

Implementing E-learning in Higher Open and Distance Learning Institutions in Developing Countries: The Experience of The Open University of Tanzania

Cosmas B. F. Mnyanyi (cosmas.mnyanyi@out.ac.tz)

Jabiri Bakari (jabiri.bakari@out.ac.tz)

Tolly S. A. Mbwette (tolly.mbwette@out.ac.tz)

The Open University of Tanzania,

P. O. Box 23409,

Dar Es Salaam.

Abstract

Tanzania like other developing and developed countries, one of the delivery modes of higher education is through open and distance learning. The Open University of Tanzania (OUT) is an accredited government institution that offers degree and non-degree courses through open and distance learning mode. The dominant content delivery mode at OUT Tanzania is printed-based materials supported largely by face-to-face sessions. However, the use of printed materials faces challenges as they are expensive and sometimes while printing the learning material new knowledge might emerge. With the current globalisation where communication is mediated through internet, e-learning can be used to supplement face-to-face sessions which are rarely organised. It cannot be underscored that e-learning has great potential in enhancing communication between the instructors and the learners, creates active engagement with the content, and do further create an avenue towards delivering instructional materials in open and distance learning (ODL) system. There are challenges pertaining to e-learning skill development among course lecturers and students that include low digital bandwidth; expertise in e-learning; e-learning infrastructure; incentive packages for retaining skilled personnel; low budget, few funding for research on ODL; and costs of e-learning equipments with its associated after sales contract adversely affects the implementation of e-learning.

The paper provides experience of implementing e-learning and its challenges and prospects. Focus is on managing e-learning, technical aspects on course development, and the skill development strategies among its educational stakeholders.

Introduction

E-learning can be referred to as the design, development and delivery of instructional materials by electronic devices, such as computers, mobile, CDs and DVDs [1]. In e-learning interaction between the learner, the instructor and the learning content is mediated by use of information and communication technologies (ICT). Implementing e-learning in open and distance learning (ODL) is imperative as shapes the study environment according to the learner needs [2]. E-learning supports both the traditional and the open and distance higher education delivery mode. In the era of globalization knowledge has no boundary. The transmission of knowledge from one end to another end of the world which in the past was difficult has been made simple with the use of internet. Internet, through e-learning has potential to change educational delivery from teacher centred to learner centred and thus seem to be one of the best support system in distance learning. Distance learners are characterized by being separated in time and space between the instructor and the learner [2]. A well established e-learning platform with barrier free to the learner might contribute much toward distance learner's achievement. Issues are how to implement e-learning in higher open and distance learning institutions in developing countries where the economies of scales are lower.

ICT might increase flexibility to the learning process by providing instructions in formats that creates interest to the learner [3]. The interest is created through animation, drawings, figures, sometimes movies and the learners have options in selecting the format of learning content to use. The current ICT has changed not only educational delivery but also social interactions, business practices, political engagement, media, health, leisure and entertainment [4]. This compounds the necessity of e-learning not only by the developing countries but also the developed countries. Though internet started in Tanzania in 1996 [5] awareness has increased the demand of internet by different groups of individuals and has increased the demand of digital bandwidth.

Importance of ICT has been emphasised in Tanzania. The Tanzania vision 2025 document states clearly the contribution of ICT towards competitive social and economic transformation [6]. In the vision 2025 ICTs are acknowledged as the driving force for its realisation. Of the steps toward realisation of the vision 2025, Tanzania, has succeeded to attract donor agency to support efforts toward implementing ICT in schools. SIDA has supported ICT initiatives in Tanzania [7]. Tanzania has shortage of ICT-skilled personnel, and both internal and external connectivity are expensive. Regardless of the costs and skilled personnel, ODL is seen as a viable means to the attainment of the Tanzania vision 2025.

The experience of the Open University of Tanzania (OUT) is taken as an example because it is the earliest higher education institution that provides both degree and non-degree courses in Tanzania. The non-degree courses are the courses that provide skill training like community development, distance education and computer application skills. There is also a non-degree course, foundation course, providing opportunity for those with low qualifications to join university upon successful completion in a degree programme of their choice. OUT was established through Act no. 17 of 1992 and became fully operational in 1994, admitted 766 students [8]. Through the expert advice from the Commonwealth of Learning (COL) for successful implementation of open learning OUT was advised to establish centres in all regions in Tanzania [8]. It started though rented buildings. By May 2009 OUT had already secured permanent buildings in Mbeya, Iringa, Ruvuma, Singida, Dodoma and Kilimanjaro while in Tanga, OUT arranged a 20 year agreement with the national trade union umbrella association (TUCTA). To speed up acquisition of permanent buildings in different regions, OUT, formed a management body at regional level that ensures the smooth running of the regional centres, Regional Advisory Committees (RAC). The RACs are headed by the Regional Commissioners. The aim was to speed up development in the rural areas through the expert advice from the RAC members toward supporting human development at local level. OUT believes that if in each region a large number of people join the OUT degree and non-degree programmes, it is likely that they would continue serving within the region and hence act as regional development catalysts.

OUT efforts like formation of RAC, ICT skill training in regional centres and implementation of e-learning are meant to increase higher education participation. In Tanzania like other sub-Saharan Africa, higher education participation is said to be low [9]. OUT by 2009 had enrolled 44,099 students of which 5117 have graduated from different degree programmes [10]. As the case in many developing countries, OUT is a fast growing institution, lecturer to student ratio has narrowed from 1:57 with 113 academic staff in 2002 to 1:108 with 246 academic staff in 2009. This partly is the impact of the successful implementation of Primary Education Development programme, PEDP [11] that has resulted to increased enrolment to about 83.5% [12] and the expansion of secondary schools. The success of PEDP resulted into another educational development programme, the secondary education development programme (SEDP).

Strategies to absorb the upcoming enrolment as a result of implementation of PEDP and SEDP might need to be laid down as the conventional universities

cannot accommodate all the students. One option is to enrol them in distance and open institutions that are likely to take many students. This might increase pressure among lecturers. At OUT lectures do face challenges on how to provide support to students [13]. Distance learners do require regular communication and interactions with the service providers. With increasing pressure of work there are possibilities of facing problems of insufficient and outdated reading resources and timely delivery of assignments and course materials [13]. Apart from other strategies that might be sought, ensuring implementation of education for all (EFA), millennium development goals (MDGs), poverty reduction and social inclusion of all people, quality higher open and distance learning through e-learning is seen to be imperative. E-learning is good to be used to up-skill or re-skill workers, students, adult learners, and employees. It is to this end OUT apart from the skimpy resources is embarking on implementing e-learning.

Challenges in implementing e-learning in ODL in developing countries

Different from the traditional universities, where student population normally is concentrated in one place, in higher open and distance learning, students are scattered in many places. Challenges then are how to support students who are located in different places. Sometimes, location cannot be a problem if infrastructures, in terms of communication, and physical buildings equipped with internet connectivity, ICT equipment, relevant software and training opportunity are in place. Like other developing countries, problems of poor supply of power, lack of internet connectivity, and in some places lack of telephone and mobile-phone services are widely acknowledged. The most affected places are the rural areas. Learners in remote areas where they have no access to ICT equipments, have to travel long distances for the services. Where university try to reach students in their places through building centres and supply centres with ICT technologies, there are limitations, that include low budgets, low capacity to purchase bigger digital bandwidth for e-learning, most of the staff and students lacking skills in use of ICT, ICT technologies fast turnover, low economies of scales in purchasing ICT equipment within the learners, shortage of technical staff to ensure smooth running of ICT equipment in the regions, and that it is difficult to estimate the resource needed in each region. Such challenges are non-existent in the traditional mode of higher education.

Apart from flexibility in employing e-learning, there are challenges in implementing it. The challenges are not only in the developing countries but also the developed countries. These challenges include reluctant of professors to

put their courses online [14]. The policies guiding promotion and work retention, skills in developing content that guides self learning, the technological turnover, skill training to both students and staff in managing and using ICT equipment and the shift of paradigm from teacher centred to learner centred need to be looked into diligently. In the case of developing countries other challenges include costs of digital bandwidth, availability of funds to purchase ICT equipments, costs of software, large number of students as compared to available human resources, after sales contracts on ICT equipment, availability of power, and infrastructure for e-learning not well developed and limited choice of technology to use. The available open source software which might be seen as the best choice for software, meets a challenge of few expertises to develop e-learning platforms for students and lecturers to use [15].

The available opportunity for use of open educational resources is hindered by the poorly developed ICT infrastructures and shortage of experts to contextualise the materials [16]. Well developed e-learning infrastructures and the available OERs are likely to contribute in the implementation of millennium development goals (MDGs). Open educational resources are free to use and thus are likely to open access to many individuals who are constrained with space and time. The training requirement is much higher in the recruitment of teachers. Use of open educational resources has been cited as one of the viable means to educate many teachers, both pre-and in-service [17]. In this case introduction and implementation of e-learning is likely to contribute to the manpower development.

The open university of Tanzania is different from many other open universities as it embraces entry qualifications. However, those who do not meet the required qualification and have at least minimum set qualification are registered to the non-degree course, the foundation course. Those who succeed in the foundation course are registered to the degree programme. In that student population at OUT is of the same qualifications as other students in other conventional universities regulated by the Tanzania Commission of Universities, TCU [8]. With successful implementation of PEDP and the current SEDP a number of students who have qualifications do not get admissions in the traditional universities. Thus OUT still have many students in both degree and non-degree courses.

There are options in implementing e-learning using mobile phones, CDs, DVDs and audio tapes for delivery of learning materials. In using phones, it has been noted that there are more hidden costs to the students, and thus makes higher distance and open learning more expensive. Similarly, not all places are connected to the mobile phone technologies. Using the offline technologies meets challenges of equipments to read the materials stored in CDs, DVDs,

Audio tapes and other types of memories one uses to store documents for later retrieval. Taking consideration to people with disabilities, both acquisition and skill training on use of equipment are challenges to students and the lecturers, especially those with visual impairment. Where the technology is available literacy to use of ICT equipment such as computers and mobile phones to access information might be another hindering block to implementing e-learning in open and distance learning in developing countries [4,18].

E-learning at The Open University of Tanzania

The Open University of Tanzania, in realizing the challenges ahead on implementing e-learning, established institute specifically dealing with issues of ICT, The Institute of Educational Technology (IET). In ensuring that IET works smoothly, there are two major departments, these are the Information and Resource Management (IRM) and the E-learning. IRM is responsible for ICT infrastructures and technical support for the University and the E-learning department is responsible for e-learning services to students and staff, research and development (www.out.ac.tz).

In the e-learning department there are 5 sections these include the African Virtual University Learning Centre (AVU-LC) responsible for skill training and professional tailor made courses. The Print media section is responsible for the university publications, in terms, of editing, proofing, typesetting, publishing and printing various OUT documents including the study materials. The Assistive Special Technology Unit, the section supported by the David Anderson African Trust (ASTU/ DAAT) is responsible for facilitating learning of distance learners with special needs, including those with disabilities. The e-learning development and multimedia section (EDMS) is made up of two units, the instructional design and delivery unit (IDDU) and the Multimedia and production unit. Both the two units in the EDMS are responsible for facilitating integration of technology in the distance teaching through providing both technical and pedagogical support for design and delivery of e-learning contents suitable for distance learners. The other section in e-learning department is the ICT research section, responsible for conducting research and evaluation on the learning support services available for distance learning in different course programmes. Therefore one can conclude that the e-learning department plays a greater role in the sustainability of distance learning at the OUT.

E-learning department is supported by the IRM department. E-learning materials in the process of development and delivery require special infrastructures in place, of which IRM is responsible. The IRM department is made up four sections. The infrastructure management section is responsible for

networking, hardware, and routine maintenance and repair. The database and system administration section is responsible for development of software and server management. The office automation section, responsible for website development, maintenance and administration, control of virus/worm/spam management, software licenses, patch and service pack development. The service control section in accomplishing its duties has four units include the system security and administration, helpdesk, quality and standardisation, and planning and development. Whereas the functions of e-learning is to provide learning resources in formats compliant to distance learner needs, the IRM ensures that there are infrastructures in place to ensure that materials are prepared and that prepared materials are delivered to the clientele for use.

In ensuring smooth running of operations in IET at OUT, policies and operational guidelines are developed and updated periodically to meet the emerging needs. The plan at OUT is to review ICT vision, mission, policy and implementation plan after five years. The current reviewed mission is “to use ICT as a strategic tool in facilitating provision of quality open and distance education, research, and public services” and the reviewed vision is “to have state of the art ICT platform to facilitate the delivery of affordable quality education through open and distance learning, dynamic knowledge generation and application” (OUT, 2004). In facilitating learning OUT through the use of ICT developed a website (www.out.ac.tz) where most of the educational resources are placed for students to use. One of the major electronic learning resources placed is the MIT Courseware. The MIT courseware provides reading materials for different subjects. The OUT website provides also a platform for OUT e-learning, student mails, different announcements and other relevant information for OUT students and the public.

With the support from Swedish program for ICT in Developing Regions (SPIDER) IET at OUT has made a progress in providing services to the public. SPIDER support started in 2006. IET in ensuring that electronic learning is a tool for academic, business and the general life activities established ICT skill training centres. By 2009 had 5 centres providing skill training to OUT staff, students and the general public. The skill training involve training that enable a graduate from such a programme to be able to confidently use ICT equipment for work and personal advancement. There are also professional and tailor made course offered in order to enable a graduate to perform specific job requiring special skills. Such courses are a bridge to skill training courses. This has increased demand for skilled staff to manage the emerging and increasing number of students at OUT. To ensure quality services in short courses, the skill training, the professional and the tailor made ICT courses, IET decided to hire trainers. The trainers are given a number of students to train, students and the

IET management evaluate the trainer. Once the trainer is seen not delivering up to the set standards and students are unsatisfied, such a trainer is stopped training. As IET always have a number of trainers another one takes the class. This has made OUT to have a large number of students to train ICT skills.

As OUT is spread through out the country, communication between the headquarters and the different regional centres has been enhanced through internet connection. For effective communication the OUT plans to have technicians in each regional centre with a student computer laboratory. The technicians among other things are expected to ensure that learning management system is always working. Currently, OUT is using MOODLE as an e-learning platform. Already there are courses that have been uploaded for students to use. Apart from learning platforms other services expected to be included are a number of e-journals, e-books and the general library information to be accessible through OUT website. Such developments are meant to realise the vision, mission and implementation strategies set by the IET at OUT for the purpose of easing the learner and researcher from learning resources constraints.

Periodically staffs are trained in new developments of ICT usage. For example in ensuring that lecturers and students are capable of using MOODLE platform, training is periodically conducted. Lecturers are trained how to develop the course and upload relevant information to the students and students are trained how to use. Apart from training in both skill and use of platform, lecturers are trained on how to conduct research in distance education. In collaboration with Commonwealth of Learning (COL) in 2009 a number of staffs have been trained on how to conduct ODL research and have prepared proposals for such studies.

There are positive changes, OUT students enrolment in skill training have increased. This indicates already there are some positive changes toward embracing e-learning. Efforts are underway to start training students with visual impairment in using ICT in their learning using the Dolphin Pen programme. The plans to implement the project for people with visual impairment are to liaison with the Tanzania Educational Authority (TEA) and the Sight Savers International in supporting students with visual impairment. The Open University of Tanzania started enrolling students with visual impairment since 1997 with support from David Anderson Trust Fund (DAAT) based in UK. DAAT provided funds that enabled construction of three recording studios. The studio is responsible for recording learning resources into audio cassettes and provides both audio cassettes and the cassette to students with visual impairment. This is one of the strategies to increase participation rate for people with special needs and disabilities in Tanzania.

Implementation challenges and prospects

Apart from support implementation of ICT at OUT has not been smooth. As an ODL institution in a developing nation is facing a number of challenges that include ICT infrastructures, human resources, attitudinal factors and the low budgets. Such factors are to be considered in order to effectively implement e-learning. The belief at OUT is that we can not stop implementing e-learning because of constraints, what is important is to address such challenges bit by bit and forge collaborations with other partners.

ICT Infrastructure

In addressing the challenge on ICT infrastructures, OUT made a number of plans that include: hosting OUT website to the Tanzania Telecommunication Company Limited (TTCL), use of mobile phone, establishing computer laboratories in regional centres, planning to use solar power in case of power cuts, use of VOIP and joining to Tanzania Education and Research Network (TERNET). TTCL is the largest telephone company in Tanzania. Hosting OUT website to TTCL meant to have an assurance that OUT website is likely to be accessible in all parts of Tanzania and outside Tanzania. As also TTCL is in a developing country faces challenges that eventually OUT faces. Such challenges include power problems, technical matters for maintenance and repair and lack of enough competent and skilled staff to manage the systems.

Use of mobile phone technology is in pilot phase and there is a discussion going on with mobile phone companies to reduce tariffs for e-learning materials. The use of telephone has been chosen because of the availability of phones in many places in Tanzania, including the rural areas. Our understanding is that if Mobile Phone Company reduce tariffs for e-content the realisation of education for all might be possible, as many people will have access to the learning resources. The use of mobile phone is flexible and that power challenges are minimal, as there are possibilities of charging phone using normal batteries. As OUT in addressing the challenge of power problem, in some regional centres, with computer training it is expected to have a standby generator. However a long plan solution is to use solar power.

As plans are to have internet connection in all regions and study centres, communication has been sought the main driver for change. In that VOIP has been earmarked to be one of the solutions for communication. VOIP are likely to reduce costs of normal telephone line and depend on internet communication on all matters, both academic and administrative.

Human resources

To embrace e-learning one need to have a motivated staff, enough number of academic staff, and e-learning development professionals. For one to be motivated there are important aspects that need to be considered: one need to have necessary skills for the job, resources necessary for the job to be performed, a working environment, assurance of the job security and assurance of the social support including the wages. However, apart from the institution incentive scheme, the institution has no power over the workers wage. Wages are controlled centrally by the government. The challenges at OUT has been how to get skilled personnel for e-learning and how to motivate them so that they continue delivering services at OUT. In that OUT established an incentive scheme, the skill training for the staff, and also established a course B.Sc(ICT). Both the incentive schemes, the skill training for the staff and the B.Sc(ICT) degree programme are meant to create e-content development professional and users.

Attitudinal factors

Attitudes in distance education implementing e-learning might include attitude toward the technology which is mediated by the fear of new technology. However, practice overtime might reduce the anxiety and make a person embrace technology [19]. It is these realisations OUT plans are to have students ICT laboratories in the regional centres. There are also attitudes toward distance education teaching methods which might also contribute to disliking of the distance education. OUT has employed a number of teaching modalities that would persuade students to learn through distance. For example, there are courses that have intensive face-to-face sessions such as MBA, B.Ed (special Education) and the B.SC (ICT). Similarly, all the ICT skill training courses are short courses where students are engaged in learning for about 2 hours a day. The variety of teaching modalities through distance learning provides students with a choice of the mode of study.

Most of the students are in remote areas, in that; OUT is suitable for many people as it is a unique government institution of higher learning in Tanzania that does not require its students to be on campus. On the contrary, it takes education closer to doorsteps of students and therefore enables them to study freely anywhere. This system not only does not uproot them from their employment obligations but also is so flexible that a student is allowed to learn at own pace, can postpone studies once finds oneself in difficulties and later on resume studies. For efficiency purposes, 25 regional centres have been established throughout Tanzania Mainland and Zanzibar. These centres function

as nuclei where students meet OUT staff to acquire strategic advice on how to study on their own, obtain study materials and a place where students converge to study. Moreover, in such centres, where spaces are available, tests and examinations are conducted. The Modus Operandi of OUT if well supported is likely to increase the participation of many people including people with special needs and disabilities in education. In this way OUT has specified strategies to address issues of attitude toward student and teacher interaction and attitude toward being a remote student.

Conclusions and way forward

Contributions of e-learning toward design, development and delivery of learning resources in higher Open and distance learning institutions cannot be underscored. In Sub-Saharan Africa where participation in higher education is low [20], e-learning is likely to support efforts of increasing participation as creates learning environments that are student centred, free from barriers of space and time. Challenges of connectivity, ICT equipment, software, training, infrastructures, low budgets, scales of economies among learners and attitudinal factors among social members, are to be tackled while implementing. Research is needed in each case so that informed decisions are made in design, development and deployment of ICT components in supporting learners. Such research need to be carried periodically during implementation stages. Efforts by OUT is to staff all regional centres with academic staff and establish ICT skill training courses to the public in all regions. Improved support systems to the students are likely to encourage many students to join OUT and hence contribute more in the implementation of the Tanzania vision 2025, the EFA goals, the poverty reduction strategies, and the Millennium development goals.

References

- [1] J. Daniel, & W. Mackintosh, "E-learning on the far side of the digital divide". Proceedings of the 2nd ACDE conference and general assembly hosted by the National Open University of Nigeria, and held at Eko Hotels, Lagos 8 – 11th July, 2009
- [2] S. Guri-Rosenbilt, 'Distance education' and 'e-learning': not the same thing, Higher Education, 49, (2005) pp 467–493.
- [3] J. M. Keller, & K. Suzuki, "Learner motivation and e-learning design: A multinationally validated process". Journal of Educational Media (Special Issue), (2004) 29 (3), 229-239
- [4] K. D. Gunawardana, "An empirical study of potential challenges and benefits of implementing e-learning in Sri Lanka". Proceedings of the Second International Conference on eLearning for knowledge-Based Society, August 4-7, (2005) Bangkok, Thailand

- [5] J. K. Bakari, T. S. A. Mbwette., & D. Shemweta, D., "Policies, master plans and a Rolling strategic plan in effective implementation of ICT infrastructure and services: The case of the Open University of Tanzania". The 5th Pan Commonwealth Forum on Open Learning, 13-17 July 2008 at the University of London, London UK.
- [6] United Republic of Tanzania [URT], Tanzania Vision 2025, Government Printers, 1998
- [7] A. Greenberg, Assessment of comparative advantages of Swedish ICT support in Tanzania. Stockholm: SIDA (2008) also available at www.sida.se/publications [10.11.2009]
- [8] T.S. A Mbwette, "A decade of delivery of open and distance education by the Open University of Tanzania (OUT) in Africa and beyond. International forum on 'a decade of distance education in the commonwealth: achievements and challenges'", Abuja, 18th – 20th May 2009.
- [9] E. T. N. Bisanda, "Opportunities for knowledge transfer through open and distance learning in Sub-Saharan Africa". Proceedings of the 2nd ACDE conference and general assembly hosted by the National Open University of Nigeria, and held at Eko Hotels, Lagos 8 – 11th July 2009.
- [10] Open University of Tanzania (OUT), "The OUT Rolling Strategic Plan 2008/09-2012/13", OU, 2009.
- [11] URT, Primary Education Development programme, Ministry of Education, 2001
- [12] V. Ndume, F. N. Tilya, & H. Twaakyondo, "Challenges of adaptive e-learning at higher learning institutions: A case of Tanzania", International Journal of Computing and ICT Research, (2008), 2(1), pp.47-59.
- [13] K. A. Nihuka, The Feasibility of E-Learning Integration in Course Delivery at the Open University Of Tanzania. Unpublished Masters of Educational Science dissertation, (2008), Enschede-Netherlands: Twente University
- [14] C. J. MacDonald, E. Stodel, T. L. Thompson, B. Muirhead, C. Hinton, B. Carson, & E. Banit, "Addressing the eLearning contradiction: A collaborative approach for developing a conceptual framework learning object". Interdisciplinary Journal of Knowledge and Learning Objects, (2005) 1. <http://ijklo.org/Volume1/v1p079-098McDonald.pdf> [12.11.2009]
- [15] J. H. Lungo, & J. J. Kaasabol, "Experiences of open source software in institutions: Cases from Tanzania and Norway". Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries, São Paulo, Brazil, May (2007).
- [16] T. Wilson, "New ways of mediating learning: Investigating the implications of adopting open educational resources for tertiary education at an institution in the United Kingdom as compared to one in South Africa". International Review of in Open and Distance learning (2008) 9(1)
- [17] J. Thakrar, D. Zinn, & F. Wolfenden, "Harnessing Open Educational Resources to the challenges of Teacher Education in Sub-Saharan Africa". International Review of Research in Open and Distance Learning (2009), 10(4)
- [18] A. S. Sife, E. T. Lwoga, & C. Sanga, "New technologies for teaching and learning: Challenges for higher learning institutions in developing countries". International Journal of Education and Development using Information and Communication Technology (IJEDICT) (2007) 3(2), pp 57-67

- [19] D. L. Smith, & M. J. McNelis. 1993. Distance Education: Graduate student attitudes and academic performance. ERIC Document Reproduction Service ED 360 948.
- [20] Mbwette, T. S. A. (2006). Higher Education Institutional Reform in Tanzania: prospects and challenge. *Journal of Issues and Practice in Education*, (2006) 1(1), pp 13-27.