E-Learning Implementation: Challenges and Opportunities for Higher Education Institutions in Rural Settings in South Africa (Case Study)

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Abstract
The use of information and communication technology (ICT) is changing all aspects of our lives and fueling the economic growth globally. Technology can play an important role in building Africa's progress in education, training and development. The utilization of modern technologies in education is becoming at the heart of higher education institutions (HEIs) generally and South Africa (SA) in particular. E-learning refers to the use of ICT in different processes of education to support and enhance learning in education. The implementation of e-learning in HEIs in SA is becoming an important factor for government and educational sector. For more than a decade, educational systems in SA are looking for e-learning programs that would help to address challenges and to significantly improve the quality and content of HE teaching and learning. But the successful implementation of e-learning in HE depends on many factors such as, the accessibility of technology, how learners and teachers are supported in its use and the integration of technology within the curriculum. The purpose of this research is to investigate the challenges and opportunities e-learning offers in a rural HEIs in SA over the traditional way. The paper also highlighted major barriers to the integration of e-learning in rural HEIs in South Africa. The findings indicated that the implementation of e-learning offered a diversity of opportunity for teaching and learning in rural HEIs but for a successful implementation some factors need to be address. Finally, the paper provides guideline for the integration of new technologies in rural settings Universities.

Keywords : *ICTs, e-learning, technology, learning, higher education, e-learning integration*

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Introduction

Information Communication Technology (ICT), has brought about heightened interconnectedness across borders. Technology is driving change globally and fueling the economic growth. There is now an urgent need for essential technological revolution Africa general is now prepared to embrace. Education is the key to the future and, if is to do what is expected of it, modern technology has to be at the heart of education systems in Africa in general and South Africa (SA) in particular. In SA context, the successful implementation of e-learning in educational systems can contribute to an intense change in teaching and learning practice in higher education (HE). E-Learning becomes possible when there is an integration of ICTs in the education system, which requires a policy and strategy of its own. Although ICT has brought about heightened interconnectedness across the world, the reality is that until now in most countries of Africa, there is no clear marriage between a national ICT policy with national education goals and strategy. A report by UNESCO (2006), confirm that the use of Information and Communication Technologies (ICTs) in educational systems in Africa, is believed to have huge potential for governments struggling to meet the growing demand for education while facing an increasing shortage of teachers, ITCs infrastructures and modern facility to usher modern technology. E-learning may have a great potential in Africa due to the great need for educational systems to speed-up the millennium development goals to the sustainable development goals. Another report by the UNESCO indicated that, the gains from the adoption and implementation of eLearning are many and varied among which are the flexibility in learning (Kocur & Kosc, 2009), lower cost compared to face-to-face contact, ability to engage the increasing number of student, availability of re-usable content, more avenues for students' development, increased educational opportunities, among others develop practices in today's fast moving work place environment by the use of modern technology. These advantages or opportunities of e-learning are however faced with some challenges that are central and critical for the entire African continent and SA specific to a successful implementation of e-learning in higher education institutions. Among these challenges, most rural universities in SA are characterized by issues such as: lack of access and connectivity, infrastructure, proper technology, funding, technological skills, strategy and policy, etc. The discussion in this paper is to investigate the challenges and opportunities that e-learning offers over traditional way of teaching/learning and also highlighted major barriers to the integration of e-learning in rural HEIs settings in South Africa.

Definition of E-Learning

Technology-based e-learning encompasses the use of the internet and other important technologies to produce materials for learning, teach learners, and also regulate courses in an organization (Fry, 2001). E-learning as a concept is not just learning with technology but also covers a range of applications, teaching pedagogy, learning methods, and processes (Rossi, 2009). According to Maltz et al (2005), the term 'e-learning' is applied in different perspectives, including distributed learning, online-distance learning, as well as hybrid learning. E-learning refers to the use of information and communication technologies to enable the access to online learning/teaching resources. In their literature review on definitions for e-learning, Liu and Wang (2009) found that the features of eLearning process are chiefly centered on the internet; global sharing and learning resources; information

broadcasts and knowledge flow by way of network courses, and lastly flexibility of learning as computer-generated environment for learning is created to overcome issues of distance and time (Liu and Wang, 2009). E-learning, according to OECD (2005) is defined as the use of information and communication technologies in diverse processes of education to support and enhance learning in institutions of higher education, and includes the usage of information and communication technology as a complement to traditional classrooms, online learning or mixing the two modes. E-Learning becomes possible when there is an integration of ICTs in the education system, which requires a clear policy and strategy of its own. In SA context this policy maybe derived from joining a national ICT policy with national education goals and strategy.

Higher Education Environments in South Africa

Higher education institutions in South Africa are working toward the new waves of change in 21st century by seeking innovative pathways and crossing new frontiers into the fundamentally different education landscape in the digital age. However, the challenges still in how rural universities in SA can make use of technology to serve on- and off-campus students. The last decade has seen unprecedented shifts in the higher education landscape in South Africa with the growth of ICTs and education technologies initiating changes in the teaching and learning practice of higher education institutions. However, the ICTs revolution in higher education, some rural universities setting are still facing challenges such as digital divide, effective physical infrastructure as well as virtual learning environments that will contribute to the successful integration of the modern technology. Rapid growth of online distance education worldwide prompted there is a need for HE in South Africa to review delivery structures for teaching and learning and re-think pedagogical practices in the digital age. Introducing PCs into school systems and building school networks is still in process and not much has been happening in some part of South Africa. The issues of technical maintenance or for capacity building for teachers with regards to the use of technology in the classroom, content development and delivery, pedagogical use of technology, and infrastructures (old building, electricity etc..), need to be address, in order to gain a foothold in the worldwide knowledge economy driven by ICTs. Currently, the effective integration of ICT in the higher education institutions in rural settings is critically important to reduce the knowledge gaps, digital literacy, and economic gaps between rural institutions and those in the urban settings.

The Use of E-Learning In Education

The expansion of multimedia, computer based program and the fast growth of the use of ICTs and Emerging technologies (EMTs), as well as the use internet as a new technique of delivery content, has caused a changes in the traditional ways of teaching and learning (Wang et al. 2007). The use of ICTs in education has created more avenues and innovation in 21st century. Agendas of schools and higher education institutions worldwide have recognized e-Learning as having the prospect to transform people, knowledge, skills and performance. Love and Fry (2006), argued that colleges, universities, and other institutions of higher learning race to advance online course capability in a speedily developing cyber education market. E-learning, has come to be more and more important in institutions of higher education. The introduction and expansion of a range of e-Learning tools has been initiating

numerous changes in higher education institutions, particularly when it comes to their educational delivery and support processes (Dublin, 2003). Figure 1, show a model adapted from Algahtani (2011), for using e-learning in education.
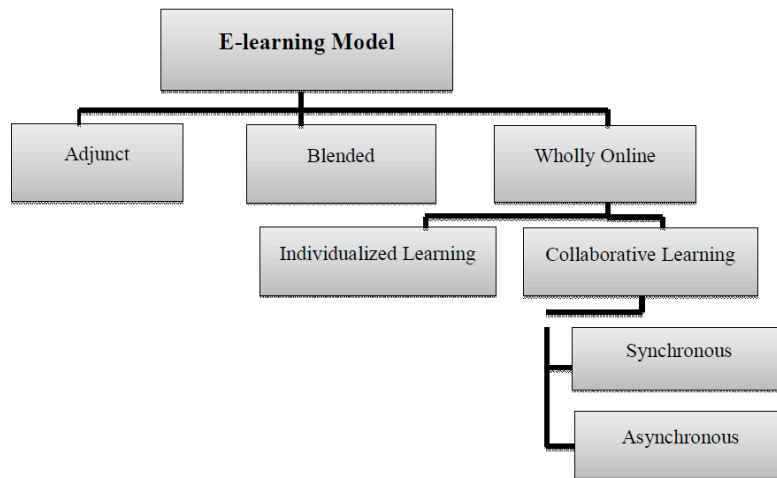

Figure 1: Source: Adapted from Algahtani (2001).

The above model is one general that can be utilize in the use of e-leaning which is different from the model use in the implementation of e-learning. The same way there are different types of e- Learning, there are also diverse ways of employing the technique in education. The model that may work for HE in the developed countries may not be the same model that can work in developing countries in Africa. That is why there is a need to inspect different types of e-learning approach and identify a suitable approach that can be used in developing countries especially in rural institutions.

Types of E-Learning

There are various ways of categorizing the types of e-learning. According to Algahtani (2011), there are some classifications based on the extent of their engagement in education. Some classifications are also built on the timing of collaboration. Some researcher divided e- Learning into two basic types, which is: computer-based and the internet based e-learning (Algahtani, 2011). In his paper, Algahtani (2011) argued that computer-based learning comprises the use of a full range of hardware and software generally that can enable better use of Information and Communication Technology (ICT). These component can be used in either of two ways: computer managed instruction and computer-assisted-learning. Whereby in computer assisted- learning, computers are used instead of the traditional methods by providing interactive software as a support tool within the class or as a tool for self-learning outside the class. In the computer-managed instruction, however, computers are employed for the purpose of storing and retrieving information to aid in the management of education. This type may be appropriate in areas where internet connection is a problem due to geographically localization. The internet-based learning according to Almosa (2001), is a more advance of the computer-based learning, and it makes the content available on the internet, with the readiness of links to related knowledge sources, for examples e-mail services and references which could be used by learners at any time and place as well as the availability or absence

of teachers or instructors (Almosa, 2001). Zeitoun (2008) classified this by the extent of such features use in education, mixed or blended more, assistant mode, and completely online mode. The assistant mode supplements the traditional method as needed. Mixed or blended mode offers a short-term degree for a partly traditional method. The completely online mode, which is the most complete improvement, involves the exclusive use of the network for learning (Zeitoun, 2008). With these technologies, HE education institutions in Africa general and SA in particular can benefits and also embrace globalization in education. With the increase number of mobile phones technology and the internet in Africa, this type of eLearning maybe be appropriate for use in urban and rural are in South Africa. But the challenge maybe in the cost of data bundle since most area do not have free access on internet.

Challenges of Implementing E-Learing in Higher Education Institutions in The Rural Settings.

In South Africa, the education systems have been shaped by the political and economic goals of apartheid and colonialism (Gordon & Qiang, 2000). Even though Several advantages can be derived from the implementation of e-learning in the education systems, most of higher education institutions in the rural settings of South Africa are still faced with challenges such as shortage of skilled instructors, learners and teachers background, shortage of ICT infrastructures, lack of pedagogical strategy in the use of ICT, inadequate technical support, and attitudes of instructors and learners towards the use of ICT. In the following section we will discuss few of these challenges.

1. *Learners background*

In South Africa, there are diverse backgrounds, languages and race; the country is divided between rich and poor. Most learners from rural institutions are from poor backgrounds, disadvantaged schools, and they receive underprivileged education. Sometimes, they are taught in their mother's tongues for better understanding even though in South Africa, English is used as the instruction language. These learners have difficulties to read, write or communicate in English since they use their home languages most of the time to communicate with their teachers and classmates. The inequality to education is still a major challenge in South Africa. The education offered in urban areas is totally different from the one learners in rural settings receive. Leaners in most rural schools have low/no access to ICT infrastructure such as computers and Internet. It also becomes a challenge to adopt ICT in these rural institutions as most of the content is English, a language still considered foreign. In most countries where English is not the first language this represents a serious barrier in integrating ICTs use in the education (Mbodila et al., 2013). Even if these learners may have access to the ICT infrastructures, if they cannot read and understand its contents it becomes a challenge to implement e-learning in these institutions. Literacy in today's digital age requires more than the ability to read and write (Hennessy et al., 2010). ICT literacy can be defined as "the ability to realise the need for finding and effectively using" ICTs. (Kawooya, 2004). The Integration of ICT in the context of eLearning, can enhance teaching and learning in these rural institutions but with this challenge, it is difficult for these type of learners to embrace it fully.

2. Shortage of skilled instructors

Most higher education institutions in the rural setting of South Africa have shortage of skilled instructors. Skilled instructors prefer to work in urban areas for different reasons. Before implementing e-learning in these institutions, there is a need of having skilled instructors that will be able to use the technology and the e-learning contents. However, for instructors to have a successful learning experience in the use of this technology, it is important that they adapt and familiarize themselves with technology. A research studies by (Gorder, 2008) reported that teacher experience is significantly correlated with the actual use of technology. Taylor (2002), reported that academics are only good as much as they can adapt to the new technology. In their study (Baek et al., 2008) claimed that experienced teachers are less ready to integrate ICT in their teaching. Sandholtz & Reilly (2004), reported that teachers' technology skills are strong determinant of ICT integration, but they are not conditions for effective use of technology in the classroom. Many academics believe that being skilled with technology is to know how to use technology such as word processing, PowerPoint to create a better presentation and upload it on e-learning system rather than learning new e-teaching skills to improve and help student learning. In their research study (Sang et al., 2010) highlight that teacher with higher self–efficacy about computers tend to use computers more often and they experience less anxiety related to computers but teachers with lower self-efficacy related to computers experience frustration and hesitate to use computers when they encounter problems. (Rosen & Maguire, 1990) claim that teachers teaching experience does not eliminate computer phobias and many experienced teachers display some wariness, discomfort and/or mid anxiety in relation to computers. Many researches have shown that whether beginner or experienced, ICT training program develop teachers' competences in using computers (Franklin, 2007) and assist teachers restructure the task of technology and how new technology tools can be used to enhance teaching and learning (Plair, 2008). The Implementation of e-learning in these rural institutions is possible if these challenge is overcome by providing adequate ICT training that will assist teachers adapt to technology and do their jobs effectively whether this relates to uploading study materials or assessing students online.

3. Shortage of ICT infrastructures and lack of access to appropriate resources

The shortage of ICT infrastructures and lack of access to appropriate resources are the major challenges in the rural institutions of South Africa. The implementation of e-learning in these institutions still posing a major challenge due to economic and social discrimination cause by the digital divide. After independency, the South African government has developed guidelines for the distribution and use of digital resources to strengthen teaching and learning to promote access to educational opportunities for previously advantaged groups (Dumbrajs et al., 2013). No matter this intervention, previously disadvantaged schools are still struggling to access appropriate resources where adapting new teaching and learning approaches with available ICTs is concerned. A study by (Lundell et al, 2000) argue that, the problem is not always caused by the lack of resources, but how teachers use the available educational tools in their teaching. Adopting e-learning raises many financial and strategic challenges (Levine & Sun, 2002). Financial problems push institutions to find adequate resources to develop and maintain proper equipment, provide static technical support, fund training courses and hire support staff. The infrastructure challenges in most rural

institutions is due to the apartheid policy of segregation and development (Dzansi and Amedzo, 2014). Access to ICT infrastructure and resources is still an issue in the rural institutions of South Africa. In these institutions, there is limited access to resources such as computer hardware, software, and Internet. Teachers and learners in these institutions struggle to use the ICT resources for teaching and learning. In their study (Plomp, 2009) reported that access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education. Access to technological resources is one of effective ways to teachers' pedagogical use of ICT in teaching (Yildirim, 2007). Without full accessibility and availability of ICT infrastructure and resources, it is difficult to implement e-learning the in rural institutions.

Some Factors to Be Consider Before Implemntation of E-Learning

E-learning has without doubt certain limitations or disadvantages in spite of the advantages that it has when adopted in education. But for a successful implementation of e-learning, there are some factors that need to be look such as: 1) Having IT infrastructure in place (Internet, Computers, LMS etc.). A successful implementation of e-learning requires proper Internet, bandwidth, and LMS so to meet the technology requirements. Lack of these technology awareness suppresses the adaption of eLearning. 2) Having infrastructures in place (computer labs, ICTs devices etc.). It is important for any organization before implementing e-learning to understand the importance of setting up facilities or infrastructure in order to ensure that students can access the courses material easily. 3) Training academic staff, tutors and learners on how to use the tools of e-learning. In rural settings most teachers and learners are computer illiterate. This is because most of them never use these type of technology before. Training them on how to use these tools will motivate and help them adopt eLearning in their teaching and learning. This is one of the crucial step for any institution to ensure a successful implementation of e-learning. 4) To upgrade the existing curriculum or review existing curriculum to ensure the integration of ICT. Once staff and students are trained, there is a need to review the curriculum to ensure a full integration of eLearning.

Guideline for E-Learning Integration

The integration of e-learning generally involved various components such as planning, design a e-learning content, available technology and infrastructure, training and monitoring. The planning is a collaborative process, that start with making stakeholder buy-in and support and involving stakeholders in the whole process. The e-learning content should be relevant to local needs of the users in our case students and teachers and adapted properly. The choice of the appropriate technology must be available and suitable to users (students and teachers). Training is the most important part for end users, implementers, and IT support personnel is a vital component of eLearning integration. Monitoring is essential for as with any project to measuring outcomes and must be planned for each stage of the process to reach the e-learning goals. Make use of the component of e-learning integration Figure 2, shows to use as guideline before integration of e-learning in some rural settings.
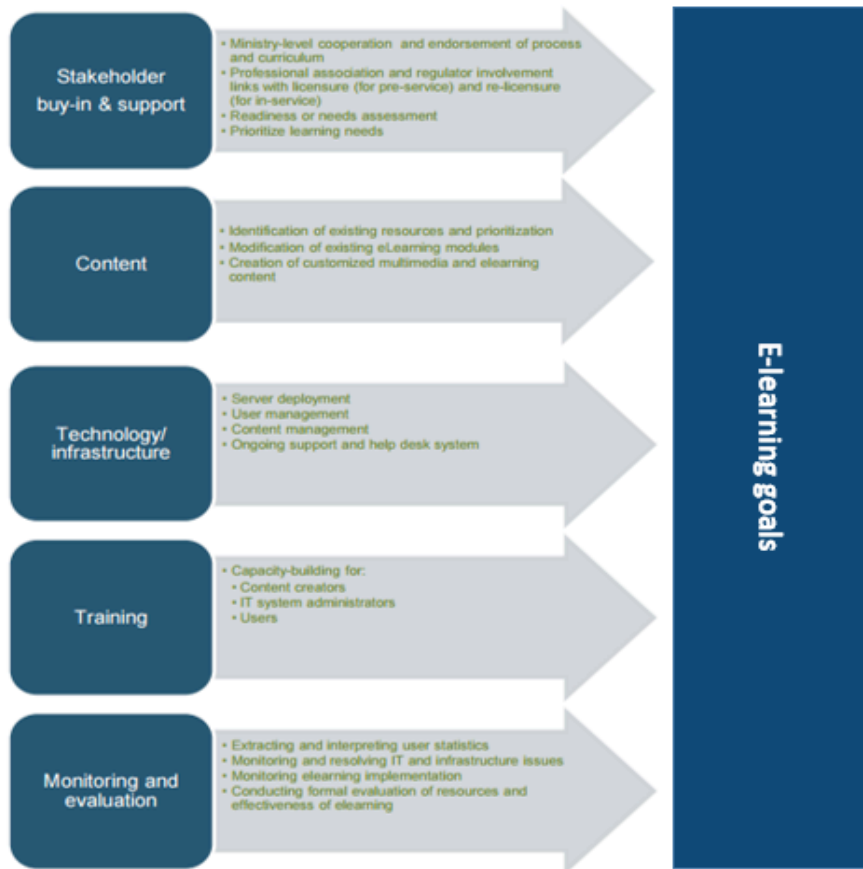
Figure 2: Components involved in e-learning integration

The actual e-learning integration in a rural settings institution, will require planning, training, implementation testing, dissemination, formative evaluation, ongoing user support, and addressing any technical issues.

Conclusion

E-Learning is still in its growth phase and holds tremendous potential for developing countries in Africa. The growth of e-learning is almost wholly dependent on the advancements in corresponding technologies. However, it requires huge amounts of financial and human resources input for rural institution in SA. There is a major data gap in ICT in education data between urban institutions and rural institutions in SA. E-Learning involves the use ICTs and digital tools for teaching and learning in education. This comprise but not limited to the policy and strategies, training, infrastructure, technology available, delivery of knowledge and motivates teacher and students to interact with each other, as well as exchange and respect different point of views. Regardless of some challenges of e-learning discussed in the literature, the reality is that the role of eLearning in SA Higher education's institutions will make a strong impact in teaching and learning delivery. Generally, the literature which explains the advantages and disadvantages of eLearning suggests the need for its implementation in higher education for faculty, administrators and students to enjoy the full benefits that come with its adoption and implementation. Although the Rural institutions in SA has not make full use of e-learning technology, by making use of the guideline proposed in this paper, there are opportunities for Rural HE institutions

in SA to close gap with the rest of the urban institutions in the use of eLearning in education.

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