Factors Effecting the Adoption of E-Learning: An Empirical Study of Libyan Universities

GholamReza Zandi (ORCID)

Associate Professor, Universit ▮ Kuala Lumpur (UniKL) Business School, Malaysia. E-mail: zandi@unikl.edu.my

Husam A. E. Lahrash*

*Corresponding Author, Department of Data Analysis, Faculty of Economics, University of Zawia, Libya. E-mail: h.lahrash@zu.edu.ly

Fadya Ramadan Shakhim

Department of Statistics, Faculty of Science, Al-Zawiya University, Al-Zawiya, Libya. E-mail: f.shakhim@zu.edu.ly

Abstract

The main aim of this thesis is to investigate the factors that could affect the students to adopt e-learning system in Libyan universities. This study is quantitative approach, a questionnaire was adopted from previous studies and distributed among the students to collect the data. The sample of the study consists 365 students from Libya. AMOS software was used to analysis the data. The results indicated that Performance Expectancy, Efforts Expectancy, Facilitating Conditions, Habit and Trust have significant impact on behavioural intention. Moreover, the relationship between Behavioural intention and use behaviour is also significantly positive. However, the relationship of social influence and behavioural intention was not found significant. Finally, the moderation effect was significant and supported between social influence, trust, and Habit with behavioural intention.

Keywords: E-learning, UTAUT2, Trust, Structural Equation Modeling, Libya.

Introduction

Due to the fast technological advancement, the academic world is constantly moving towards change. In the recent years, the internet is being utilized along with the modern learning and teaching techniques and the modern communication system has become a core component of educational strategies in the institutions and universities. Nowadays, e-Learning has become a practical option rather than traditional techniques, and it has been adopted, particularly by many institutions of education, because of the advantages that are obtainable by the possibility of continuous training. (Simo, Barbulescu, and Kilyeni, 2015). Besides that, in Romania, these new teaching and learning strategies face hasty improvement. As a result, in the Romanian academic environment, e-Learning is expected to   be an exceptional tool. Primarily, this idea has replaced the classical approach of distance education, associated together with materials written on CDs. Those authors added that,   the opportunity of the connection via the Internet has simplified the development of collaborative environments, virtual classrooms, and synchronous and asynchronous training. So that, their findings demonstrates that, the modern teaching and learning methods (e-Learning) can accomplish results at least as good as those who involving into the traditional methods. (Simo, Barbulescu, and Kilyeni, 2015).

In addition, Harandi (2015) stated that, E-learning has a important role in instruction of students in higher education, in this regards the current research is objective to evaluate the strength of the relationship between e-learning and students' motivation among the students. Overall, his results his study have ensured that e-learning is an element which influence the students' motivation. Harandi (2015)   provides a Practical implication in his study which implies that, the findings of his study will be helpful in developing countries for educational thinkers in order to get better comprehension of e-learning on students' motivation.

In view of this; it is being mentioned that there is significant change and advanced technology is being observed in the multimedia and internet based technology (Lin, Chen and Nien, 2014). Similarly; in the educational sector this innovation and technology has penetrated in a positive way. Researcher is conducting the research on the Freshman College's students in the context of e-learning system based upon the accounting course to analyze the results and execution of this system into education. The research design is based upon quasi experimental which is being divided into experimental group and controlled group as well. Leaning impact will be evaluated before and after test. For the sake of achievement the results of the study experimental group will be using the e-learning system while the controlled group will be using the traditional system of the education. The time period has been given to the experimental group is six week after that researcher will be analyzing the usefulness of the learning system adequately. The results is based upon the two categories such as; e-learning system is not different and it is as the traditional system; while the second category results of controlled group that are having traditional system of getting the education

of accounting considers that e-learning education is more effective and beneficial for learning purposes (Lin, Chin and Nien, 2014).

In Turkey; another study is being conducted which was aim to undertake the EFL learning regarding the technology that how it is beneficial for the students and academics (Cakir and Solak, 2014). Researchers have used the survey strategy to collect the data regarding the technology adaptation of the Turkish Foreign Language Learners. This study was conducted in public university back in 2012-2013; the participants were 231 males and 279 were females and they were enrolled in the e-language English course at the Vocational Higher School. The results of the study suggested that; there is the influence of Technology Acceptance Model features on the student that are getting education through e-learning. The most prominent feature among the students were the anxiety that has negative impact on success of e-learning; perceived ease of use, attitude, satisfaction and self-efficacy having positive significance with the e-learning. The results concluded that Turkish EFL students are having positive impact of learning through technology and they can make the decision regarding their option towards e-learning or traditional method of learning (Cakir and Solak, 2014)

Furthermore, Al-adwan, and Smedley (2012) indicated that the more the involvement of technology in the life of a common man the more the academic institutions and universities are under pressure to adopt the new technologies for their teaching method. This confirms that, they continue to be competitive in a continually changing market with international and cultural links. Their study investigates the factors that affected the improvement of learning throughout using of technology at two Jordanian universities, concentrating on full-time staff and students. It takes into a consideration, the general attitude towards interacting in learning through technology with outcomes signifying that, the training and the development is required preceding to implementation to sufficiently support the learning transition. The organizational infrastructure often presents the greatest barrier to such developments. The findings of their study demonstrated that, a training and development programme has been arranged, developed and implemented to support the cultural change and increase its influence.

The current study is aimed to meet the following research objectives: (1)To investigate the effect of performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and habit on behavioral intention of Libyan universities students.(2) To investigate the effect of Behavioral Intention on the Use Behavior of Libyan universities students. (3) To investigate the effect of moderating role of level of experience on the relationship between   performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and Habit with students behavioural intentions to use e-learning system.

Literature review

In the past there are number of studies are being conducted in order to assess the online learning feature adoption and different theoretical models and framework were designed to deliver the factors that are affecting the successful adoption and implementing of technology. There are few examples such as: Theory of Acceptance Model (TAM); Theory of Reasoned Action (TRA); Theory of Planned Behaviour (TPB); Innovation Diffusion Theory (IDT); Model of PC Utilization (MPCU); Unified Theory of Acceptance and Use of Technology (UTAUT) and UTAUT2. It is concluded that in the entire model only UTAUT model is highly influential for all the models mentioned above (Venkatesh et al, 2003). There are four variables that are important in the model of UTAUT that are performance expectancy, effort expectancy, cultural impact and effective environment and there are four moderating variables such as Demographics (age, gender), experience and voluntariness. It is proposed that UTAUT2 is being extended by the intiatil model of UTAUT by induction of four models that are: Price, value, hedonic motivation and habit; to facilitate the explanatory powers. In this study; researcher is using the UTAUT2 to analyze the factors that are impacting upon the e-learning adoption in the Libya universities in the context of students (Venkatesh et al, 2003; Venkatesh and Zhang, 2010) and modern studies are using the same features because they are simple, parsimony and quick to assess the variables (Venkatesh et al, 2012; Venkatesh and Zhang, 2010). It is evident from the previous studies that UTAUT and UTAUT2 did not analyzed in the context of developing countries such as Arab and African because it is being tested in the developed countries in the studies (Alalwan et al, 2015; Kamoun and Almourad, 2014). It is criticized that UTAUT is a biased model towards specific countries and its features (Zuiderwijk et al, 2011). The importance of the model of UTAUT2 in the developing countries and using the different cultures will give different approach and results in the context of adoption of new technology by the users and others (Venkatesh et al, 2012). Researcher has included the variable of trust as it is highly important because in the previous studies it has played an important role in order to assess the adoption of the technology (Al Gahtani, 2016; Wong et al, 2015). In this way; researcher has extended the UTAUT2 model in order to increases the effectiveness of the model in the context of adoption of the technology with respect to e-learning in order to get the more efficient result regarding the study.

Hypotheses development and conceptual framework

This section discusses the hypotheses of this research. The hypotheses are developed based on the conceptual framework.

Performance Expectancy

Researcher has selected the performance expectancy from the several models of information system that are: perceived usefulness (TAM and TAM-TPB both); extrinsic motivation (MM), Job fit (MPCU), relative advantage (DOI) and outcome expectancy (SCT). It is evident that the performance expectancy forecast about the behavior intention towards the technology and it is effective and necessary in both the cases of voluntarily and mandatory setting (Venkatesh et al, 2003). As far as the performance expectancy is concern it is considered as the individual perception about the e-learning system will be effective in order to attain the objective at the workplace. Therefore; this variables is being analyzed with the other variables such as: perceived usefulness, relative advantage, outcome expectations, benefits and availability. The purpose of using the performance expectancy in the study by the researcher; because it is considered it is an effective predictor towards the intentional behavior about the technology (Al Awadhi and Morris, 2008; Davis et al, 1989; Venkatesh et al, 2003). There are number of factors being highlighted in the context of acceptance of technology (Al Shafi and Weerakkody, 2010; Al Awadhi and Morris, 2008; Carter and Belanger, 2005) particularly at the starting stage towards electronic development.

Performance expectancy is being analyzed with the help of perception in order to use the electronic system is effective, which saves cost, time, attempt, facilitate communication, increasing the quality learning and making the way for users to conduct their operations and achieve objectives (Al Shafi, Al Shafi, Weerakkody, and Janssen, 2009; Al Awadhi and Morris, 2008). In the previous literature it is suggested that performance expectancy is used as a predictor towards the intention of using the information technology (Chang, Hwang, Hung, Li, (2007); Davis et al, 1989; Taylor and Todd, 1995; Venkatesh and Davis, 2000; Venkatesh et al, 2003). In order to discuss the performance expectancy towards behavioral intention to use electronic learning; below is the developed hypotheses for the said construct:

H1: performance expectancy has the positive relation with the behavior intention on the usage of e-learning system.

Effort Expectancy

Researcher has used the effort expectancy from different models of information system such as: perceived ease of use (TAM/TAM2); complexity (MPCU) and ease of use (IDT) (Kijsanayotin, Pannarunothai, Speedie, 2009). It is suggested that constructs are having similar feature according to the definition and analyzing measures (Venkatesh et al, 2003).

Effort expectancy variable assumed as the forecaster of intentional behavior of the individual towards the technology initially and considered as the ineffective after the usage (Venkatesh et al, 2003). Effort expectancy is considered as the individual belief towards using the electronic learning system and it will be helpful in achieving the tasks or objectives. There

are number of researchers used the construct of effort expectancy in order to test the impact on intention to use behavior (Agarwal and Prasad, 2007; Al Gahtani, Hubona and Wang, 2007; Chang et al, 2007; Davis et al, 1989). It is argued that effort expectancy having no significant influence upon the intention to use behavior (Chau and Hu, 2002).

In the literature or prior researches concluded that effort expectancy is affiliated with the factor of age (Morris and Venkatesh, 2000; Venkatesh et al, 2003). In that case; age is considered as the most significant feature in the acceptance and usage of the technology. Therefore; young people are having more effective behavior towards the technology rather than the old people; that is the reason it is suggested that the adoption of e-learning is rely upon the age factor. It is suggested that the effort expectancy is effective on the intentional behavior of electronic learning if the researcher using the moderating factor of demographic such as age, computer knowledge and sex. The researcher has developed the below hypotheses:

H2: Effort expectancy having positive relation with the behavioral intention towards using E-learning system.

Social Influence

Social influence can be explained that individual has the impact on the concept that she or he can use the new system (Venkatesh et al, 2003). There is no evidence that the impact will be positive or negative which is highly essential feature to be considered in the daily life of the individual that might impact upon the future prospect as well (Venkatesh et al, 2003). It is evident in the family, friends, colleagues have a strong impact upon the individual decision to adopt the electronic learning (Irani, Dwivedi and Williams, 2009; Tan and Teo, 2000). Integration of subjective norms in TRA, TPB and TAM2, social influence in MPCU and in IDT; as a factor to have an impact on the individual from the society.

Social influence is the main factor that is being mostly used by the researcher in order to assess the information system area (Fulk and Boyd, 1991; Fulk, Steinfield, Schmitz and Power, 1987; Venkatesh and Brown, 2001). It is evident that social influence is being observed from the family, colleagues and friend in order to adopt the new technology (Venkatesh and Brown, 2001). Social influence is being increased through the experiences and sharing of information regarding the actions or products (Venkatesh and Brown, 2001). In the different researches it is suggested that the social influence is being put by the family, friends and colleagues in order to adopt the behavior intention on the individual (Irani et al, 2009; Tan and Teo, 2000). Different results of the findings suggest that; Social influence is the major factor that analyzes the behavior of the individual (Rogers, 1995; Taylor and Todd, 1995). It is predicted if the social influence that is being received the positive message then

the preferable intentional behavior will be towards the adoption of the electronic learning system. The researcher has developed the below hypotheses:

H3: social influence having positive impact upon the behavior intention towards adopting electronic learning system.

Facilitating Conditions

As far as the facilitating condition is concern it is the individual understanding that an institute and technical structure is available to support the system requirements (Venkatesh et al, 2003). The facilitating conditions in the model of UTAUT comprises of perceived behavior control, facilitating conditions and compatibility from the TAM, TPB and IDT models (Ajzen, 1985;1991; Taylor and Todd, 1995; Triandis, 1979; Venkatesh et al, 2003).

It is evident from the previous studies and literature that; facilitating conditions is having positive impact upon the intention to use the technology (Venkatesh et al, 2003; Moore and Benbasat, 1991; Thompson et al, 1991; Chang et al, 2007; Taylor and Todd, 1995; Chau and Hu, 2002; Venkatesh and Speier, 1999). The findings of the study suggested that facilitating conditions are a positive predictor of using the technology.

It is suggested from the researches that adopting of technology is being restricted by the demographic issues (Belanger and Carter, 2006; Loges and Jung, 2001; Selwyn, 2004). It is evident from the studies that old age people are reluctant to adopt the technology; therefore; it is important for the researcher to undertake the age factor prior the study in the model in the case of e-learning system.

It is obvious that old age individual require time and guidance as compare to the younger people for the adoption of the technology (Selwyn, 2004; Venkatesh et al, 2003; Morris and Venkatesh, 2000; Thompson et al, 1991). Education is also a factor in the adoption of technology and the literacy about the technology as well (Al Awadhi and Morris, 2008; Selwyn, 2004; Venkatesh and Speier, 1999). In e-learning study it is important for the users to know about the use of computer adequately which will increase the value of the study and easy to use it. Researcher has developed the hypotheses on the basis of the above mentioned literature:

H4: Facilitating conditions having positive impact upon the behavioral intention on e-learning system.

Trust

Trust can be explained as the person's own will to acknowledge on the basis of positive aspects about the intention in a particular situation that is free from the dependency and risk (Ennew and Sekhon, 2007). In the case of adopting the technology; literature suggest that

trust is the most important aspect of informing about the behavior intention of the individual (Venkatesh et al, 2012; Yadav et al, 2016) in the case of electronic learning as well (Dzunic et al, 2011; Sharma et al, 2016). Individual is highly sensitive when using the system or technology due to the factors of trust and security. The issues of this constructs are: vulnerability, uncertain, intangible, vogue while using the intent based features. The addition of trust increases the effectiveness of the UTAUT2 and it is assumed that it will having positive impact upon the adoption of e-learning. In this study; trust of the students is dependent upon the system and its security; so if the students are having confidence in the system then it is likely possible that trust of the students towards e-learning will be increased. Therefore; researcher has developed the following hypotheses:

H5: Trust having positive relation with the behavioral intention to use to adopt the e-learning system.

Habit

Habit is being explained that individual performs certain actions or behavior unconsciously due to their experience and practice to use the technology (Venkatesh et al, 2012). Habit is also identified as the substitute feature towards the using of technology of the individual intentional behavior (Davis and Venkatesh, 2004). Habit is having impact upon behavioral intentions in using the technology in the case of information technology study (Alalwan et al, 2015; Arenas Gaita'n, 2015) in electronic learning as well (Lewis et al, 2013). It is evident that those students that are having habit of using the system then they are more likely to adopt the e-learning system for education. The hypothesis is being developed on these grounds:

H6: Habit having positive relations upon behavioral intention in using the e-learning system.

Behavioral intention

Behavioural intention is considered as the behaviour of the individual towards the adoption and making the use of a specific tool in future (Ajzen, 1988; 1991; Taylor and Todd, 1995; Venkatesh and Brown, 2001; Venkatesh et al, 2003). In the case of information technology studies; researchers have used the behaviour intention in order to assess the adoption of the technology of the individual (Irani et al, 2009). It is also suggested that behaviour intention is having direct impact upon the individual to adopt the technology (Ajzen, 1991). The analysis of behaviour intention is a part of individual intention and predicted the adoption of electronic learning as well. For the purpose of testing the impact of behaviour intention towards the adoption of e-learning following hypotheses is being developed:

H7: Behavioural intention having positive relation with upon use behaviour towards using e-learning system.

Moderating role of level of experience

In the UTAUT model level of experience is being considered as the moderating variable (Venkatesh et al, 2012). It is considered that little amount of efforts is being exerted by the users to use the system on the basis of experience (Venkatesh et al, 2003). It is also a fact that those users that are aware of the technology are having more influence by the social factors (Venkatesh and Davis, 2000). They are also not considering whether the conditions are facilitation for them or not (Venkatesh et al, 2003).

Researcher has also used the level of experience as the moderating factor in the model of the current study; in order to analyze the e-learning system and increase the validity of the existing model for the study. It is suggested that there are different level of experiences observed as the level of experience is high or low due to the performance expectancy, effort expectancy, social influence, facilitating conditions, habit and trust in the case of the students towards the behavioral intention on e-learning system. The following hypothesis is being developed on the above mentioned ground:

H8 to H13: Level of experience with e-learning system moderates the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and Habit and students' behavioral intentions to use e-learning system.
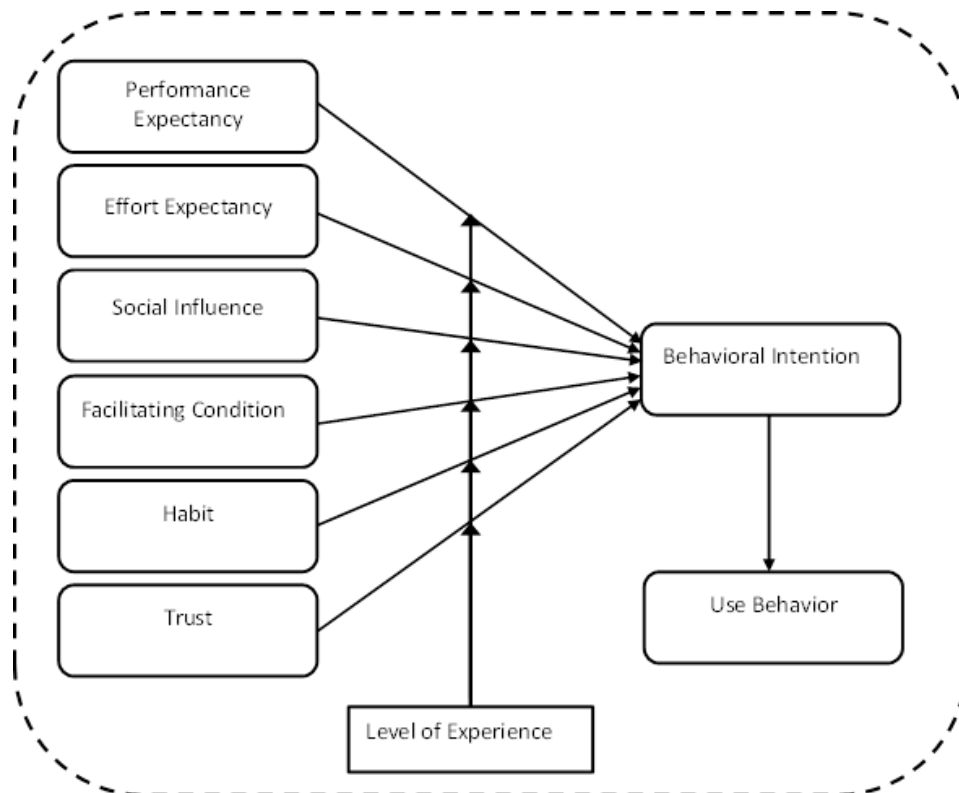

Figure 1. The conceptual framework

Methodology

In the current study, questionnaires has been developed, in order to determine the factors that influence the behavioral intention to use e- learning among students in Libya context, as has been displayed in appendix A.

The selected population for the study is based upon the entire students of the universities of Libya. Two universities have been chosen in this study first one is Tripoli University, which consists 75877 students, and second one is Benghazi University which consists 70000 students. Thus, the population of the study consists 145877 students. The sample of the study according to Krejcie & Morgan (1970) around 375 students. The researcher distributed 375 questionnaires and received only 365 questionnaires.

In this study, the data collected is analyzed through AMOS version 20, where SPSS are employed for the purpose of descriptive analysis while the use of Cronbach Alpha is intended to assess internal reliability. The inferential analysis of this study is organized in accordance to Bentler's (1980) suggestion where SEM as a statistical analysis technique, is employed so that the relationship between the dependent and independent variables can be investigated concurrently.

Considering that the relationships between multiple dependent and independent variables can be simultaneously analyzed, the choice to employ AMOS is therefore the most suitable. Likewise, SEM has received much attention especially in interdisciplinary statistical package.

Analysis and results

Table 1. Demographic Analysis of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	222	60.8	60.8	61.1
	Female	142	38.9	38.9	100.0
	Total	365	100.0	100.0	
Age	Below 20	67	18.4	18.4	18.4
	21 to 25	84	23.0	23.0	41.4
	26 to 30	165	45.2	45.2	86.6
	Over 30	49	13.4	13.4	100.0
	Total	365	100.0	100.0	
Exp	Less Experienced	221	60.5	60.5	60.5
	Experienced	144	39.5	39.5	100.0
	Total	365	100.0	100.0	
Years	Less than 1 year	91	24.9	24.9	24.9
	1 to 3 years	91	24.9	24.9	49.9
	3 to 5 years	92	25.2	25.2	75.1
	More than 5 years	91	24.9	24.9	100.0
	Total	365	100.0	100.0	

The above table shows that the out of total 365 respondents around 61% were male and the remaining 39% were females. While looking at the age of respondents it can be said that most of the respondent were above the age of 26 and their percentage being 59% while around 41% of the respondents were below the age of 26. Moreover out of 365 respondent 60% having less experience while 40% of them was having more experience. Furthermore the respondent using e learning for less than one year were around 25% while those who have been using between 1 and 3 years were also around 25%. More than 3 years of using e learning respondents were around 50%.

Reliability and Convergent Validity

Table2. Results of Cronbach Alpha and Convergent Validity for CFA Model

Construct	Item	Internal Reliability	Convergent validity		
		Cronbach Alpha	Final Factor Loading	Average Variance Extracted (AVE)a	Composite Reliability (CR)b
Performance Expectancy	PE1	0.967	0.965	0.918	0.978
	PE3		0.965		
	PE4		0.965		
	PE5		0.936		
Efforts Expectance	EE1	0.982	0.961	0.928	0.985
	EE2		0.962		
	EE3		0.955		
	EE4		0.969		
	EE5		0.969		
Social Influence	SI1	0.939	0.913	0.797	0.940
	SI2		0.958		
	SI3		0.869		
	SI4		0.825		
Facilitating Conditions	FC1	0.972	0.895	0.913	0.977
	FC2		0.934		
	FC3		0.846		
	FC4		0.949		
Habit	HAB1	0.967	0.969	0.914	0.969
	HAB2		0.947		
	HAB4		0.956		
Trust	TRU2	0.872	0.954	0.696	0.873
	TRU3		0.977		
	TRU4		0.936		
Behavioral Intention	BI1	0.91	0.802	0.797	0.922
	BI2		0.825		
	BI3		0.873		
Use Behavior	UB1	0.964	0.947	0.905	0.966
	UB2		0.983		
	UB3		0.924		

There were total 5 items deleted which is not a high number of item in comparison of the total of 34 items and their deletion is not much effective on the constructs conceptualization. The table 2 shows the remaining elements of the questionnaire and all of them have higher factor loading then the cut-off value of 0.5 and due to the fact that these items have the higher loading they are retained in the analysis. The table also shows the Average variance extracted for the constructs and shows all the values are above 0.5 and ranged between 0.696 and 0.985 see (Nunnaly & Bernstein, 1994). The values depicting the extent to which the indicators are representing a latent construct (the composite reliability), being higher than the threshold value of 0.6 see Bagozzi and Yi (1988) for all the constructs included in the framework of the study and ranged between 0.873 and 0.985. The value of alpha were found to be above 0.7 as as suggested by Nunnally and Bernstein (1994) and ranged between 0.873 and 0.985 showing that the measures are error free. Hence the level of Cronbach alpha found to be sufficient and confirming the constructs' scale reliability.

Discriminant validity

The examination of the discriminant validity was done to understand that how the constructs in the model are different from each and if they have the correlation coefficient of under 0.85 than they are considered to be discriminant (Kline, 2010). The discriminant validity was assessed by performaning correlation analysis and AVE2 (Fornell and Larcker, 1981). The following table depicts the validity of CFA model.

Table 3. Discriminant validity of Modified Measurement Model

	TRU	PE	EE	SI	BI	FC	HAB	UB
TRU	0.834							
PE	-0.06	0.958						
EE	-0.045	0.327	0.963					
SI	0.153	-0.023	-0.049	0.892				
BI	0.123	0.157	-0.126	0.025	0.892			
FC	0.034	-0.13	-0.699	0.062	0.378	0.955		
HAB	0.079	0.191	0.053	0.018	0.235	0.132	0.955	
UB	-0.048	0.217	0.154	0.043	0.185	0.057	0.535	0.951

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the square correlations.

The benchmark value for the inter-correlations between the constructs is 0.85 (Kline, 2010). After examining the values of inter-correlations among construct we can see that they ranged between -0.69 and 0.535 which are under not exceeding the standard value hence no issue regarding the discriminant validity of the constructs. Moreover the above table shows the values for correlations are less than the squared average variance extracted which is an indication of good discriminant validity (Kline, 2010).

Table 4. Fit indices for the measurement model

Absolute Fit Indices		Incremental Fit Indices
df = 349	GFI = .864	CFI = .968
Chi Square = 808.885	AGFI = .830	TLI = .962
p – value = .000	RMSEA = .067	IFI = .968

Direct Effects of the Variables

In the structural model for effects of Performance Expectancy, Efforts Expectancy, Social Influence, Facilitating Conditions, Habit and Trust on Behavioural Intentions while the effect of Behavioural Intention on Use Behaviour refereeing to hypotheses H1, H2, H3, H4, H5, H6 and H7. And the moderating effect of e-learning in the relationships is tested in H8 to H13.

An examination of goodness-of-fit indices indicates that the structural model adequately fitted the data: $\chi2$ = 932.643, df = 355, p=0.000, GFI = 0.849, AGFI = 0.815, CFI = 0.959, TLI = 0.954, IFI = 0.960, RMSEA =0.067 and $\chi2$/df=2.627. Although the chi-square statistic is statistically significant, this is not deemed unusual given the large sample size (Bagozzi, Yi, and Phillips 1991). The values for GFI and AGFI is above the threshold 0.8 (Forza & Filippini 1998) and 0.8 (Chau and Hu, 2001) respectively. The value of RMSEA is well below the threshold value of 0.1 (Schumacker and Lomax, 2010). Moreover the values of CFI, TLI and IFI are also above the cutoff of 0.9 (Bagozzi and Yi, 1988; Byrne, 2013 & Hair et al 2006). The table below shows the results of past coefficient and their respective significant level so the developed hypotheses can be examined properly.

Table 5. Assessment of Hypothesized Effects in the Structural Model

Path			Unstandardized Estimate		Standardised Estimate	c.r.	P-value	Hypothesis Result
			Estimate	S.E.	Beta			
BI	<---	PE	0.113	0.04	0.15	2.809	0.005	Supported
BI	<---	EE	0.122	0.052	0.176	2.35	0.019	Supported
BI	<---	SI	-0.01	0.04	-0.012	-0.242	0.809	Not Supported
BI	<---	FC	0.384	0.057	0.5	6.78	0.000	Supported
BI	<---	HAB	0.092	0.036	0.13	2.527	0.012	Supported
BI	<---	TRU	0.111	0.052	0.113	2.141	0.032	Supported
UB	<---	BI	0.301	0.084	0.195	3.6	0.000	Supported

As shown in Table 6, 5 paths from Performance Expectancy, Effort Expectancy, Facilitating Conditions, Habits and Trust to Behavioural Intention were supported as their p-values were all below the standard significance level of 0.05. Thus the hypotheses H1, H2, H4, H5 and H6 were supported. Moreover the effect of Behavioural Intention to Use Behaviour was also found to be supported being the P-value less than 0.05. However only one hypotheses H3 was not found to be supported being the P-value greater than 0.05 and hence being insignificant.

Hypothesis testing for Moderating Effect

This section will provide the results for moderating effects of level of experience with e-learning system in the relationships between performance expectancy, effort expectancy, social influence, facilitating conditions, trust, and Habit with students' behavioral intentions to use e-learning system. The below figures depicts the models with both of the different categories of experience of the respondents i.e. Less Experienced and Experienced.

Table 6. Model Comparisons

Hypotheses	Model	DF	CMIN	P
H8	Structural weights	1	45.654	.10
H9	Structural weights	1	55.421	.08
H10	Structural weights	1	60.213	.04
H11	Structural weights	1	32.013	.29
H12	Structural weights	1	62.421	.03
H13	Structural weights	1	65.321	.01

Discussion of the findings

Performance expectancy and behavioral intention toward using e-learning system

Researcher has used the performance expectancy construct in order to forecast the behavioural intention of the individual towards the adopting of e-learning system is effective. Therefore; H1: performance expectancy having positive relation upon behavioural intention to adopt the e-learning system. This hypothesis advocates the objective of the research that suggests examining the performance expectancy and behavioural intention impact upon the adoption of e-learning system. The results of the study suggested that there is a positive and significant relation found among the construct with the adoption of e-learning system. This phenomenon suggest that students considered that they are having the capability to undertake the new system such as e-learning then they will be successful in adopting the system without any hurdle and will be helpful in their education area.

Effort expectancy and behavioral intention toward using e-learning system

Researcher has developed the hypothesis by taking the construct of effort expectancy towards e-learning in view of behaviour intention of the students is positive or not. H2: effort expectancy having positive relation upon the behavioural intention towards e-learning system. The results of the study suggested that effort expectancy is having positive and having significance upon the behavioural intention to adopt the e-learning system. In the case of the student; they consider that technology is easy to use then it will increase their interest and urge them to adopt the e-learning system as well.

Social influence and behavioral intention toward using e-learning system

The findings of the results suggest that they hypothesis of social influence is not significant and advocate that there is not significant relations among the behaviour intention towards e-learning system adoption. H3: Social influence having positive relation upon the behavioural intention to adopt the e-learning system. It is evident from the findings of this study that there is a negative relation and they are not significant impact upon the behavioural intention of the students to adopt the e-learning system.

Facilitating conditions and behavioral intention toward e-learning system

Facilitating conditions is also the construct which is being used to develop the hypotheses of the study that suggests: H4: facilitating conditions having positive relations upon behavioural intention to adopt the e-learning system. The results of the study suggested that facilitating conditions are having positive and significant impact upon the student's behaviour to adopt the e-learning system.

Habit and behavioral intention toward using e-learning system

Habit is also a construct that is being used by the researcher in order to assess the behavioural intention to adopt the e-learning system. The hypotheses were: H5: Habit having positive relation upon behaviour intention to adopt the e-learning system. The results of the study suggested that habit is having positive and significant impact upon the behavioural intention to adopt the e-learning system.

The findings of this study is similar to the previous studies conducted that suggest habit is a predictor of using the e-learning system with the behavioural intention of the individual (Limayem, Hirt and Cheung, 2007). Habit is also having impact upon the intentions of the individual that impact upon the behaviour towards adopting the e-learning (Lewis et al, 2013; Raman and Don, 2013).

Trust and behavioral intention toward using e-learning system

Trust is also used in the study as a construct in order to analyze the impact of it on the behaviour intention to adopt the e-learning system. H6: Trust having positive relation upon behavioural intention to adopt the e-learning system. The results of the study suggest that trust is having significance impact upon behavioural intention to adopt the e-learning system.

The construct of trust is also used in other studies and it is highly reliable in the case of behavioural intention to adopt the e-learning system. The users are highly concerned over security and leaking of private information that reduces the trust on the system and adopting of new technology but in the case of e-learning student trust on the system therefore; they are likely to have the e-learning system.

Behavioural Intention and Use Behavior toward using e-learning system

Behavioural intention is the other construct of the study that focuses upon the use behaviour to adopt the e-learning system. H7: Behavioural intention is having positive relation upon the use behaviour to adopt the e-learning system. The results of the study suggested that it is having positive and significant relationship with the use behaviour to adopt the e-learning system. It is important from the perspective of the students that they required facilities, support and infrastructure that enable them to develop the behaviour to adopt the e-learning system. Behavioural intention to use behaviour to adopt the e-learning system hypotheses is accepted and significant as well. The result of the findings is similar to the literature review. In different information technology adoption researches; researcher has used the behaviour intention to use behaviour towards the adoption of the e-learning system (Irani et al, 2009). It is considered that behaviour intention is having direct impact upon the individual behaviour towards adopting the technology (Ajzen, 1991; Alalwan et al, 2015).

Moderating role of experience

In this study researcher has used the level of experience as a moderating construct in the UTAUT model because it is being used in the other studies of information technology adoption studies (Venkatesh et al, 2012). H8: Level of experience in regard with the e-learning system having moderating impact among the effort expectancy, performance expectancy, social influence, facilitating conditions, trust and habit of the students upon the behavioural intention to adopt the e-learning system. The results of the study suggest that level of experience in the case of e-learning is not having the moderating relationship with the effort expectancy, performance expectancy, facilitating condition of the students upon their behaviour intention to adopt the e-learning system. Therefore; it is suggested that the hypotheses is rejected and having no significance with the constructs. The findings indicated that there are a significant moderation between habit, trust, social influence with behaviour intention to adopt the e-learning system.

The findings of the study are having similarity with the previous researches such as; the moderating factor like level of experience is associated with the demographic variables such as age, gender and experience because old age people are highly resistance to accept the technology therefore; in the case of adopting of e-learning system it is not having any impact upon the behaviour intention of the students (Wang, 2016).

Practical and theoretical contributions

There are different perspective is being extracted of the theory and practice implementation of the study. The results of the study suggested that there is a need to develop fit model that enable the Libya's universities to develop the system allow the students to adopt the e-learning system adequately.

The research concluded that effort expectancy, performance expectancy, facilitating conditions, habit and trust are the important factors that bring change in the behavior intention of the students towards the adoption of e-learning system in Libya's universities. The UTAUT2 implementation is not adequate in the educational system because this research is not regarding the educational system. The model UTAUT2 testing is feasible in different conditions and cultures that increase the validity and generalization of the construct. Researcher has added the construct of trust in the UTAUT2 model. The trust is the most influential factor in order to assess the behavior intention of the individual to adopt the new technology. In the previous studies trust is being used as a potential factor but in this study researcher has used it empirically with the help of UTAUT2 model in order to analyze the adoption of e-learning. The results of the research are validating and providing assurance that trust in an essential part in order to adopt the e-learning system.

This study will be helpful for the policy makers and for the university management to undertake the conditions and issues that are being discussed and develop the system that enable the students to show their interest in order to adopt the e-learning system accordingly. This research will support the management to implement those strategies that improves the system and bring the effective decision making in order to increase the efficiency of the system and develop the trust of the student upon the e-learning and technology adoption. This study is an addition to improve the e-learning system for the Libyan universities that they are required to focus upon the adoption and acceptance of the system through the improvement of learning management system.

Limitation and future research

Every research study has different limitations so; in the case of this study researcher found certain limitations that are being addressed for the future researcher. The researcher has collected the data from the two universities of the Libya; the data collection should be made in different countries will increase the validity and generalization of the results adequately. Researcher has conducted the study by using the country of Libya but it is suggested to the future researcher to use the model in different countries to get the more different and unique data regarding the e-learning adoption. Researcher has conducted the study in the Arab region which is a developing country; future researcher can select the developed country and compare the findings of the results to make the study innovative. Researcher has used the quantitative approach to collect the data through questionnaire from the Libyan university and it is one time study. Future researcher can use the interview and group discussion by using the longitudinal study to get the findings.

Conclusion

The research is being conducted in the context of analyzing those factors that are influencing the successful adoption of e-learning system in the developing country such as Libya. In order

to attain the objective of the research; researcher has adopted the model's variables that is UTAUT2: effort expectancy, performance expectancy, social influence, facilitating conditions, behavior intention and use of behavior; along with this researcher has included the new construct with the name of Trust and level of experience is being used the moderator variable in the study. Researcher has analyzed the data in two categories in the first category initial analysis was done in order to assess the data is having similarity with the research problem of the study by using the SEM. After that in the second phase researcher has used the normal distribution technique in order to assess that there is no missing values, univariate and outliers exists in the data set. Researcher has use the two phases of SEM; in the first phase researcher has developed the measurement model for the latent construct of the study. Researcher has also tested the reliability and validity of the construct and then tested the hypotheses through the structural modeling equation. Researcher has tested the eight hypotheses of the study. For the sake of this researcher has used the AMOS to analyze the hypotheses and its coefficients adequately.

The findings of the study suggested that UTAUT2 model is a fit to support the theory and practice of usefulness in the case of adopting the e-learning tools. It is suggested from the findings that students of Libya are willing and interested to use the e-learning system on the basis of their previous experience of using the technology. It is argued that the development in the phase of online learning is being increased in the Arab region or developing countries in the last decade prior to that there was not concept of getting education through the intent services. Models construct such as performance expectancy, effort expectancy, facilitating conditions, habit and trust having significant impact on the behavior intention and impact of behavior intention to use behavior are advocating the significance level of the hypotheses on the other hand; social influence is not having any significance on the behavioral intention of the students.

Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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Appendix

Questionnaire

Factor	References
Performance Expectancy (PE)	
I find e-learning system allow me to accomplish learning tasks more quickly.	(Venkatesh et al. 2003) (Tarhini et al, 2017)
Using e-learning system improve my learning performance.	
Using e-learning system make it easier to learn course content.	
Using e-learning system increases my productivity	
Using e-learning system enhance my effectiveness in learning	
Effort Expectancy (EE)	
Learning how to use the e-learning system is easy for me.	(Venkatesh et al. 2003) (Tarhini et al, 2017)
My interaction with the e-learning system is clear and understandable.	
I find e-learning system easy to use.	
It is easy for me to become skilful at using e-learning system.	
I do not have difficulty in explaining why using e-learning system may be beneficial	
Social Influence (SI)	
My Instructors thinks that I should participate in the e-learning activities	(Venkatesh et al. 2003) (Tarhini et al, 2017)
My colleagues think that I should participate in the e-learning activities.	
Management of my university thinks that I should use the e-learning activities	
The opinion of non-academic groups (e.g., friends and family) is important to me.	
Facilitating Conditions (FC)	
I have the knowledge necessary to use the e-learning system	(Venkatesh et al. 2003) (Tarhini et al, 2017)

The technology necessary (computers, cables, modems, etc) for the Internet and e-learning use in my university are modern and updated.	
I have the resources necessary to use the e-learning system	
When I needed help to use the e-learning system, Guidance was available to me.	
Habit	
The use of e-learning system has become a habit for me	(Venkatesh et al, 2012) (Tarhini et al, 2017)
I am addicted to using e-learning system.	
I must use e-learning system.	
Using e-learning system has become natural to me	
Trust	
The website presents enough online security	(Tarhini et al, 2017)
I trust that my activities while using the e-learning system is secure and private	
I believe my personal information on the e-learning system will be kept confidential	
Overall, I am not worried to use the e-learning system because other people will not be able to access my account	
Behavioral Intention to Use E- learning System (BI)	
I intend to use the e-learning system for preparing for the exam and course work.	(Tarhini et al, 2017)
Given the chance, I intend to use the e-learning system to do different things, from downloading lecture notes and participating in chat rooms to learning on the Web	
I predict I would use e-learning system in the next semester	
In general, I plan to use e-learning system frequently for my coursework and other activities in the next Semester	
I intend to engage in e-learning routinely	
Use Behaviour	
On an average working day, how much time do you spend using e-learning	(Paola Torres Maldonado et al, 2011)
On average, how frequently do you use e-learning system	
How many different applications of use e-learning system have you worked with or used in your studies	