The Changing Role of Information and Communication Technologies (ICTs) for Instruction in Higher Education Institutions in Kenya

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Abstract

The use of ICTs in Higher Education Institutions (HEIs) for instruction became prominent in the late 1960s and early 1970s with the introduction of web based learning (Gunilla, 2004). Research has shown that ICTs engage learners, allow learners to explore and simulate abstract concepts while encouraging self learning (Agostilio 2002). They also offer learners the ability to address complex problems, encourage team work, allow for critical thinking while inspiring learners to desire for enquiry. Although HEIs continue to invest heavily in ICTs, there is no compelling evidence that there exists a causal relationship between the use of ICTs and learning outcomes (Louis et al 2007).

In 2006, the Kenya Education Network Trust (KENET) carried out an e-readiness survey to determine the degree to which higher education institutions in Kenya were prepared to participate in the networked world for learning, teaching, research, and management (Meoli & Waema, 2007). The findings indicated that more than 50 percent of the 17 universities and 8 tertiary institutions of higher learning in Kenya did not have sufficient ICTs to support teaching and research.

This paper reports on the changing trends in use of ICTs for instruction in HEIs and discusses a mini-case study of how ICTs are being used by lecturers in one university in Kenya.

Introduction

Teaching approaches and pedagogy used in HEIs are changing from the traditional Oxbridge model of master – learner or teacher centred approach to a learner centred approach of teaching where the learner controls his or her learning (Reinhart, 2008). Learning environments of HEIs in developed countries are often supported by ICTs and continue to evolve to include more active learning through student participation. The term ICTs as used in this paper includes and is not limited to the hardware, software, networks and media for collection, storage, processing,

transmission and presentation of information. The learner centred approach encourages learning to take place both inside as well as outside the classroom.

ICTs offer flexibility, they engage and motivate learners and therefore encourage a learner centred approach to teaching. The use of ICTs has evolved from the simple e-learning systems of the 1960s to the more collaborative WEB 2.0 technologies where students are not just passive learners but also generators of knowledge.

Unfortunately, developing economies such as those in the East African region are grabbling with inadequate resources such as low student to computer ratios, low IT literacy, poor infrastructures, low Internet availability and limited bandwidth. The latest e-readiness survey by KENET carried out in 2008 (Meoli & Waema, 2009) indicated that there is low usage of ICTs for teaching and that most HEIs often use ICTs for operational functions rather than instruction. However, simply putting computers into universities may not on their own positively impact student learning. Instead, HEIs in the region will need to be more innovative and tackle those problems that cause resistance to using ICTs such as negative attitudes, low IT literacy, low interest from lecturers, and poor technical support.

Role of ICTs in Education

Over the years, business organisations have used ICTs to raise productivity and improve the efficiency of their processes. The introduction of ICTs in HEIs has often targeted operational functions rather than teaching. In cases where they have been acquired for teaching, institutions hardly bother to evaluate their impact on the productivity of lecturers, quality of learning output and cost of production of their products (students). Most of the lecturers in HEIs simply use ICTs to process and store data. This is however changing as learners start to demand for accountability from HEIs for quality teaching and research through the use of ICTs.

In the year 2007 the Kenya Education Network Trust (KENET) in partnership with the Kenyan government initiated a project to interconnect more than forty HEIs in Kenya onto a single portal and then to the Internet. This project allows KENET and subsequent member institutions to benefit from the recently completed project that links the East African region to the global network through the Middle East using a fibre cable. This will create an impetus where HEIs will develop local digital content that can be shared among member institutions. The project is expected to encourage these institutions to adapt new teaching and learning technologies such as e-learning, use of Web 2.0 technologies, e-journals, podcasts, blogs, and forums in order to create flexibility in learning.

ICTs can transform the traditional authoritative learning into more transparent learning, with the teacher becoming a facilitator rather than the expert. Through ICTs, learning can become more active rather than passive, more conversational as opposed to publication. Information technology will transform learning from traditional formal schooling to lifelong learning. The concept of a library continues to evolve such that it is no longer a physical reading room but an

online virtual location where learners can access different databases in different formats (multimedia). New learning technologies are evolving to allow for collaborative and flexible learning such as the use of LibriVox (www.librovox.org) and Teachertube (www.teachertube.com) that are highly motivational to learners.

The demand for quality teaching from stake holders in education (learners and employers) has created a need to re-define teaching. Teaching is no longer restricted to scheduled classroom (same place and same time) where the professor imparts knowledge to learners. Instead, teaching has become flexible, asynchronous and controlled by the learner (any place and any time).

Proper use of the Internet encourages critical thinking thus cultivates deep learning where learners learn independently. **McMclintock (1997)** says that HEIs would benefit more from ICTs if they aligned their curriculum with the ICT tools being used. He concludes that ICTs will soon become mutually exclusive in the labs, such that the classroom, library and the computer labs will no longer be separate learning places.

Carnoy (**2005**) studied the cognitive impact of ICTs on the intellectual content and competence of students. His findings showed that Internet usually has a positive measurable impact on learners' intellectual content (what learners think). However, on the contrary there was no compelling evidence on the cognitive impact of ICTs on the intellectual competence (how learners think). It means that although ICTs might not directly improve the thinking process of the student, it improves his ability to learn by gathering and analysing content. He recommended that since lecturers appear to resist the change from the traditional lecture method to learner centred, then HEIs should retain the status quo and blend ICTs with the current approach rather than radically transform it.

Learning Technologies

The Internet supports different types of technologies that can be used by HEI to improve the quality of teaching. Institutions with limited access to computers should install hotspots to provide wireless connectivity to encourage learners to connect to the Internet from their laptops.

Learning management systems such as WebCT, Sakai, Blackboard or Moodle can be used to deliver educational content to learners in the form of e-learning through various electronic media.

Universities may also use social network sites such as Facebook, Twitter, MySpace that will support learners who want to share online information and therefore provide a powerful mode of communication between lecturers and students. Students and lecturers can also share book marks through the social bookmarking sites such as Delicious which will promote collaborative learning.

Bloging or‘weblog’could be exploited by lecturers since they provide bi-directional learning where learners fully contribute to the learning process. Learners may join or start their own blogs that will create a rich learning environment and provide for a diverse, alternative source of information for higher education.

Wikis, like Wikipedia are also an effective tool for mass collaborative authoring among students or even between students and lecturers. HEIs can take advantage of this powerful phenomenon that has played a massive role in challenging the way we create knowledge.

Podcasting could also be utilized since it makes available a very broad spectrum of educationally useful audio material, including radio programmes from around the world, lectures, conference speeches, and custom-produced podcasts created by enthusiasts. It is also possible for universities to avail their lectures as podcasts to their students through librovox on the Internet.

With more and more students owning mobile phones, instant messaging (IM) is becoming such an integral part of students’ lives such that universities should work out modalities to incorporate IM as a tool for teaching and learning.

Web based services such as Google Apps or Lulu provide access to office productivity, communication, and file storage tools that support teachers to design, publish, and print original material. These tools can be used to facilitate inexpensive production of publications by both students and lecturers.

Nearly all university students have an e-mail address which could be exploited by teachers where assignments, discussion points or feedback from teachers can be mailed to students to encourage learning away from the classroom

Challenges of Using ICTs for Teaching

Most technologies used for teaching still suffer from a one directional approach in their use such that it is difficult for learners to fully interact with the resources. The material is pre-prepared and learners are left to make sense of it without much flexibility which limits the level of creativity of learners who use these resources. In case of forums and blogs, strict supervision is required of the learners which forces lecturers to use assessment tests in order to check that all learners are active in the forums. The learning curve to some of these tools is also high especially to the older teachers. Content development for e-learning requires extra time to learn the tools as well as high IT skills to prepare this content. There are also times when the learners are de-motivated by frustrating low Internet speeds or inability to access certain online services required for learning because of tight controls imposed by institutional policies.

Although the effective use of ICTs for teaching require closer interaction between learners as well as extra time and effort for content development, most of the institutions do not recognise

this effort. No university incorporates the use of ICTs as a performance indicator towards academic staff promotion.

Jedeskog (**2004**) argues that ICTs distort the objective of learning such that learners end up focusing more on searching for information and not the understanding of the content searched. Basic Internet serch is limiting since it does not allow learners to convert information into knowledge. In some other cases, learners put too much emphasis on the use of ICT which leads to individualistic approach to learning and therefore lose the important aspect of the shared growth of cognitive acquired through working together.

Some students find learner centred approach of teaching too demanding and often get left behind. This means that users of ICTs for learner centred must be themselves very conversant of these challenges in order to maximize their advantages.

It is also worth noting that the social cultural theory of learning, **(Sutherland & Amstrong, 2004)** asserts that students often bring their past IT skills and habits to the classroom which could promote or inhibit learning. In some cases experiences brought to class need to be unlearned in order to create new stuff as the past could be interfering with what is being taught.

How e-ready are HEIs in Kenya for Teaching and Learning

In 2008, there were 7 public universities, 8 public university colleges and 11 private fully chartered Universities as per the Commission of Higher Education database (www.che.ac.ke).

The e-readiness survey by Meoli & Waema (**2009**) serves as an important source of strategic information for HEIs that could be used to enhance the use of ICTs for teaching and learning. The survey noted that:

a) Institutional leadership does not consider ICT strategically important for teaching, learning and research
b) Most universities have poor Internet connectivity and yet they spend only 0.3% of their income to pay for bandwidth.
c) Although HEIs are purchasing more computers for staff than students only 23% of staff have computers in their offices
d) Most students think Internet access on campus is worse than that of the cyber
e) 8% of the students reported that their primary access to computers was at campus
f) The biggest challenge of most universities is the inability to access the internet which leads to low development of local content
g) HEIs are at their initial stages of using ICTs for teaching and learning
h) Access to e-content is low with only 27% of the HEIs with an Online Public Access (OPAC) that can allow learners to access off campus
i) There is low usage of research databases with only 17% of lecturers accessing or owning a database
j) The inconvenience and the cost for both staff and students to access the internet is the cause low usage of ICTs for learning.

From these conclusions, it can be deduced that more than 50% of the universities are not e-ready to use ICTs for teaching, research and learning. A few of the universities that might have been included among those with just enough bandwidth, have put in place too many controls that limit downloading of audio and video content which limit Internet use to only text downloads.

Findings from a single mini-case study at Strathmore University

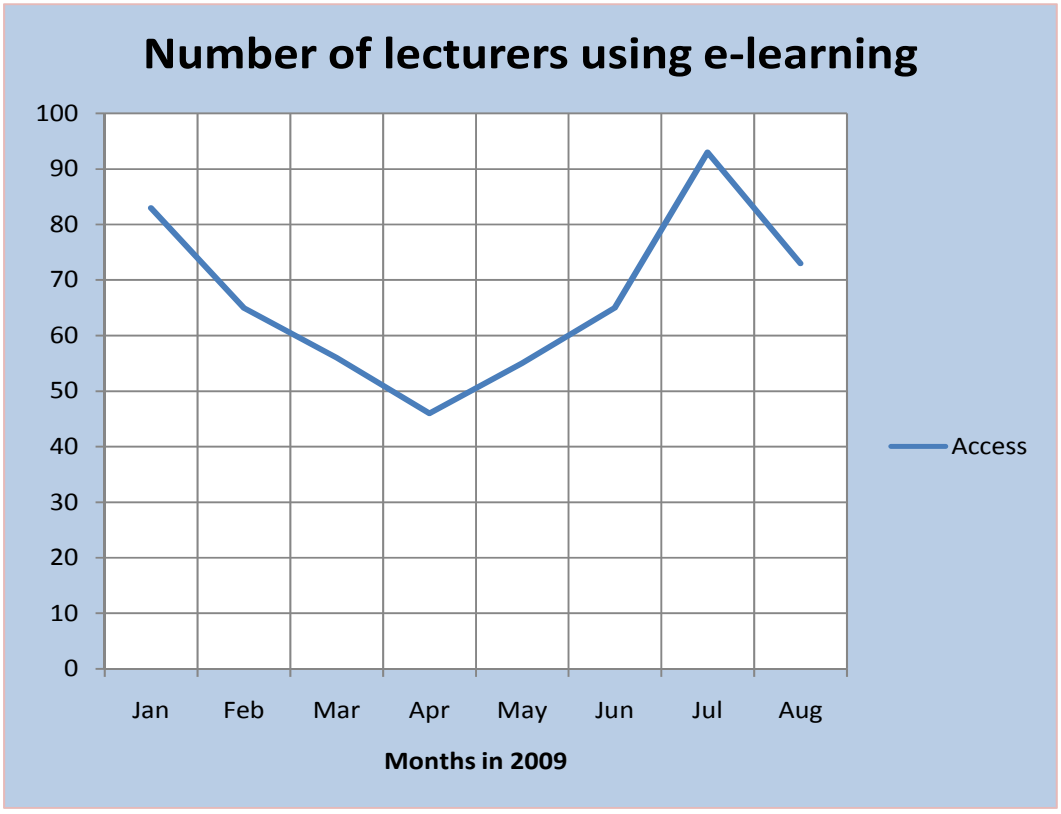
The min-case study was carried out at Strathmore University. In this study, secondary data from the e-learning system, the library management system and schedules of audio visual usage by academic staff was collected and analysed. Four participants (lecturers) were also interviewed in order to test their perceptions on the use of ICTs for teaching. The selection of participants required that the participant must have used both audio visuals and the e-learning platform for no less than two years. The use of ICTs across the three core disciplines of humanities, information technology and business was analysed. The objectives of the study were:

1. To find out what type of ICTs are used and how they are used. This was to assess the use of e-journals, courses on the e-learning platform and percentage use of audio visuals and other ICTs.
2. To study what motivates or de-motivates lecturers to use ICTs
3. To study the perceived impact of collaboration among users of ICTs on campus
4. To study the impact of organisational support (inaction of policies) towards use of ICTs for teaching and learning

Results

The analysis of the data in the e-learning Moodle platform indicated that over the last eight month in the year 2009, 67 out of 110 (61%) of the academic staff members were actively using the learner management system. Graph 1 shows the distribution of usage (number of lecturers with courses on e-learning platform) over the eight months. The drop in the curve between March and June was caused by low usage when the full time classes were on recess.

A 61 percent usage of e-learning can be considered as being good since it is easier to diffuse the use among the remaining 39% non ICT users. It was not possible in this study to measure the impact of ICTs on the learning outcome of students.

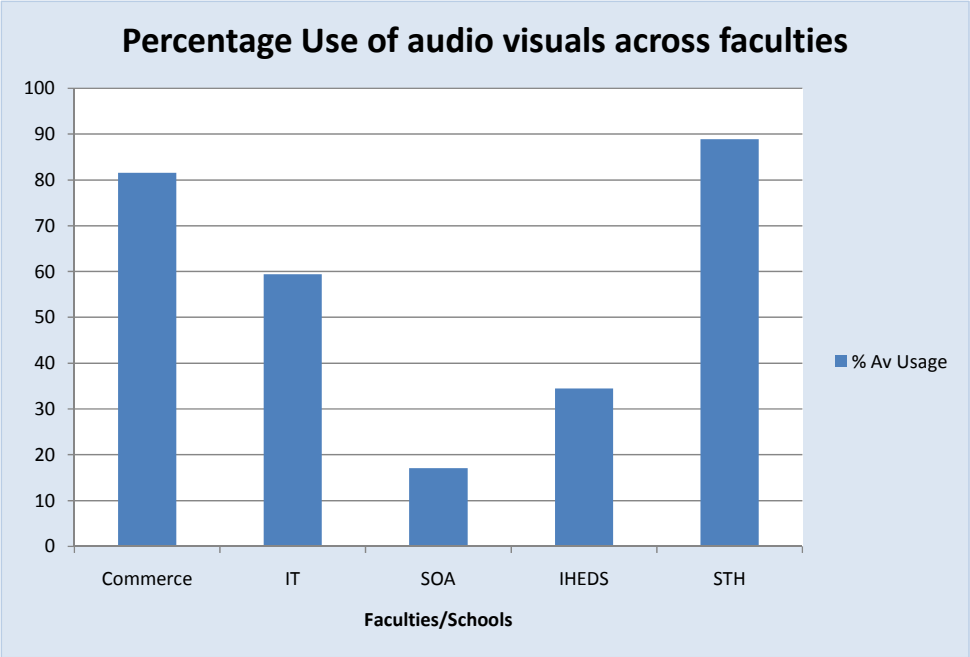


Graph 1: Lecturer use of e-learning over the first eight months of 2009

The e-learning was mainly used to post notes, manage quizzes, process timed and un-timed assignments uploaded by students, post reading references, run learner forums on specific topics, send e-mails to students, upload rated learning journals, use blogs for collaborative learning and post announcements. Two of the participants said they used short text messages (SMS) to communicate with their students.

It was also identified that lecturers were either not conversant or did not see the importance of using web based ICT options such as podcasting, blogs, wikis, facebook and other web applications. One participant said he would have used web based ICTs if only he had been trained on how to use them. Other participants did not use other web based tools since they preferred a single point of meeting their students where all the resources are hosted and accessed. Having to move between different hosting portals such as facebook, blogs, wikis caused confusion among students and wasted time. They therefore preferred the single Moodle portal for teaching.

It was also learned that a good number of the lecturers use audio visuals to teach in their classes. The studied noted that 72 out of 110 (65%) of lectures use audio visuals to teach which is a 17% increase from previous semester. Graph 2 shows the use of audio visuals across faculties.



Graph 2: Faculty use of audio visuals at Strathmore University

Key:- IT:- Information Technology, **SOA:-** School of Accountancy, **IHEDS**:- Institute of Humanities Education and Development Studies, **STH**:- School of Tourism and Hospitality

Analysis of the data from the library management system indicated that Strathmore University has registered with 28 e-databases (http://peri.inasp.info/peri/peri.pl?cid=23&pid=&iid=6293&do=view_resources).

Lecturer and student access to e-content was low, with EBSCO one of the most accessed databases showing 2942 searches with 648 full text down loads over the month of July 2009. However, institutional collection and analysis of data from other databases was not available. If one assumed that this is only access by the teaching staff then there were 646/110 (6) full text downloads per lecturer per month and 2942/110 (27) searches per lecturer per month. This narrows down to less than a single search per day per lecturer.

Different participants had different motivational reasons for using ICTs but in general the participants felt that ICTs are more convenient to use in delivery of their course content and that ICTs encouraged students to read on their own (learning outside the classroom). Use of audio visuals help clarify issues such as pronunciation from those with strong accents while e-learning brings about a higher level of interactivity where more students can contribute to a topic in a forum. Two of the participants felt that students that take classes in humanities found it easier to apply what they learn when ICTs are used as opposed to those from other disciplines. ICTs also

motivate and create interest in the learners (helps avoid the monotony of continuous two hour lectures).

Contrary to the belief that students often resist the use of ICTs, a participant from the humanities courses commented that most students preferred those classes that blended ICTs with the traditional methods of teaching:

> *At the beginning of each semester, every student in my class starts to work on a self directed journal that I rate every week. I also use discussion forums to complement my teaching but always have to monitor the discussions in these forums. By the end of the semester, I often notice great improvement in my students' abilities to think out of the box and become more independent learners. When I ask them which mode of delivery they preferred, most of them chose the use of ICTs.*

All the four participants interviewed felt there was very little interaction among users of ICTs on campus to share experience and encourage each other. They felt that the rate of diffusion of use of ICTs would be higher if a forum was created to discuss experiences and challenges while supporting each other and encourage those who have not yet adapted to using ICTs to teach.

Participants said they are sometimes discouraged and de-motivated to use ICTs for teaching because of the unstable Internet connectivity and low speeds, viruses in computers for students and teaching staff. The participants also said that some students tend to miss classes once they realise they have the material they require on the e-learning platform. It was also pointed out that uncontrolled use of ICTs reduces the level of creativity where many students copy and paste content from the Internet into their assignments. This level of plagiarism is hard to detect since the university has not yet acquired an anti-plagiarism software. The computer to student ratio is still low which makes it hard for students to access computers for self learning.

Participants agreed that learners often reject or resist the use of ICTs if lecturers use them to simply rush through the syllabus content or if so much content is dumped to students without appropriate feedback or evaluation of learning outcomes. Learners may also get discouraged if there is no time set aside to reflect on taught content or if students are unable to connect to the resource away from campus. Lack of support from the IT team and appropriate training has also hindered the use of ICTs by some non IT lecturers.

Some participants felt that institutional policies on the use of ICTs will have a positive impact if lecturers view the policies as being supporting to the way they work with ICTs rather than being presented as punitive. A participant said that a policy that recognized the use of ICT for teaching and learning and promoted lecturers based on this indicator would go a long way to enhance its acceptance. It was also noted that the current curriculum did not favour the use of ICTs since it is rigid with pre-determined structures that indicate 70% weighting for the final 2 hour written exam while only 30% is allocated to course work covered throughout the semester.

Conclusion

The use of ICTs for teaching and learning may become a reality in Kenya when higher education institutions get ready to use therm. This will require proper network infrastructures, increased computer to student ratios, good Internet connectivity speeds with high availability as well as technical support for the users. The commitment being shown by the government of Kenya to improve Internet connectivity at reduced costs is a move in the right direction towards making the use of ICTs for teaching a reality. However, for HEIs to be able to benefit from this initiative, they need to set appropriate strategies on why they wish to invest in ICTs for teaching since use of ICTs do not necessarily improve learning outcomes.

The mini-study showed that students are willing to adapt and use ICTs for learning but institutions are slow to implement them and lecturer are slow to adapt to their use. Lecturers prefer an all inclusive learner management system that will offer blogs, e-mail, wikis, podcasts and other web applications to avoid disrupting students' attention.

There is need for a change in the curriculum to integrate the use of ICTs in teaching and learning while at the same time enhance policies that recognise and award those whos use of ICTs for teaching.

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