Paper presented at the First International Conference for Information and Communication Technologies in Education and Training, Hammamet, 5-10 / 5, Tunis.

- Almseidein, T., & Mahasneh, O. (2020). Awareness of ethical issues when using an e-learning system. *International Journal of Advanced Computer Science and Applications*, 11(1), 128-131. Available at: <https://doi.org/10.14569/ijacsa.2020.0110116>.
- Babu, G., & Sridevi, K. (2018). Importance of e-learning in higher education. *International Journal of Research Culture Society*, 2(5), 48-88.
- Budu, K. W. A., Yinping, M., & Mireku, K. K. (2018). Investigating the effect of behavioral intention on e-learning systems usage: Empirical study on tertiary education institutions in Ghana. *Mediterranean Journal of Social Sciences*, 9(3), 201-201. Available at: <https://doi.org/10.2478/mjss-2018-0062>.
- Davis, F., Bagozzi, R., & Warshaw. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003. Available at: 10.1287/mnsc.35.8.982.
- El-Seoud, S., Seddiek, I., Taj-Eddin, P., Ghenghesh, M., & ElKhouly, M. (2013). *The effect of e-learning on learner's motivation: A case study on evaluating e-learning and its effect on egyptian higher education*. Paper presented at the International Conference on E-Learning in the Workplace 2013 (ICELW 2013), June 12th - 14th, 2013, New York, NY, USA.
- Elkhouly, M. (2010). Cases on challenges facing e-learning and national development: Institutional Studies and Practices, elearning in EGYPT (Vol. I). Eskisehir-Turkey: Ugur Demiray, Anadolu University.
- FitzPatrick, T. (2012). Key success factors of elearning in education: A professional development model to evaluate and support elearning. *US-China Education Review*, A(9), 789-795.
- Hawamdeh, M. (2011). Barriers to using e-learning from the viewpoint of faculty members at Al-Balqa Applied University. *Damascus University Journal*, 27(1 + 2), 803-830.
- Mahasneh, O., Al-tawah, H., & Al-Msadeen, T. (2013). The extent of familiarity and employment of faculty members at Shoubak and Maan University colleges to the strategies and methods of teaching and ways to improve their performance. *Ain Shams University Journal*, 1(2), 250-300.
- Mahasneh, O. M. (2020). A proposed model for the University students' E-Portfolio. *Journal of Education and e-Learning Research*, 7(1), 28-33. Available at: <https://doi.org/10.20448/journal.509.2020.71.28.33>.
- Mahasneh, O. M., & Murad, O. S. (2014). Suggested model (Related to the Student Portfolio) used in evaluation the students in university courses. *Higher Education Studies*, 4(3), 72-81. Available at: <https://doi.org/10.5539/hes.v4n3p72>.
- Mahasneh, O. (2013). *Professional education curricula and teaching methods*. Amman, Jordan: Culture World for Publishing and Distribution.
- Mahasneh, O. (2020a). A proposed model for the university students' e-portfolio. *Journal of Education and e-Learning Research*, 7(1), 28-34. Available at: <https://doi.org/10.20448/journal.509.2020.71.28.33>.
- Mahasneh, M. (2005). The impact of the efficiency of information systems on the effectiveness of decision-making (a field study in the Jordanian customs department). *Jordanian Journal of Business Administration*, 1(1), 78-90.
- Mahasneh, O. (2020b). *The effect of teaching by (mobile learning) in university students's achievement*. Paper presented at the 16th International Conference Mobile Learning 2020, Bulgaria, IADIS.
- Mahasneh, O. (2020c). *Dataset on perception among male secondary school students on underage smoking in Jordan*. Paper presented at the Proceedings of the 16th International Conference Mobile Learning 2020, Data in Brief, 29.
- Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record*, 115(3), 1-47.
- Noesgaard, S. S. (2014). *Supporting transfer of learning: Practice-based considerations on the applicability of transfer literature in online design*. Paper presented at the Designs for Learning.
- Patterson, B. J., Krouse, A. M., & Roy, L. (2012). Student outcomes of distance learning in nursing education: An integrative review. *CIN: Computers, Informatics, Nursing*, 30(9), 475-488.
- Prensky, M. (2009). H. Sapiens digital: From digital immigrants and digital natives to digital wisdom. *Innovate: Journal of Online Education*, 5(3), 1-9.
- Salim, T. (2013). The effectiveness of integrated education in Al-Balqa electronic academy from the viewpoint of members of the teaching faculty at Al-Balqa Applied University. *Journal of Studies in Higher Education*, 5(4), 10-30.

- Sheikh, T., & Rachna, G. (2018). E-learning for higher education. A case study. *Jour of Adv Research in Dynamical & Control Systems*, 10(04-Special Issue), 1539-1545.
- Smedley, J. (2010). Modelling the impact of knowledge management using technology. *OR Insight*, 23(4), 233-250. Available at: <https://doi.org/10.1057/ori.2010.11>.
- Tawarah, H. M. (2013). Teachers' effectiveness in asking classroom's questions and their interaction with student responses and questions. *International Journal of Educational Sciences*, 5(2), 117-122. Available at: <https://doi.org/10.1080/09751122.2013.11890068>.
- Tawarah, H., & Mahasneh, O. (2020). The reality of university education in Jordan from the viewpoint of faculty members. *International Journal of Psychosocial Rehabilitation*, 24(8), 7034-7037.

Views and opinions expressed in this article are the views and opinions of the author(s), International Journal of Education and Practice shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.