

Influence of University Factors on the Students' Acceptance of Internet-Based Learning tools in Higher Education

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ABSTRACT

In recent years, an increasing number of higher education institutions have been keen in integrating internet based technologies to be an integral part of the teaching and learning environment. However, research has revealed that in comparison to studies on other information and communication technologies, individuals' behavior towards internet based learning tools has not been investigated and understood thoroughly. Consequently, the intention of this paper is to investigate the factors of availability of information and communication technologies (ICTs) and other university context factors that have influence on students' intentions to use Internet-based learning tools (ILTs). The paper is based on a survey questionnaire distributed to a sample of 1092 university students, with a response rate of 72.8 percent. The result showed that availability of ICTs, university readiness, perceived usefulness (PU), subjective norm, Vice chancellor characteristics, university support and top management support significantly and directly impacted students' intention to use ILTs. The integration of a university's environment perspective into the technology acceptance model (TAM), resulted in our extended TAM model that captured both extrinsic motivation and university's characteristics for explaining students' intention to use new internet based learning tools.

Keywords: ICTs, Support, ITLs, Readiness, TAM

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INTRODUCTION

The past decade has witnessed extensive use of the Internet and the world wide web that has made digital technologies to revolutionize higher education practices of learning and teaching at universities and colleges all over the world (Sheng, Jue, and Weiwei, 2008; Nanayakkara, 2005). Accordingly the speed of transformation of learning and teaching in the education sector has increased, with a rising number of universities progressively exploring the potential use of Internet Learning Tools (ILTs) to support learning and instruction delivery within the classroom and distance education out of the classroom as part of the learning and teaching environment (Nanayakkara, 2005; Elliot and Sweeney, 2007). According to Nanayakkara, (2005), the advantages of ILTs to both students and instructors have been widely recognized and accepted. Some of the benefits that educational institutions can enjoy include reduction of operational costs and increased revenues (Lepori, Cantoni, and Succi, 2003). Unfortunately these benefits are rarely realized since the rejection of technology such as ILTs is common

(Davis, 1989; Venkatesh and Bala, 2008). The rejection phenomenon is a paradox since universities make huge investments and enormous efforts in the deployment of ILTs yet the students, lecturers and staff often do not use the deployed technology as anticipated and more often these tools keep on to be underutilized (Odini, 1995).

In an analysis of the determinants and effects of information and communication technology (ICT) adoption and diffusion in developing countries, Balamoune-Lutz (2003, p. 151) cited in Richardson (2009, p. 1) found that while extensive body of literature exists “on the possible determinants of globalization, much smaller work has been devoted to understanding the determinants of ICT diffusion, particularly in developing countries.” Richardson (2009, p.1) states that “The need to better understand ICT diffusion is balanced with the reality that it is difficult to find sustained success stories”. In higher education institutions (HEIs) particularly in developing countries, there is a real challenge of effective adoption and diffusion of ICT artefacts like ILTs deployed to transform learning and teaching. A recent study by UNESCO (2008, p. 2) on e-learning in Africa, concluded that “e-learning is still very much in its infancy across most of the continent” and yet “there is much enthusiasm amongst respondents for developing the potential of e-learning” in these countries. Thus there is an urgent need for universities in these countries to increase their understanding and knowledge on the successful adoption and diffusion of e-learning and other ILTs. Consequently, to address this knowledge gap, this research aims to investigate the nature and extent of the influence of university factors on the students’ acceptance of internet based learning tools in higher education institutions. This will consequently result in reduced underutilization and increased uptake of internet based learning tools, which will in turn improve learning and teaching in HEIs.

THEORETICAL BACKGROUND

The emergence of the internet and web technologies is revolutionizing the practices of learning and instruction delivery at universities all around the world. These institutions of higher learning are increasingly exploring the potential use of e-learning technologies to accommodate for the ever growing demands of flexible teaching needs within the classroom and in distance education. This anticipated benefit is making higher education institutions invest significantly in associated information technology infrastructure and make considerable efforts in e-learning development with the expectation of high return on their investment. However, despite this investment and efforts “the teachers and faculty do not always use the technology as expected and more often e-learning systems continue to be underutilized” (Nanayakkara, 2005, p.1). Nanayakkara results showed that although individual factors have significant influence to the learning management system adoption, the technology and institutional factors are most crucial for user acceptance in e-learning systems. This study agrees with Nanayakkara that university factors have a significant influence on the adoption and diffusion of e-learning technologies. However, Nanayakkara study had two limitations, which are overcome in the current research. First it was done in a developed world where universal access to ICTs may be assumed to hold, and hence the influence of access to ICTs and availability of ICTs in a university may not matter. Secondly, the CEO characteristics variable is among the factors that was not investigated, yet just like the many cases of African countries where leaders determine success of the nation like that of South Africa, or total collapse like that of Somalia, the success of the institutions of higher learning in these countries depend heavily on the characteristics of their leaders. The current study therefore finds it rational to investigate the influence of University CEOs on E-learning technologies adoption and diffusion. The problem of underutilization of technologies such as e-learning which is the subject of this study, is among the major persistent issues in Information Systems (IS) research. Consequently, there is an urgent need to fill the gap in the identification of university variables that influence individuals to

accept and make use of e-learning systems developed and deployed by other people in the general technology space (King and He, 2006). This need is supported by a recent study by Venkatesh and Bala, (2008) that posits that the problem of technology resistance by users is common.

In previous studies, several theories and models have been proposed to address the technology acceptance/rejection problem over the decades. Some examples of these theories/models include Davis, et al., (1989) and Venkatesh and Bala, (2008) who proposed technology acceptance model (TAM) and TAM3 respectively as a means of investigating and understanding information system acceptance or rejection by users even after the systems have been deployed for them. TAM is based on the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), which is a psychological theory that attempts to explain user behaviour. TAM involved two primary predictor's namely perceived ease of use (PEOU) and perceived usefulness (PU). In both TRA and TAM, behavioural intention of use (BIU) is the dependent variable and was assumed in TRA to be closely associated to actual system usage behaviour by individuals.

Several studies including Macharia and Nyakwende, (2009) have proposed that, distinction had to be made between the various factors that influence adoption and diffusion of information systems including environmental (Gong, Li, and Stump, 2007), technical (Sheng, Jue, and Weiwei, 2008), individual (Yang and Jolly, 2008), and organizational factors (Seyal, Rahman, and Mohammad, 2007). This study focuses on university factors using TAM since TAM is the most extensively used model in information systems research. This is partly due to its generality and parsimony (King and He, 2006). However, several studies have argued that TAM is imperfect (King and He, 2006). To address some of TAM shortcomings, several recent studies have proposed extension of TAM (Venkatesh and Bala, 2008; Nanayakkara, 2005; Sheng, Jue, and Weiwei, 2008). This study follows that line of investigation to further provide additional understanding of the role of availability of ICTs (AICT), Organizational readiness (OR), subjective norm (SN), organizational support (OS), CEO characteristics (CEO), and top management support (TMS) as antecedents to the perceived ease of use and perceived usefulness constructs in TAM.

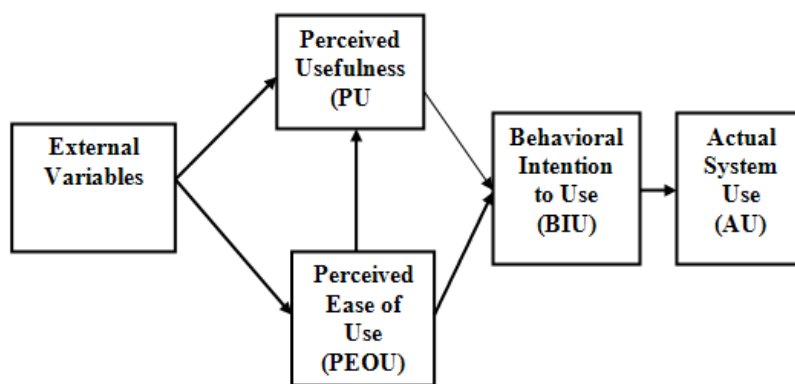


Figure 1: Technology Acceptance Model (TAM) (Davis, Bagozzi, and Warshaw, 1989)

RESEARCH MODEL AND HYPOTHESES

Technology Acceptance Model (TAM)

This research is based on the technology acceptance model (TAM) proposed by Davis (1989) and Davis et al. (1989) shown in Figure 1. Davis proposed in the TAM that the influence of other variables on technology acceptance is mediated by two individual beliefs: perceived usefulness (PU) and perceived

ease of use (PEOU). According to Davis et al. (1989), TAM proposes that the real use of information system is determined by the users' behavioural intentions (BIU) to use the system such as ILTs, which is consecutively determined by the users' perceived usefulness (PU) and perceived ease of use (PEOU) of the system. In addition, TAM has been applied to different information technologies, and its validity has been extended in a variety of work environment, and end-users (Legris, Ingham, and Colletette, 2003). The TAM model shown in Figure 1 has been used in previous studies to successfully predict users' information systems acceptance behaviour (Venkatesh and Bala, 2008; Saadé, Nebebe, and Tan, 2007). For purposes of this study the definitions of PEOU and PU are adopted from Davis et al. (1989). The theoretical TAM basis was assessed using the following hypotheses:

- H1** Behavioural intention to use is a predictor of actual usage of the ILTs.
- H2** Perceived usefulness has a strong positive influence on the behavioural intention of the ILTs usage.
- H3** Perceived ease of use has a strong positive influence on the behavioural intention of the ILTs usage.
- H4** Perceived ease of use has a positive influence on the perceived usefulness of the ILTs.

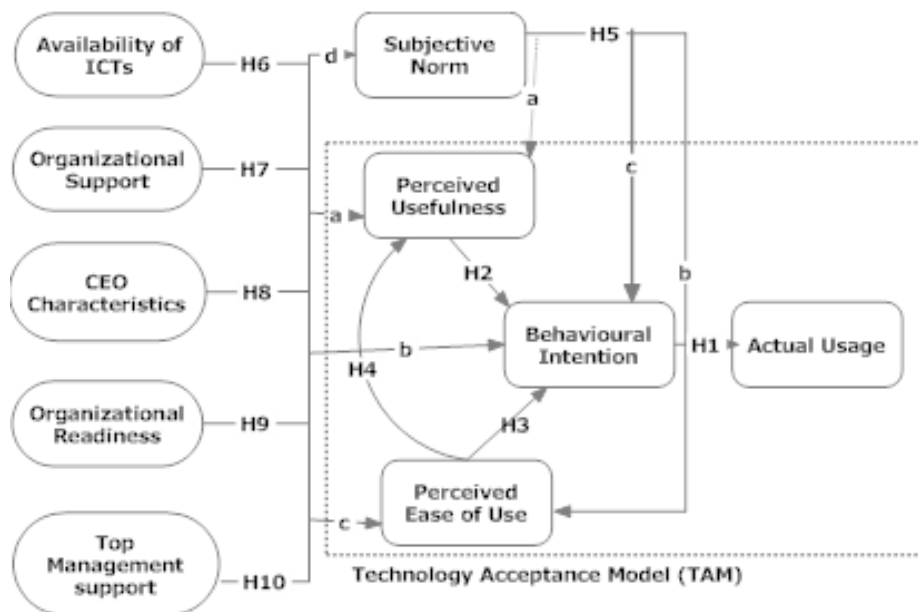


Figure 2: Research Model

Organizational Factors Hypothesis

Previous studies have established that organizational variables of Subjective Norm (SN), ICTs Availability, Organizational Support (OS), CEO Characteristics (CEO), Organizational Readiness (OR) and Top Management Support (TMS) are pertinent to this study. The measuring constructs in Table 2 were designed using the definitions from literature review. The survey items for these constructs were adopted and designed for ICTs in higher education context using a 7-point Likert Scale similar to those corresponding to sources in the literature, namely: (1) very strongly disagree, (2) strongly disagree, (3) disagree, (4) neutral, (5) agree, (6) strongly agree, and (7) very strongly agree. Figure 2 shows the model variables and the hypothesis associated with them. All influence relationships were hypothesized in the positive direction.

Subjective Norm

At an educational institution, the cases of freshers, new faculty and staff will always arise every semester. The pressure put on them by their peers may have an effect on their adoption and diffusion of the ICTs such as e-learning that they encounter either in the institution, or out in the general environment to accomplish their task. Consequently this variable is given consideration in the model for this research. We therefore hypothesise:

H5. Subjective Norm has positive influence on (a) perceived usefulness (b) perceived ease of use, and (c) behavioural intention.

ICTs Availability

In contrast to e-readiness studies where ICT availability in countries is taken as “total number of telephone subscribers per 100 inhabitants, personal computers per 100 inhabitants and Internet users per 100 inhabitants”, technology acceptance measurement of ICT availability at the organizational level will both measure the perceptions of potential adoptors as well as organizational ratios of computers and other relevant ICTs artefact such as the internet connection bandwidth to the organization. We therefore hypothesis that:

H6. ICTs Availability has positive influence on (a) perceived usefulness (b) perceived ease of use and (c) behavioural intention, and (d) subjective norm.

Organizational Support (OS)

Theoretically, it is logical to conjecture that higher organizational support would result in higher judgements of self-efficacy on the part of users because they would have more resources to enable them become more skilful. We therefore hypothesis:

H7. Organizational support has a direct effect on (a) perceived usefulness and (b) perceived ease of use (c) behavioural intention, and (d) subjective norm.

CEO Characteristics (CEO)

Several studies including that of Weltevreden and Boschma (2008) showed that the CEO characteristics have major influence on IS adoption and diffusion. The CEO’s knowledge about ICT is a major factor in ICT adoption as it reduces the uncertainty and risk involved the process (Al-Qirim and Corbitt, 2006). We thus hypothesis:

H8. CEO’s characteristics have a direct effect on (a) perceived usefulness and (b) perceived ease of use, (c) behavioural intention, and (d) subjective norm.

Organizational Readiness (OR)

According to Scott, (2007), organizational readiness is determined by financial and technological skill readiness. Studies by Iacovou, Benbasat, and Dexter, (1995) found that organizational readiness is positively related to adoption, integration, and impact of EDI adoption. However in higher education this variable has not been investigated yet particularly in developing countries like Kenya, where both financial and technological resources are scarce. We therefore find this variable pertinent to this study and hence hypothesize:

H9. Organizational Readiness has a direct effect on (a) perceived usefulness, (b) perceived ease of use, (c) behavioural intention, and (d) subjective norm.

Top Management Support (TMS)

The absence of management support in any ICT project will not only lead to project failure, but also creates a major barrier to the effective diffusion of information technology (Igbaria, Zinatelli, Cragg, and Cavaye, 1997). A failure of an institutional ICT system will not only disrupt the learning, teaching and operations of such an institution, but will also incur huge financial and time resources. We therefore hypothesize that:

H10. Management support has a direct effect on (a) perceived usefulness(b) perceived ease of use, (c) behavioural intention, and (d) subjective norm.

RESEARCH METHODOLOGY

Data collection

The target population consisted of students with computer and internet access from 7 public and 23 private universities in Kenya. A sample of 1092 students from 16 sampled universities participated in the survey. The study respondents were asked to fill in a research questionnaire voluntarily. Each student was approached by a fellow student, faculty member, or ICT staff in their university who invited them to participate in the survey. This process was done that way to remove the researcher's possible influence on the subjects.

Instrument

All the instrument items used in this study to evaluate the constructs were adapted from preceding research with modifications to fit the ILTs specific research context. Both the perceived ease of use and usefulness were assessed using four construct items adopted from Davis et al.(1989). On the other hand two items were used to measure behavioural intention (Ajzen and Fishbein, 1980), A seven-point Likert scale with anchors ranging from *very strongly disagree* to *very strongly agree* was used to ensure statistical variability among survey responses for all items in the questionnaire instrument except for the background and demographics data. The measurement for usage which is based on the frequency of ILTs usage and duration of use was adapted from Teo, Lim, and Lai, (1999).

DATA ANALYSIS AND RESULTS

The SPSS 15.0 and AMOS 7.0 with multiple indicator structural equation analyses were used to analyze both the measurement model and the structural model.

The Measurement Model

Demographics

According to Grandon and Pearson, (2004), it is necessary to start assessment of the measurement model before estimating path coefficients which indicates both the sign and the power of the relationships since the item's weights and loadings indicate the strength of the measures. The demographic results showed that 52.3% of the respondents were male, while 85.4% of the responses were from persons below the ages of 25. Further, 66.3% of the participants also had above average ICTs experience, and 90% were undergraduates in year 1 to year 4 of their study.

Normality of the data

The research results showed that the assumptions of normality and linearity were satisfied prior to the next steps of the analysis. An examination of the skewness and kurtosis statistics revealed that the data

had no outlying cases detected. According to (Pinder, Price, Wilkinson, and Sean, 2003), the results implied that all items of the measurement model were acceptably normally distributed.

Sampling Adequacy

The correlation matrix showed that a large number of correlations exceeded 0.3, which implied that the matrix was appropriate for factoring. From the results shown in Table 1, the Bartlett test of sphericity was significant (<001) and the Kaiser-Mayer-Olkin measure of sampling adequacy was 0.913, which is greater than the threshold of 0.6 (Pinder, et al., 2003).

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.913
Bartlett's Test of Approx. Chi-Sphericity	23554.969
df	630
Sig.	.000

Instrument Reliability

The results in Table 2 shows that the reliabilities of all the study constructs had a factor loading above 0.7 and that the Cronbach's Alpha reliability is higher than 0.8 for all the constructs, which represents an acceptable level for this study. In addition to item loadings and Cronbach's Alpha reliability, the measurement model was further assessed in terms of convergent and discriminant validity that follows below:

Table 2 Factor Loadings and Cronbach's Alpha

Construct	Items	Factor Loading	Cronbach's Alpha	Construct	Items	Factor Loading	Cronbach's Alpha
Perceived Usefulness	PU1	.828	0.923	Availability of ICTs	AICT1	.760	0.910
	PU2	.868			AICT2	.837	
	PU3	.879			AICT3	.813	
	PU4	.827			AICT4	.759	
Perceived Ease of Use	PEOU1	.825	0.903	Organizational Support	OS1	.682	0.902
	PEOU2	.873			OS2	.800	
	PEOU3	.875			OS3	.861	
	PEOU4	.773			OS4	.839	
Behavioural Intention	BIU1	.845	0.883	CEO Characteristics	CEO1	.680	0.923
	BIU2	.865			CEO2	.715	
	BIU3	.843			CEO3	.757	
Usage	U1	.838	0.762	Organizational Readiness	OR1	.754	0.896
	U2	.765			OR2	.776	
	U3	.746			OR3	.812	
Subjective	SN1	.820		Top	TMS1	.815	
	SN2	.861			TMS2	.824	

Norm	SN3	.830	0.900	Management	TMS3	.811	0.916
	SN4	.784		Support	TMS4	.773	

Content Validity

According to Grandy, (1992) and Haynes, Richard, and Kubany, (1995), it is important to avoid subjectivity on content validity that is usually attributed to researchers' subjective judgment, and not from empirical error. Consequently in this study, content validity was achieved and justified by examining how the scales were derived and validated in preceding research. Generally, the TAM constructs have been validated by Davis (1989) and Davis et al. (1989) and other researchers. They are therefore found to be robust in subsequent studies (Venkatesh and Bala, 2008). Additionally, organizational variable constructs have been supported and validated by several successive researchers (Straub, Boudreau, and Gefen, 2004; Hung, Chang, and Lee, 2001).

Convergent validity

Convergent validity measurement can be achieved by assessing three aspects namely: construct reliability, item reliability, and average variance extracted (AVE) (Bagozzi, 1981). For brevity, this paper used the average variance extracted (AVE) value, which is an evaluation of the amount of variance shared by in-group items captured by the underlying construct in relation to the amount of variance due to measurement error. This measurement was computed as follows: $(\text{sum of squared factor loadings}) / \{(\text{sum of squared factor loadings}) + (\text{sum of error variances})\}$ (Bagozzi, 1981). It is required that to conclude convergent validity the value of AVE should be higher than 0.50. From the results shown in Table 3 all AVEs results except one out of ten constructs in this research have AVE values greater than the required threshold of 0.50.

Table 3 Convergent Reliability

Construct	Average Variance Extracted (AVE)	Construct	Average Variance Extracted (AVE)
Perceived Usefulness	0.74	Availability of ICTs	0.85
Perceived Ease of Use	0.88	Organizational Support	0.84
Behavioural Intention	0.24	CEO Characteristics	0.83
Usage	0.70	Organizational Readiness	0.83
Subjective Norm	0.61	Top Management Support	0.88

The results displayed in Table 3, makes it possible to conclude that the instrument used in this study demonstrates sufficient convergent validity. The AVE results of the study constructs are all greater than 0.50 except one, indicating that variance due to the construct is greater than the variance due to measurement error for all research constructs except BIU (0.24).

Discriminant Validity

In this study, the discriminant validity, was established by requiring that the average variance extracted (AVE) should be greater than 0.50 except for BIU (0.24) and the value of every AVE in the AVE analysis should be much larger than any square of correlations among any pair of latent constructs. The results of Table 4 shows that the AVEs of all the variables are above the acceptable level (>0.5) except for BIU (0.24) (Gallego, Luna, and Bueno, 2008).

Table 4 Discriminant Validity–Comparing AVEs and Squared Correlations

	PU	PEOU	BIU	AU	SN	AICT	OS	CEO	OR	TMS
AVE	0.74	0.88	0.24	0.70	0.61	0.85	0.84	0.83	0.83	0.88
PU	1.00									
PEOU	0.45 (0.20)	1.00								
BIU	0.31 (0.09)	0.17 (0.03)	1.00							
AU	0.27 (0.08)	0.28 (0.08)	0.28 (0.08)	1.00						
SN	0.31 (0.10)	0.28 (0.08)	0.41 (0.17)	0.26 (0.07)	1.00					
AICT	0.28 (0.08)	0.34 (0.11)	0.20 (0.04)	0.47 (0.23)	0.22 (0.05)	1.00				
OS	0.26 (0.07)	0.29 (0.09)	0.13 (0.02)	0.29 (0.08)	0.32 (0.10)	0.39 (0.15)	1.00			
CEO	0.19 (0.03)	0.15 (0.02)	0.18 (0.03)	0.21 (0.04)	0.24 (0.06)	0.32 (0.10)	0.49 (0.24)	1.00		
OR	0.21 (0.04)	0.16 (0.03)	0.21 (0.05)	0.22 (0.05)	0.26 (0.07)	0.31 (0.10)	0.44 (0.20)	0.69 (0.48)	1.00	
TMS	0.23 (0.05)	0.16 (0.03)	0.19 (0.04)	0.20 (0.04)	0.25 (0.06)	0.29 (0.08)	0.39 (0.15)	0.66 (0.43)	0.72 (0.52)	1.00

Note: The values in the brackets represent the squared correlation values between constructs of the respective row and column

The structural model

Table 5 presents the results of the analysis of the structural model. Fifteen of the twenty five hypotheses investigated in the structural model have significant outcome.

Table 5 Significance of the Individual Paths

			Estimate	S.E.	C.R.	P	Label	Hypothesis	
SN	<---	AICT	0.084	0.029	2.888	0.004	par_23	H6d	Supported
SN	<---	OS	0.21	0.027	7.815	***	par_24	H7d	Supported
SN	<---	CEO	0.004	0.025	0.151	0.88	par_25	H8d	Not Supported
SN	<---	OR	0.054	0.028	1.956	0.05	par_26	H9d	Not Supported
SN	<---	TMS	0.099	0.028	3.478	***	par_27	H10d	Supported
PEOU	<---	TMS	0.04	0.027	1.47	0.142	par_3	H10b	Not Supported
PEOU	<---	OR	-0.014	0.026	-0.538	0.591	par_4	H9b	Not Supported
PEOU	<---	CEO	-0.055	0.024	-2.319	0.02	par_5	H8b	Supported
PEOU	<---	OS	0.154	0.026	5.849	***	par_6	H7b	Supported
PEOU	<---	AICT	0.229	0.027	8.375	***	par_7	H6b	Supported
PEOU	<---	SN	0.176	0.029	5.986	***	par_8	H5b	Supported
PU	<---	PEOU	0.38	0.032	11.868	***	par_9	H4	Supported
PU	<---	AICT	0.079	0.029	2.713	0.007	par_10	H6a	Supported
PU	<---	SN	0.167	0.03	5.489	***	par_11	H5a	Supported
PU	<---	OS	0.051	0.027	1.887	0.059	par_12	H7a	Not Supported
PU	<---	CEO	-0.016	0.024	-0.678	0.498	par_13	H8a	Not Supported
PU	<---	OR	0.017	0.027	0.616	0.538	par_14	H9a	Not Supported
PU	<---	TMS	0.088	0.028	3.206	0.001	par_15	H10a	Supported
BIU	<---	PU	0.191	0.032	5.928	***	par_1	H3	Supported
BIU	<---	PEOU	-0.02	0.036	-0.559	0.576	par_2	H2	Not Supported
BIU	<---	AICT	0.089	0.03	2.941	0.003	par_16	H6c	Supported
BIU	<---	OS	-0.113	0.028	-4.023	***	par_17	H7c	Supported
BIU	<---	CEO	0.032	0.025	1.297	0.195	par_18	H8c	Not Supported
BIU	<---	OR	0.09	0.028	3.232	0.001	par_19	H9c	Supported
BIU	<---	TMS	-0.012	0.029	-0.418	0.676	par_20	H10c	Not Supported
BIU	<---	SN	0.37	0.032	11.611	***	par_21	H5c	Supported
AU	<---	BIU	0.332	0.036	9.272	***	par_22	H1	Supported

Note: *** means $p < 0.001$

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Discussion

The results of Table 5.5, shows that Subjective Norm (SN)- ($\beta = 0.37$, $p < 0.001$, Availability of ICTs (AICT)- $\beta = 0.089$, $p < 0.05$, Perceived Usefulness (PU) - $\beta = 0.0191$, $p < 0.001$, Organizational Support (OS)- $\beta = -0.113$, $p < 0.001$, and Organizational Readiness (OR)- $\beta = 0.09$, $p < 0.05$ have a strong direct significant effect on behavioural intention to use Internet based tools. However, the insignificant effect of PEOU in affecting BIU, and the negative direction of organizational support require further investigation. On the other hand the results from classic TAM research posits that PEOU has less influencing effect on BIU

than PU concur with these findings. This result underpins the importance of usefulness in order to diffuse Internet based learning tools effectively in universities. In addition, SN has the strongest interaction with the BIU relationship ($\beta = 0.37, p < 0.001$). The three constructs PEOU, CEO, and TMS did not have significant direct impact on BIU. The variance of BIU explained by the predictors is 75%, higher than the usual amount of variance explained by TAM in prior information systems studies which is usually around 50% (Venkatesh and Davis, 1996).

This study includes availability of ICTs, organizational readiness, and subjective norm perspectives into the TAM and postulates PU and subjective norm as the key drivers to Internet based learning tools diffusion by students in universities. The results of PU agree with recent finding (Sheng, Jue, and Weiwei, 2008). In addition, subjective norm is found to play an essential role as a predictor of BIU yet many studies have not investigated this dimension. Unfortunately the few studies that have examined subjective norm, it has not been on internet based learning tools and majority have not been in a developing economy like Kenya, where availability of ICTs is critical. While the findings on PEOU influence on BIU are inconsistent with some prior research, it agrees with others. The PEOU findings differ with studies using subjects from developed countries that frequently show that the direct effect between PEOU and BUI is significant (Venkatesh and Bala, 2008). The results of PEOU influence on BIU being not significant agree with the finding of (Teo, Lim, and Lai, 1999; Saadé, Nebebe, and Tan, 2007). The findings of this study demonstrate that the foundation formulation of the TAM is valid in the Kenyan higher education setting. However the emergence of subjective norm as the dominant factor in addition to the commonly used variables PU and PEOU require further investigation.

Implications and Recommendations

From the results of this paper, organizational readiness and availability of ICTs are critical for ILTs diffusion. Thus, vice chancellors and university administrators should improve availability of ICTs in their campus by increasing student/computer ratio. In addition, universities should have a clear change management process in the deployment of ILTs. Strategically they should ensure that first users of ILTs find it useful and consequently influence others by subjective norm context. In addition, to enable the students to find ILTs useful, they must find content. This requires vice-chancellors and administrators to establish university policy and motivation to encourage instructors to engage students by placing dynamic, rich and useful course material (such as slides, notes, quizzes, cases, video clips, audio clips, blogs, flush animation) on the ILTs. Such content will require lecturers to strategically adjust their instructional methods by embedding and making use of playful ingredients in the ILTs environment to foster learning, fun and interest in the educational activities. Students are more likely to use ILTs if they find the system can help their learning process and improve the learning effectiveness (Sheng, Jue, and Weiwei, 2008).

Limitations and conclusions

The findings of this study must be considered in light of its limitations. In the first instance, the usage measurements used in this study were self-reported because it was not practical to objectively log all the respondent student behaviour in all sampled institutions. Further, this study only used student responses regarding their behaviour. Consequently, the general validity of the findings should be treated with caution, especially when applied to other organizations such as companies. The findings validate the TAM as a basis for this new model and support the value of new factors in technology acceptance behaviour. Accordingly, we can conclude that a successful internet based learning tool deployment should integrate the variables of organizational readiness, subjective norm and availability of ICTs.

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