Using e-Learning as a Tool for Enhancing Teaching and Learning in University Education: Lessons Learned from Machakos and Chuka Universities

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Abstract

This paper argues that e-learning is a critical component in teaching and learning especially during the Covid-19 pandemic. The paper interrogates the online teaching and learning environments, the Moodle as an e-learning platform for teaching and learning, the challenges of using e-learning in teaching and learning, and the effect of E-Learning on University Education. This paper also provides some practical lessons on e-learning from Machakos and Chuka Universities. The study adopted a desk review approach that focuses on document analysis to get information on e-learning. The documents analyzed were journals, Internet Communication and Technology (ICT) websites, and paper reviews on online teaching and learning. Also, interviews of OdeL staff in the two universities was done The paper concludes that e-Learning can be adopted and utilized to promote education in Africa even during covid-19 pandemic times and post Covid era. In addition, e-learning can make learning easier and accessible to everyone, everywhere in the world. It provides the opportunity to achieve great results at lower costs and thus revolutionizing the conventional education system.

Key Terms*: Online teaching, Moodle as an e-learning platform, Challenges, Effect of E-Learning*

INTRODUCTION

E-learning has become an increasingly popular learning approach in higher educational institutions due to the rapid growth of internet technologies. Use of information and communication technology to enhance and facilitate teaching and learning is called E-learning. (oye, N.D., A.Iahad, N., *at-al*, 2012). According to Rogers (2008), in this modern age e-learning has a competitive advantage and many universities have implemented it and this has impacts on student's performance. According to Fisser and felliccione (2001) developments in information and communication technologies (ICTs) have impacted all sectors of society, including the education sector. In higher education, application of ICTs in form of e-learning is already changing teaching and learning processes. There are many pedagogical and socio-economic factors that have driven higher learning institutions to adopt e-learning. These include greater information access; greater communication via electronic facilities; synchronous learning; increased cooperation and collaboration, cost-effectiveness (e.g. by reaching different students and in greater numbers) and pedagogical improvement through simulations, Virtual experiences, and graphic representations. Both trainers and learners can choose more appropriate applications which are flexible in time, in place, personalized, reusable, adapted to specific domains and more cost-efficient.

According to Pei-Chen sun and Hsing Kenny Cheng (2013), the rapid development of computer and internet technologies has made e-learning become an important learning method. There has been a considerable increase in the needs for multimedia instructional material in e-learning recently as such content has been shown to attract a learner attention and interests. Virtual

learning systems (VLSs) offer a repository for course documents, discussion forums, chat boxes, mass communication options, among others. According to Green (1999), In the last few decades with the use of internet, email, multimedia technology and intelligence tutoring system on campus the Computer Assisted Learning (CAL) system become so popular. According to a survey, it is recorded that majority of college professors use email to communicate with their students and one-third of college courses utilize CAL technology. Similarly, according to the report of Jones (2002), that majority of the college and university student's own computers and wireless devices and use internet to enhance their learning experience and to save time. With the passage of time, the use of internet is increasing rapidly that's why the training and learning institutions have devoted great efforts and large sum of money to develop e-learning progress for use because it saves time and increase skills. (Chiu, Sun, *et al*., 2007). The students involved in higher education through distance learning need a venue to connect and actively engage with other member of the class, who they often have never met in person, and activities in distance education courses need to allow for students to apply their learning to authentic educational contexts, (Correia & Davis, 2008).

FROM RELEVANT LITERATURE

Online Teaching and Learning Environment Vs Traditional Environment

E-learning is an innovative approach used to deliver electronically mediated, well designed, student-oriented, content to learners. The development and advancement in computers and electronic communications has removed barriers of space and time in teaching and learning. Lecturers can deliver knowledge anytime anywhere in the world (Horton, 2000). An educational environment has three basic elements. These is a teacher who teaches, a student who is taught and the content to be imparted. For educational dream to be realized, two things are very critical. These are: the teacher who is expected to create a good educational environment and the learner who is the recipient of the content. e-learning technology is becoming increasingly used in the higher education in the world today especially during the Covid-19 pandemic times. This is because, e-learning technology enables students to step out of the traditional class room environment. To create an e-learning environment, lecturers are required to have the content, technology, instructional support, technology support, infrastructure and organization. In addition, the success of e-learning requires the following human resources. This includes the teacher, programmer, multimedia expert, expert in both e-learning technology and pedagogy, the instructional designer and an administrator.

Virtual environments support a range of functionalities that includes supporting social interactions, modelling of real environments, document sharing and recording facilities that allow learners to replay activities undertaken in the real world. But the one-million-dollar question that we should ask ourselves is "How can we engage learners in an online learning environments? In the online learning environment, engagement by learners requires some cognitive effort and attention. When learners are engaged in the learning process, their levels of learning and retention increase and thus their learning experience is improved. (Kearsley & Shneiderman, 1998).

The challenge that most learners face online is not being aware of the structure of the online learning environment, and the strategies to be applied. Also, learners do not know the interactive online elements and how to use the online support tools. To mitigate this lack of awareness and

learning strategies, it is important for institutions of higher learning to conduct trainings for students and learners on how to learn or teach online. Such training will help lecturers and learners to learn the technical procedures needed in navigating the virtual environments such as logging on the LMS and navigating through the online learning environment and how to use the various tools available (Potter, 2000; Lim, 2001).

Equally important is setting ground the rules or guidelines for participation in the online learning environment. Outlining guidelines for online discussions is of great importance in online teaching and learning (Lim & Cheah, 2003). Guidelines about online discussions or chats are necessary to avoid the conference turning into a monologue of lecture-type material to which very few responses are made (Harasim and colleagues,1995). The online learning environment provides opportunities for learners to have control over their learning process and become more engaged in it than the traditional teaching and learning.

Before beginning to teach online, lecturer's should strive to work on the learner's attitude, knowledge and learning strategies to enable them learn independently in the online learning environment. e-Learning provides different environments for learners as it provides dynamic, interactive access to a wide range of information. For example, text, graphics, and animation (Jonassen, 1996; Jacobson &Archodidou, 2000). E-Learning environments may contribute to the process of teaching and learning but only if the integration is done within the framework of proper pedagogy, both educational and technological.

Moodle as an E-Learning Platform for Teaching and Learning

Most institution of higher learning have acquired a MOODLE to aid in teaching and learning. The acronym MOODLE stands for Modular Object-Oriented Dynamic Learning Environment. This software is designed to help educators in the creation of quality internet-based courses. The Moodle is sometimes referred to as a Learning Management System (LMS), Course Management System (CMS), Virtual Learning Environment (VLE) or just Online Education (Dobrzański, 2006; Martin-Blas & Serrano Fernandez, 2009). The Moodle contains tools for construction, design, organization and management of courses or lessons in different levels of information communications technology (ICT) (Brandl, 2005). The Moodle has many benefits that includes 24 hours' availability, a variety of network interfaces (Internet explorer, Google Chrome, Netscape, FireFox) and support in different languages (English, Arabic, Hebrew etc.) The main benefit advantage of this software is the platform's code transparency that enables learners and developers to adapt the platform to individual needs and develop new advanced features and add-ons. (Dobrzański, 2006; Martin-Blas & Serrano-Fernandez, 2009).

The Moodle e-learning platform is also easy to use and provides a good communication tool, discussion area, group space, workspace, and makes learning more interesting". It enables the students can access courses' contents in different formats (text, image, sound), as well as interact with lecturers and colleagues, via message boards, forums, chats, video-conference or other types of communication tools.

One of the most important benefit of this software is that it allows for the exchange of information among users in different geographical regions by use of mechanisms of synchronous (chats) and asynchronous communication (discussion forums). It can easily be concluded that a Moodle's interface is very intuitive and allows for easy navigation. It is divided into sections that

has its own tools such as lessons, quizzes, assignments, and forums which are all linked (Goodwin-Jones, 2004). Moodle is also developed in such a way that it allows teachers or course participants to provide feedback in qualitative or quantitative form. Higher distance education offers a scenario for the development of teaching-learning processes through educational platforms and their functionalities for didactic communication, mainly online forum (Lopez, &Camilli, 2014; Guedez, &Navea, 2014; Bousbahi, &Alrazgan, 2015; Bin, 2017).

Challenges of Using E-Learning in Teaching and Learning

According to Mpofu et al. (2012), the adoption of e-learning in Africa is slow, as evidenced by the low number of African scholars who are familiar with teaching in an online environment. Hollow and ICWE (2009), reporting on a survey of 147 e-learning practitioners from 34 countries in Africa, observed that e-learning was developing at a slow pace due to many challenges that impede its adoption and utilization in the universities.

Inadequate ICT and e-learning infrastructure is one of the major challenges hindering the implementation of e-learning in Kenyan public universities. It is quite clear that infrastructure plays a key role in the implementation of e-learning. Infrastructure like computers, network and internet connectivity, and computer labs are inadequate in most public universities to support the high numbers of students who want to access e-learning. However, most universities have made some progress in improving their ICT and e-learning infrastructure in the last few years. ESIB (2003) also points out that the institution providing e-learning must provide adequate technological infrastructure, including network connections and computers, and technical support for both students and staff.

In addition, financial constraint is one of the challenges hindering the implementation of e-learning in Kenyan public universities. Implementation of e-learning is generally expensive for an average university at the initial startup stages. Inadequate financing of e-learning is therefore a major barrier to its successful implementation in Kenyan Universities. Though it's clear that Kenyan public universities make yearly budgetary allocations for e-learning implementation, it these allocations are inadequate to carry out all important e-learning activities like training of staff on e-learning, maintenance, e-content development, Internet bandwidth and e-learning infrastructure development. It also emerged that most ICT and e-learning related projects in public universities rely on donor funding. Most Kenyan public universities do not prioritize e-learning in their budgetary allocations. Huynh et al (2003) found out that budgetary restriction is a primary concern for institutions. According to Kashorda and Waema (2014), on average, Kenyan universities were spending only 0.5% of their total recurrent expenditures on Internet bandwidth.

Moreover, public universities in Kenya lack affordable and adequate Internet bandwidth, hence it is one of the challenges hindering implementation of e-learning. Additionally, though the cost of bandwidth in most public universities has gone down following the introduction of bandwidth subsidy by the government through the Kenya Education Network (KENET) and the arrival and operationalization of the undersea backbone fibre-optic cables in Kenya in the year 2012, the cost of Internet bandwidth is still high, hence currently universities cannot afford to procure adequate internet bandwidths. Faster internet connectivity is critical to an institution using e-learning to support teaching and learning. According to the E-Readiness Survey of Kenyan

Universities (2013) Report, the current price of $160 per Mb/s was still a high price in comparison to developed countries.

On the other hand, lack of operational e-learning policies is another challenge hindering the implementation of e-learning in Kenyan public universities. Notably some Kenyan public universities don't have an e-learning policy and in cases where a policy exists, it's not operational. Most Kenyan public universities are unable to implement their e-learning policies due to budgetary constraints and lack of the necessary e-learning infrastructure. A policy framework on e-learning is critical to the success of implementation of e-learning in any given institution. In developing the appropriate e-learning policies, the core business of the university must take the center stage so as to ensure that e-learning puts the university on a competitive edge. Appropriate and operational e-learning policy is critical to the success of e-learning implementation. Awidi (2008) pointed out that the universities must have clearly defined strategic plans that spell out e-learning policies and implementation strategies. Catherall (2005) also established that most Kenyan public universities have no ICT and e-learning policies of any sort or where it is available, it is still in draft form.

Additionally, lack of relevant technical skills on e-learning and e-content development by the teaching staff is a challenge hindering implementation of e-learning in public universities. This is attributed to inadequate or lack of training in e-learning skills among majority of the teaching staff. It is evident that only a few of the teaching staff have been adequately trained on e-learning skills. Though some of the teaching staff have basic computer literacy skills, these skills may not be adequate for them to use e-learning in teaching as well as developing e-content, hence need for training. Wanyembi (2011) found out in a survey done in Kenya that most of the academics in universities have low ICT and e-learning skills because most of them were trained in the absence of ICT environment. E-learning skills for lecturers and relevant e-content are critical components necessary for successful implementation of e-learning.

Lack of interest and commitment among majority of the teaching staff to use e-learning in teaching in public universities is another challenge hindering the implementation of e-learning. This is attributed to lack of motivation among the teaching staff who perceive conversion of their courses to e-content as extra work with no additional pay. Fear of loss of jobs as a result of implementation of e-learning is also cited as a cause for lack of interest and commitment to use e-learning by the teaching staff. Khan, Hasan and Clement (2012) also found out that if teachers want to successfully use technology in their classes, they need to possess a positive attitude to the use of technology.

Lastly, the study revealed that creating e-content takes a longer time, hence hindering the implementation of e-learning in public universities. It came out clearly that most teaching staff are busy with routine teaching and research tasks, hence do not have adequate time to convert their courses from hard copy to e-content. However, on the other hand, the benefit is once a course has been developed in digital format, it is easier and less time consuming to maintain and update. Tarus (2011) found out that developing one complete e-learning course requires a longer period of time as well as resources such as computer and reliable internet connectivity.

LESSONS FROM MACHAKOS AND CHUKA UNIVERSITIES

The universities created the Centers for Open, Distance and e-learning in 2020 during the Covid-19 to coordinate all OdeL activities. The Centers has been able to do the following to enhance digital skills for faculty and students as they embarked on the blended teaching and learning: the training of faculty and students on the use of Kenet and other platforms. The faculty members are now able to use these platforms to conduct classes. At the same time, learners are able to log in to these platforms and participate in all classes. Faculty members have been trained on the development of interactive content. Most lecturers are now able to develop e-notes, prepare PowerPoint presentations and develop personal videos to use. All developed content developed are vetted by the departmental committee before they are uploaded on the Learning Management system. The universities also procured a Learning Management System software that is used to supplement teaching and learning. About 98% Faculty have been trained on the use of LMS to upload e-notes, journal articles, assignment, quizzes, CATs, Videos etc. on the same breath, students have been trained how to access e-notes, journal articles, assignment, quizzes, CATs, Videos etc. Ninety-eight (98%) of our faculty has been trained on online teaching and learning. However, the universities have had to contend with the following challenges; lack of enough infrastructure, unstable servers; capacity building and retraining of teaching staff; are tedious preparation of e-Notes; lack of enough computers for students; Use of smartphones with limited functionalities.

REFERENCES

An Online Virtual Learning Environment for Higher Education Conference Paper · June 2011 DOI:10.1109/VS-GAMES.2011.44 · Source: IEEE Xplore, 2014

Awidi, T. (2008). Developing an e-learning strategy for public universities in Ghana. *EDUCAUSE Quarterly Magazine*, Volume 31, Number 2.

Brandl, K. (2005). Are You Ready To "Moodle"? Retrieved March 15, 2004 from: http://llt.msu.edu/vol9num2/pdf/review1.pdf

Chiu, C. M., Sun, S. Y., et al. (2007). An empirical analysis of the antecedents of web based learning continuance. Computers and education, 49(4), 1224-1245.

Correia, A., & Davis. N. (2008). Intersecting communities of practice in distance education: the program team and the online course community. Distance Education, 29(3), 289-306.

Dobrzański L. A, Honysz R., & Brytan Z. (2006). Application of interactive course management system in distance learning of material science. Journal of achievements in materials and manufacturing engineering, 17, 429-432.

Green, K. C. (1999). The 1999 national survey of information technology in us higher education-the continuing challenge of instructional integration and user support. The campus computing

project, center for educational studies, the Claremont graduate university, Claremont, CA 91711.

Harasim, L., Hiltz, S. R., Teles, L. and Turoff, M. (1995)**.** Learning Networks: A Field Guide to Teaching and Learning Online.Cambridge, MA: MIT Press.

Horton, W. (2000), Designing Web-based Training, Wiley, New York, NY

Huynh, M.Q., Umesh, U.N. and Valachich, J. (2003). E-learning as an emerging entrepreneurial

Jacobson, M. & Archodidou A. (2000). The design of hypermedia tools for learning: fostering conceptual change and transfer of complex scientific knowledge. Journal of the Learning Sciences, 9, 149–199. Jonassen, D. (1996). Computers As Mind Tools For Schools. Merril, Columbus, OH.

Jones, S (2002). The Internet goes to college: how students are living in the future with today's technology. Pew internet and American life project.

Kashorda, M., & Waema, T. (2014). *E-Readiness survey of Kenyan Universities (2013) report*. Nairobi: Kenya Education Network.

Kearsley, G. and Shneiderman, B. (1998). Engagement theory: A framework for technology-based teaching and learning. Educational Technology, 38(5), 20-23

Khan, S., Hasan, M. and Clement, C. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of Instruction*, Vol. 5(2), pp. 61-80. Available online at http://www.e-iji.net/dosyalar/iji_2012_2_4.pdf (Accessed on November 15, 2014).

Lim, C.P. & Cheah, P.T. (2003). The role of the tutor in asynchronous discussion boards: A case study of a pre-service teacher course. Educational Media International, 40(2).

Lim, C.P. (2003). Information and Communication Technologies (ICT) addressing the challenges of economics education: To be or not to be. *International Review of Economics Education, 2{*!), 25-

Lopez, E. & Camilli, C. (2014). Métodos mixtos de investigacion en modalidad b-learning: análisis de la comunicacion asincronica [Mixed methods research in b-learning modality: asynchronous communication analysis]. Historia y Comunicacion Social, 19, 403-415. doi: http://dx.doi.org/10.5209/rev_HICS.2014.v19.44966(Goodwin-Jones, 2004).

Ministry of Education Policy Framework for Education and Training (2012): Reforming Education and Training in Kenya.

Mpofu, V, Samukange, T, Kusure, LM (2012) Challenges of virtual and open distance science teacher education in Zimbabwe. International Review of Research in Open and Distance Learning 13(1): 207–219.

Oye , N. D., Salleh, M., and lahad, N.A. (2010). Holistic E-learning in Nigerian Higher Education institutions. Computing, 2(11), 20-26.

Potter N, (2000). First steps in organising ICT in the Primary classroom. In M. Lcask & J. Meadows (Eds.), Teaching and Learning with ICT in the Primary School, pp. 124- 143. London: Routledge. Stage, RK. (1996) Setting the context: Psychological theories of learning. Journal of College Studetit Development, 37(2), 227-235.

Sun. P.C and Cheng. H.K. (2007). "The design of ins tructional multimedia in e-learning: A media richness theory based approach". Computer & education. 49, 6 62-676

Tarus, J. (2011). *Adoption of e-learning to support teaching and learning in Moi University.* Thesis presented in partial fulfillment of the requirements for the degree of Master of Philosophy (Information Technology), Moi University.

Waema, M. T. (2005). A brief history of the development of an ICT policy in Kenya. In E. F. Etta & L. Elder (Eds.), *At the crossroads: ICT policy making in East Africa* (pp. 25-43). Nairobi: East African Educational Publishers Ltd.