

An assessment of e-learning utilization by a section of Ugandan universities: challenges, success factors and way forward

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Abstract

Existing and emerging e-learning technologies are having intense, immediate, and disruptive transformations on education systems (Archer, Garrison & Anderson, 2008). The rise of e-learning technologies in all sectors of education is responsible for the accelerated global competition (Daniel, 2000), increase in the quality of learning experiences (Garrison, 2002), removal of situational barriers and cost effectiveness. This paper is intended to make an assessment of e-learning adoption and utilization in Ugandan institutions of higher learning. A comprehensive literature review on e-learning adoption and utilization in institutions of higher learning was conducted which facilitated an understanding of the challenges and opportunities of the technology.

The study adopted a cross sectional qualitative research method to select out the institutions to study. Questionnaires were used to collect data and the findings were authenticated by literature. The Unified theory of acceptance and use of technology (UTAUT) was used to assess the adoption of e-learning in Ugandan institutions of higher learning (universities). From the assessment of the challenges and success factors, we propose new variables of financial budgeting, training and performance evaluation as additions to the UTAUT model to guide full scale utilization and optimization of e-learning.

Key words: e-learning, online learning, adoption, utilization, UTAUT.

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Introduction

E-learning as opposed to distance learning is a term that used to refer to all ICTs, networks, internet and other forms of electronic media that can be used to enhance teaching and learning so to transfer knowledge and skills. The integration of ICT in education has revolutionalised and transformed the education sector worldwide and created positive impacts provided successful implementation strategies are followed (Intel, 2012). E-learning takes various forms, for instance, it can be web-based, computer-based, virtual classrooms and content delivery via e-networks, audio or video tape, satellite TV, video conferencing, CD-ROM, i-pods, e-mails, wireless and mobile technology among others (Eke, 2011). The growth in Internet characterized by the decreasing costs and increasing bandwidth has facilitated the expansion and increased use of e-learning to offer formal as well as informal educational opportunities that were previously not possible to hundreds of millions of learners (Bonk et al.; 2009).

Regardless of the level, e-learning can be adopted and applied in the education system. E-learning adoption and usage has been successful in the developed world as the success factors depict to that effect. Evidence from literature indicates that in underdeveloped countries like Uganda, work is still at large to realize the adoption, utilization, optimization and full potential of e-learning at all levels of education (Zemsky and Massy, 2004) despite the increased application of ICTs in university teaching.

The changes in education have led to a paradigm shift from teacher centeredness to learner centredness through to subject centredness. This implies that the teacher can no longer decide what to be learnt but rather the interests of the learner do so and determine how they should learn it. It is therefore a learner-controlled self-paced education environment where the learner has authority over the learning environment; there by allowing the learners to work on their pace, convenience access and assessment (Eke, 2011).

Benefits provided by e-learning are undoubtedly several as discussed by various authors. According to Intel (2012), use of ICTs for effective e-learning leads to a range of educational opportunities to help students develop needed skills essential to their countries. E-Learning further leads to student learning, teaching and administration, family and home, social and

community, and economic development. The Kineo group suggests a number of other benefits of

e-learning like Lower costs to education, faster delivery of education materials, more effective means of learning and lower environmental impact by reducing on stationery requirements and minimized wastes. Bhuasiri et al., (2012) summarise the benefits of e-learning in terms of the benefits it provides to stakeholders some of which include; an increased accessibility to information, better content delivery, personalized instruction, content standardization, accountability, on-demand availability, self-pacing, interactivity, confidence, and increased convenience.

In developing countries e-learning is still in its infancy and early adoption stage, and the countries experience challenges unique from developed countries (Bhuasiri et al., 2012). There are deliberate efforts in such countries to implement e-learning. For Uganda, e-learning adoption has been observed mainly in higher institutions of learning. Despite the minimal adoption, the implementation of e-learning has not gone unchallenged. The challenges have been accountable for the small adoption percentage usage, abandonment, and failure of e-learning projects.

This paper therefore was set out to answer the following questions;

1. To what extent has e-learning been adopted in Ugandan higher institutions of learning?
2. What challenges are responsible for the adoption /failure e-learning in those institutions?
3. What remedies can be used to overcome the challenges of e-learning adoption?

The paper is divided into 5 sections, section 1 presents the status of e-learning adoption in Uganda and the theoretical background. Section 2 includes the challenges to adoption of e-learning in Uganda as well the success factors. Section 3 presents the remedies to the challenges as well as the model upon which this study was based. Additional findings are presented in section 4 along with the modified UTAUT model. Section 5 concludes the paper.

Section 1 - E-learning in Uganda

Like other underdeveloped countries, the ICT sector in Uganda is still at the inception stage but growing at a much faster pace witnessed in terms of establishment of an ICT national policy and vision, the increase in Internet accessibility at lower costs, lower costs of device acquisition, Convergence of telecommunications, data processing, and imaging technologies. The application of ICT in education is traced right from the lower primary level, secondary level up to the higher

institutions of learning. The government of Uganda has setup various initiatives through which to support ICT inception in education, the notable ones include;

Education Management Information System (EMIS); It is a component of ICT in the Ministry of Education and Sports, intended to provide quality education statistics in a timely, cost-effective and sustainable manner.

School net Uganda: this is a national network of professional educators with a vision to transform the Uganda educational system from an Industrial model to a knowledge-based model

Connect-ED (Connectivity for Educator Development); supported by USAID, the project is using technology to enable and enhance learning and teaching for primary educators through the creation of multifaceted approaches to integrating media and computers in the Primary Teacher Colleges (PTC).

Institute for Information and Communication Development (IICD); There are four projects under this, namely: ICT Based Educational Content, ICT Training, ICT Workflow Management and Financial Information and ICT Maintenance Capacity.

British Council; This initiative aims at introducing ICT to be used in teaching and learning.

Global Teenager Program; the project is aimed at assisting Students to learn and use ICT in Secondary schools.

Curriculum Net; The National Curriculum Development Centre worked with International Development Research Centre to come up with the CurriculumNet project to develop, test and implement a mechanism for curriculum integration and delivery for primary and secondary schools in Uganda via Communication networks using computer related tools.

UNESCO: Creating learning networks for Africa is meant to assist teachers in secondary schools to appreciate ICT in their works.

U-Connect The goal of the Project is to introduce more widespread use of ICTs in Uganda's primary and secondary schools, especially in rural towns. It raises awareness of the benefits of ICT-enhanced primary and secondary school education, especially the ability to dramatically amplify the limited educational resources in rural towns, and demonstrate best practices in the economical provision of school computer labs and affordable high bandwidth connection to the Internet in a developing country.

New Partnership for Africa in Development; the goal of this project is to provide ICT skills and knowledge to primary and secondary school students that will enable them to function in the emerging Information Society and Knowledge Economy.

The above efforts are geared towards the integration of ICT in education to improve the quality and quantity of education outputs in terms of human resources produced.

E-learning adoption cycles

According to Zemsky and Massy, (2004), new and nearly simultaneous waves of related innovations occur leading to overlapping of innovations' adoption cycles that produce complex situation difficult to analyze and predict. The authors assert that application of technology in teaching and learning represents this complexity in large part because they have undergone four distinct adoption cycles as depicted in Figure 1.

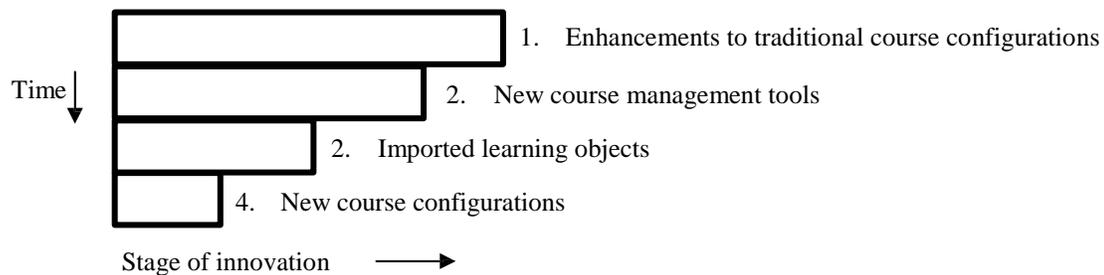


Figure 1 Adopted from Zemsky and Massy, (2004),

In figure 1 each cycle represents a different stage of innovation that also requires a different level of change in the existing instructional culture as described in the section below;

1. Enhancements to traditional course/program configurations. This cycle injects new tools into teaching and learning processes without changing the basic mode of instruction. Such tools include use of e-mails, student access to information on the Internet, and the use of multimedia and simple simulations and, use of presentation software like PowerPoint to enhance classroom presentations and homework assignments.

2. Course Management Systems. This cycle involves use of tools that facilitate effective interaction and communication between professors and students, amongst students, quick access to course materials, and support for administering and grading examinations. Examples are fully

integrated education information systems that enable creation of true online courses and learning networks.

3. Imported course objects. Involve tools which enable trainers to embed a richer variety of materials into their courses, for instance, the use of interactive simulations and enterprise-level Learning Content Management Systems.

4. New course/program configurations. These result from the reengineered teaching and learning activities to take full and optimal advantage of the new technologies that focus on active learning and combine face-to-face, virtual, synchronous, and asynchronous interaction in novel ways.

Status of e-learning adoption in Ugandan institutions of higher learning

Regarding e-learning, a survey conducted in the top universities in Uganda indicated that e-learning has been adopted but on a small scale as illustrated in the chart in figure 2. The universities represent the institutions of higher learning that included; Makerere University Kampala (MAK), Makerere University Business School (MUBS), Kampala International University (KIU) and Islamic University in Uganda (IUIU). The choice of these institutions was based on the fact that they are the highest ranking institutions in Uganda in terms of the quality of education, student population and ICT adoption.

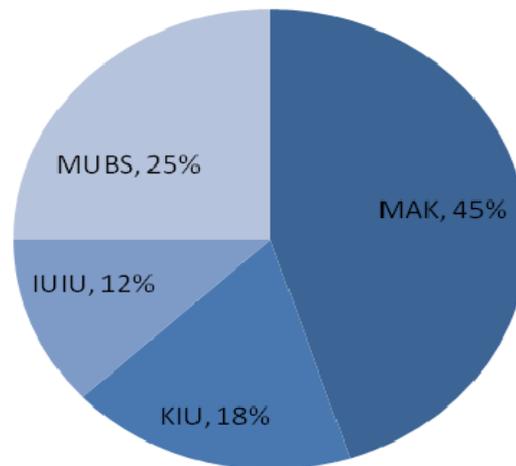


Figure 2: Pie chart showing E-learning Adoption rates by institutions of higher learning

The data in the chart indicates low adoption rates of e-learning in ugandan institutions of learning as compared to universities in the developed world. The elearning technologies used in these universities is highly limited to learning managemnt systems as table 1shows;

Table 1: E-learning technologies used

Technology	MAK	MUBS	KIU	IUIU
Web based learning	✓	✓	✓	✓
Computer-based learning	✓	✓	✓	✓
Virtual classrooms				
Content delivery via e-networks				
Audio or video tape				
Satellite TV				
Video conferencing	✓	✓		
CD-ROM	✓			
I-pods				
E-mails	✓	✓	✓	✓
Wireless and mobile technology				

The data in table 1 above indicates that not all e-learning technologies are used, web based learning, computer based learning and Emails are the only technologies adopted by all universities in the data set. This meant that e-learning has not yet been adapted to its entirety. Additionally, an assessment of the particular aspects of learning are being aided by e-learning,

the results indicated that delivery of learning materials as being the main purpose of e-learning systems. This is further illustrated in the chart in figure 3

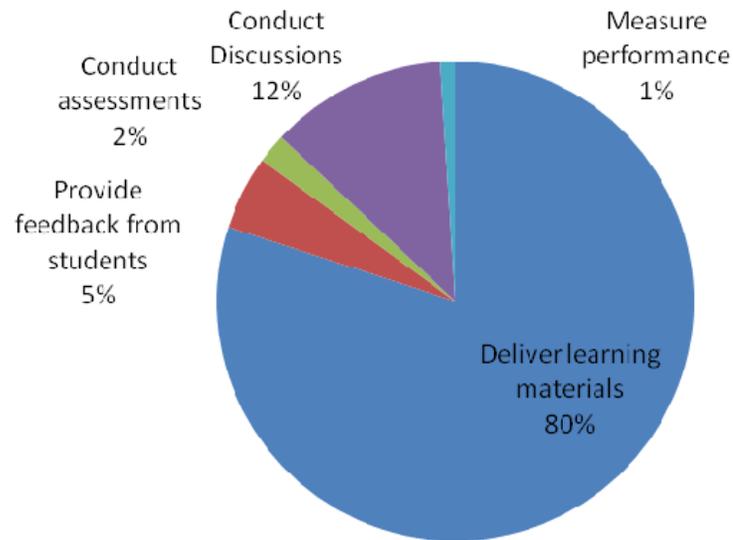


Figure 3: chart showing the purpose for which e-learning is applied

Figure 3 further indicates that e-learning is not fully adopted and utilized; this can be explained by a number of factors as described in section II.

Section II: E-learning challenges

The adoption of e-learning has been hampered by a number of challenges that have negatively affected its full scale adoption, utilization and optimization. Various scholars have highlighted some of these challenges in general terms without particularly addressing their effect.

The e-learning Africa report (2012) highlights some of the most significant constraining factor as being limited bandwidth (17%), followed by the lack of financial resources, inadequate human resource capacity and limited electricity, all with 11%. The report was conducted in selected African countries with Uganda being among them. The constraining factors were further summarized in figure 4;

Rank	Constraining factor	%	The country most likely to identify this as a constraint	The country least likely to identify this as a constraint
1	Bandwidth is limited	17	Zambia	Kenya
2	Financial resources are lacking	11	Zambia	Nigeria
2	Human resource capacity is inadequate	11	South Africa	Tanzania
2	Electricity is limited	11	Nigeria	South Africa
5	Appropriate training is lacking	8	Kenya	Uganda
6	Appropriate hardware is lacking	7	Tanzania	Ghana
7	Lack of trained teachers	6	South Africa	Nigeria
8	Appropriate software is lacking	6	Tanzania	Ghana
8	Political will is lacking	4	Nigeria	Uganda
8	Corruption and theft of resources	4	Uganda	Zambia
11	Lack of good quality educational content	4	Tanzania	Nigeria
12	Pressure of poverty	3	Kenya	Uganda
12	Sustainability is not prioritised	3	Kenya	Tanzania
12	Leadership is lacking	3	Nigeria	Uganda
15	Instability and lack of security	1	South Africa	Zambia
15	Other factors	1	N/A	N/A

Figure 4; Adapted from Africa eLearning report, 2012

Factors responsible for the adoption /failure e-learning in Ugandan institutions

The challenges that limit full scale adoption of e-learning can be categorized in terms of Infrastructural, technical competence, attitudinal challenges.

Infrastructural challenges

Like in all underdeveloped countries, ICT projects have been hampered by infrastructural challenges. For instance lack of electricity, lack of necessary devices like computers to facilitate continuous access to e-learning, higher internet costs and its unavailability, lack of space for establishment of e-learning centers among others. According to Eke, (2011), Infrastructure like the availability of electricity, computers and the Internet is not yet fully in place to enhance the e-

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learning projects. Grönlund & Islam, (2010) assert that the developing countries mainly face obstacles in infrastructure, resources, information access. A collection of such infrastructural problems have negatively affected e-learning in underdeveloped countries.

Technical competence

For the underdeveloped countries, the lack of pedagogical skills and the technical competence required to setup, run and maintain e-learning centers are still farfetched. Even where donations have been made and training has not taken place, that has left e-learning underutilized and its potential not fully exploited.

Attitudinal challenges

E-learning adoption has been highly affected by attitudinal challenges more especially from both the trainers and the trainees. According to Abdel-Wahab (2008), attitudinal factors like perceived ease of use of e-learning, perceived usefulness of e-learning, availability of resources highly determine the intention to adopt e-learning by both students and trainers in higher institutions of learning. Additionally, Eke (2011) puts it forward that e-learning adoption by students is determined by their readiness for it especially if they are satisfied with the quality of service offered by e-learning which will in turn determine the extent of e-learning utilization.

Al-ammari and Hamad (2009) examine computer self-efficacy, content quality, and subjective norms as factors that influence the intention to adopt the e-learning systems. They further suggest cultural factors that affect the students' attitude toward using the e-learning. The cultural factors discussed include the power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance and the long-term vs. short term orientation. The authors contend that such cultural factors are important to consider with respect to adopting and using e-learning systems.

Annika and Anik, (2009) categorise challenges according to four major strands to include; *Course* challenges – i.e. challenges related to course content, course design and course delivery; Challenges related to characteristics of the individual, i.e. challenges that emanate from the side of the student or the teacher; technological challenges i.e. challenges related to e-learning

infrastructure and contextual challenges i.e. organisational, cultural and societal related challenges.

The above section highlights the different challenges from various authors experienced by organizations implementing e-learning, however these studies do not suggest any measures that can be used to take care of such challenges. This study therefore bridges this gap by highlighting remedies and measures that can be used to overcome or mitigate the challenges.

Section 3 - Remedies to the challenges

Financial Budgeting; institutions of higher learning in Uganda need to improve and expand their budgets for e-learning to be able to support the necessary activities, put in place necessary infrastructure and conduct training. Putting in place e-learning is very resource intensive in terms of financial requirements, hardware and software requirements and human resource requirements. Psycharis (2005) puts it out clearly on the requirements of successful e-learning implementation in an educational system by specifying a criteria that should be met that includes acquisition of adequate technological infrastructure and adequate educational content of persons with the university skills and a developed culture which encourages learning and sharing of knowledge. These requirements can only be met by an increased budget within these institutions.

Training; training involves the act of imparting knowledge and skills to individuals. Adoption of e-learning represents a paradigm shift from the conventional methods of teaching to modern methods facilitated by technology and electronic means. According to Beckstorm et al., (2004), e-learning is recognized worldwide as an alternative teaching method giving it recognition as an important part of education. Adoption of new technologies is normally challenged by lack of technological confidence and commitment to use the technology, demoralization and incompetence from the users. Therefore training will act as a change agent to prepare the minds of intended user (both trainers and trainees) to take up the technology, build confidence and commitment that they can use the technology, and show support and motivation from management thereby overcoming challenges related to attitude, culture, traditions, rules and lack of necessary skills.

Training would as well create and enhance a support workforce to both the teachers and students that need technical help while using e-learning.

Performance evaluation: Evaluation is one of the most critical key success factor for e-learning. Evaluation is intended to ascertain whether the learning system results in the desired outcomes. By defining the e-learning evaluation metrics when designing courses, appropriate evaluation metrics can include assessment of skill proficiency, relevant knowledge obtained, the degree to which learners can transfer knowledge, and a measure of predictive validity to ensure the learning module is associated with better understanding of task requirements and improved long term task performance.

The Unified theory of Acceptance and use Model (UTAUT):

The model was developed by Vanketesh *et al.*, (2003) after examining eight models of technology acceptance and use from which they chose constructs to form UTAUT. The model was intended to improve the predictive powers of behavior of intentions to use a technology. According to Vanketesh *et al.*, (2003), performance expectance, effort expectance, social influence and facilitating conditions are used to determine behavior intention to use a technology as illustrated in figure 5. Gender, age and experience are moderating variables for the key variables of performance expectance, effort expectance, social influence and facilitating conditions (Vanketesh *et al.*, 2003).

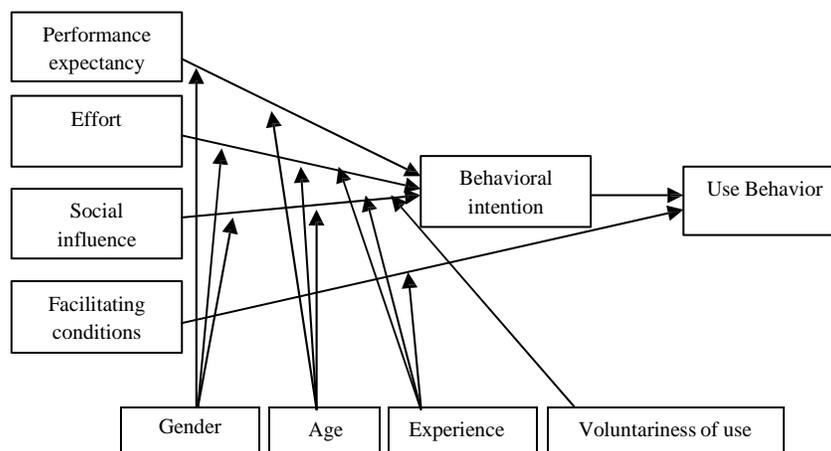


Figure 5: The UTAUT Model (Source: Vanketesh et al., 2003)

Section 4 - Additional Findings

Performance expectancy: students and trainers adopt the technology if they expect it to improve their performance. Many respondents had not adopted because they were not sure whether it would improve their performance.

Effort: people would adopt e-learning if it takes them less efforts to learn and use the technology. Observed findings indicated that if the users' perceived ease of use of e-learning is high, then they would easily adopt it.

Social influence: users adopt a technology if there are factors that force or encourage them to use it. For instance, it could be an organization policy to use a particular technology. The findings indicated that adoption would be high if there is social influence to adopt it, it could be a colleague or the team leader in the organization. E-learning had not been adopted to full scale due to lack of influence from the colleagues within the universities. Additionally, some institutions lacked policies that were specific and deliberate to encourage e-learning usage.

Facilitating conditions: users adopt a technology based on existence of conditions that favor its adoption. It was found out that existence of conditions like user support, motivation, usability encouraged the users to adopt e-learning.

Based on the findings the moderating variables of Gender, age and voluntariness were no longer making a serious contribution because adoption of e-learning as a technology does not necessarily depend on gender or age. This paper therefore replaces gender and age with Training, financial budgeting and performance evaluation variables as key success factors for e-learning adoption.

This transforms the UTAUT model as seen in figure 6.

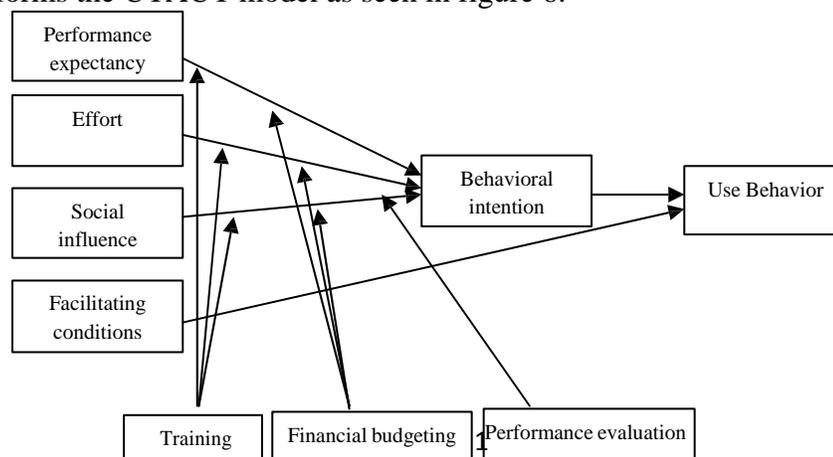


Figure 6: The modified UTAUT Model

Section 5 - Conclusion and future work

E-learning plays a vital role in the provision of education services and extending them to even the remotest of the places. In developing countries, e-learning adoption is in its early stages meaning that it has not yet been exploited to its full potential. The limited adoption is accounted to the various discussed challenges that hamper full scale adoption and utilization. The UTAUT model was found usable to assess the adoption of e-learning but was modified to include more relevant variables of financial budgeting, training and performance evaluation. However, the modified model needs to be empirically evaluated to prove its suitability to adoption and utilization of e-learning.

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