

Analysis of the Factors for the Successful E-Learning Services Adoption from Education Providers' and Students' Perspectives: A case study of Private Universities in Northern Iraq

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ABSTRACT

Electronic learning (e-learning) adoption has always been a challenge for developing countries which is often stunted by the facilitating conditions as well as the resistance of both the professionals and students. Two-step research methodology is applied in private Universities of Northern Iraq by utilizing a hypothesized model of technology acceptance model (TAM). First, the readiness factors were investigated through University staff by analysing 516 participants. As the second research objective, the intention of students is explored with 256 valid respondents in these Universities. Data were obtained from seven private Universities' staff and students via a paper based quantitative survey. Respondents were selected based on the convenience sampling method, where researchers visited Universities during the semester with permission of their administration bodies. The findings reveal that the lowest value was for human resource readiness factor. Cultural acceptance, both from education providers' and students' perspective, is quite crucial in order to have a sustainable e-learning applications. From a technical point of view, our findings also confirm the importance of the technological readiness and the main TAM constructs of perceived ease of use (PEOU) and perceived usefulness (PU). Therefore, management of the Universities need to ensure that selected systems adequately address these issues.

Keywords: e-learning, readiness, technology acceptance model, developing countries, adoption

INTRODUCTION

The rapid growth in Information and Communication Technology (ICT) and the power of Internet has continued to make strong impact on the service delivery models of today's global digital environment, such as: e-learning, e-government, e-commerce, e-health, e-business, e-banking, etc. World education sector has also evolved significantly by electronic learning (e-learning) which utilizes various technologies to improve the quality of content (Sulčić & Lesjak, 2009). E-learning is defined as the use of communication technologies and information in education sectors in order to be able to offer services in order to enhance academic outcome (Baris, 2015). In today's digital world of globalization, education which involves teaching and learning is regarded as an important element for achieving competitive advantage. In order to gain competitive grounds, both individuals and institutions are becoming more knowledge-intensive, which enables them to focus more on acquiring and maintaining knowledge in order to gain significant advantage. ICT upgrades educational standards, to put it differently, by means of technological devices so that students can be more successful in learning. Developing new technologies in universities create more efficient learning atmosphere and learning environment (Baris, 2015). The field includes delivery methods and approaches diverging services from education sector to students. As the technology changes rapidly, new possibility in learning increases. The aim of e-learning in education sectors is to increase the efficiency of teaching and enhance students' learning. E-learning is the centrepiece of information systems-supported improvements to digitize the services distribution and the development of education sector taking place through all stages. Electronic learning uses the Internet and the World Wide Web for both information distribution and

Contribution of this paper to the literature

- Contribution both to theory and practice to implement effective e-learning systems for the private universities in Northern Iraq and other developing countries that are at the same level of development.
- Identification of the factors and barriers towards a sustainable e-learning implementation from education providers' perspective.
- Measurement of behavioral intentions for e-learning applications by using technology acceptance model (TAM) within the student community.

services distribution (Shareef et al., 2011). There are many advantages of using e-learning in education sectors. The quality of education can be improved in several ways by implementing e-learning, one of them is learning course materials anytime and anywhere, therefore students will have the ability to access their learning materials easily. Moreover, it provides motivation resulting in active learning. E-learning involving broadcasting technologies, computers, the internet, videos, slides, etc, provide visual and audio learning atmosphere, resulting in effective participation process.

Institutions who are interested in deploying e-learning implementations have different cultures and also different facilitating conditions (Kaur, 2004). Therefore, it is a crucial first step research objective to identify the barriers in order to realize a sustainable e-learning implementation (Rohayani et al., 2015). It was realized from the previous studies that e-learning implementations without proper planning have difficulties to succeed (Borotis & Poullymenakou, 2004). In accordance, the adoption of e-learning can be initiated by measuring the readiness of e-learning (Clark & Mayer, 2016).

While considering the great potential of ICT, it should be noted that its effectiveness greatly depends on the degree of acceptance and use within the target population (Teo & Noyes, 2014). From the previous studies, users' perception and knowledge for a recently proposed technology have shown to affect acceptance and usage (Tarhini et al., 2015; Wong et al., 2015). Technology Acceptance Model (TAM) is one of the most well-known and used models to empirically explore the determinants of technology acceptance (Davis, 1989). It is a challenging research objective both to realize the barriers and identify users' intention in order to motivate a sustainable e-learning implementation.

With the above mentioned issues in mind, two-step research study was conducted to realize the determinants of e-learning technology readiness as well as to identify the factors of influencing consumer's acceptance in private Universities of Northern Iraq. First, e-learning readiness assessment was applied to realise the knowledge of the state for current related technologies, requirements and barriers from the service providers which would enhance sustainable implementation of strategies for e-learning technologies. The first part of the study mainly focused on the private Universities staffs' perspective, because they are the key stakeholders who could decide the level of technology for the specific region and also able to decide what or which e-learning applications would be appropriate to consider. As a second research objective, TAM assessment was tested to determine whether the students' intention and knowledge are enough to use an e-learning technology. In this research, two factors, Perceived usefulness (PU) and Perceived ease of use (PEOU), were discussed that will have impact on consumer's acceptance of electronic learning. PU is the degree to which an individual believes that the term of technology, under exploration, will improve her/his efficiency or outcome (Davis, 1989). On the other hand, PEOU is the degree to which an individual believes that using a technology will be easy, clear and simple. The researcher used two independent variables (PU and PEOU) to measure the dependent variables which are factors influencing consumers' acceptance.

MODEL DEVELOPMENT

Two-step research methodology is applied in this study as can be seen in [Figure 1](#) to realize a sustainable and future proof e-learning adoption strategy for the region.

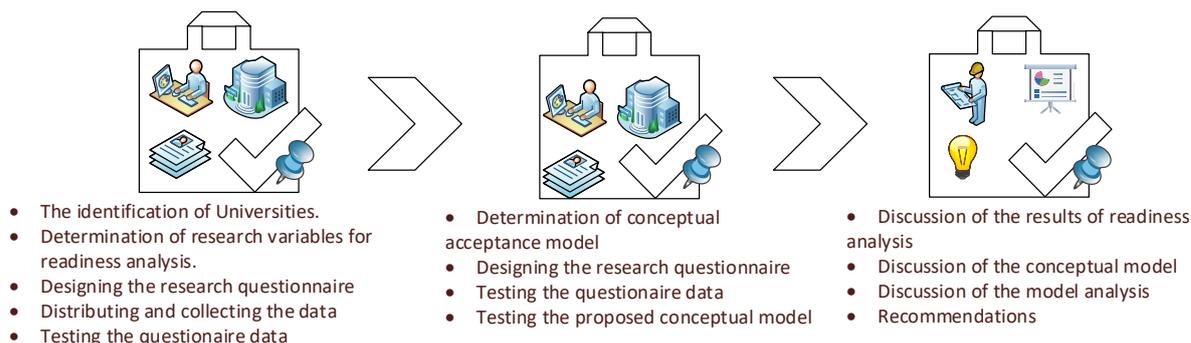


Figure 1. Proposed research methodology

Table 1. Definition for the readiness factors

Readiness	Definition
Technological	This refers to the observable and measurable technical competencies involving users' capabilities with the software and hardware technologies that are required for e-learning deployment
Human resource	This refers to the readiness of the professional service providers in terms of knowledge, experience and interest in e-learning technology
Content	This refers to the readiness of e-learning content to the lecturers, their satisfaction with the content, and assess if they need training on eLearning content development
Educational	This refers to issues such as content analysis, audience analysis, goal analysis, design, methods and strategies which assess the principles and methods of instruction (i.e., teaching and learning)
Leadership	This refers to the government and institutions management's leadership dimensions that address the continuation, updating, and upkeep of the learning environment
Cultural	This refers to the enculturation of e-learning in terms of Internet use and networked technologies to disseminate information, communication, interaction and teaching

Despite the well-known potential benefits of using e-learning applications, there are some potential barriers that need to be overcome so as to cross the line in implementing the e-learning system (Rohayani et al., 2015).

It was revealed by Kuldip Kaur and Zuraini Wati that policy makers have to take a preliminary role for e-learning applications as information systems deployments (Kaur & Abas, 2004). On the other hand, Sadik has found out from his study in an Egyptian University that knowledge, skills and experience are the key factors in the acceptance and implementation of e-learning technologies (Sadik, 2007). Policy, technology, financial, human resource and infrastructure have been considered in order to measure students' e-learning readiness (Saekow & Samson, 2011). Another research work by Oketch et al. (2014) considered technology, cultural and content as factor to assess e-learning readiness in University of Nairobi, Kenya. It was found out by the study that technology and cultural factors are important for e-learning adoption while the content is not so important (Oketch et al., 2014). The factors that are considered in the first part of the research study are presented in Table 1. The problems listed below seem to be the general problem affecting e-learning implementation in private universities in Northern Iraq.

In accordance to the definitions presented in Table 1, a conceptual model for e-learning readiness is introduced as illustrated in Figure 2.

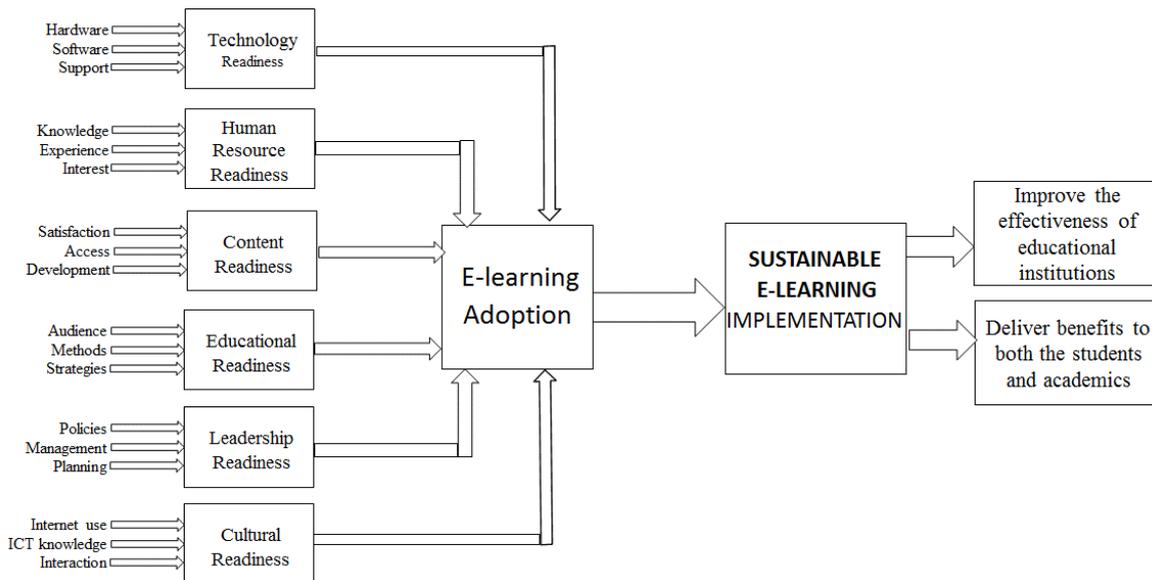


Figure 2. The conceptual model of e-learning readiness

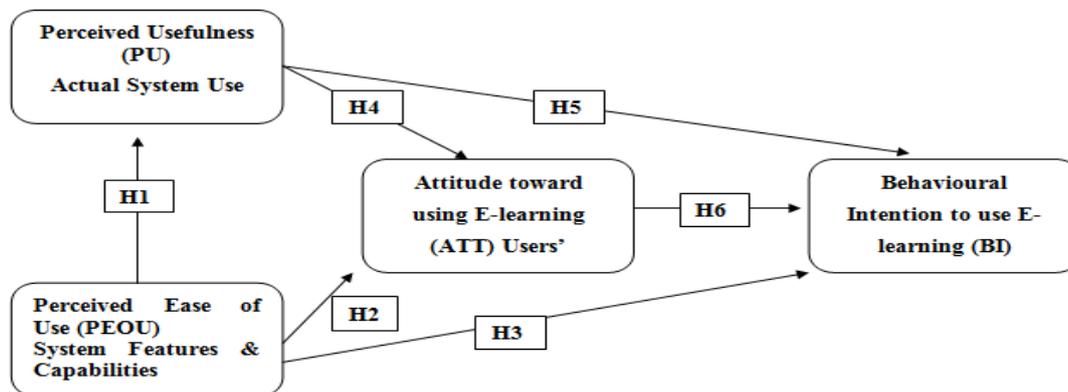


Figure 3. Proposed theoretical TAM research model

As mentioned earlier, TAM is used as an information-theoretic model for the second-step of the research study. It enables researchers to make statements about possible acceptance or rejection of a new technology by a designated user group. With a growing demand for technology and the starting computerization, difficulties increase in system integration. As a consequence, the acceptance of specific technologies by their designated operators became a field of research to diminish the effects of possible rejection. Davis (1989) adjusted the Theory of Planned Behaviour by adding a technical scope, with the intention to give recommended procedure for the search of acceptance of technical products. His aim was to identify and neutralize reasons of rejection for these technical items. There are several studies in the literature that have successfully extended TAM applications for e-learning technology (Alshare et al., 2011; Hu & Hui, 2012; Sharma & Chandel, 2013; Sharma et al., 2014). TAM has also been used to measure e-learning acceptance in developing countries, such as Jordan (Abbad et al., 2009; Al-Adwan & Smedley, 2013). In most developing countries, traditional styles of pedagogy are utilized in education, due to a lack of financial resources and appropriately trained staff (Baroud & Abouchedid, 2010; Dagher & BouJaoude, 2011).

It was highlighted by the TAM that perceived usefulness and perceived ease of use has a direct effect on attitudes towards using a new technology (Chen et al., 2011). Attitude is another important factor which is defined as the degree to which the user is interested in specific systems. It has a direct effect on the intention to use those specific systems in the future (Davis et al., 1989). It should also be noted that behavioural intention is affected by perceived ease of use and perceived usefulness (Johnston et al., 2015). Furthermore, examples of the external variables were given in the new model by Venkatesh and Davis (2000) as TAM2, such as “job relevance”, “output quality” and the “results demonstrability” (Nyoro et al., 2015). In this study about e-learning, the factor of design is of special interest, as it gives evidence of the dependency between system design and system use. The link between these two parameters is the behavioural intention influenced by PU and PEOU, as there is no direct dependency. Proposed theoretical model for the second part of the research study is presented in Figure 3.

Access and ease of technology are realized as one of the most important factors that contribute to the sustainable implementation of e-learning systems (AbuSneineh & Zairi, 2010). Therefore, perceived ease of use (PEOU) is considered as a direct determinant of attitude towards using technology (ATT) in many research studies (Park, 2009; Chang et al., 2012). In addition to this, PEOU has an indirect effect on behavioral intention to use technology through increased perceived usefulness (PU) (Sek et al., 2010; Lee et al., 2011). It was also investigated that increased PEOU leads to greater perception of usefulness (Venkatesh and Davis, 2000). Therefore,

- H1:** Perceptions of ease of use an e-learning should lead to increased perceptions of usefulness in e-learning.
- H2:** Perceived ease of use of an e-learning will lead to an increasingly positive attitude toward e-learning.
- H3:** Perceived ease of use of an e-learning will lead to increases behavioural intention to use e-learning.

PU was theorized as direct determinant of ATT and indirectly results in more positive for behavioural intention to use technology (Teo et al, 2014). Therefore,

- H4:** Perceived usefulness of an e-learning will lead to an increasingly positive attitude toward e-learning.
- H5:** Perceived usefulness of an e-learning will lead to increases behavioural intention to use e-learning.

ATT is defined as the individuals respond to a recently proposed technology. It was clearly revealed from the previous studies that positive attitude towards a new technology is required in order to realize a successful implementation (Huang and Liaw, 2005). Therefore, ATT has been hypothesized as a direct determinant of behavioural intention to use (ITU) (Alharbi & Drew, 2014).

- H6:** Positive attitude toward an e-learning will lead to increases behavioural intention to use e-learning.

METHODOLOGY

Methodology for the First-step of the Research Study

Quantitative research method is applied for the first-step of the research methodology to find the readiness factors including (technological readiness, human resource readiness, content readiness, educational readiness, leadership readiness, and cultural readiness) in implementing e-learning. The questionnaire items were adopted from the studies of (Aydin & Tasci, 2005; Lašáková et al., 2017), which consists of survey questions asking the participants to express their opinions on their knowledge, perception, and experiences with e-learning technology applications. Currently there are seven private universities in the Erbil city. The questionnaire was distributed randomly among 700 academic and administrative staffs (education providers) of private universities. The participants of the present study were 516 participants from different private universities in Kurdistan region of Iraq. The questionnaire included 16 items of technological readiness, 15 items on human resource readiness, 19 items on students' readiness, 15 items on content readiness, 15 items on educational readiness, 15 items on leadership readiness, 16 items on cultural readiness and 20 items on e-learning implementation. All items were evaluated by using five point Likert scale ranging from 1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree to 5= Strongly Agree. After the completion of data gathering, all data were examined by SPSS to find out readiness factor level of e-learning implementation.

Methodology for the Second-step of the Research Study

Quantitative method was also applied for the second-step of the research methodology with a questionnaire regarding factors influencing students' acceptance of implementing electronic learning in private universities in Northern Iraq. The survey was used to collect data by the form of a questionnaire related to participants' perceptions and opinions regarding the factors influencing the students' acceptance of e-learning. 270 questionnaires were distributed and 256 were received in which 14 questionnaires were missing. The questionnaire was validated from pervious researchers and adapted from (Tarhini et al., 2015).

RESULTS

Results for the First-step of the Research Study

The demographic data was analysed to determine the characteristics of the academic and the administrative staff of the Universities, and the result in shown in [Table 2](#).

Table 2. Summary of demographic data of the academic and administrative respondents

	Items	Frequency	Percent
Gender	Male	318	61.6
	Female	198	38.4
Age	20-29	134	26.0
	30-39	160	31.0
	40-49	138	26.7
	50 and above	84	16.3
	Bachelor	80	15.5
Level of education	Master	174	33.7
	PhD	262	50.8
	Staff	76	14.7
Position	Assistant lecturer	78	15.1
	Lecturer	116	22.5
	Assistant professor	114	22.1
	Associate professor	76	14.7
	Professor	56	10.9

Table 3. Correlation Analysis for the first-step of the research study

Items	Correlations	
	Pearson Correlation	E-learning implementation
Technological readiness	Pearson Correlation	.915**
	Sig. (2-tailed)	.000
	N	516
Human resource readiness	Pearson Correlation	.769**
	Sig. (2-tailed)	.000
	N	516
Content readiness	Pearson Correlation	.885**
	Sig. (2-tailed)	.000
	N	516
Educational readiness	Pearson Correlation	.764**
	Sig. (2-tailed)	.000
	N	516
Leadership readiness	Pearson Correlation	.876**
	Sig. (2-tailed)	.000
	N	516
Cultural readiness	Pearson Correlation	.826**
	Sig. (2-tailed)	.000
	N	516

** Correlation is significant at $p < 0.01$ level (2-tailed)

Table 2 shows that majority of the respondents' are male which is an expected characteristics in most developing countries. The table shows age, level of education and position of the participants. The surveyed participants are the professionals who are expected to improve the effectiveness of educational institutions by utilizing e-learning technologies. The reliability of the constructs was checked by Cronbach's alpha. Cronbach's alpha measures how well a set of items measures a single unidirectional latent construct. Different reliability values were considered satisfactory by different researchers. For instance, it should be at least 0.7 according to DeVellis (2003) and Robinson et al. (1991) or 0.6 is considered satisfactory while a value of 0.8 or higher is preferred according to Nunnally (1970). Given that all constructs had composite reliability scores above 0.7, this suggests that the constructs had adequate reliability. The correlation analysis of the factors is presented in **Table 3**.

As can be seen in **Table 3**, the correlation analysis for the study indicates that all the items have a significant correlation (the value of $r^{**} > 0.76$, $p < 0.01$) with e-learning implementation in which linear correlation is strong between all readiness items and e-learning implementation. Multiple regression analysis is depicted in **Table 4**.

Table 4. Multiple Regression Analysis

Independent variable	Coefficients (β)	t-value	P-value
Technological readiness	.737	51.319	.000
Human resource readiness	.556	27.259	.000
Content readiness	.698	43.121	.000
Educational readiness	.629	26.857	.000
Leadership readiness	.684	41.167	.000
Cultural readiness	.627	33.193	.000
R ²		.0731	
F value	1786.337		.000

Dependent Variable: E-learning implementation

Table 5. Summary of demographic data of the participated students

	Items	Frequency	Percent
Gender	Male	158	61.7
	Female	98	38.3
Age	18-19	44	17.2
	20-21	54	21.1
	22-23	60	23.4
	24 and above	98	38.3

Multiple regression analysis was employed in order to find out the predictive relationship between each independent variable and dependent variable. In this section, the relationship between seven independent variables and e-learning implementation as dependent variable was found. As can be seen in **Table 4**, technological readiness factor has significantly predicted e-learning implementation ($\beta = .737$, $p < .001$). Content ($\beta = .698$, $p < .001$), educational ($\beta = .629$, $p < .001$), leadership ($\beta = .684$, $p < .001$) and cultural ($\beta = .627$, $p < .001$) readiness factors have a strong influence on e-learning implementation. Majority of the participants have indicated that technology (both hardware and software) and content are either available or the management (leadership readiness) has intention to take necessary actions to implement e-learning applications in private Universities of Northern Iraq. Professionals recognize that large-scale course redesign for e-learning initiative involves a strong collaboration among the teachers, IT personnel, and administrators in the planning as well as the implementation. Technical and funding support from the management are available to implement e-learning applications. For the educational readiness, the institution has the capability to transfer the learning content online. Professionals are also aware that organizational (cultural) change is going to occur after e-learning implementation process which eventually change daily routine in University environment.

On the other hand, human resource readiness factor has the lowest value ($\beta = .556$, $p < .001$). Therefore, it indicates that human resource readiness have positive influence for e-learning implementation but not as strong as other readiness factors. It was found out from the research study that all the education providers are well-aware of the e-learning technology and willing to use such applications. However, majority of the participants thought that it would have been better for the institutions to establish mechanisms which maintain high levels of employee morale and motivation among them in order to use such e-learning applications. There should be a management initiative to have training programs for professionals.

Results for the Second-step of the Research Study

The demographic data was first analysed to determine the characteristics of the participated students, and the result is shown in **Table 5**.

Table 5 depicts that majority of the respondents' age are above 24 which is positive indication in terms of higher education for a developing country. The surveyed participants are the first target group who are going to benefit from the advantages of e-learning technology. For the second-step of the research methodology, reliability test is also applied in order to find out whether all items used to analyse the current study are reliable or not. The results are depicted in **Table 6**. In terms of Perceived Usefulness factor, the Cronbach's Alpha = .829 for 11 items, since (.829 > .6) therefore 11 questions of perceived usefulness were reliable. In terms of Perceived Ease of Use as independent factor, the Cronbach's Alpha = .872 for 8 items, since (.872 > .6) therefore 8 questions of perceived ease of use were reliable. In terms of Behavioural Intention to Use E-learning factor, the Cronbach's Alpha = .862 for 3 items, since (.862 > .6) therefore 3 questions of behavioural intention to use e-learning were reliable, and in terms of Attitudes towards using e-learning factor, the Cronbach's Alpha = .798 for 3 items, since (.798 > .6) therefore 3 questions of Attitudes towards using e-learning were reliable (Hair et al. 2010).

Table 6. Reliability statistics of the TAM variables

Dimensions	Cronbach's Alpha	Number of items
Perceived usefulness (PU)	.829	11
Perceived ease of use (PEOU)	.872	8
Behavioral intention to use	.862	3
Attitudes towards using e-learning	.798	3
Total	.840	25

Table 7. Correlation analysis

		BI	PEOU	PU	ATTITUDE
BI	Pearson Correlation	1	.729**	.673**	.821**
	Sig. (2-tailed)		.000	.000	.000
	N	256	256	256	256
PEOU	Pearson Correlation	.729**	1	.662**	.564**
	Sig. (2-tailed)	.000		.000	.000
	N	256	256	256	256
PU	Pearson Correlation	.673**	.662**	1	.412**
	Sig. (2-tailed)	.000	.000		.000
	N	256	256	256	256
ATTITUDE	Pearson Correlation	.821**	.564**	.412**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	256	256	256	256

** . Correlation is significant at the 0.01 level (2-tailed)

Table 8. The relationship between PU and PEOU

	Dependent Variable: Perceived Ease of Use					
	B	Std. Error	Beta	t	P	Decision
(Constant)	.821	.151		5.423	.000	
PEOU	.797	.037	.803	21.465	.000	Supported
Model F	460.765					
R ²	.645					

P<0.05

Table 7 shows the correlation analysis between variables and all the factors exhibited significant relationships. It could be stated that apart from the relationship between PU and ATTITUDE constructs, the results show that all the other constructs' have correlations above 0.5. All the factors exhibited positive relationships with attitude towards using e-learning.

The hypothesis testing

The relationships between constructs were tested after supporting the validity and reliability of the measurement model. Structural equation modelling (SEM) was used to test all hypothesized relationships amongst constructs as can be seen from the sections below.

A multiple regression analysis was conducted to test the first Hypothesis (H1), perceived usefulness (PU) as an independent variable and perceived ease of use (PEOU) as dependent variable (**Table 8**).

The value of R² is .645, which indicates that 65% of the variables have been explained. According to (Anderson & Gerbing, 1988) this is a large effect. PU has a strong influence on PEOU ($\beta=.803$) in which this analysis gave support to Hypotheses 1. The value of F = 460.765>0.01 this means there is positive relationship between variables. The value B for perceived ease of use PEOU = .797 (.797>0.01) which indicates that increases in perceptions of ease of use an e-learning should lead to increased perceptions of usefulness in e-learning.

Hypothesis 2 was supported as PEOU ($\beta=.564$) was found to positive influence on the attitude towards using e-learning (ATT) at the .05% level as shown in **Table 9**.

Table 9. The relationship between PEOU and ATTITUDE

Dependent Variable: ATTITUDE						
	B	Std. Error	Beta	T	P	Decision
(Constant)	.879	.213		4.132	.000	
PEOU	.780	.054	.564	14.364	.000	Supported
Model F	206.313					
R ²	.564					

P<0.05

Table 10. The relationship between PEOU and BI

Dependent Variable : BI						
	B	Std. Error	Beta	T	P	Decision
(Constant)	.728	.140		5.211	.000	
PEOU	.799	.036	.729	22.415	.000	Supported
Model F	502.445					
R ²	.729					

P<0.05

Table 11. The relationship between PU and ATTITUDE

Dependent Variable :ATTITUDE						
	B	Std. Error	Beta	T	P	Decision
(Constant)	.471	.174		2.703	.000	
PU	.907	.043	.800	21.236	.000	Supported
Model F	450.963					
R ²	.800 ^a					

P<0.05

Table 12. The relationship between PU and BI

Dependent Variable :BI						
	B	Std. Error	Beta	T	P	Decision
(Constant)	.766	.148		5.171	.000	
PU	.900	.036	.841	24.771	.000	Supported
Model F	613.620					
R ²	.841					

P<0.05

As can be seen from the results of single regression analysis, the value of $F = 206.313 > 0.01$ which states a positive relationship between variables. The value of $R^2 = .564$ means that 56% of the variables have been explained, and the value B for perceived ease of use PEOU = .780 (.780 > 0.01) which indicates that increases in the perceived ease of use of an e-learning will lead to an increasingly positive attitude toward e-learning.

As proposed by the TAM, PEOU and behavioural intention towards using e-learning (BI) explained a significant percentage of variance in attitude, $R^2 = .729$ (Table 10). PEOU had a strong significant effect on BI ($\beta = .729$) which supports third research hypothesis.

The value of $F = 502.44 > 0.01$ refers that there is positive relationship between variables and the value B for perceived ease of use PEOU = .799 (.799 > 0.01) which indicates that increases in the perceived ease of use of an e-learning will lead to increases behavioural intention to use e-learning.

Hypotheses 4 focus on the impact of perceived usefulness on attitude. Similar to the other studies on TAM (Davis, 1989), perceived usefulness has a positive direct effect on attitude ($\beta = 0.75$, $p < 0.05$) as depicted in Table 11. Therefore, H4 is supported.

Hypotheses 5 & 6 investigate the relationship of PU and ATT to BI. Perceived usefulness has a positive direct effect on behavioural intention ($\beta = 0.841$, $p < 0.05$), and attitude towards e-learning ($\beta = 0.821$, $p < 0.05$) as can be seen from Table 12 and 13 accordingly. Therefore H5 and H6 are also supported.

Table 13. The relationship between Attitude and BI

	Dependent Variable : BI					Decision
	B	Std. Error	Beta	T	p	
(Constant)	1.289	.086		15.059	.000	
ATTITUDE	.651	.022	.821	30.223	.000	Supported
Model F	913.415					
R ²	.821					

P<0.05

DISCUSSIONS AND RECOMMENDATIONS

The demonstration of a two-step research methodology is important in order to understand the perceptions of both education providers and students in Northern Iraq. Quantitative research approach is conducted for the first part of the research study in order to identify the barriers for implementing e-learning technology from University staffs' perspective. It was found out that technological readiness factor has significantly predicted e-learning implementation ($\beta = .737$, $p < .001$). Content ($\beta = .698$, $p < .001$), educational ($\beta = .629$, $p < .001$), leadership ($\beta = .684$, $p < .001$) and cultural ($\beta = .627$, $p < .001$) readiness factors have also a strong influence on e-learning implementation but not as strong as technological readiness. Majority of the participants have indicated that technology (both hardware and software) and content are either available or the management (leadership readiness) has intention to take necessary actions to implement e-learning applications in private Universities of Northern Iraq. Technical and funding support from the management are available to implement e-learning applications. On the other hand, human resource readiness factor has the lowest value ($\beta = .556$, $p < .001$). Hence, it describes that human resource readiness have positive influence for e-learning implementation but as strong as other readiness factors. It was revealed from the research study that all the education providers are well-aware of the e-learning technology and willing to use such applications.

Quantities research approach is again conducted for the second part of the research. TAM model reveals an additional contribution by clarifying the specific pattern of cultural responses from students. Hypotheses 1, 2 & 3 states that "PEOU will positively influence perceived usefulness in e-learning", "PEOU will positively influence attitude towards e-learning" and "PEOU will positively influence behavioral intention to use EMR" respectively. All hypotheses were accepted; PEOU is one of the most important factors especially in the early stages of new technology use. It was found out from the previous studies that a new technology could be accepted without major resistances if an individual is familiar with the proposed technology (Marchewka & Liu, 2007).

Hypotheses 4 & 5 states that "perceived usefulness will positively influence attitude towards e-learning", and "perceived usefulness will positively influence behavioral intention to use e-learning" respectively. Both hypotheses were accepted; it was found that when users perceive the relative advantages of new technology, they are more likely to adopt it. Previous literature shows that perceived usefulness is significant for TAM studies, by adversely influencing both attitude and intention to use new technology (Teo et al., 2014).

Finally, the sixth hypothesis (H6) states that "attitude towards e-learning will positively influence behavioral intention to use e-learning". This hypothesis was accepted; it was found that the attitude, belief, and willingness of students' have a significant influence on their decision and intention to use e-learning systems. This result corresponds to the findings of other researchers (Alharbi & Drew, 2014).

Based on the findings from our research discussed above, we identified the major barriers to the adoption and implementation of e-learning technology applications in a developing country, which we categorized into five principal areas; they include: (1) Technology infrastructure barriers, related to hardware, software, and networking; (2) Human resource barriers, related to attitude, willingness, and belief to use e-learning; (3) Educational Content barriers, related to knowledge, experience and strategy of using ICT tools and applications; (4) Administrative barriers, related to organizational and management policies; and (5) Cultural barriers, related to society's technology use.

Limitations and Future Research

We acknowledged that the study is limited by geographical scaling, since it was conducted in seven private Universities. We believed that the results of the study would have been better and more generalized if we were able to visit other cities and more Universities by using stratified sampling. Another relevant factor that we acknowledge as a limitation is that the study focused on academic & administrative staff of Universities and students, without considering the opinion of government officials. Further research could investigate the opinions of the government officials, especially in the area of policies and grants to support e-learning technologies.

CONCLUSION

Many developing countries have implemented e-learning applications to deliver services and information to the students through the Internet. As the population grows, several developing countries try to facilitate sophisticated web sites by providing many features to perform in better way to help students, other governments, businesses, and other web visitors. It is very essential to understand and recognize the importance of successfully implementing e-learning projects. Although most of e-learning implementation projects fail either partially or totally due to the resistance from the users, some e-learning implementation projects are successful. The findings of this study make a significant contribution both to theory and practice to implement sustainable e-learning systems for the private Universities in Northern Iraq and other developing countries that are at the same level of development. From the theoretical point of view, the first contribution is to identify the factors for a sustainable e-learning application from education providers' perspective. Second significant contribution of this work is the measurement of perception for e-learning applications by using TAM within the student community in private Universities. Six hypotheses, from the TAM, were supported and it was found out that all the TAM constructs are positively correlated between each other. PEOU has a significant effect on BI ($\beta > .729$) but has .564 correlation on ATTITUDE. The reason for the difference is that students never had the chance to use an e-learning application. It was also realized from Shroff et al. (p.610, 2011) that "user's positive feelings toward the ease of use of technology are associated with sustained use of the technology". Davis (Davis, 1989) point out that PU is influenced by PEOU which was also the finding of the research study. It was demonstrated that the most significant relationship among the variables is between BI and ATTITUDE ($\beta > .8$). This may be due to the fact that students are well-aware of the advantages and willing to adopt e-learning systems.

Cultural acceptance, both from education providers' and students' perspective, is quite crucial in order to have a sustainable e-learning application. Our work also contributes to the growing body of evidence with regard to the impact of behavioural intentions of both education providers and students in Northern Iraq which elucidates the impact of individual level on technology acceptance. From a practical point of view, our findings also confirm the importance of the technological readiness and the main TAM constructs of PEOU and PU. Therefore, management of the Universities and the policy makers need to ensure that selected systems adequately address these issues. Our results also confirmed the importance of content and leadership readiness for e-learning implementation. This emphasizes the need to consider implementation strategies both from the Universities and policy makers in order to implement a sustainable e-learning system.

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