



Information and Communication Technologies for Higher Learning Institutions in Developing Countries Using E-Learning

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Abstract The Information and Communication Technologies (ICTs) have brought many changes in the organization and delivery of higher education. There are pedagogical and socio-economic factors that have influence in higher institutions to integrate ICTs in teaching and learning include greater information access; greater communication; synchronous and asynchronous learning; increased cooperation and collaboration, cost-effectiveness and pedagogical improvement. However, due to many socio-economic and technological circumstances, many higher learning institutions in most developing countries were not fully integrated ICTs in their educational purposes.

Keywords information and communication technology, delivery of higher education, socio-economic, technological circumstances

1. Introduction

Advancement in Information and Communication Technologies (ICTs) have affected all parts of society including the education area. There are numerous pedagogical and socio-economic that have driven higher learning education to embrace e-learning. It may help the greater information access, greater communication, synchronous learning, increase cooperation and collaboration, cost effectiveness and pedagogical improvement. Both trainers and learners can choose more appropriate applications that are flexible in time, place, personalized, reusable, adapted to specific domains and cost-efficient.

There are various difficulties that face colleges in creating nations as they try to actualize the e-learning frameworks. This paper talks about the use of ICTs in educating and learning by assessing the e-learning setting and afterward concentrates on the academic, cost and specialized ramifications of various ICTs that can be utilized for learning purposes. Challenges for coordinating these innovations in higher learning foundations in creating nations are talked about, giving best practice approaches for tending to each of the difficulties.

2. E-Learning in Context

E-learning alludes to the utilization of ICTs to improve and bolster instructing and learning process. It is the instructional substance or learning encounters conveyed or empowered by electronic advancements. It fuses a wide assortment of learning techniques and technologies. E-learning in reaches from the way student utilize email and getting to course work on the web while taking after a course on grounds to programs offered altogether on the web. Enlarge accessibility to preparing and gets to be distinctly basic to supplement the conventional method for educating such as face-to-face is an optional arrangement.

E-learning incorporates a continuum of coordinated instructive innovations. Toward one side are applications like PowerPoint which have little effect on learning and showing procedures or the association. At the flip side



are virtual learning situations (VLEs) and oversee learning situations (MLEs) which can have critical effect after learning and showing methodologies and upon the association.

In supplemental utilization of ICTs to supplement conventional learning encounters, the teacher shows all session in classroom however with the incidental utilization of innovation. For examples, illustrations based exercises, interactive media recreations, virtual labs and internet testing. Besides that, mixed learning gives an answer that joins a few distinctive conveyance techniques such as coordinated effort programming. Synchronous learning requires the instructors and understudies to associate in the meantime however might be scattered topographically. Asynchronous learning permits instructors and understudies to collaborate and take part in the instructive procedure at various time regardless of their area.

3. E-Learning Technologies

E-learning is one of learning strategies and ICT applications of exchanged information and gain knowledge. There are many types of ICT applications such as televisions, CDs, DVDs, video conferencing, mobile e-learning and many more.

Televisions is a receiver that can displayed visual images either live or pre-recorded that accompanied by sound which are can be captured, processed and re-displayed electronically. For example, this applies to the term radio which is both live generated sound as well as pre-recorded sound. From this type of ICT applications, it can improve the teaching and learning process in many ways.

CDs and DVDs are the technologies for writing and reading data. It is a simulation for self-study. It always be used with the presence or remote support of the trainer.

Video conferencing is a system that where many people can see and hear each other in live based on different locations. This type of ICT applications is using special equipment to perform it and high-speed internet connection. A videoconference can be either two-way or multipoint, linking three or more sites with sound and video and it can also include data sharing.

Mobile e-learning is a new method in order to learn using small, handheld computers, portable computers, internet-enabled cell phones and two-way messaging. This type of technologies is very potential as learning tools nowadays.

World Wide Web or also can be called WWW, is one type of software tools and standards that allow users to obtain and give information that stored on a server and connected to the internet. It is a decentralized information system so that anybody can add any new information. For example, the lecturer can place the lecture notes on the WWW, so that the students can access it easier. The usage of web technologies in e-learning are further enhanced with the web 2.0. It is a set of economic, social and technology trends.

E-learning platforms are applications for delivering learning content and facilitate learning process. This software enables the lecturers to arrange enrolment data by electronically. The lecturers also can carry out assessment and offer electronic access to course materials. Furthermore, it supports multimedia presentation, of course, content while others are text based. In addition to manage the administrative functions of online learning, some systems helps create, reuse, locate, deliver, manage, and improve learning content. These type of systems are called LCMS which provide tools to deliver instructor-led synchronous and asynchronous online training.

E-Learning at Higher Learning University in Tanzania, Africa

In Tanzania, the use of Information and Communication Technologies (ICT) in every university is still very low. There are many opportunities that have been provided by the government even in the 2003 government of Tanzania have enacted about ICT through National ICT policy and the Tanzania Communications Regulatory Authority Act (URT 2003). These two major actions made it possible that by 2007 licenses for two basic telephone service provider, four land cellular mobile telephone operators, one global mobile personal communication service (GMPCS), eleven public data communication companies, nine private (dedicated) data services companies, and 24 public internet service providers (ISPs) were issued (TCRA) 2007. The government has also abolished all taxes to relate to computer and allied equipment, and reduced license fees and royalty payable by the telecommunication operators.



There are 13 universities and institutions in the Tanzania such as University of Dar Es Salaam (UDSM), Sokoine University of Agriculture (SUA), Mzumbe University (UM), Open University Tanzania (OUT), and others. Every university and institution in the Tanzania have used the e-learning as their module to teaching and learning. There are four systems e-learning that they use, WEBCT and Blackboard, KEWL-NextGen (Knowledge Environment for Web-Based Learning Next Generation), Moodle software and Atotur for students. At the University of Dar Es Salaam, WEBCT and Blackboard is their e-learning system for teaching and learning method. The WEBCT's strategy is to deliver the best of breed learning tools, robust content management capabilities, dynamic learning information management, enhanced learning personalization, enterprise class architecture, and strategic implementation services that institution will need to compete effectively, today and years from now. WEBCT is committed to giving institutions the best learning tool available provided within WEBCT, and is also compatible with third-party tools that one might wish to integrate. It allows course creators to reuse and share learning objects and to track how content is used. Finally, WEBCT provide a highly customizable learning experience that is altered by the instructor and student, as well as provided multiple levels of interactivity. Blackboard has a similar strategy and mission as WEBCT. Blackboard is dedicating to simplicity, making sure it is easy to use for students and faculty, and to developing an all-encompassing teaching and learning solution that is scalable, easy to integrate with other tools, flexible and customizable. WEBCT and Blackboard learning system, but owned by Blackboard is actually an online proprietary virtual learning environment system that is license to collage and institutions many computer uses for e-learning. UDSM get support from the Flemish University Council. When they use the e-learning, sometimes they had some problem. The major UDSM problem is TEIL project, the issue of software license. In the University of Western of Cape (UWC) in South Africa, they use KEWL (Knowledge Environment for Web-Based Learning) but nowadays they use KEWL-NextGen. This project is under the AVOIR project (African Virtual Open Initiative and Resources). AVOIR project is an effort to unity software developers, educational specialist and other in Africa to build capacity to produce educational software while at the same time building software design, development and support capacity in the higher education sector. KEWL-NextGen is first projects that serve as the basis for creating next generation e-learning features. KEWL-NextGen is the free software e-learning platform It can be used to build any kind of application that requires a web interface, and by combining some of the over 200 different modules in different ways entirely new systems can be created without any programming. The quiz module has been significantly improved in order to cater for real time testing of very large classes (around 800 students). Also included are some new modules, including a completely rewritten email module that has better integration with external mail systems.¹ The Sokoine University of Agriculture and University Dar Es Salaam are the partners in this project. Video conference facility also offers open and distance learning to the university student and the community at large in Tanzania but this facility is only available in the UDSM Computing Centre and Tanzania Global Learning Centre (TLGC).

Moodle software is one of the e-learning software that they use for teaching and learning module. Moodle is a course management system (CMS). CMS is a software application used to upload, edit, and manage content displayed on a website. A content management system can perform a variety of different tasks for a website including regulating when content is displayed, how many times the content is shown to a specific user, and managing how the content connects or interacts with other elements of the website. This software also enables less technical individuals to manage content on a website easily without having an extensive coding background. This software was used all over the world by the universities, colleges, schools and organizations.

The last famous software that they use is ATutor e-learning. ATutor e-learning system is an Open Source Web-based Learning Management System (LMS) used to develop and deliver online courses. Administrators can install or update ATutor in minutes, develop custom themes to give ATutor a new look, and easily extend its functionality with feature modules. Educators can quickly assemble, package, and redistribute Web-based



instructional content, easily import prepackaged content, and conduct their courses online. Students learn in an accessible, adaptive, social learning environment. The Open University of Tanzania is usually use ATutor e-learning as their learning management system. OUT has enacted its own ICT policy, which guides on how to use ICT to fulfill the function of university that is teaching, research and consultancy. The blended e-learning and distance learning are very useful for student to be a successfully student in the university and institution. With this software learning management system can help student and lecturer to get more information and module to teaching and learning.

ICT Implementation Challenges in Higher Learning Institutions

Contempt of the achievements revealed by some of the Tanzanian universities in implementing ICT for teaching and reading processes, these universities still face a great deal of challenges in attempting such a procedure.

A lack of structured approach to ICT implementation: it is a complex process that needs to be fully abstracted and defined from the beginning to integrate ICTs in the functions of any organization. Nevertheless, many higher learning institutions in developing nations do not need clear plans to guide the way as most of them have embraced the ICT integration process. The institution ICT policy and strategic plan are significant as to provide a framework for the development and implementation of specific ICT projects. The following issues, amongst others, should be taken into consideration: (i) ICT infrastructure already in place; (ii) ICT skill levels in the institution; (iii) number of staff and students in each department and projected growth; (iv) academic management process: curriculum development, assessment methods and administration; (v) cost-effectiveness analysis (including hidden costs) and the choice of proper technologies for the needs of the institution; and (vi) staff development in new technologies.

Awareness and attitude towards ICTs: According to Tusubira and Mulira (2004), there tends to be some vague knowledge about ICTs, some interpreting them as simply advanced technologies that require a great heap of money and very advanced skills. Many INGOs are not well equipped internally to sustain and raise the effective development of ICT to benefit development. They just do not possess the knowledge, expertise, or organizational capacity required. The role of information technology is frequently viewed as a thorn, problematic issue relating to back office arrangements. Furthermore, ICT often has a questionable reputation as a result of previous unsuccessful or costly initiatives. Formally organized awareness programs, visits to similar institution where success has passed off, and short trainings can contribute to enhance the awareness and change the attitude of stakeholders towards facilities and serves.

Administrative support: Administrative support is critical to the successful integration of ICTs into teaching and interpretation processes. Administrators can provide the conditions that are commanded, such as ICT policy, incentives and resources. The commitment and interest of the top management and other leaders at every stage is the most decisive element for successful implementation of ICTs. According to Cameron and Ulrich (1986), a transformational leadership is a leadership that involves a process of fundamental change which is demanded for the institutions to adapt to changes brought about by the information society³. Dwyer *et al* (1997) emphasizes that for the integration of ICTs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, pedagogical, administrative, financial, and social dimensions of ICTs in education.

Expert support: This includes topics like facility, cognitive process, maintenance, network administration and protection. This is a significant piece of the implementation and integration of ICT in education system. In most instances however, technical documentation is not useable, which implies that trainers and students need some basic troubleshooting skills to master technical problems when using ICTs. Appropriate strategies should be in position to ensure that integration of ICTs in teaching and learning process goes together with the recruitment, training, retaining and retention of needed staff.

Transforming higher education: Many institutions fail to integrate ICTs into teaching and learning because they are using ICTs to replicate their traditional practices, content and control. Section of that revolution necessitates restructuring universities and colleges – that is, modifying the way higher education institutions are planned, managed and organized. It is relatively easy to utilize ICTs to sustain and improve current organizational constructs and approaches, making it a useful but incremental progress. However, it is unbelievably difficult to



conceive of new ways of working with organizational constructs that are essentially different from the status quo and require a break in terms of strategy, competence, skills, and organizational structure.

Staff development: Integration of ICT in teaching and learning does not only deal with the introduction of new hardware and software, but both trainers and the students have to adopt new roles, and change their ICT behaviors and ways of teaching and learning. As Farrell (1999) points, training and workshops are needed not only to improve the introduction instructors, but also as a means of getting them involved in the process of implementing and integrating ICTs in teaching and learning. Pelgrum (1999) recommends staff training to be a continuous process for regular updates with the development of ICTs.

Inadequate funds: There also is a significant challenge in adequately planning and financing the use of ICT in development plans. With cyclical donor funding and force per unit area to minimize administrative and management costs, it is frequently difficult for INGOs to properly design and resource financial and human investments in ICT as a core capability for development plans. Financial resources form a central ingredient for the successful execution and integration of ICTs in teaching. It is obvious that countries with higher financial resource bases stand a good chance than those with limited resources to reap benefits offered by ICTs. Coming up to the problem of special funds and sustaining donor funded projects, higher learning institutions can serve the following: (i) adopt freeware and open source software for instruction and scholarship activities; (ii) continuously press for more funds from their regimes; and (iii) diversify sources of funds to throw a wide financial base.

Conclusions and Recommendations

We are now in the 21st century the era of cutting-edge technology, so we are lost if we not use ICT as possible. ICT is very important and great opportunity to their teaching and learning processes in the universities and institutions. E-learning is a greater information access, greater communication via electronic facilities, synchronous learning (continuous learning), and others. E-learning is actually is to improve the standard of teaching and learning. Student and teacher or lecturer use e-learning to get the syllabus before teaching lesson.

There are so many of the variety of learning strategies and ICT applications for exchanging information and gaining knowledge such as Compact Discs (CDs) and Digital Versatile Discs (DVDs), video conferencing, mobile technologies and others. In Tanzania, there are four application that they use for e-learning, WEBCT and Blackboard, KEWL (Knowledge Environment for Web-based Learning, Moodle software or CMS (Course Management System) and Atutor (Open Sources learning management system). Even in Malaysia, every universities and institutions have their own e-learning portal.

In dealing with e-learning, there are so many challenges for implement ICT in the higher learning institution and universities such as lack of system, awareness and attitude towards ICT, administrative support and others. The challenges make the ICT know where the weakness and strength. This can reinforce the use of e-learning in the ICT. And we believe ICT can make the blended learning or e-learning can improve the quality of teaching and learning in the universities and institution throughout the country.

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