Information Technology Research Journal Vol .2(1), pp. 1 – 7, April 2012
Available online http://resjournals.com/ITJ/Index.htm

Full Length Research Paper

An Analysis of E-learning Information System Adoption in Ugandan Universities: Case of Makerere University Business School.

***Kituyi Geoffrey Mayoka[1] and **Robert Kyeyune[1]**

[1] Makerere University Business School, Uganda.

**Email: rkyeyune@mubs.ac.ug

*****Corresponding Author's Email: kimayoka@gmail.com

Abstract

This paper presents an examination of e-learning Information Systems failures and adoption problems in Ugandan universities based on Rogers and Shoemaker's Diffusion of Technological Innovation Theory. Makerere University Business School was used as a case study, where two e-learning systems at Makerere University Business School were surveyed. A self-administered questionnaire was given to 200 respondents who comprised of academic staff, administrative staff and students. The results were analyzed using descriptive statistics. Findings indicate that Assistant Lectures and Lecturers were more willing to adopt to e-learning than their senior counterparts, the Professors. The results also indicate that although students are aware of e-learning, many of them were not comfortable using the technology. The most hideous challenges for e-learning adoption were identified as lack of resources, knowledge and resistance to change. A number of recommendations have been made for faster adoption and use of e-learning information systems at Makerere University Business School and other universities.

Keywords: e-learning, adoption, sustainability, information systems, Uganda.

Introduction

In a bid to improve literacy levels in the country, the government of Uganda introduced Universal Primary Education (UPE) and Universal Secondary Education (USE), whereby all children of school going age are facilitated to study for free. However, these developments have led to a surging increase in the number of students enrolling to study hence putting pressure on the available infrastructure (Kisubi, 2008). This pressure is currently being felt in higher institutions of learning where there is limited space and other resources such as facilitators (MoES, 2009). As a result, many Ugandans remained illiterate with literacy rates standing at only 65% (Aguti, 2002). The government of Uganda is now encouraging alternative means of meeting the demand particularly of higher education, one of these being e-learning, especially in higher institutions of learning. Subsequently, universities have tried to develop and implement e-learning information systems (Mugaba, 2002). Makerere University, the biggest and oldest university in the country was the first to start e-learning using the Blackboard platform. They have since moved to a new system called Makerere University Electronic Learning Environment (MUELE) based on a Moodle platform. Other universities such as Nkozi and Makerere University Business School and other universities have also followed suit.

The advent of e-learning at Makerere University Business School was pioneered by NettelAfrica, a conglomerate of universities promoting ICT usage and policy on the African continent. NettelAfrica introduced the Knowledge Environment for Web-based Learning (KEWL) system, which targeted students pursuing a postgraduate programme in ICT Policy and regulation.

The system has most of the e-learning requirements with a lot of course content, materials and online discussion forums. The introduction of the KEWL system excited and attracted quite a good number of students initially until recently when the MUBS failed to enroll students on the programme in the academic year 2010/2012. In the early 2010, the International Center for Information Technology and Development (ICITD) introduced another e-learning system that runs a Moodle platform but the system has failed to pickup to date. For example, since its inception in 2010, the eMUBS system has registered only about 60 users. This number is less than 10% of the Makerere University Business School and other universities community. Worse still is that the 60 registered users are not active. Virtually no activity takes place on the system despite huge maintenance costs being incurred to keep the system running. Out of the 3 Ugandan universities that have attempted using e-learning, it is only Makerere University that has registered considerable success. However, this achievement is only at postgraduate level as most undergraduate students use classrooms and other traditional teaching methods only.

This paper uses the terms e-learning and e-learning information systems interchangeably. E-learning encompasses all teaching activities carried out electronically over distant locations. It may include all technologies such as teleconferencing, online discussion forums, chartrooms and boards, television, radio, to mention but a few. On the other hand, Adoption of new technologies in this paper refers to the acceptance and use of new technological innovations by a given group of people or community (Davis *et al.* 1989). Adoption and implementation of new technologies in e-learning can be done in three phases including technology, pedagogy and presentation style (Johnson, 2001). According to Goktalay (2006), for an individual contemplating to adopt online technology for their course instruction, three important factors must influence their decision: (1) adoption of the technology, (2) adoption of a new or modified pedagogy, and (3) adoption of a new or modified presentation style.

Related work

The failure of universities to adopt e-learning has been studied by a number of scholars. For example Goktalay (2006) carried out a qualitative study on faculty adoption of online technology in higher education, in which he identified that staff development is a key factor for successful implementation of any technological innovation in education. In his study, Lynch (2002) found out that although 80% of public colleges provided e-learning facilities to their professors, they used those facilities in only 20% of their courses. These findings positively correlate with Goktalay (2006) and HERI (1998; 1999) who argue that 67% of university lecturers find using ICTs a stressful process.

According to CERI (2005) there are numerous barriers encountered in the implementation and use of e-learning i.e. the initial outlay and running costs of providing flexible pedagogy and personalized materials to students, hardware and software limitations and maintenance problems, connectivity and the lack of reliable internet and data centers. These are so prevalent especially in developing countries like Uganda. A number of e-learning systems have failed even before implementation. For instance the adoption of KEWL system at MUBS has largely failed and the recently introduced eMUBS Moodle system has not even seen the light.

Notwithstanding the challenges however, Hollow and ICWE (2009) argue that eLearning if well implemented can significantly improve student motivation, understanding and increase value of education amongst the community. Broadley (2007) carried out a study and established that e-learning enabled teachers to attend to individual students needs more effectively and that it enabled students to learn from a global perspective.

Diffusion of Technological Innovation Theory

After a careful consideration, this study adapted Rogers and Shoemaker's (1971) D*iffusion of Technological Innovation Theory* in trying to understand the process through which new technological innovations are implemented. Rogers and Shoemaker's theory gives 5 stages through which adoption takes place. These include knowledge, persuasion, decision, implementation and confirmation. Knowledge is the process of enlightening and provision of relevant information about the new technology, while persuasion involves performing activities that convince the users to take-up the innovation. Decision stage is when the users chose to actually adopt or reject the technology, thereby resulting into two opposing groups (adopters and rejecters). During the implementation phase however, some adopters stop using the technology while the rejecters may change and start using the technology. These are called late adopters. The last stage, confirmation presents 4 user groups at the end of the process i.e. 1) continued adopters (those who have continued using the technology), 2) later adopters (those who adopt late), 3) discontinuance (those early adopters who drop out), and 4) continued rejecters (those who maintain their rejections). The five phases of Rogers and Shoemaker (1971) *Diffusion of Technological Innovation Theory* are presented in figure 1.

Methodology

A survey research design was used, in which two e-learning systems at MUBS (which was taken as a case

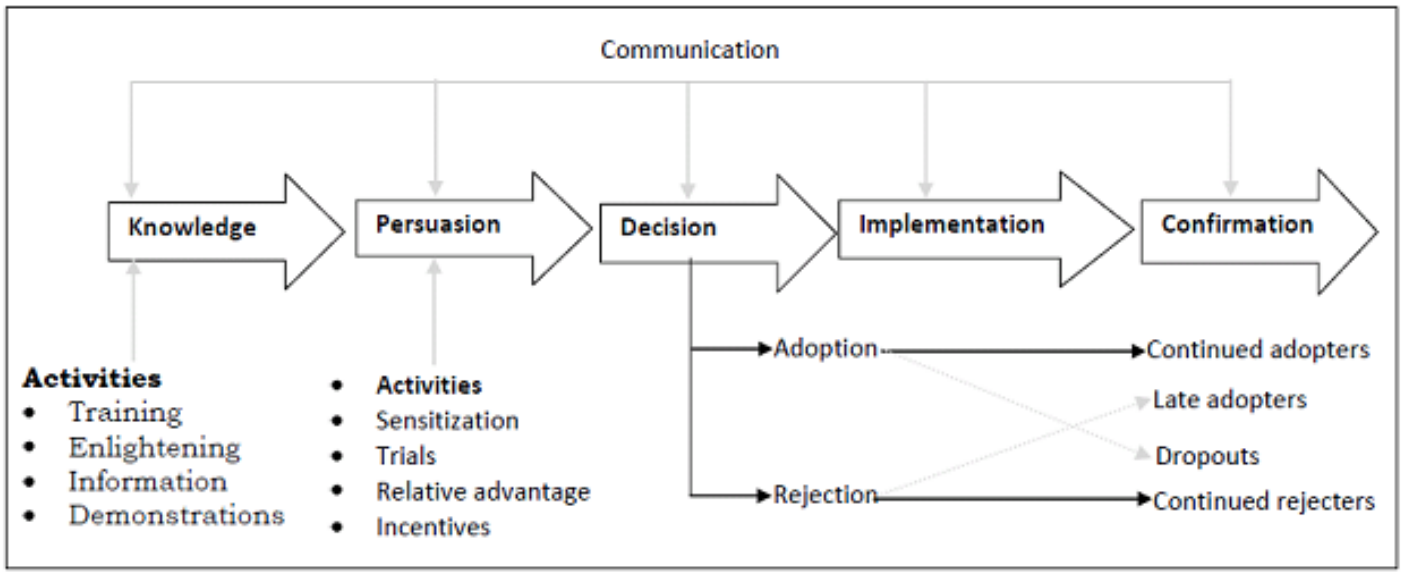

Figure 1. Diffusion of Technological Innovation Theory (Source: Rogers and Shoemaker, 1971)

study) were surveyed. The study used quantitative research methods to study e-learning systems at the business school. The study population covered students, academic staff, administrative staff and IT personnel of Makerere University Business School. A target sample of 200 respondents was used in line with Roscoe's (1970) rule of thumb that sample size between 30 and 500 is sufficient. Purposive sampling method was used to ensure multivariate respondents and diversity of opinions from all the selected study groups i.e. students, academic staff, administrative staff and IT personnel of Makerere University Business School. Data was collected from two sources i.e. primary and secondary. Primary sources included students and staff of MUBS while secondary data was gathered from published material both within and outside Makerere University Business School. A self-administered questionnaire was given to the selected respondents to fill-in. A total of 170 (85%) questionnaires were returned. However, 66 questionnaires that were incomplete and inconsistent were removed during data cleaning before the analysis was performed on the 104 fully filled in questionnaires.

Content validity index was used to test for validity of the questionnaire (CVI > 0.50 for both experts) and Cronbach alpha coefficient was used to test for reliability (Cronbach alpha >0.60 for all variables). Using SPSS' descriptive statistics and means analysis methods, the most important factors influencing the success and/or failure of e-learning adoption in Ugandan universities were extracted. These factors were then fitted on Rogers and Shoemakers *Diffusion of Technological Innovation Theory,* in order to help understand and improve e-learning information systems adoption in Ugandan universities.

Findings

This section presents the findings from primary data.

Challenges impeding e-learning IS adoption in Ugandan universities

A number of factors were put to the respondents suggesting the challenges to e-learning IS adoption in Ugandan universities. Using a likert scale of 1-5 (1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree). Out of the 14 factors suggested, on average, the respondents strongly agreed that students have no knowledge about e-learning (MEAN=4.44), there was lack of top management support and leadership in e-learning (MEAN=4.43) and resistance to change by members of staff (MEAN=4.36). The respondents also strongly agreed that there was lack of resources for implementing e-learning projects (MEAN=4.35). These factors therefore significantly explained why Ugandan universities have failed to adapt to e-learning IS. However, some factors such as students cannot afford using e-learning (MEAN=2.22), high cost of telecommunication services (MEAN=3.17) were weak in explaining e-learning IS adoption failures in Ugandan universities as seen in table 1.

State of e-learning IS adoption at MUBS

A number of parameters were used to understand the current state of e-learning IS adoption at MUBS. These included knowledge of e-learning, level of experience with e-learning IS and user characteristics. These

Table 1. E-learning adoption challenges in Ugandan

	Minimum	Maximum	Mean	Std. Deviation
Resistance to change by members of staff	1	5	4.36	.637
Lack of staff training on e-learning	2	5	3.70	.725
Lack of computers and software for implementing e-learning	2	5	3.79	.997
Lack of e-learning skilled staff in universities	1	5	4.08	.915
Lack of policy and guidelines for using e-learning in universities	3	5	4.17	.663
Lack of government support for e-learning projects	1	5	3.26	1.343
Lack of private sector support for e-learning	1	5	3.33	1.465
High cost of telecommunication services	1	5	3.17	1.147
Lack of laws protecting e-learning practitioners in the country	1	5	4.25	.827
e-learning system are not secure enough to uphold academic integrity	1	5	3.23	.931
Students have no knowledge about e-learning	1	5	4.44	.709
Students cannot afford using e-learning	1	5	2.22	1.084
Lack of resources for implementing e-learning projects	2	5	4.35	.882
Lack of top management support and leadership in e-learning	3	5	4.43	.516
Valid N (listwise)				

parameters were applied on both staff and students in isolation. The findings indicated that majority of MUBS staff (62.5%) were knowledgeable about e-learning, while majority of MUBS students were not knowledgeable (40.5%). On the level of experience with e-learning usage, majority of MUBS staff (62.5%) indicated that they used e-learning for a period of 2-5 years while majority of students (78.5%) had experienced e-learning usage for a period less than 2 years and only 18% had used e-learning for a period of 2-5 years. Thirdly, we looked at user characteristics such as age, title and level of education in terms of influencing e-learning adoption. Our findings on the staffs' side show that Assistant Lecturers comprised majority users of e-learning scoring 35.6% followed by Lectures with 24%. The Senior Lectures, Associate Professors and Professors scored poorly in this regard i.e. 12.5%, 12.5% and 2.9% respectively. While on the students' side, the results were in contradiction as master's students were identified as majority users of e-learning followed by PhD students with scores 52.5% and 22.8% respectively. Results also indicated that diploma and undergraduate students were the list users of e-learning with scores 0.6% and 11.6%. The descriptive statistics on staff knowledge of e-learning, student knowledge of e-learning, staff experience with e-learning IS, students experience with e-learning IS, staff who used e-learning IS and students who used e-learning IS are shown in tables 2, 3, 4, 5, 6 and 7.

Factors influencing the use of e-learning

Guided by Rogers and Shoemakers' theory, we asked both students and staff to state their reasons for using e-learning. Our findings indicate that 56.7% of staff used e-learning because of its relative advantage or need. Others used e-learning IS because they were easy to use i.e. ease of use (21%). On the other hand, majority of students used e-learning out of curiosity (42.6%) this was closely followed by relative advantage/need at 42% as seen in tables 8 and 9.

Success factors for the adoption of e-learning in Ugandan universities.

Descriptive statistics were used to examine the success factors for better adoption of e-learning in Ugandan universities as suggested by both staff and students. Using a likert scale of 1-5 (1= Strongly Disagree,

Table 2. Staff knowledge of e-learning

	Percent
Not knowledgeable	5.0
Somewhat knowledgeable	12.5
Neutral	20.0
Knowledgeable	62.5
Total	100.0

Table 3. Student knowledge of e-learning

	Percent
Not knowledgeable	40.5
Somewhat knowledgeable	27.0
Neutral	12.0
knowledgeable	20.5
Total	100.0

Table 4. Staff experience with e-learning IS

	Percent
Less than 2 years	25.0
2-5 years	62.5
5 and above years	12.5
Total	100.0

Table 5. Students experience with e-learning IS

	Percent
Less than 2 years	78.5
2-5 years	18.0
5 and above years	3.5
Total	100.0

Table 6. Staff who use e-learning IS

	Percent
Professors	2.9
Ass. Professors	12.5
Sen. Lecturers	12.5
Lecturers	24.0
Assistant Lecturers	35.6
Total	87.5
System	12.5
Total	100.0

Table 7. Students who use e-learning IS

	Percent
PhD students	22.8
Masters students	52.5
Undergraduate students	11.6
Diploma students	0.6
Total	87.5
System	12.5
Total	100.0

Table 8. Factors influencing staff use of e-learning

	Percent
Relative advantage/need	56.7
Compatibility	10.0
Ease of use	21.0
Curiosity	12.3
Total	100.0

Table 9. Factors influencing students use of e-learning

	Percent
Relative advantage/need	42.0
Compatibility	0.8
Ease of use	14.6
Curiosity	42.6
Total	100.0

Table 9. Factors influencing successful adoption of e-learning IS

	Min	Max	Mean	Std. Deviation
Sensitize staff to embrace changes in technology	3	5	4.50	.592
Staff training in ICTs and e-learning	2	5	4.31	.929
Availability of computer hardware and software	2	5	4.53	.826
Existence of e-learning policy and guidelines in universities	2	5	4.12	.973
Government support for e-learning projects in universities	2	5	4.35	.936
Private sector support for e-learning projects	2	5	4.23	1.050
Affordable telecom rates /prices	2	5	4.08	.926
Existence of laws governing the use of e-learning	2	5	4.23	.888
Security and confidentiality of students and lectures data in e-learning	1	5	3.77	1.173
Sensitize students about e-learning benefits	2	5	4.46	.764
Free e-learning equipments for students	1	5	4.06	1.008
Strong Top management support for e-learning	2	5	4.30	.906

2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree), the results were analyzed using SPSS means. Findings indicated that availability of computer hardware and software (MEAN=4.53), sensitization of staff to embrace changes in technology (MEAN=4.5) and sensitization of students about e-learning benefits (MEAN=4.46) significantly influenced the success of e-learning adoption in Ugandan universities. Respondents were however in disagreement that Security and confidentiality of students and lectures data in e-learning affected the successful adoption to e-learning as seen in table 10.

Summary of findings.

Rogers and Shoemaker (1971) outlined the factors influencing adoption of new technologies as knowledge, top management leadership, incentives through persuasion, relative advantage, implementation resources and perceived ease of use. The findings in this study to a greater extent agree with Rogers and Shoemaker on all these factors. For example, majority of e-learning users and those who were willing to use e-learning were staff who were most knowledgeable about the technology. The staff, PhD and masters students used e-learning because they were aware about the relative advantage of e-learning, while diploma and undergraduate students shunned it because they did not know its benefits, instead they used the technology out of curiosity. The fact that resistance to change is mainly manifested in older groups of respondents explains why only 2.9% of professors, the most senior and elderly category used e-learning systems.

From the findings therefore, we identified lower level academic staff (Assistant Lecturers and Lecturers) as early adopters to e-learning. On the other hand, findings indicate that medium level and senior academic staff including Senior Lecturers, Associate Professors and Professors were the rejecters/later adopters of the e-learning technology. On the students' side, postgraduate students i.e. Masters and PhD students are early adopters of e-learning while diploma and undergraduate students were the rejecters/later adopters of e-learning.

Recommandations and Conclusion

The challenges to e-learning adoption were found to be both *knowledge* and *Usability based*. On the knowledge based challenges, we recommend that universities should work towards improving knowledge and skills of students and staff through training in order to increase chances of technology acceptance by users as had been suggested by Rogers and Shoemaker. Training will also improve on perceived ease of use which directly translates into early adoption. On *Usability factors,* we recommend that the government and university management should address resistance to change through persuasion and sensitization programmes. The government through parliament should also enact relevant e-learning laws to guide e-learning users. Above all, this study recommends that university top management should support e-learning projects through resource mobilization, monitoring and establishment of internal mechanisms that foster e-learning usage.

Since lower level academic staff and postgraduate students have shown significant interest in the e-learning technology, they should be supported and encouraged so that they do not drop out through a discontinuation process of Rogers and Shoemakers model. On the other hand, senior academic staff and undergraduate students who have been identified as rejecters/later adopters should be sensitized on the benefits of e-learning technology in order to improve their acceptance. Management can setup a mechanism that provides incentives to these categories directly aimed at persuading them into becoming later adopters through the process of late adoption according to Roger and Shoemaker (1971).

References

Aguti Jessica Norah (2002). Facing up to the Challenge of Universal Primary Education, (UPE) in Uganda through Distance Teacher Education Programmes, *a Paper Presented at Pan Commonwealth Forum on Open Learning: Open Learning: Transforming Education for Development*

Broadley Tania (2007). Implementation of E-Learning: A Case Study of Three Schools Curtin University of Technology (SiMERR WA), *AARE.*

Goktalay Sehnaz Baltaci (2006). Faculty Adoption of Online Technology in Higher Education, *The Turkish Online Journal of Educational Technology – TOJET.*

HERI (1999). Faculty Survey 1998/1999. *Retrieved from http://www.gseis.ucla.edu/heri/fac_survey.html on May 13, 2011*

Jonassen D (1994). Thinking technology. *Educational Technology,* 34 (4), 34-37.

Kisubi Alfred T (2008). Critique and Analysis of Universal Primary Education (UPE) In Uganda in General and Suggestions for Improvement In Particular Local Areas, *Presented At the Houston, Texas Busoga Twegaite Annual International Convention, May 22 – 26th, 2008*Lynch, D. (2002) Professors should embrace technology in courses. *Chronicle of Higher Education*. P. B15.

Ministry of Education and Sports, (2001c) Policy Statement for 2000/2001, *MoES.*

Mugaba V, (20th Feb 2002) No School for 100,000; Minister Named in Election Fraud, *Enter Uganda.*

Rogers EM (1995). Diffusion of innovation. *The Free Press, New York (1995).*

Rogers EM, Shoemaker F (1971). Communication of Innovations: A cross-cultural approach. (Re-titled 2nd edition of 'Diffusion of Innovations'). *New York: Free Press.*