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The advantages and challenges of e-learning implementation: The story of a developing nation

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e-learning may have a greater potential in developing countries than in developed countries due to the great need for education to speed-up development and the potential for enrolment. According to a 2006 UNESCO report, the use of Information and Communication Technologies (ICTs) for dissemination of education is believed to have huge potential for governments struggling to meet the growing demand for education while facing an escalating shortage of teachers (UNESCO 2006). This belief is evidenced in Ghana by the numerous efforts and attempts by the government through its Ministry of Education (MoE) and private partners' – both multilateral and local IT companies – initiatives and programmes aimed at introducing and inculcating e-learning into educational institutions at all levels. In 2006, an ICT in Education Policy was drafted by the MoE. This policy made compulsory the use and teaching of ICT at the primary and secondary levels of education, an indication of the government's commitment to e-learning (electronic learning).

As indicated by the UNESCO report, the gains from the adoption and implementation of e-learning are many and varied among which are the flexibility in learning (Kocur & Kosc, 2009), lower cost compared to on-campus presence, ability to absorb the increasing number of student, availability of re-usable content, more avenues for human development, increased educational opportunities, among others. These advantages are however faced with some challenges that are fundamental and critical to a successful implementation in a developing country like Ghana. It must be noted however that these challenges are not alien to developed economies (Andersson and Grönlund, 2009). Notable among these challenges are infrastructural, technological, funding, institutional support, etc. In this paper, a theoretical discussion is presented of the advantages and challenges of e-learning to Ghana, a developing country in the western part of Africa. The discussion of the challenges to e-learning implementation uses the conceptual framework developed by Andersson and Grönlund (2009) and considers their relevance to the Ghanaian context.

BACKGROUND

Ghana, a developing country has seen an increase in its population from 3.6 million in the 1960s to over 23 million in 2009. This growth has resulted in an increase in the number of students of school going age at all levels, from the primary to the tertiary levels. In the face of globalization and the advent of ICT all over the world, a phenomenon that has brought advancement to most developed economies and promoted high levels of literacy due to

increased access to digitized information, Ghana can best be described as yet to take advantage of the opportunities created by ICT to accelerate its development. The potential for accelerated development using ICT was identified in 2004. Ever since then, the government of Ghana has initiated several programmes aimed at harnessing its potential for development. Of particular relevance to this discussion is how e-learning can be integrated into the Ghanaian educational system to bridge the digital divide and provide solutions to some of the educational challenges being experienced by Ghanaian institutions.

Evidence exists from the primary levels of education in Ghana to the tertiary level of increasing numbers of student enrollment. This situation has resulted in double streams being created for students at the primary levels and high teacher to student ratios at the secondary and tertiary levels. At the primary levels, the predominant problems are the inadequate teachers, inadequate resources and technical expertise. At the secondary level, the predominant problems are the high student to teacher ratios and inadequate resources and technical expertise. While at the tertiary level, the predominant problems range from high student lecturer ratios, inadequate infrastructure, inadequate and low technical expertise, and high numbers of potential students turned down every year due to inadequate resources, among others. E-learning has the potential to reduce and possibly eliminate these challenges if properly implemented. Given this background to the current situation in Ghana's educational system, let us now look at the advantages e-learning offers and the challenges posed to a successful implementation.

ADVANTAGES OF E-LEARNING

e-learning offers the opportunity for information to be presented in various forms – text, sound, pictures, etc. More than that, it affords the opportunity for the information to be stored in various mediums and formats over long periods of time and accessible over long distances. Compared to face-to-face learning, these mediums can provide means of revision several times over in a day and over a period in a manner more accurate and convenient to students who are at the centre of the teaching and learning activity. These facts are not only true for primary education; their relevance spans all levels of education, and even work place learning. To this end, integrating them into Ghana's education system would not only bridge the digital divide, but also bring about an improvement in the teaching and learning activities, opportunities for life-long learning and attainment of the Information and Communication Technologies for Accelerated Development (ICT4AD) goals of Ghana. In this section, we take a look at the following advantages e-learning can offer to Ghana.

e-learning offers great flexibility in learning (Kocur & Kosc, 2009). This flexibility provided by the various forms in which the learning material can be presented, allows the students a variety of options to learn from at their own pace and time. From rhymes and songs, alphabetical to numerical studies at the primary level to different courses offered by tertiary institutions through Computer-Based Training (CBTs) and Learning Management Systems (LMS), students can learn as often as they want and at their own pace. Though some research have shown that this flexibility does not always lead to learning, this can be attributed to the lack of discipline, competency in the use of the medium (technology) and general attitudes of

the users. Where these issues are non-existent or minimised, the flexibility benefits of e-learning could be harnessed to provide a world of information that have been tried, tested and preserved for centuries for the purposes of learning and development.

e-learning also offers lower cost to both students and implementers. There are different e-learning products and packages. From CBT materials on CDs to LMS on the internet, students have the option to select products and packages that suits their available funds. Some of these are often one-off purchase or payments which place little or no burden on the student who needs to learn. Again compared to having to enrol in an institution with its inherent accommodation and other expenses, e-learning offers the same opportunity to learn without incurring these implicit costs. For the implementers, there is evidence to show that the initial setup can be quite expensive. This however need not be the case as different vendors, products and packages exist. Also, when the experiences of other implementers are considered, it reduces the potential of escalating costs and failure of e-learning implementation. Coupled with proper maintenance and updates, the e-learning system could be brought up to state of the art through updating and assurance of reliability of access at all times.

e-learning also has the potential to absorb the increasing number of students that characterise the Ghanaian educational system particularly at the tertiary level (Karim & Hashim, 2004). The major issues creating these problems include inadequate teachers, inadequate learning resources like books, classrooms/lecture halls, accommodation, etc. This creates a situation where teaching and learning can become ineffective due to large numbers of students and the inadequate and sometimes unavailable required learning materials. This has resulted in many institutions limiting their admission of the many qualified applicants they receive each year particularly at the tertiary level. With e-learning access to digital content becomes easy, always available and easily accessible. When students are properly trained to access and use them, learning then becomes driven by the student and guided by the teacher in a flexible way. This can actually enable institutions to absorb more students while enhancing the teaching and learning activities using e-learning.

e-learning also makes available content for re-use. Through careful research and development of learning curriculum, materials essential for learning to take place are developed and stored through digital mediums. These contents are therefore available for further study and review in the face of developments in the field through research. This makes them always available for re-use without the stress of development from scratch. This has the potential to save time and allow adaptation of the content to different learning situations with only slight modifications. If well managed, there can only be improvements in the content over time, a situation that will ensure improvement in the learning effort and availability of scarce learning materials in a developing country like Ghana.

e-learning also provides more avenues for human development and increased educational opportunities. After the initial educational experience at the primary and secondary levels, people aspire for more specialised educational experience for their professional life. Often times because of working conditions and problems with funding, many people are unable to

pursue higher education at the tertiary level. e-learning provides a variety of avenues for human development. People of all ages with little or much experience in formal education can develop themselves through the opportunities afforded by e-learning. While some educational institutions may require certain previous background experience and qualifications before students can enrol, others are more professional based and simply require ability to read and understand. In all this, there is the opportunity for increased learning, human development and life-long learning. There is also a wide spectrum of knowledge made available for assessment of users before enrolment. All of these in no small terms ensure a knowledgeable society in a fast growing digital world.

CHALLENGES OF E-LEARNING IMPLEMENTATION

Though there are several advantages to be derived from the implementation of e-learning, these benefits are not likely to be realised due to certain fundamental challenges facing the educational system in Ghana. Andersson and Grönlund (2009) proposed a conceptual framework for understanding the challenges facing e-learning implementation in developing countries and for conducting further research. This conceptual framework consists of thirty major challenges categorised under four major categories: individual characteristics (both students and teachers), technological challenges, course challenges, and contextual challenges. A study of the Ghanaian educational environment shows that these challenges identified by the framework exist in different levels. Considering the presence of all the challenges operating at different levels, there appears to be a long way for Ghana to benefit from the adoption of e-learning. Below we discuss the various challenges.

INDIVIDUAL CHALLENGES

Student

- Motivation
  Student motivation is seen as a very critical factor in a successful implementation of e-learning. Research has shown that highly motivated students perform well whereas those not motivated tend to drop out. Students must be motivated to use the e-learning system. There is the need to provide some kind of reward system that would motivate students to use e-learning. This can be done through recognition by the laws of the land, distinctly cheaper cost of enrolment, and commitment by the institutions and its lecturers. The e-learning must be aligned to the expectations and needs of the students. When they perceive that they can achieve their educational objectives and aspirations through the e-learning medium, they will be more willing and motivated to continue. Where this is not the case, the potential for high drop out rates will cause the implementation to be unsuccessful.

- Conflicting priorities

The amount of time students have to and want to commit to the course also plays an important role in the success of e-learning implementation. The time devoted to learning is an important predictor of a student's learning and retention. Research shows that most students feel stressed and have problems arranging time for the course due to work and family commitments. When several activities compete for the attention of the student, without prioritization and discipline, very little can be realized from an e-learning programme. This is based on the belief that with e-learning, the level of progress made in learning is highly dependent on the student. Thus without making time for studies – reading materials, answering test questions, engaging in group assignments, etc – due to other equally important activities like job and home requirements, the expected impact will not be felt. This would create dissatisfaction, high drop out rates, and a rippling effect of discouraging potential students.

- Economy

  The lack of student funding and financial difficulties can make students drop out of an e-learning programme. Funding is a major problem for most students in Ghana due to the prevalence of poverty. In the typical classroom education, most parents are unable to afford fees and other educational charges, leading to the drop out of many students. Many institutions have instituted flexible payment terms for their students and yet still many are unable to meet the payment deadline. Though e-learning can provide a cheaper alternative, this must be seen to be reasonably cheaper and more affordable if its implementation is to be successful. A special fund can be created to encourage interested students into enrolling on the e-learning programme.

- Academic confidence

  The academic confidence of a student can predict the success or failure of a student in an e-learning course (Simpson, 2004). Some researches show that academic factors such as previous academic experience and qualifications can best describe students' performance (Andersson, 2008). Where a student's self efficacy, which is the student's confidence in his or her ability to successfully complete a course, is high, the potential for impacting positively on the success of an e-learning implementation can be positive. Where the self-efficacy is low, it can result in difficulties in the implementation.

- Technological confidence

  Students also need to have the necessary computer skills and feel confident in the use of computers. The lack of these skills can be a hindrance to learning, especially for students who are entirely new to computers as computer confidence accounts for much of the predictive power of good achievements. Many students in Ghana have either not been introduced to computers or have a difficult time grasping the concepts and skills due to many factors like no access to computers, little time spent using computers due to the number of students wanting to access them, etc. many students

therefore leave school with little confidence in their ability to use these type of technology. Where this is the case, implementing e-learning systems become a challenging task both for the implementers and the users.

- Social Support (Support from home and employers)
  A stable and supportive study environment affect e-learning to a very large extent and some research suggest that this is perhaps the most important factor influencing drop out and retention. Social support can be about the time, and help students get from family and friends, and employers for those working. The very nature of e-learning that suggests self study, either in part or whole, shows that a conducive environment, devoid of distractions, and full of support from the home and work place is required. Where there is little understanding of e-learning and its contributions to personal, organisational and national development, the denial of this support can negatively affect its implementation.

- Gender
  Issues of gender can also influence e-learning implementation in developing countries. Where there is a higher drive towards male education, compared with the girl child education, the total number of potential users of e-learning can be drastically reduced. Encouraging more girls in education can increase the number of users, particularly as there are evidences that girls learn faster than boys. In Ghana, before the year 2000, there were more boys in education than girls, even to the tertiary level. when the gender policy was passed in 2005, the number of girls enrolling in schools have increased. If this is not well managed and promoted, it could affect the implementation of e-learning in some institutions.

Teacher

- Technological confidence
  The confidence of the teacher in using computers and other technologies is very important. The ability of teachers to use technology in imparting knowledge and skills to their students can determine the impact to be made with e-learning. This ability is equally dependent on their prior experience in the technology's use and skills acquired. Where the confidence of the teacher in the use of technology is low, the teacher would either not use it or use it ineffectively. In both cases, the chances of a successful implementation of e-learning would be poor.

- Motivation and commitment
  Teachers and trainers also need to be motivated and committed to the e-learning if its implementation is to be successful. Benefits of an e-learning implementation must be explained to teachers in order to gain their commitment and raise their motivation. The absence of this can lead to mistrust and resistance to the implementation of e-learning. Motivation and commitment would ensure that teachers research into and

look for ways of improving learning aspirations of students. Failure in this can cause student dissatisfaction. For instance where teachers fail to provide feedback, students tend to either drop out or not pass.

- Qualification and competence
  The teacher's qualification and competence in general and in online teaching in particular also play important roles. There is the notion that the higher qualification a teacher has, the tendency to appreciate new things like the use of technology in education. Also, where the competency of a teacher is enhanced, fear of failure and use of a technological medium is reduced, if not eliminated. For e-learning, training must be provided to the teachers and instructors. Their competencies need to be strengthened through training from time to time. Research can also be carried out to ascertain their levels of development. Where this is not the focus of attention, any attempt to successfully implement e-learning can be flawed.

- Time
  The time available for developing e-learning materials, and taking part in e-learning course matters also play important roles. Where time is not made to develop and ensure quality of e-learning materials, contents made available will be of little help to users. Again the failure of teachers to engage in e-learning activities that improves upon the teaching and learning functions can greatly affect the implementation of e-learning.

COURSE CHALLENGE

Course design

- Curriculum
  There is the concern that the curriculum, which details all the activities and contents to be undertaken are often taken from the classroom context without modification and placed in the e-learning setting. A curriculum developed for a classroom takes the physical presence of students into consideration and clarifies the concerns of students immediately. An e-learning medium would need to anticipate most of these and provide answers before use. Some research emphasise the need to develop new curricula specifically designed for an e-learning setting (Andersson and Grönlund, 2009). The failure of implementers to take this seriously shows a lack of understanding of the inherent differences between e-learning and classroom based teaching. As Karim & Hashim (2004) put it, 'in education, curricula and instruction mus be reviewed in the light of the demand of information and communication technology (ICT) – related technologies. Where this is not considered, it can lead to difficulty in learning, leading to dissatisfaction, discouragement and subsequent drop out and failure of the programme.

- Pedagogical model

The choice of pedagogical model is believed to have effects on learning. Andersson and Grönlund (2009) argue that the appropriateness of pedagogical models favour a move from a more instructor-centred approach to a learner oriented approach where the students take ownership of their learning (Karim & Hashim, 2004). Choosing a wrong pedagogy for an e-learning programme makes all the difference between success and failure of the implementation. The pedagogy may vary from programme to programme depending on nature of the content and level of difficulty. Not considering this well is actually planning to fail.

- Subject content
  This refers to what is actually being taught or learned. How interesting, relevant, accurate, up to date and in line with the needs of future employers go a long way to determine the successfulness of the e-learning implementation. Where students do not perceive or feel that the information being provided is useful, they would be discouraged from using the system and discourage future users. There is the need for the subject content to be relevant to the expectations of the students and future employers, else the implementation of the e-learning will not be successful.

- Teaching and learning activities
  According to Andersson and Grönlund (2009), a lot of the papers discussed the impact that the teaching and learning activities used during a course have on e-learning. Among the various factors raised are interesting learning interactions, attractive design, frequent follow ups, teacher interventions, continuous assessment, students' choice between self study or group work (Andersson, 2008). Undoubtedly, teaching and learning via technology differs from classroom experience. Its use therefore requires adaptation to the needs of the subject matter. Also, the use of technology in teaching and learning should not leave out the basic experience like teacher intervention, follow ups, continuous assessments, etc found in the classroom experience. Where this is left out unduly, it can pose challenges to a successful implementation of the e-learning.

- Localization
  The idea of localization has to do with providing familiar artefacts with which the learners can identify with (Pagram & Pagram, 2006; Andersson, 2008). There are claims for the contents to consider religious beliefs, use local language, have relevance for a local setting and match with local needs. The images and symbols used should be appropriate for the local culture in order not to be offensive or simply confusing. Ghana has many ethnic groups with deeply entrenched traditional beliefs. Care needs to be taken in using artefacts that are familiar and do not imply negative things in relation to their belief system. This is applicable to both teachers and students alike. When this is not taken into consideration, artefacts used could discourage use and lead to poor implementation.

- Flexibility
  Flexibility in how learning should take place, where, when examination should be taken, and selection of the medium of content delivery should be open to the student (Andersson, 2008). This is believed to have a number of advantages in terms of for instance global mobility of the learners with no restriction to a particular nation. Students should have the option to choose their medium of learning. If they want online mediums, sue of CDs, Video Conference, etc, they should be given the opportunity to choose. Where the opportunity is not given and they are restricted to an e-learning medium which is unsuitable in their situation, it could lead to poor implementation of the e-learning.

Support provided

- Support for students from faculty
  In traditional classrooms, support is often given instantly and questions answered immediately in a face-to-face manner. There are claims that contact or intervention from the institution and support from the tutor or other staff improve learning and pass rates (Andersson, 2008). This can take various forms but the aim is often to ensure that students do not get confused or lack understanding in any matter. The support provided ensures that improvements are made in the system where necessary to ensure the optimum satisfaction of students. This is one of the areas where students are likely to consider before continuing with an e-learning programme. A low level support provision would discourage many people from using an e-learning system.

- Support for faculty
  Through the provision of technical support, training, assistance and commitment to the e-learning implementation to faculty, motivation could be whipped and commitment gained. This needs to be carefully planned out and implemented if it is to be successful. Research has shown that teachers in institutions vary in their knowledge, understanding and ability to use technology in teaching and learning (Karim & Hashim, 2004). Where the institution fails to provide the needed support to teachers, it could result in low motivation and commitment which could also result in little support to students. This will eventually cause many students to drop out, causing losses to the implementers and failure in the programme.

CONTEXTUAL CHALLENGES

Organisational

- Knowledge management
  For a successful implementation of e-learning, most researchers argue that there is the need for a knowledge management or knowledge building system where a knowledge repository is created built on research, evaluation, sharing of experiences among e-

learning implementing institutions, and the establishment of e-learning units. Ongoing research must be carried out in iterative fashion to improve upon what is learnt. Both students and teachers must be researched on and their concerns taken, studied, analysed and solutions identified and implemented. Where this is not done, the implementation is bound to fail in time.

- Economy and funding
  There is the need for economising and funding of e-learning project both with the human resource development and technology needed. There are some who argue for getting return on investment and cost sharing for e-learning projects. The e-learning implementation is not a one-off project and as such requires continuous funding. The funding goes into developing of staff, contents, research and others; all essential to a successful implementation. Not making provision for these is tantamount to wanting the programme to fail.

- Training of teachers and staff
  The failure to make provision for the training of teachers and staff of the institution implementing the e-learning also has the potential of marring the implementation of e-learning. This must be ongoing, monitored and evaluated to make meaningful adjustments for improvements. These trainings ensure that the competencies of the teachers are enhanced to make effective use of the technologies. Where this is not done, developments in the world of technology and their implications for effective teaching and learning cannot be harnessed for effective e-learning implementation.

Societal/Cultural

- Role of teacher and student
  The power distance between teacher and student, measured as the inequality between bosses and inferiors and the extent to which this is accepted, can affect the successful implementation of e-learning. Where the culture demands respect for the elderly by children and students, and teachers are regarded as experts who teach wisdom and cannot be questioned, learners act as receivers, and this would pose serious challenges for e-learning implementation. In Ghana, the educational system portrays the teacher as the source of knowledge. This culture already is causing many students simply to rely on what the teacher says in the classroom. Very few students bother to research further. This attitude could make e-learning implementation difficult as many students have a high dependency on the teacher.

- Attitudes on e-learning and IT
  The beliefs and attitudes of decision-makers in a political system will affect the growth of both technology and e-learning in a country (Andersson and Grönlund, 2009). The political backing and support from policy makers will ensure that appropriate policies are made and also encourage schools to adopt e-learning. Some

research findings show that at times both teachers and students question the credibility of e-learning courses with the perception of e-learning being inferior to traditional courses. If these attitudes and perceptions are not corrected through rigorous education, they can negatively affect the implementation of an e-learning system.

- Rules and regulation
  Situations where e-learning programmes are run without the proper rules and regulations being adhered to pose challenges to implementation. There is the need to ensure that all relevant laws are taken into consideration to prevent government regulations from catching up with the institution. Though no explicit rules and regulations exist in Ghana on e-learning implementation, they are bound to be formulated in time. However this may not be favour the implementers and may hinder future implementations. But if these regulations are not in place, the reliability and authenticity of e-learning programmes can be in question. This actually may be a significant factor delaying many institutions from implementing e-learning in Ghana.

TECHNOLOGICAL CHALLENGES

- Access
  Having access to technology in e-learning is evidently an enabling or disabling factor. Access here implies the physical access to a computer, an internet connection, the reliability of the connection and bandwidth, as may be needed to access the full range of the content needed (Burn & Thongprasert, 2005). In Ghana, many individuals and institutions have little or no access to computers and other technologies like the internet. Where the contents can be disseminated via CDs, they do not have the means of reading the content. This also is another critical challenge to the successful implementation of e-learning in Ghana.

- Cost
  The cost of the technologies needed in setting up the e-learning system is considered a limitation to the successful implementation of e-learning. This factor has been discussed where there is the need for affordable and low-cost ICT alternatives such as television, radio and telephones, and lower user charges. There is the notion among many Ghanaian individuals and institutions that technology is expensive. Research however shows that open source technologies also exist and function equally effectively as proprietary ones. Where funds are unavailable for proprietary e-learning systems, open source ones could be resorted to. The cost here also looks like they have been blown out of proportions as little research exist to show actual costs. This factor often scares many an institution from even thinking about implementing e-learning.

- Software and interface design

Where the software (LMS) supports the chosen learning model and pedagogy and the software is also easy to use, the implementation would seem highly successful. However the absence of this support and usability would result in challenges. Where a software is difficult to use for instance, there is little motivation for the user to use it. Interface designs that are unfamiliar to other systems the user may have experienced could discourage a user from continuing with the e-learning programme.

DISCUSSION

In the discussion above, it is obvious that e-learning holds huge potentials for Ghana's development as a developing nation. It can help absorb the increasing number of qualified students seeking admission year in and out, it can provide a rich source of current and updated information relevant to the needs of employers, enhance the teaching and learning experience, and also provide the opportunity for life long learning. Through e-learning, a true knowledge economy can be developed where people are increasingly and constantly educating themselves. Through the availability of current research in relevant subject areas, the nation would have the requisite human resource needed for accelerated development. Students would also derive satisfaction from flexible learning opportunities which can afford them the opportunity to work and earn a living at the same time as they educate themselves. With a higher literacy rate, the nation stands the chance of achieving its development goals through the successful implementation of e-learning. There is the possibility developing countries leapfrogging developed nations in this area (successful implementation of e-learning) if the challenges discussed above are eliminated or limited.

The challenges discussed above individually can make any implementation of e-learning an uphill task. However when many of these challenges are present in a single country, then it appears the country would face severe challenges, despite the benefits that could accrue from it. Looking carefully at the challenges, they could be further classified into government (national) challenges, institutional (local) challenges and individual challenges. However very little empirical evidence exist in Ghana to provide insight into these challenges. It is as a result of this that the doctoral thesis on the Adoption, diffusion, and implementation of e-learning in a developing country is being carried out.

Through an empirical research using action research an e-learning project would be studied to identify and analyse factors that influence a successful implementation of an e-learning project. A survey would also be carried out to study the position of the government on e-learning and its potential for development; while institutions already implementing some form of e-learning and individuals using it, would be studied to further enlighten the research community on advantages and challenges to successful implementation of e-learning to a developing country.

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