Information and Communication Technology and E-Learning Education in Nigeria: A Paradigm Shift

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Abstract

The problems of securing admission into higher education and the inflexibility in conventional universities that made individuals to opt for correspondence courses in time past have intensified because of the current population explosion problems in developing world as a whole. As a result, there is an increase in demand for a more flexible and cost effective means of education through e-education, e-learning or open and distance learning. This has brought a paradigm shift on how people generally view the significance of e-learning for higher education in Nigeria. Though e-learning is powered by Information and communication technology (ICT) resources, there are challenges in the implementation of ICT for e-learning despite their advantages in education. It was recommended that the integration of simple, accessible, and mobile technologies should be pursued as solutions to the full implementation of effective and result-oriented e-learning education in the Nigeria educational system.

Key Words: *ICT, e-learning, education, Paradigm shift, Nigeria*

Introduction

In Nigeria, education has over the years moved from one stage of development to the other with its peculiarities and challenges. There have also been series of innovations, strategies and policies based on the changes in the society. Some of these changes require technological approach which usually poses challenges because the country, like other developing countries, is ill-prepared and unable to immediately address each educational challenge as it appears.

Since it is becoming increasingly difficult to obtain admission into higher education due to population explosion, poverty, ignorance, and so on, the introduction of Open and Distance Learning (ODL), e-Learning or e-Education has brought a paradigm shift from the way learners view e-learning because some who have privately and individually sought to obtain degrees awarded through correspondence education by overseas institutions in the past, can now use the opportunities provided through e-learning education in the country. This aspect of the e-education objective is being gradually achieved. For instance, since the inception of the National Open University of Nigeria in 2003/2004, 34,000students were reported to have been admitted out of which 10,260 eventually registered for various programs; the university has about 141,527 applicants out of which 60,963 have been registered and that 24,689 students matriculated in the 2010/2011 session (Jegede, 2010). There is no Nigerian University that has recorded such because the National Universities Commission regulates the admission of other conventional or federal universities which should not, in normal circumstances exceed 5,000 new intakes per session.

According to Simiyu (1999), while correspondence education utilized print materials majorly, distance teaching or e-learning has incorporated a variety of media, especially information and communication technology resources to achieve its educational results.

Open and distance learning and e-learning incontrovertibly provide the most effective, flexible and cost effective means of operationalizing the learning paradigms which the contemporary knowledge demands. The open education, e-learning and ICT are inseparable especially when we consider some definitions of open education resources and that the resources for open education and e-learning are powered by ICT. D'Atoni (2007) describes open education resources as technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes. These resources are typically made freely available over the web or the internet, and the principle used is by teachers and educational institutions to support course development, but they can also be used directly by students.

Furthermore, open education resources can also be referred to as digitalized materials, offered freely and openly for educators, students and self-learners, to use and re-use for teaching, learning and research. Other researchers such as Geith & Vignare (2008) describe open education and e-learning resources as teaching, learning and research resources that reside in public domain which grant freedom to share, reprint, translate, combine or adapt such resources.

Stages in the Operations of ICT for Teaching and Learning

The utilization of information and communication technology resources generally display three stages that can be adapted for any form of the educational systems – formal, informal, e-education or e-learning – especially as they relate to the teaching and learning processes. These are as discussed below:

Information and Communication Technology (ICT) Input

ICT input refers to the acquisition, assimilation or absorption of issues, knowledge, messages and skills relating to ICT which are capable of making teachers more competent and effective. The input enables the individual to be functional, to maintain and influence the behaviors of the learners. This process also involves collecting, gathering or seeking information from researches and sources of information. The new media (such as the telnet, the file transfer protocol (FTP), the electronic mail (E-mail)) are examples of the various means of achieving the input aspect of ICT (Adegbija, 2000). The conventional media such as the television, slides, filmstrips, videos, audio formats, visuals, are also good sources of receiving ICT input. At the local level, researches show that e-learning generally has its input through facilitation, print media, audio media and rarely through other more sophisticated media in most developing countries (Karuna & Roy, 1991; Adegbija, 2011).

Information and Communication Technology (ICT) Processing

ICT processing refers to the documentation of information for e-learning. It is concerned with how current and effective the information from ICT input is; how to update and improve on the information or the data bases given. According to Thayer (1968), information processing

deals with evaluation (especially summative evaluation) of received information. This may involve indexing, categorizing and transformation. Evaluation at this instance can be achieved by possibly comparing past developments in ICT with the current ones. This enables users of ICT for any form of education to be able to interpret, expand and convert information received for their educational purpose and situation.

ICT processing also involves storing of information with the aid of files keeping, books, journals, memorizing and visuals in the study centers. In the new technologies storing of information can be achieved with the use of computer systems, World Wide Web (www) site, recordings (videos, audios, etc.), slides, filmstrips, gophers and so on.

Information and Communication Technology Output

Accordingly, ICT output refers to all the activities performed by individuals and e-learning providers for the dissemination of scientific information for their e-learners. This is made possible if the input and process stages are adequately managed. The three stages are very important and they are dependent on each other. In short, one can rarely do without the other. That is why people often say that you can only give out what you have. ICT output can be successfully achieved through the use of appropriate media. Also the new media, such as the computers, e-mails, www, virtual or e-library, the gophers and the Internet are examples of excellent means of ICT output.

Approaches to ICT

The implementation of information and communication technology sources should be planned in such a way as to ensure that the input, processing and output are attainable for the general objectives of e-education as a whole. The following approaches should therefore, be considered when planning for ICT for e-learning:

1). Participatory-oriented approach: ICT is a multi-level process of communication involving a variety of senders and receivers of ideas, knowledge and materials. This will make them see it as not merely foreign ideas imposed on them, or a difficult venture but will be like partners in progress with all other stakeholders of ICT that are committed to moving e-education forward. (Adegbija, 2000).

2). Mobilization/Motivation-Orientated Approach: This approach involves propelling learners into participating in the use of ICT devices adequately for their studies, assignments, tests and examinations which are usually electronically delivered. Mobilization is a full blown functional education through the use of technological devices. Even though Clark (1983) claimed that media do not only fail to influence learning, one can count on Salomon (1984) who argued that the new cognitive theories attribute motivation to learners' beliefs and expectation about their reactions to external events. Motivating learners to use ICT materials in the teaching and learning processes will in turn help to motivate their learner.

3). Communication-Oriented Approach: The communication approach is concerned primarily with the use of ICT to improve the effectiveness of communication skills in education. This approach when taken to the negative extreme will be like the claims of Clark (1985) that media

are mere vehicles that deliver instruction but do not influence students' achievement any more than the truck that delivers our groceries causes changes in our nutrition. Undoubtedly, communication-oriented approach nonetheless, brings more humanistic attitude to education because of the skills developed for improving human relationships through development and acquisition of communication skills. This approach can also be achieved through the use of m-learning.

Implementing and Monitoring of ICT for e-Learning

The importance of the implementation and careful monitoring of ICT resources for e-learning needs some emphasis at this juncture. The following are steps needed for proper implementation and monitoring of ICT resources which can be adapted for e-learning:

1). Audience Analysis: ICT should be purposive, problem-oriented and participatory-oriented and should focus on a specific issue or recommended technology. Thus, audience analysis should be carried out using techniques such as Knowledge, Attitude and Practice (KAP) survey regarding innovations being proposed for the use of ICT in education. Information gathered through this can reveal the message design, the most appropriate media or channels to use, how and when to use them.

2). Objectives of ICT: The objectives should be specific and based on e-educational or e-learning felt needs and directed to solving problems identified through the audience analysis.

3). Strategies of ICT: An educational strategic planning approach should be developed with the aim of solving problems that may be responsible for e-learners non-involvement, inappropriate or discontinued use of ICT media in learning. This can also be applied to the process of target audience segmentation, technology or multi-media selection, information positioning and design, educational materials packaging, development and production, with a view to obtaining maximum (information input, process or output) impact with the least or minimum efforts, time and resources.

4). Evaluating ICT: Formative evaluation in the form of e-assignments, e-courseware and pre-testing of prototype multi-media or educational materials should be conducted before ICT resources are produced en-mass. Formative evaluation is usually referred to as a corrective level of the process of evaluation. Summative evaluation on the other hand, helps to appraise or access the progress of implementation and impact of ICT on education and results are used to improve the overall effectiveness and future replications.

5). Social-cultural factor: Accessibility to regular information and messages is important from sociological as well as geographical perspective since learners are not confined to a classroom setting, but are learning from different locations. Even though culture is dynamic, technologies should be made compatible with the cultural domain of learners and the society as a whole. Globalization is in vogue now. However, the cultural dimension should be considered when dealing with the message design, development and production of ICT materials for e-learning.

6). Economic/Financial: The profitability and economic gains of the use of technology is the most important factor that will ensure continued use especially by the learners. Economic issues

that are related directly or indirectly to cost of technology and service delivery systems and the economic viability should also measure technology in terms of social costs and benefits. This makes e-learning more cost effective, affordable, acceptable and attractive.

7). Institutional factors: The type of government support for the institutions that are involved in the generation and transfer of technologies can also affect the use of such technologies. Inadequate institutional arrangements and capacity to carry on educational or project activities without outside supports may be detrimental to the efforts of ensuring sustainability of results achieved (Mangstl, 1998).

ICT and e-Learning education in Nigeria

Information and communication technology (ICT) is the practical off-shoot of Educational Technology which by definition is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Januszewski & Molenda, 2008). If we marry this definition with the definition of e-learning which is the use of internet and digital technologies to create experiences that educate our fellow human beings (Horton, 2005), we will be able to create a complete and perfect approach to the art of teaching and learning at all levels of Nigeria e-educational system.

The Federal Ministry of Education of Nigeria launched the ministerial initiative in 2004 of which e-education (electronic education) was part of the initiatives for the attainment of Education for All (EFA) and Millennium Development Goal (MDG) using ICT as the delivery systems. The main ingredients for the e-education according to Abimbade (2006) are:

- IT Policy and ICT infrastructure

- Trained teachers and support personnel

- Appropriate computer studies curriculum

- E-learning hardware and software protocols

The major objectives of the e-education or e-learning in Nigeria are to:

- Enhance access to quality education through e-education/e-learning
- Improve the education delivery system
- Ensure optimal utilization of existing ICT resources
- Ensure a globally competitive education system
- Reduce/eliminate social vices

From the foregoing, one can conclude that ICT is e-learning and e-learning is ICT. E-learning in particular cannot exist without ICT except by print technology only which may not exhibit the needed interactive mode provided by ICT. ICT is an essential delivery source of educational resources globally. It is a means of transferring, storing, retrieving and sharing information and resources world-wide.

Unfortunately, despite the advantages of ICT being enjoyed by the developed countries, the developing countries are still lagging behind in the development and utilization of ICT in

education. According to research, at least 300,000 new users in the United States of America get connected to the Internet daily (Awake, 2002). By 2006, for instance, it was estimated that about 175,000 million people were online. At least 80% of all employments in the U.S.A. would have been computer related. By 1999, 75% of all productions were being handled by computerized machines or robots and all Americans who were not computer literate by then were to be regarded as functionally illiterates. While we lack correct figures to show where Nigeria stands in ICT development and implementation, it is obvious that by 2006 the National Universities Commission (NUC) alerted that less than 20% of the nation's universities have access to ICT (NUC, 2006). No wonder e-learning in Nigeria is still far behind the developed countries and other countries such as India, Turkey, Tanzania, and so on.

ICT application in e-Learning education in Nigeria

Though there is the popular assumption that e-learning is still at the embryonic level of development, there is a strong indication that e-learning is no longer a new idea in principles but its implementation, application or practice is still far below expectation in most developing countries, especially Nigeria. However, e-learning can be used as the main approach/strategy for disseminating instructional packages whereby learning takes place solely through electronic contacts and packages (software and hardware). Also, e-learning can be used as a combined strategy in which case learning is presented electronically as well as with the conventional face-to-face mode of teaching. According to Rosenberg (2001) some of the key characteristics of e-learning solutions are:

- Relying on computer networking techniques to make it capable of instant updating, storage, retrieval, distribution and sharing of information.
- Delivering to the learner via computer that is connected to standard internet technologies
- Focusing on the broadest view of learning (p.14).

The e-learning solutions as we can see from above are ICT driven, that is, without ICT, the solutions listed above will remain in the dark. There are also several advantages of e-learning which when fully implemented, will help to solve several of the educational crisis being experienced in many of the developing countries. Some of the advantages are:

- Accessibility: e-Learning makes learning easily accessible to students who may enroll and start at any time of the year and there is flexibility in admission requirements.
- Students choose the course(s), activities or topics within courses and the types of media to be used in delivering the courses, such as CD, audio cassette, internet, e-mails, telephones or handsets and so on.
- Students study where it is most convenient for them e.g. home, at work or study centers
- Students study at any time to suit them and their circumstances – there is flexibility of time
- Students work at their own pace based on their ability, interest, achievement and so on
- Cost – as a result of multi-media or ICTs in relation to the number of learners involved, it is cost effective and affordable. (Osuji, 2006).

Despite these advantages, there are more than enough problems waging war against the full implementation of ICT in e-learning especially in Nigeria. The most distressing of these problems border on computer illiteracy among students and even lecturers, lack of enough e-

learning resources or ICT tools for instructional delivery; lack of adequate electricity supply; lack of e-courseware for onward transmission to students; and so on.

Challenges to the implementation of ICT in e-learning

Besides the problems listed earlier, the full implementation and practice of ICT for e-learning in Nigeria are plagued with several challenges that are too numerous to mention here. However, we shall try to highlight the challenges from two major categories of perspectives that is; from the Government perspective and other stakeholders in the educational sector:

Government perspectives – The government is the most significant and influential stakeholder in education worldwide. As already indicated, both ICT and e-learning are not new to Nigeria or the developing countries, but the main issue is the inability of the governments to implement or cause the implementation of the policies made with regards to ICT and e-learning. Policies and initiatives taken in most cases never saw the light of the day. Even where it appears a particular government is doing something, lack of continuity of government policies truncates the policies. In addition, the emphasis placed on education in Nigeria can be described as being 'myopic' because the government makes policies based on the present situation without paying regards to the consequences for the future generations (Adegbija, 2011). There are hardly any projections for moving the educational system beyond this decade. This explains why the standard of education is stagnant or rather falling and cannot meet with the standard of the present technological pace globally.

Other stakeholders in the Nigeria educational system – other stakeholders in the Nigeria educational system include: the National Universities Commission (NUC), School Administration, National Teachers' Institute (NTI), Nigerian Teachers' Registration council, and private institutions and other capable individuals.

The involvement of the stakeholders in the design, implementation and evaluation of ICT resources used in e-learning cannot be overestimated. Stakeholders and individuals are to be involved as it is practiced in the developed countries. For example, the major custodians, producers and evaluators of ICT tools or resources are individuals or groups such as the Apple by Steve John, Microsoft by Bill Gates, Paul Allen, etc. All these made personal computers and other technologies accessible to individuals, companies, institutions and governments. These personal computers allow and provide applications through the Internet for e-education, e-learning, e-banking, e-communication, e-shopping, e-medicine, etc.

However, Olakulehin (2010) there is still a lot to be done to properly sensitize the individual stakeholders to fully grasp the importance and relevance of ICT resources in e-learning or open and distance learning systems. The National Universities Commission (NUC) which is the Federal government regulatory body on higher education should maintain and regulate all the good policies on ICT and e-learning. This will further strengthen the National Open University of Nigeria that is committed to upgrading the educational standard from every perspective.

In addition, the need to raise the awareness level of the relevance of ICT resources in e-learning cannot be overemphasized (Olakulehin, 2010). A shift from looking up to high-technology as the only resource for disseminating e-learning is necessary. As Romiszowski

(2010) observed, high quality of learning may not necessarily correlate closely with high technology. Simple, day to day technologies which Osuyi (2006) referred to as m-learning, that is, mobile technologies should also be employed in learning and teaching. These mobile technologies include – mobile phones, handhold computers, tablet computers, PDAs, Smart phones, laptops, electronic papers, MP players, personal response systems, USD sticks, digital voice recorders, digital camcorders, portable DVD player. According to the observation of Romiszowski (2010), excessive emphasis on technology as the solution on "E" in e-learning especially in the African environment where technological expertise or manipulation is not good enough, may be a part of the problem in the developing countries. He opined that the reuse of e-learning objects facilitated by poor standards may promote the easy replication of past instructional design blunders and may contribute to a general lowing of educational quality.

Also, the teachers and students who are the main consumers of ICT resources in the educational system need to be more computer literate in order to sustain and encourage the current zeal or paradigm shift and because there is no short cut to implementing ICT in e-learning education as a whole.

Conclusion

Information and communication technology (ICT) is said to have progressively repositioned the way knowledge and information are directed towards achieving educational goals through the operations of open and distance education, e-education, e-learning, m-learning, and so on. By definitions and practice, ICT and e-learning are inseparable but dependent on each other for effective learning. There are challenges militating against the full implementation of ICT in e-learning education and these were discussed from the perspectives of the government and other stakeholders in the Nigerian educational system.

The paradigm shift, general acceptance of the new move or model in global technological education, government policies and massive enrollment for e-education and e-learning by the learners, the attitudes of all concerned in the design and full implementation of ICT and e-learning policies in education should be sustained. According to Abimbade (2006), resistance to change is a factor which prevents the full implementation of ICT in the classroom and this type of resistance can also affect users of e-learning or e-education resources. Some of the students and even the teachers or facilitators may still prefer the print materials which may limit their knowledge, effectiveness and resourcefulness with time.

Recommendations

Based on this study, the following recommendations are proffered:

- Policies made by the government on ICT and e-learning should be implemented. This can be done by having a specific monitoring or implementation committee
- Workshops/seminars are recommended for teachers and students who definitely need more exposure on computer literacy to be able to use ICT tools more confidently for e-learning
- There should be improvement in the power/electricity supply in the country and that ICT resources to be made more available and affordable

- The National Open University of Nigeria, the main official provider of e-education/e-learning should be further enabled and well equipped with ICT resources for better service.

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