العوامل والاختلافات المؤثرة في نية المدربين لاستخدام التكنولوجيا والتعليم الالكتروني في التعليم العالي

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الملخص :

تصف هــذه الورقة العوامل والاختلافات التي تؤثــر على نية المعلمين في استخدام التكنولوجيا والتعليم الإلكتروني في التعليم العالي الليبي (LHE). وبغض النظر عن البحوث التي أدّت إلى فحص هــذه العوامل والاختلافات ، لم يحدد ذلك كثير. أربعة متغيرات مستقلة مستخدمة ، وهي تجربة الكمبيوتر والإنترنت (CIE) ، الكفاءة الذاتية للكمبيوتر (CSE) ، جودة تكنولوجيا الإنترنت (TIQ) ، والمواقف تجاه الاستخدام (ATE) ، بينما كان المتغير التابع المستخدم هو النية لاستخدام التكنولوجيا و التعلم الالكتروني (ITE). من الضروري اكتشاف وتقييم العوامل والاختلافات التي تؤثر على نية المدرسين في استخدام التكنولوجيا والتعلم الإلكتروني ، وقد تم اختبار 14 فرضية على عينة بحجم 136. وبناءً على نتائج هذه المقالة نقترح استراتيجيات للبحث الإضافي من خلال تطبيق التحليل الإحصائي على عينة بديلة لإظهار العوامل والاختلافات المذكورة

Factors and Differences that Effects Instructors' Intention to Use Technology and E-learning in Libyan Higher Education

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Abstract –

This paper describes the factors and differences that effect instructors' intention to use technology and e-learning in Libyan Higher Education (LHE). Irrespective the researches who lead to examine these factors and the differences, no numerous have determined that. Four independent variables used, computer–internet experience (CIE), computer self-efficacy (CSE), technology-internet quality (TIQ), and attitudes toward the use (ATE), while the dependent variable used was intention to use

technology and e-learning (ITE). It is necessary to detect and evaluate the factors and the differences that influence instructors' intention to use technology and e-learning. 14 Hypotheses were tested a sample with size of 136. Based on the results of this article suggests strategies for additional search by applying statistical analysis on alternative sample to demonstrate mentioned factors and differences.
Keywords: Computer-internet experience, Computer self-efficacy, Technology-internet quality, Attitudes toward using, intention to use, gender, field of work.

1 INTRODUCTION

Recently e-learning systems have been used in education and learning in numerous universities that caused in changes in education process in those institutions [1]. In addition, with the wide spread use of the WWW, many higher education institutions (HEIs) are taking the opportunity to develop e-learning courses [2]. Moreover, the use of e-learning systems in universities is a result of advancement of IT. According to [3], As a result of the growth of Web application e-learning systems are becoming an important instructional medium in universities. Besides, with the progress of IT, e-learning systems are becoming an integral part of the teaching and learning process in HEIs [4]. Furthermore, the role of faculty in the whole e-learning process is greatly important. Teachers who play the identical role of being experts in subject matter and technological specialists are the real makers in the teaching-learning system [5]. Besides, despite the status of e-learning, there is a lack of clear agreement on the attitude and ability of academic staff in higher education to participate in these developments [6]. In addition researchers have suggested that human factors (i.e., age, social status, and gender) play a critical role in one's learning experience [7][8].

In the same direction, many studies have extended TAM by adding various external factors. Some of them divided the extension constructs into three main categories after an extensive literature review. The first category is those used to quantify individual differences, including cognitive style, personality, demographic and situational variables such as experience [9], locus of control [10], computer anxiety [11], personal

innovativeness in the domain of IT [4], computer self-efficacy [12][13], self-efficacy [9][14] and perceived playfulness [15]. The second category is those used to quantify organizational-based differences such as management support [16][13], organizational support [13], technical support [2][17], and facilitating conditions [18]. The third category is those used to quantify system-based differences such as system quality, information quality, service quality and information support [16][19][20]. All the three classes have been almost theoretical and practically supported.

Overall from our point of view, there are a number of factors and differences that influence instructors' intention to use technology and e-learning, some of these critical factors and differences will be reviewed in the next section.

1.1 The main and specific questions

The main research question this article addressed is: to what extent are instructors' computer & internet experience, computer self-efficacy, technology & internet quality and attitudes toward e-learning influencing instructors' intention toward using technology and e-learning in LHE. The following specific research questions that results from the main research question:

H1: Instructors' computer and internet experience will positively related to instructors' intention to use technology and e-learning.

H2: Instructors'computer self-efficacy will positively related to instructors' intention to use technology and e-learning.

H3: Instructors' attitude toward e-learning will positively related to instructors' intention to use technology and e-Learning.

H4: Technology and internet quality will positively related to instructors' intention to use technology and e-learning.

H5a: there are differences in instructors' computer and internet experience pattern based on gender.

H5b: there are differences in instructors' computer self efficacy pattern based on gender.

H5c: there are differences in instructors' sight to technology and internet quality pattern based on gender.

H5d: there are differences in instructors' attitudes toward technology and e-learning pattern based on gender.

H5e: there are differences in instructors' intention to use technology and e-learning pattern based on gender.

H6a: there are differences in instructors' computer and internet experience pattern based on field of work.

H6b: there are differences in instructors' computer self efficacy pattern based on field of work.

H6c: there are differences in instructors' sight to technology and internet quality pattern based on field of work.

H6d: there are differences in instructors' attitudes toward technology and e-learning patter based on field of work.

H6e: there are differences in instructors' intention to use technology and e-learning pattern based on field of work.

2 Methods

A 29 items questionnaire had been conducted in five constructs, each of which contains a number of items, then, the questionnaire was translated to Arabic language and distributed to a sample of 210 faculty member (teachers, teaching assistant) in LHE (Zawia University, and institutions of the national authority for technical education) in the academic year 2017/2018. The factor analysis identified 25 items in five groups, as Factor1, Factor2, Factor3, Factor4, and Factor5,

2.1 Analysis of measurement validity

SPSS used to analyze data for this research, descriptive statistics (means (M), standard deviations (SD)) and alpha reliability of instructor intention were evaluated. Measurement validity in terms of reliability and construct validity also assessed, reliability of the instrument was evaluated using Cronbach's alpha and was to be highly accepted (α = 0.94). All the values of different scales were in range from 0.85 to 0.94,

exceeding the common threshold value. The high alpha reliability gives a support for questionnaire content reliability.

Measurement validity in terms of reliability and construct validity was evaluated for instructor intention. reliability of the instrument was evaluated using Cronbach's alpha. All the values were in range from 0.85 to 0.94 (table 1), exceeding the common threshold value.

Table 1 : Descriptive statistics of instructors' items and Cronbach's alpha total alpha= 0.94

Item	Mean	SD	Cronbach's alpha
Computer and Internet Experience (CIE):			
4-points likert scale			
CIE1	2.88	0.77	
CIE2	2.60	0.99	0.85
CIE3	2.86	0.89	
CIE4	2.70	0.91	
CIE5	2.84	0.84	
Computer and Internet Self-Efficacy (CSE):			
5-points likert scale			
CSE1	3.08	1.09	
CSE2	3.29	1.10	
CSE3	3.01	0.96	
CSE4	3.10	0.98	0.92
CSE5	3.26	1.08	
CSE6	3.05	1.04	
CSE7	3.07	0.99	
CSE8	3.03	0.96	
Technology and Internet Quality (TIQ):			
5-points likert scale			0.86
TIQ1	2.90	1.06	
TIQ2	3.05	1.05	

TIQ3	2.94	0.95	
TIQ4	3.01	1.01	
Attitudes toward Technology and E-learning (ATE):			
5-points likert scale			
ATE1	2.98	1.00	
ATE2	3.16	1.12	0.94
ATE3	3.05	0.99	
ATE4	3.00	0.92	
ATE5	2.98	0.90	
Intention to Use Technology and E-learning (ITE):			
5-points likert scale			
ITE1	3.08	0.94	0.92
ITE2	3.14	0.93	
ITE3	3.05	1.04	

A correlation matrix approach were applied to examine the convergent and discriminant validity. The smallest within-factor correlations are: computer and internet experience = 0.35; computer self-efficacy= 0.31; technology and internet quality = .46; attitudes toward technology and e-learning = .71; and intention to use technology and e-learning=.72. In addition, each smallest within-factor correlation was approximately considerably higher among items intended for the same construct than among those designed to measure different constructs. This suggests adequate convergent and discriminant validity of the measurement.

The correlation coefficients among the variables are presented in table 2. The bi-variate relationships indicated that the variables significantly correlated with each other, however are all less than 0.60, and in general except for Technology and Internet Quality, the correlations between the IVs and DV are greater than the correlations between the IVs them selves.

Table 2: Correlation analysis of instructors' intention

	1	2	3	4	5
1-Computer and Internet Experience		.48***	.36**	.48***	.58***
2-Computer Self-Efficacy			.37**	.44***	.50***
3-Technology and Internet Quality				.46***	.43**
4-Attitudes toward Technology and E-learning					.53***
5-Intention to Use Technology and E-learning					

** P<.05 , *** P<.001

2.2 Regression analysis

Concerning analytic strategy for assessing the hypothesises H1, H2, H3, H4, multiple regression analysis is an appropriate multivariate analytical methodology for empirically examining sets of relationships in the form of linear causal models.

Stepwise multiple regressions were performed for the path associated with the variables and presented in table 3. The regression analysis was performed to check the effects of IVs variables on instructors' intention to use technology and e-learning variable (DV).

Table 3: Regression results of instructors' intention

DV	IV	B	R^2	P
ITE	CIE	.21	.53	< .001
	CSE	.13	.31	< .001
	TIQ	.18	.14	< .001
	ATE	.11	.18	< .001

3. The Result

As the result of regression analysis (reference to table 3). We can said that, the independent variable computer and internet experience have the biggest effect on intention to use technology and e-learning and they are moderately strong in association (R=.74), (F(5,281) = 65.45, p< .001, R^2=.55), the variables computer self-efficacy, and attitudes toward

technology and e-learning could be moderately predict intention to use technology and e-learning (R=.56) (F(8,278)=15.91, p<.001, R^2= .31), (R= .42) (F(5,281) = 13.25, p<.001, R^2= .18) respectively, while the weakest predictor variable on intention to use technology and e-learning is technology and internet quality (R=.37) (F(4,282) = 11.50, p<.001, R^2=.14).

Hence, H1, H2, H3, and H4 are supported. i.e all the IVs variables (CIE, CSE, TIQ, and ATE) are positively related to the DV variable (ITE). In fact the IV (CIE) alone can predict the DV variable ITE, since explains more than half of the total variance.

The final instructor intention model is summarized in Figure-1 Heavier lines indicate the stronger effects; thinner lines indicate small effects. The arrows show the implied direction of causality in the relationships between factors.

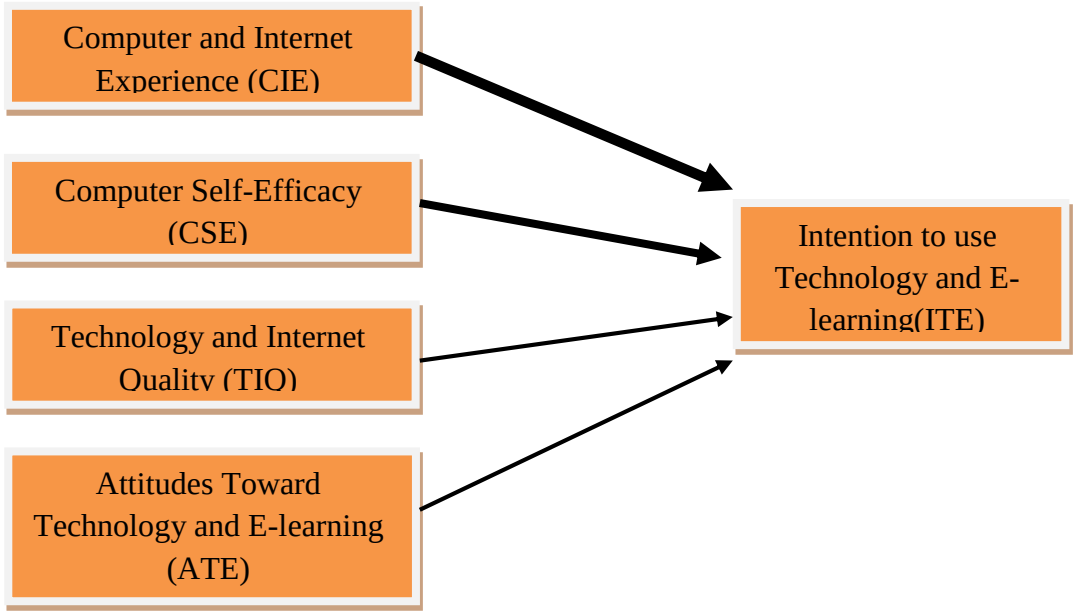

Figure-1: instructors' intention model

3.1 Differences based on gender

To test the hypotheses H5a, H5b, H5c, H5d, H5e, t- test was carried out from entire data sample (i.e., men and women pooled together) then each of the subsamples (i.e., men taken separately and women taken separately).

Referring to table 4 to show the differences in computer and internet experience, computer self-efficacy, technology and internet quality, attitudes toward technology and e-learning, and intention to use technology and e-learning based on gender, there were no gender significant differences found for all the variables CIE, CSE, TIQ, ATE, and ITE. Hence H5a, H5b, H5c, H5d, H5e are not supported.

Table 4: t-test results for instructors' differences based on gender

	Gender	N	Mean	SD	T	df	P
CIE (1=never, 4=daily)	M	154	2.810	0.863	0.767	285	0.302
	F	133	2.740	0.711			
CSE (1=not at all confident, 5=totally confident)	M	154	3.192	0.990	1.455	285	0.500
	F	133	3.015	1.057			
TIQ (1=strongly dissagree, 5= strongly agree)	M	154	2.966	.998	.551	285	.397
	F	133	2.979	1.041			
ATE (1=strongly disagree, 5=strongly agree)	M	154	3.021	0.925	0.397	285	0.137
	F	133	3.053	1.051			
ITE (1=very unlikely, 5=very likely)	M	154	3.143	0.969	1.012	285	0.422
	F	133	3.025	0.974			

3.2 Differences Based on Field of Work

The test was performed from entire data sample (i.e., all the participants pooled together) then each of the subsamples (i.e., computer & IT,

sciences, education & languages, economy & Accounting & Business management, and engineering) taken separately.

The effects of field of work upon CIE, CSE, TIQ, ATE, and ITE were examined using One-way ANOVA test to test the hypotheses H6a, H6b, H6c, H6d, H6e. The sum of squares, and mean of squares together with significant F ratios are shown in table 5. Except for the variable Technology and Internet Quality, significant in field of work differences were found for Computer and Internet Experience, Computer Self-Efficacy, Attitudes Toward Technology and E-learning , and Intention to use Technology and E-learning.

There was however differences based on instructors' field of work (reference to table 6), for example in computer and internet experience variable, Instructors in computer and IT department have experience in computer and internet (Mean=3.114) better than others, sciences (Mean=2.755), Economy-Accounting-Business management (Mean=2.744), Engineering (2.728) while the smallest rated area in CIE was Education-languages (Mean=2.126). Hence H6a, H6b, H6d, H6e are supported, while H6c not supported.

Table 5: One-way ANOVA results for instructors' differences based on field of work

	SS	**DF**	**MS**	**F**
Computer and Internet Experience (CIE)				
Between group	32.667	4	8.167	14.899***
Error	190.383	282	0.675	
Total	223.050	286		
Computer and Internet Self-efficacy(CSE)				
Between group	33.530	4	8.383	8.798***
Error	267.890	282	0.950	
Total	301.420	286		
Technology and Internet quality (TIQ)				
Between groups	15.584	4	3.896	3.956 ns
Error	281.195	282	.997	
	296.779			

Total				
Attitudes Toward technology and E-learning (ATE)				
Between group	37.041	4	9.261	10.779***
Error	241.555	282	0.856	
Total	278.596	286		
Intention to use Technology and E-learning (ITE)				
Between group	43.126	4	10.781	13.342***
Error	227.497	282	0.807	
Total	270.623	286		

*** P<.001

ns not significant

Table 6: Mean and standard deviation for instructors' CIE,CSE, TIQ, ATE, and ITE based on field of work differences.

Field Of	CIE		CSE		TIQ		ATE		ITE	
Work	M	SD	M	SD	M	SD	M	SD	M	SD
1	3.114	.751	3.304	.924	3.110	.894	3.248	.832	3.480	.816
2	2.755	.810	2.728	.940	3.026	.929	2.972	.939	3.037	.963
3	2.126	.979	2.316	1.064	2.461	1.144	2.168	1.109	2.228	.901
4	2.744	.928	3.095	1.145	3.000	1.073	3.144	.919	3.000	.993
5	2.728	.751	3.157	.939	3.013	1.052	3.189	.910	3.120	.899

1= computer& IT

2= Sciences

3= Education& Languages

4= Economy&Accounting&BM

5= Engineering

4. Conclusion and future research

Research findings essentially measured in light of limitations. First, there are various individual differences may affect individuals' intention to use technology and e-learning systems, such as age, gender, computer

experience, computer anxiety, subjective norms, etc. but in our study researcher just focused on some of these differences and factors. He intend to study the effects of other possible factors in future research. Hence other extra variables included in futures studies may support or affect our results, as well as using different sample (size, quality) could influence or strengthens the results. Second, as this study used a snapshot approach, an expanded approach should be considered in future research.

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