Strategy for Implementation of e-Learning: (lessons from the case of JKUAT and CUCK

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Abstract

E-learning is a global move and Kenya has not been left behind. Like any other developing country, learning resources cannot meet the ever increasing demand of university education with over 120,000 qualifiers every year. Advancements in ICT have created opportunities and allowed exploration of delivery methods that utilize these opportunities. This paper documents the strategy used to roll out successful e-Learning programmes at one of the Kenyan public universities and its constituent colleges. Although the initial investment in content development and systems establishment was enormous, return on investment at JKUAT was realised almost immediately after e-Learning for on -campus students was launched. More than USD 100,000 was saved within a period of less than one year. The paper is a form of showcase of what worked well and why we believe it worked. Every new student was required to report with a Laptop or be facilitated to acquire one through a university programme. Innovative ways of managing access to content were used to minimize server overloads. The main lesson learnt is that, with the right policies in place, right incentives, and right management strategies, lecturers and students will readily go digital. This strategy shows that e-Learning could easily be sold by gradually introducing students to on-campus students unit by unit incrementally and on semester basis. After successful implementation at JKUAT, this strategy is being applied at The Co-operative University College of Kenya (CUCK), one of her constituent colleges.

Keywords: eLearning; on-campus; ICT integration; Public Universities; content development; conditional release; innovative.

1. Introduction

Traditionally, content delivery at most Higher Education Institutions (HEIs) is teacher-centered where students acquire knowledge by reading texts and listening to lecturers. This system of learning gives tutors an opportunity to make instant decisions on students' learning capacities within the class environment and where possible implement interventions as appropriate, but e-Learning encourages restructuring this setting into student-centered learning in which learning is extended beyond fact retention through challenging learning activities that require critical thinking and the development of contextualized knowledge. In the e-Learning design, student achievement is assessed using a combination of practical applications and rigorous examinations which are normally accessed through electronic gadgets.

In Kenya, the global move to go digital in content delivery has been enhanced by the current government which has been sold as the digital government sending the Universities back to the track of integrating ICTs in their mode of delivery of content to their students. Just like any other developing country, learning resources in Kenyan Universities cannot meet the ever increasing demand of university education with over 120,000 qualifiers every year. Advancements in ICT has created opportunities and allowed exploration of delivery methods that utilize these opportunities. There have been encouraging case studies which are documented by Locke (2010) in which; M-learning has been identified as a catalyst of building more flexible programmes. Recently, the Aga Khan University-Institute for Educational Development, Eastern Africa made a bold venture and included mobile learning component certificate courses, a step that reflected quick institutional change and learner benefit (Onguko, 2010). This innovation has led to recognition of the need to utilize locally available technologies in delivery of programs by the university.

Effort to implement e-Learning at Jomo Kenyatta University of Agriculture and Technology (JKUAT) dates back to 2006 but for a long time, the implementation policy appeared to be that of a willing buyer willing seller. Many attempts were made to make e-Learning a reality but minimal progress was made largely because of lack of support from top management. Between 2007 and 2009, a pilot programme was tried but it died as soon as it was started due to policy issues. In 2009 an e-readiness survey by Kenya Education Network (KENET) placed Jomo Kenyatta University of Agriculture & Technology (JKUAT) as one of the top-ranked universities in East Africa based on staging of the 17 indicators of e-readiness survey framework used. As such a JKUAT team was granted research funds under KENET East African Universities Accession Project to undertake a project entitled "E-LEARNING ECO-SYSTEM FOR IMPLEMENTATION OF MOBILE LEARNING (A Case of JKUAT IT Students)". The results of this project which include use of dynamic quizzes for conditional release of lessons (Kihoro et al., 2013) largely contributed to the successful implementation of e-Learning at JKUAT. The study conducted under this project revealed that e-Learning if properly implemented may be superior to classroom based learning in terms of mastery of concepts. The lessons learned, the skills acquired and the server used in the project became key resources in achieving the results of this documentation.

In 2013, the top management never pushed the adoption process and incentives to lecturers were minimal. In 2012, the former school of e-Learning was merged with a directorate that was offering the fast depleting continuing education with a mandate to implement Open, Distance and e-Learning JKUAT. Riding on the results of the aforementioned successful M-Learning project, the new office embarked on content development process which yielded some results in February 2013. ODeL programmes were advertised and the first batch of 43 students admitted and officially oriented on 11th may 2013.

2. Description

2.1 Systems

Having undertaken KENET funded project and posted encouraging results, the national body was more than willing to go an extra mile in upscaling the project. The body offered to help with free hosting and collocation of servers. An open source survey system (Limesurvey system) was customized and configured to allow for electronic money transfer during online application by distance learners. MOODLE LMS was configured to allow use of any electronic gadget (Desktop, Laptop, and Tablet, Smartphone etc) to allow mobility of the learner. Both JKUAT and KENET were engaged to support and troubleshoot technical issues.

2.2 Content development

The CODs identified some lecturers to digitize their content as per guidelines provided by School of Open, Distance and eLearning (SODeL). The compensation policy was well communicated that each unit which is comprehensively done was to be paid an equivalent of one (1) part-time unit. Previous experience has already revealed that, working with MSWORD content was highly limiting and LaTeX gave a superior content in many aspects. The school advocated the use of LyX document processor (http://www.lyx.org) for flexibility in producing HTML and PDF formats of content and in future EPUB formats. The course manual was then broken down into ten (10) weekly lessons and implemented in the Topic format of MOODLE LMS.

2.3 Content Management

Content was uploaded on MOODLE LMS which was hosted at KENET servers. Students were provided with the whole module manual which could be used downloaded and used offline. The learners were required to read and understand a Lesson presentation offline or otherwise in order to have the next presentation. Each lesson was accompanied by a dynamic quiz in which related questions were randomly pulled from a database of lesson questions. This allowed online tracking of learners' progress where they were required to read and understand sections of the content in order to respond correctly to lesson questions. Navigation to the next lesson was conditional on getting a score of at least 50% of the lesson questions. The concept of conditional release of lessons based on auto-marked quizzes was one unique innovation that enabled us to manage the large number of students. Without this tool, the facilitation would have become practically impossible because lecturers observed that online marking/assessment was more tedious than offline marking/assessment.

2.4 Students Management

Each module was assigned a principal facilitator who was required to;

1. Enroll the paid up students into the module,
2. Create a database of questions corresponding to each lesson,
3. Create dynamic quizzes corresponding to each lesson and set conditions for release of the content,
4. Address all learner issues directly through the system,
5. Create all assessment tools including the end of semester examination and
6. Manage the examination process.

3. On-campus strategy

Although SODeL mandate was to deliver distance and e-Learning programmes, the availability of relevant systems and content and the challenge of inadequate physical facilities (lecture rooms and seats) prompted the University to try an on-campus e-Learning solution. This was also due to slow uptake of purely distance e-Learning programmes with some parents expressing their fears and unwillingness to expose teenagers to uncontrolled internet at early age.

Dziuban et al., (2004) identified three different modes of on campus e-learning implementations as;

1. Web-enhanced mode which involves enhancement of face-to-face teaching but students are required to attend all lectures.
2. Mixed mode (blended) instruction which involves a fundamental redesign of instruction in which some face-to-face teaching sessions are replaced with online instruction and
3. Wholly online instruction in which all content and instructions are provided online instruction with no face-to-face contact.

JKUAT, having tried the first two options earlier decided to try the third option because it has a potential to reduce the demand for on-campus facilities, such as classrooms and laboratories. The top management made it compulsory for every new reporting student to acquire a laptop. About 1000 first year students who reported in May 2013 were required to adhere to this requirement in order to take the HIV/AIDS unit online. SODeL was required to ensure that all the reporting students are taken through a thorough e-orientation on how to go about the online unit. This was done during the first week and all the students made aware of the mode of delivery and what was expected of them. Each student was given access to the Learning Management System (LMS) and initially required to practice on an e-orientation unit before embarking on the actual unit.

3.1 Management of the process and policy implications

Managing over 1000 students for some of whom were having their first online experience was not easy. SODeL had to assign two staff members to deal with students issues which included; forgetting passwords, requests for re-opening quizzes after exhaustion of the maximum attempts and failing to reach threshold score for the conditional release, issues to do with inaccessible server either due to memory loss or WI-FI failure.

The immediate financial implication was that instead of having normal classes of about 50 students (1000/50=20) for which the University should have paid out USD 1000 x 20= USD 20,000, the unit was fully facilitated by a single resource person. The standard teaching policy at JKUAT requires that 35% of the fees per student be used in facilitating the learning/teaching process including payment of the lecturers on part-time bases. Under this mode, less than 5% of the money was used. This experience and the cost saving implication opened the eyes of the University management to the fact that on-campus e-Learning could address some of the institutional challenges. Besides exploring the possibility of placing other units online, the following semester (September – December 2014) saw about 5000 first years placed online. This time the University was quick to provide the servers and most of the required equipment for local hosting of the servers. In addition a lab with 120 computers was also allocated to ensure that e-testing was possible. The students did most of the reading on their personal computers and could visit the lab once per week to do the lesson-associated quiz and then download the subsequent lesson.

The following are some key achievements since 2013;

1. At JKUAT, distance e-Learning programmes are now on offer and so far have attracted over 400 students mainly pursuing postgraduate programmes with a period of one year.
2. At least three University level units are offered online to on-campus students every semester leading to massive saving on payments to lecturers and efficient use of physical resources

3. CUCK has started the same mode and has been able to accommodate about 1000 students in a constrained environment and Units have been identified for each future semester.

In one of the Master programmes, the online class attracted over 30 applicants in a semester while the offline one attracted only 3 students clearly painting a bright future for distance e-Learning mode.

Figure 1 Student going through a lesson at work in his room

3.2 Feedback from Learner

A short survey was carried out to find out the learners experiences at the Cooperative University College of Kenya (CUCK) and the following are the findings. The main focus was their general experience and the issues that they thought should be addressed if future units were to be offered online. Asked what they liked most about taking this unit online, the students mentioned mainly; instant marking of the dynamic quizzes because made them do more and more. Taking the unit online keeps the student occupied most of the time and the unit provided good reading material too which may have been missed or abandoned in classroom based learning. The ability to do the unit at their own pace and at any time was also exciting the students. This unit is "`fast, effective and mostly enjoyable" was a comment from one of the students.

Asked about what they did not like about taking the unit online, the answers included; Poor internet and Wi-Fi___33 connectivity, lack of enough computer labs. Some complained that they were using their own smart phones and required internet bundles. Figure 2 gives the ratings of some of the potential challenges to the students. It is clear from the figure that; poor internet connectivity is a main concern with over 90% of the students being affected; lack of computer lab time which is related to internet access affected more than 40% of the students. It is also clear that the student would be glad to have some interaction with the lecturers online. The use of discussion forums had been disabled during the course to avoid overloading the facilitator with many issues. A strategy for auto reply of student posts in a forum is being explored.
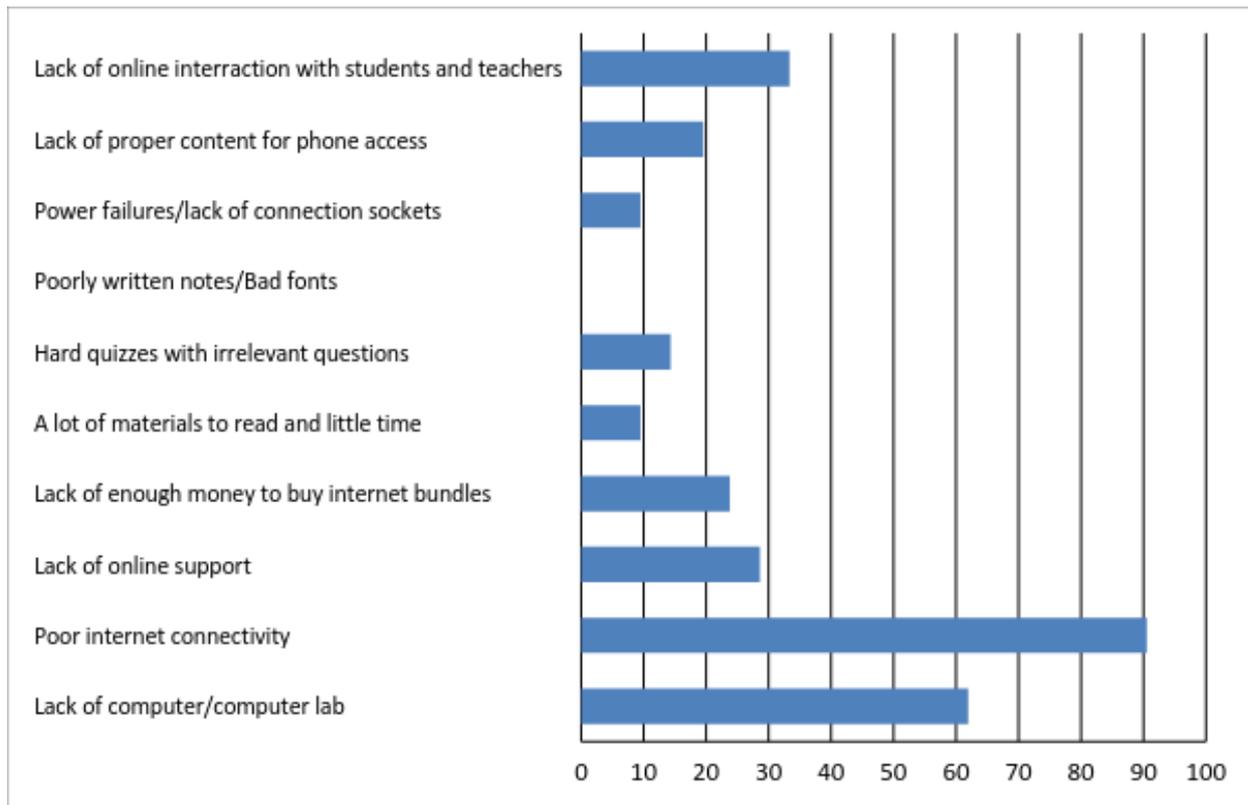
Figure 2 Percentage of students affected by the identified issue

Asked if they could recommend the mode of learning to other students, about 90% said yes and all those who said no to this item had no previous exposure to computers. The students also recommended that an average of 3 units be placed under this mode of learning.

3.3 Lessons learned from the experience

The experience helped us to identify the following challenges that hinder successful implementation of e-Learning in Universities. Some of them are highlighted in the following sections

Although budget allocation is important, its implementation is more important. In the case of JKUAT the process of acquiring e-Learning servers started way back in 2007 but the realization came in 2013, seven years later!. In all the subsequent years, the budget allocation was provided for but the year closed having not delivered the same either due to procurement procedures and cash flow problems. Leaders should be proactive and should not wait to see the benefits from donor funded projects before the move to action. Some management decisions can go along way into harnessing the process of adoption of e-Learning. Policies controlling moonlighting and embedding content digitization into academic staff performance contracts can only be driven by the top managers. On several occasions, this was suggested in writing but not given much consideration. It is worth noting that until key policies on incentives and acquisition of laptops, there was very little progress.

With support policies, there are two other key aspects that must be addressed, the content and the delivery systems:

Content: e-content is a key component of the e-Learning undertaking. The choice of whether to have comprehensive content or linking students to OER resources with specific

instructions is dependent on the supporting infrastructure. Although the use of OER resources could provide readily made learning materials, subject experts have a role to re-organize the materials in a coherent manner that suits their unit or/and provide specific instructions on how they should be used. Some sites do not allow downloads and so the learners may be forced to remain online and sometimes use their internet bundles. JKUAT model was to have all the lecture notes compiled into one complete teaching manual which was later broken into 10 lessons each expected to take 3 hours offline and 1 hour online. A total of 4 fours per week translate to 40 hours. The written CAT and Examination build up the contact hours to 42 or 45 as required by the regulating bodies. To ensure that the content was interactive, it was expected that the Authors would go through relevant training in order to do their own content conversion. Unfortunately, very few (less than 10% of the targeted) were available for the scheduled training and even those who were trained immediately resumed their busy part-time schedule and majority failed to do the conversion. Instead they put together their notes in MS Word and delivered them to the SODeL for conversion by the section. This demanded that SODeL engages content conversion clerks. Due to challenges on instructional design, the content development/packaging was restricted to some disciplines. Engineering and highly practical programmes were avoided because their instructional design requires more advanced ICT skills.

Although the intention was to provide highly interactive content offline in interactive PDFs including embedded quizzes (Horan and Lavelle, 2003), this happened in some few units due to the passive role of the content authors. Some units were delivered for conversion without examples, exercise and questions for embedded quizzes as prescribed.

Delivery systems: Implementation of Learning Management System (LMS) based e-Learning for Distance Learners may not be a big issue due to the fact that all that is required is a hosted server with appropriate content in a versatile LMS. The users can then start interacting assuming that each meets the costs of access. This means that the server could even be placed in a remote place and all the institution needs to do is to facilitate the lecture/online facilitator with reliable internet access. When the same is meant for on-campus students, fresh demands are placed on the ICT department. Besides justifying why to improve an already working system, there is need for infrastructural upgrade including providing additional power and Wi-Fi___33 connection points. Since the implementation is for many users, the server requirements are quite high and if internet is to be used throughout the cost could be limiting thus the recommended use of intranet. JKUAT and CUCK adopted the mixture of intranet and internet but placed the servers locally but allow for internet access of the same through Kenya Education Network (KENET).

The team also identified that some of the challenges are beyond the institutions. They include

1. Inadequate funding by government and planners and the government making it hard for managers to implement new ideas without looking at the immediate financial benefits.
2. Appointments of top managers who have no passion for use of ICTs and promotion criteria that is focused on traditional parameters.
3. Lack of qualified e-curriculum for instructional designers in the market.

4. Conclusion

This paper has provided some insights into implementation of on-campus e-learning as a way of addressing shortage in physical resources. The model works best if targeted to young school leavers who are not engaged elsewhere and so are unwilling to take up distance e-

Learning programmes. The main lesson learnt is that, with the right policies in place, right incentives, and right management strategies, lecturers and students will readily go digital.

The concept of conditional release of lessons based on auto-marked quizzes is unique innovation that enabled implementation of e-Learning to a large number of students. It is also observed that, students are willing to be physically present within the campus but unwilling to attend classes and so a blended programme in which some units are taught face-to-face and the rest placed is quite attractive. This strategy shows that e-Learning could easily be sold by gradually introducing students to it incrementally and on semester basis. In so doing the University can benefit from the rapid growth in ICTs and also ensure that the social dimension of young learners is not affected.

Acknowledgements

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Biographies

John Mwaniki Kihoro is a self-driven and highly motivated individual who has passion for Technology driven solutions to problems affecting mankind. In the last 5 years, John's effort has enabled individuals and institutions to embrace technology in automating processes. Although John is an Associate Professor of Applied Statistics, he has professional training in Information and Communication Technology (ICT) and his passion has made him make as much impact in that field as in his field of academic specialization. His ICT passion and orientation has earned him appointments in related fields; currently as the Director in charge of Computing and eLearning at CUCK. He is a proud holder of two ICT associated awards

- Kenya Education Network (KENET) innovation Champion of the year (2012)
- Distinguished Scholar Award (DSA)-2013 ICTAK AWARDS for Kenya @50

He is also a regular Consultant in Research methods and Statistical Data Analysis.

The most recent consultancy in eLearning was Consultant Trainer on MOODLE LMS and eLearning EDULINK eLEFANS (elefans.org) - project e-learning training 8/9/2014-12/9/2014 at Kenyatta University, Kenya.

Shadrack M. Muya: Besides having a PhD in Biological Sciences, Dr Shadrack Muya has a keen interest in application of technology in knowledge transmission. He implements online content sharing with students and even popularised e-Learning in JKUAT. It was therefore easy for him to adopt use of e-Learning programmes because he had already digitized the content of most of the Units he teaches. Although he is not an IT guru, Dr Muya is a clear illustration of how leveraging technology can implement knowledge sharing on an e-Learning platform. He is currently the principal course coordinator for a University Unit (HIV/AIDS) that is taught online to all first years. He has a wealth of knowledge in implementing e-Learning program to large groups.

Rachel Wangui Ibukah: Self-motivation is the drive behind Rachel's achievement. She has Information Systems expertise and has worked with Learning Management Systems for the last 7 years. She has co-authored a journal paper: *E-learning eco-system for mobility and effective learning: A case of JKUAT IT students*, in 'IST-Africa Conference and Exhibition (IST-Africa), 2013', IEEE, pp. 1–9. She is currently pursuing her MSc in Computer Information Systems. Her work involves administering all JKUAT Distance Learning Students.