Knowledge Enhancement through ICT: Challenges and Opportunities of Adoption of eLearning in Kisii University

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Abstract

The need to increase accessibility of education to meet growing global demand has necessitated a shift from traditional methods of providing instruction resulting into theutilization of Information Communication Technology (ICT) as an alternative means of accessing educational resources. Such development has enabled education providers to shift from traditional methods of instruction delivery to use of ICT and emergent technologies as a platform for provision of education. This study argues that despite the opportunities presented by adoption of eLearning and open education resources; namely: cost effectiveness; saving time; easy access to material and referencing; interactive learning; and, collaborative learning, universities are hindered in increasing access to quality education by a number of challenges. The study examined the challenges that universities face in the adoption of eLearning as a means of increasing access to quality education and interrogates its low uptake despite the enormous opportunities it creates for greater access to quality education. The study applied case method in analyzing the infrastructural aspects that pose challenges to adoption of sustainable eLearning in Kisii University. The paper established that the major challenges to uptake of eLearning include; lack of adequate infrastructure, low technical competency levels among lecturers and low state funding. It is also shown that opportunities presented by adoption of e-Learning include knowledge acquisition, saving of time and costs. Local improvisation is recommended as option for maximising on existing infrastructural capacity to increase uptake of individual self paced offline and online eLearning methods and asynchronous eL-Learning methods

Key Words: ICT, eLearning, Infrastructure, Access, Quality Education

INTRODUCTION

Open educational resources as a form of instructions traces its roots from distance education. Early correspondence education in Lund, Sweden in 1833 is credited as the earliest form of distance education (Hjeltens & Hanson, 2005). By 1840, distance education had spread to England where Sir Isaac Pitman provided correspondence training. Distance education has evolved from text-based correspondence courses, to radio and TV education, to computer based education which was introduced in early 90‘s. Indeed this shift in teaching and learning from traditional methods to embracing of information communications technology is reflective of the increasing demand for accessible and quality education.

New educational systems have been developed necessitated by the importance of coping with societal changes. The dynamic technological advances have meant that education is not limited to face to face classroom interaction. Current open educational courses (OER in its simple form is the point of interaction between instruction and technology for purposes of facilitating learning and development of human capability. Other conceptualization encompasses OER as teaching with technology) are also not limited to use of desktop computers but have extended to other electronic devices including laptops, tablets and mobile phones and mode of delivery places little reliance on internet only but broadened to include use of satellite for real time classroom interaction. Hence, through the use of ICT, education has become a broader teaching and learning experience shifting from traditional methods to e-Learning.

Adopting Naidu's (2006) description, e-learning refers to the intentional use of networked information and communications technology for teaching and learning**.** It incorporates all educational activities that are carried out by individuals or groups working online or offline through networked or standalone computers and other electronic devices. Hence by this definition e-learning is more comprehensive than online learning, networked learning, distributed learning, web-based learning or virtual learning. E-learning is classified into four (4) categories; namely, individualized self-paced online, individualized self-paced offline, group-based e-learning synchronously, group-based e-Learning asynchronously.

Individualized self-paced online e-Learning refers to a situation where an individual learner is accessing learning resources such as a database or course content online through internet or intranet. An example includes a learner researching using the internet or through a local network. On the other hand individualized self-paced offline e-Learning is where an individual learner gains access to a computer assisted learning package without connection to internet or intranet like using education resources stored on a CD or DVD.

Synchronous group-based e-learning refers to a situation where groups of students work together to access learning resources in real-time through internet or intranet. This includes audio-video conferencing or real time text chatting. Asynchronous group-based e-learning refers to accessing learning resources by a group of students through internet or intranet where exchanges occur with a time-delay. An example includes online discussions through electronic mailing lists. E-learning also extends to the combination of two or more of the types of e-Learning explained above.

Use of Information Communications Technology (ICT) in universities is not a completely new practice. Computers were introduced in universities decades ago and have been embraced in management and learning but the main purpose of purchase of computers and establishment of computer labs was geared to enhancing computer literacy broadly referred to as Computer Based Training (CBT) (Uchendu, 2012). Computer labs are also used for e-mail communication and accessing social media and research to a certain extent. E-learning, however, goes beyond knowing how to use a computer but instead entails delivery of content through ICT with a focus on improving quality and efficiency. This forms a broader approach to knowledge

enhancement in contrast to traditional methods of instruction. Further, use of ICT is not limited to computers only as e-Learning encompasses use of handheld devices like phones, tablets and television, which adds to the convenience of the OER model over traditional model of computer literacy.

In the past decades the use of ICT has become widespread in higher education institutions in Africa (Chitanana Makaza & Madzima, 2008). According to Nyerere *et al.* (2012) increased demand has seen eLearning fast becoming an accepted and indispensable part of the mainstream educational platforms not only in Africa but the world over. It is observed that the increased adoption of e-Learning in Kenya is attributable to the expansion of institutions of higher learning and high demand for education created by such expansion. This trend is in line with Paris Declaration on Open Educational Resources and has been reflected in Kenya‘s policy on ICT.

Prior to Sessional Paper No. 14 of 2012, there was little policy guidance on the mainstreaming of ICT use in education and no monitoring and evaluation mechanism to ensure effective implementation (Government of Kenya, 2012). Though Sessional Paper No. 1 of 2005 mentioned use ICT, it did not provide any governmental policy direction and it needed to be overhauled to incorporate use of ICT in teaching and learning. In 2006, the government adopted the National Policy on ICT acknowledging that Kenya‘s educational system can be modernized through use of ICT. Expected outcomes included enhanced access to education, training and research resources, information production and transformation of Kenya into knowledge driven nation that is responsive to the needs of society. How was such transformative potential to be achieved? Apart from capacity for teachers and development of ICT curriculum for all levels of education, the policy envisages partnership with Universities as a key strategy for mainstreaming ICT use in education. Despite such recognition, governmental support (strategic, technical or financial) promised in the national strategy was anything but forthcoming. Universities still remain underfunded especially in the acquisition of infrastructure for eLearning.

Scholarly analysis of eLearning has mainly focused on benefits, opportunities and rationale for its adoption in primary, secondary and tertiary levels. The factors contributing to opportunities and challenges of adopting eLearning have also received sufficient academic attention. Accordingly, Uchendu (2012) observes that the opportunities presented by e-Learning are no longer the subject of academic debate as the benefits are apparent. A fundamental attribute to eLearning is the flexibility and access. Hence, a fundamental means of enhancing knowledge through ICT is the adoption of eLearning. The significance of studying its opportunities and challenges cannot be overemphasized and is at the core of this study.

Prominent commentators on eLearning have identified opportunities presented by eLearning to include: enhanced knowledge acquisition and support independent training (Ongori & Mburu, 2010); potential of development high-level cognitive capabilities for learners (Adebayo, 2008); enables flexible access to educational resources to convenience and pace of the learner (Naidu, 2006); provision of electronic access to multi-based resources different from conventional classroom setting (Dede, 2000); and savings on cost and time (Hjeltens and Hanson, 2005).

Challenges to eLearning adoption include; inadequate technological infrastructure (Ongori &Mburu, 2010); lack of technical support for development of content; low levels of lecturer competency (Chitanana, 2008). Culture and change process also proves to be a challenge largely amongst teachers (Adebayo, 2008).

The study examines the underutilization of ICT use in university education, in particular, the low levels of integration of eLearning into teaching and learning in Kisii University, despite its well documented benefits. The study was undertaken to establish the effect of adoption of ICT in enhancing knowledge acquisition in Kisii University by examining attendant challenges and opportunities. In addressing this general objective; the study pursued four specific objectives; namely; to determine the opportunities presented by adoption of e-Learning; to establish the levels of infrastructural capacity of Kisii University; to establish existing use of ICT by lecturers; and, to determine the challenges faced by lecturer‘s in the use of ICT in teaching.

MATERIALS AND METHODS

The study being exploratory in nature sought better understanding of low uptake of eLearning in universities despite its well documented advantages with particular interest to Kisii University, Faculty of Law where its adoption has been mooted. Exploratory study formed the basis for formulating further specific research questions on effectiveness of eLearning in enhancing learner‘s experiences.

A case study of Kisii University was undertaken and data collected through documentary review, non-random sampling, observations on learning and teaching at the Faculty. Non-random sampling was employed to draw a sample from the target population. In particular, purposive sampling was used to draw a specific population from the whole population which comprises all teaching and administrative staff. The study collected data from staff from ICT department due to the focus of the study which centered on levels of infrastructural development hence technical information was required. We held the view that ICT staff was best technically equipped to provide relevant data on infrastructural and other logistical requirements for installation of effective e-Learning. Information was also sought from fifteen (15) members of faculty to collect their views on eLearning, especially its perceived benefits and their preparedness to embrace it as a platform for instruction. Of the 15 sampled respondents, 14 questionnaires were returned.

Survey Instrument

Two different interview schedules were administered. Open-ended questions were administered to ICT staff on the levels of infrastructural development, cost and general requirements for successful adoption of e-Learning. Semi-structured interviews were conducted on staff from faculties, which entailed administering a standardized list of closed questions and open-ended questions (Kothari, 2004). Closed questions were administered to ensure that each member of staff was asked the same questions in relation to challenges and opportunities to adoption of e-Learning at the University. Open questions were then administered to the Faculty staff aimed at

gauging their opinions on challenges and opportunities to adoption of e-Learning at the University. Respondents were also encouraged to provide recommendations on the best measures that can be taken in facilitation of uptake of e-Learning.

RESULTS AND DISCUSSION

All Lecturers interviewed were positive that the adoption of eLearning has enormous benefits to both teaching and learning (Table 1). Although, lecturers unanimously indicated that eLearning enhances knowledge acquisition, 21% lacked confidence on the platform‘s potential to provide opportunity for interaction, independent and critical thinking and problem solving. A significant majority (93%) believed that adoption of eLearning would result in saving of time and costs.

Further, what is discernible from Lecturer‘s responses (Table 1) is that to a certain extent, there was interaction with ICT in teaching and learning. On-line eLearning was a more popular method for providing content to students than offline eLearning through CDs or DVDs. A small proportion of the respondents (29%) had used CDs to provide material like the Laws of Kenya. 57% of the respondents embraced the internet as means of availing course content and material to students. Although, simpler forms of online (57%) and offline eLearning (29%) were embraced by a majority of staff, there was little exposure to eLearning Management systems. Only 2 of the respondents (17%) had necessary skills to use eLearning Management software.

Table 1. Lecturer‘s responses on eLearning

No.	Questions	Yes	No
1	Enhances knowledge acquisition	14(100%)	-
2	Saves of costs and time	13(93%)	1(7%)
3	Provides opportunity for independent/ interactive/ problem solving	11(79%)	3(21%)
4	Use of CD, DVD in Teaching/ Provision of Material	4 (29%)	10(71%)
5	Use of Internet in teaching/ provision of Material	8(57%)	6(43%)
6	Adequate skills for using eLearning Management software	2(17%)	12 (83%)

(n=14)

Challenges

Majority of respondents (79%) found reliability of internet connectivity to be low while only 21% found connectivity to be of average reliability. None of the respondents indicated that the connectivity was highly reliable (Table 2).

Table 2. Responses on reliability of internet connectivity on campus

No.	Question	High	Medium	Low
8	Reliability of Internet connectivity	-	3(21%)	11(79%)

(n=14)

Data collected from ICT staff on infrastructural capacity, summarized in Table 3, shows that the current bandwidth is very low. During the open interview it was clarified that the current connectivity is quite low compared to the minimum required

for running eLearning which is 45 mbps as recommended by KENET, the internet service provider.

Network points are inadequate; coupled with inadequate networking of campuses. Only 2 out of 9 campuses are linked to the Main campus where network points and main servers are located. Purchase of bandwidth currently is costly in light of other competing university priorities and gross underfunding to University education.

Table 3. Level of infrastructural development

Infrastructure	Particulars
Wi-Fi network masts	5
Servers	3
Size of Bandwidth	15mbps
Cost of Bandwidth	Kshs. 300,000/= per month
Type of Network Link	Leased Line
Number of Computers	300
Number of Users	8000
Learning Management Systems	None in use

Lack of Learning Management Systems

As shown in Table 3, none of common e-Learning software like Blackboard, Moodle or Web-CT is available in the University. However, the University library has subscribed to several open resources for access to e-journals, e-books and online catalogues like HINARI, AGORA and j-STOR. A shift from the mere use of internet for research to more sophisticated methods synchronous group based e-Learning, adoption of LMS will be vital if the desired real time interaction is to be achieved.

Opportunities of eLearning

It is clear from the research results in relation to whether eLearning created opportunities for learning, an overwhelming majority of responses were positive. Perceived benefits of e-Learning for lecturers were that it would enhance knowledge acquisition which was vital in legal training. The lecturers‘ unanimity as to the value of eLearning is informed by acceptance that its attributes can bridge capacity gaps in teaching by allowing delivery of instruction through collaborative teaching with the Faculty‘s strategic partner, University of Minnesota (UMN). Concerns arose relating to the length time for operationalisation of collaborative teaching aspect of Memoranda of Understanding (MOU) between education institutions in Africa and US. Typically, collaborative teaching would be undertaken through visiting professorships where professors from University of Minnesota would visit for a period of 4 to 5 weeks to teach Law students.

The length of time became a constraint because course allocations have been already made 3 year in advance such that Faculty in UMN already committed to teaching according to their schedules. Hence, the earliest visiting professorship programme would have been effected in 2016. Another constraining factor was the cost of catering for Visiting Professor for the period of the visit to Kisii University. Costs would include; air tickets, accommodation, transfers, salary and living expenses. In

the intervening period, it was suggested that eLearning be adopted to solve time and cost constraints and to increase access to educational material.

Lecturers were in agreement that eLearning would save time and costs, however, apart from the above example of collaboration with UMN, they were not articulate on the specific manner in which costs would be reduced by adopting eLearning in teaching and learning at the faculty. Members of staff from the ICT department were more articulate in their responses, which is largely attributable to their familiarity and interaction with eLearning Management Systems (LMS). The cost of acquisition, installation and introduction of eLearning in itself in Kisii University is not a hindrance as existing infrastructure can support its operation with improvisation of universities' ICT department. It was explained, ―Most e-learning Systems are free (Moodle, WebCT and Blackboard) and operate on open source platform. The system can be hosted on the current web-server at no additional cost open source Online E-learning Servers can hosted locally on Remote servers. Currently, the issue of local servers to start e-learning might not rise as there is an optional platform for eLearning with the remote servers hosting KSU website‖. This reinforces Gichoya's (2005) view on the utility of local improvisation which is a self-recognition of one's own capacities and exploiting it to achieve success in the use of ICT.

Procurement of adequate infrastructure and concomitant costs for such acquisition poses a major challenge to the adoption of eLearning for Universities in Kenya and this is no different in Kisii University. Results shown that infrastructure available is inadequate to sustain eLearning platform. Infrastructural challenges relate to low bandwidth capacity, low computer-user ratio and inadequate network points. Addressing all these concerns have an impact on costs, which in itself becomes a challenge. The bandwidth available is 15mbps which is way below the minimum threshold of 45mbps required to support eLearning as recommended by KENET. Operating at 30% of the required level proves to be unreliable and creates an unrewarding experience for the end user. Indeed, such connectivity inimical to objective of introducing eLearning which is to enhance quality access and interaction. An interview with ICT Expert at the ICT department explained, ―With a population of over 300 computers struggling to get online at any given time, this connection is very slow and cannot support video streaming hence, lectures cannot conduct their lessons remotely‖ (Personal Communication, Gordon Ouma, ICT Expert, ICT Department, Kisii University, 5 July 2013). This view is in tandem with the observation by Chitanana (2008), that universities cannot be successful in implementation of eLearning without attributes of its infrastructure properly in place.

Data collected also reveals that the prohibitive monthly internet costs availing only 30% of the requisite level to support eLearning. To scale up the bandwidth to the required level of 45mbps, cost of purchasing internet will rise three-fold pro rata. However, the existing servers are adequate for current needs. However, with envisaged expansion in student population extra investment will be required. Such expansion will have a strain on computer-user ratio which is already very low. While the policy is articulate in pledging support for universities to mainstream ICT use in education, government has yet to set aside or advance specific funds to assist Universities to implement its policy objective. This situation reinforces Boit *et al.*

(2012) perspective on the necessity of governmental support. Boit*et al.* (2012) posits that ―without financial support of the government and assistance from development partners introduction of computers in educational institutions will continue to remain an expensive venture in spite of the fact that the cost of hardware and software has been coming down over the years‖

A major challenge is the competence levels of Lecturers' to operate eLearning software. As the nature of the study was limited to understand the state of things, no data was collected on whether low uptake of eLearning by lecturer's lack of exposure to emergent technologies, lack of institutional support to pursue training or simply resistance to change. Possible reasons can be attributed to lack of awareness and lack of preparedness which is attributed to lack of training and continuing professional development (Adebayo, 2008).

CONCLUSION

The use of ICT for education has created a number of opportunities for university education. The study of impact of the use of ICT in the following conclusions were drawn;

1. Use of ICT especially through integration of e-Learning enhances knowledge acquisition in Kisii University.
2. ICT infrastructure is available to support online and offline eLearning in Kisii University. However, the infrastructure available is not adequate for the use of interactive real-time online eLearning which is responsive to changing educational needs.
3. ICT infrastructure is available There are low levels of use of eLearning for teaching amongst lecturers.
4. Lecturer's cite inadequate competence in use of eLearning software, unreliable internet connectivity and lack of learning management systems as major challenges to adoption of e-Learning

To address any of the challenges will have an implication of cost. For example, professional training of Lecturers, University still has to incur a cost. Further professionals must be recruited to develop content that fits in pedagogical models for legal training. The challenge therefore is to find solutions to the upscaling infrastructure to optimise access without increase in costs which are already prohibitive in light of no budgetary allocations to support University in eLearning adoption.

RECOMMENDATIONS

It is recommended that we adopt an approach similar to that proposed by Hjeltens and Hanson (2005) for cost effectiveness and cost efficiency of eLearning. This would mean, classrooms may not be needed as such for students on eLearning courses and this would save the institution considerable costs for construction of classrooms for lecturing. Re-use and modularization for learning objects and materials can be adopted to reduce fixed costs. Re-use, rapid production and ease of updating of

content saves money because lecturers would not have to develop content from scratch every time the institution wants to offer a new course. Economies of e-learning are highly dependent on the number of learners involved. The greater the numbers the greater the probability that economies of scale will make eLearning an attractive proposition as opposed to conventional classroom learning. The institution therefore can increase the student intake and this would mean achieving a greater economy of scale and reduce the overall cost per student.

Through cost effective eLearning, we can also apply a local improvisation approach which is to assess our capabilities and strengths and build on them. This would entail supporting increased uptake by harnessing existing methods and ensure what is available is efficient. With connectivity certain interactive online eLearning activity like chat-rooms, live text and blogs on topical legal issues can be availed to students.

The study also recommends further research on specific mechanisms and modalities for adoption cost efficiency/cost effectiveness and local improvisation models as a way of optimising use of eLearning without increasing overall cost in Universities.

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BIO-DATA

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