Chapter Four

INFORMATION AND COMMUNICATION TECHNOLOGY

The Prospects and Challenges of ICT in Nigeria Tertiary Education

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Introduction

Information and Communication Technology (ICT) has become a key tool in acquiring, processing and disseminating knowledge. It has become an imperative tool for measuring development of a nation in the 21st century. The revolutionary impact of ICT on all sphere of the society has not spared the educational sector.

Education is a prerequisite of today's knowledge-based economy. The production and use of new knowledge required a more educated population. ICT is playing a major role in the acquisition and diffusion of knowledge which are fundamental aspects of the education process. It is offering increasing possibilities of codification of knowledge about teaching and for innovation in teaching activities through being able to deliver learning cognitive activities anywhere at any time (Larsen and Vincent-Lancrin, 2005). The availability of the Internet has given rise to an electronic approach to the educational system called e-learning.

Tertiary educational institutions have always being at the forefront of new scientific discoveries and innovations brought about by the activities of teaching, learning and research. E-learning is becoming increasingly prominent in tertiary education. E-learning being delivered on the platform of ICT infrastructure promise to widen access to education and improve quality of education at reduced cost. Apart form electronic learning, ICT infrastructures are being widely use to support teaching, learning and research activities in tertiary education. Such infrastructures include personal computers, specialized software, handheld devices, interactive whiteboard, intranet and visual library.

Despite the potentials of ICT to enhance the activities of teaching, learning and research, report showed that the application of ICT in Nigerian tertiary institutions is less than five percent (Guardian, 2007). The reasons for the under utilization of ICT are due to some challenges which are highlighted in this paper. This paper takes a look at the prospects of e–learning in tertiary education and the support offered by other ICT infrastructures to the activities of teaching learning and research. The paper further highlights the challenges facing the adoption of e–learning and utilization of ICT infrastructure in Nigerian tertiary education.

The remaining of this paper is organized as follows: Section Two takes a look at the impact and promises of ICT in tertiary education. Section Three presents the present state of ICT facilities and challenges facing the expansion and utilization of these facilities in improving teaching, learning and research activities in Nigerian tertiary education. Section Four recommends some approach to overcoming the challenges and Section Five concludes the paper.

The Impact And Promises of ICT In Tertiary Education Learning

Electronic Learning (E-learning) is an electronic delivery and administration of learning opportunities and support via computer network and web-based technology (Akinyemi et al, 2007). It covers a wide range of systems, from students using e-mail to accessing course work on-line. E–learning can be of different types: Web-supplemented, Web-dependent and mixed mode (OECD, 2005). Application and processes of e-learning include web-bases learning, computer-based learning, virtual classroom, video-conferencing and digital collaboration where contents are delivered via the internet, intranet/ extranet, audio/ or video tape, satellite TV, CD-Rom. E-learning creates a self-centered approach to learning by relaxing time and space, it enrich learning content and enhance wider access to information resources.

When the potential of e–learning is fully harnessed, it could advance knowledge by expanding and widening access, improving the quality of education and reducing cost. When the needs are huge, fully online learning can be crucial and possibly the only realistic means of increase and widen access to tertiary education. Some developing countries like Nigeria have many young people craving for tertiary education and too small an academic workforce to meet the huge demand; training new teachers would take much time and cost, e-learning might be a means for many potential students and learners to study (World Bank, 2003).

Institutions worldwide are adopting Learning Management System (LSM) software developed for administration and teaching in tertiary education. The software enables the treatment of enrolment data electronically, offer electronic access to course materials and carry out assessments as well as offering online interaction between faculty and students (OECD, 2005)

Apart from e-learning, other ICT infrastructures are also aiding effective teaching and learning in the traditional classroom setup. Availability of personal computers and its accessories have enhanced the output of teachers and students. Computer Aided Instruction (CAI) software which are tutorial software are widely available to compliment classroom work. These

software sometimes have limited capabilities, but very useful in presentation of graphics that aid learning. Handheld devices like mobile note takers are available to aid learning in term of mobility. Interactive White Board is another infrastructure that allows the projection of images generated by computer onto a touch sensitive screen that is of the size of the traditional white board. The Interactive White Board provides instant access to materials form variety of sources and possibility of using pre-prepared lectures that move without apparent from visual to verbal and vise-visa.

Intranet is a web-based collaboration among members of the same group. In education system, Intranet aids collaboration among staff and students of the same department, faculty or institution (Obaniyi and Soroyewun, 2007). It serves as a repository of academic materials and knowledge available for use by members of the same academic group. In Intranet, collaboration is faster and cost effective with the removal of cost associated with Internet connectivity. Visual library is another area where ICT is aiding teaching, learning and research. Visual library sites provide access to a large volume of library resources (articles, journals, books, etc.) and online reference services via the Internet.

Research

Scientific research is a core activity in tertiary institutions. This activity has been revolutionized by the possibilities offered by ICT; from digitization of information to new recording, simulation and data processing possibilities. Advance ICT infrastructure offers the resources, information and collaboration needed to solve fundamental scientific problems. This has resulted in finding solutions to grand challenges, such as accurate weather forecasting, building more energy efficient automobiles, designing life-saving drugs and lots more (Adedoyin and Akinnuwesi, 2006).

Some of the ways in which ICT infrastructures are being used by researchers are:

Solving Grand Challenges:

High performance computer, software and high-speed networks allow researchers access to more computational resources. This has resulted in the achievement of grand feats such as accurately modeling earth's climate, design and simulates high-speed civic transport, improve detection of cancer and enhance the recovery of oil and gas from reservoirs.

Enabling Remote Access to Scientific Instruments:
Advance in networks and visualization software has enabled scientists to control and share scientific resources such as network electron microscope, radio telescope etc.

Supporting Scientific Collaborations:
The internet has allowed scientists allover the world access to database, documents and communicate with colleagues.

The Challenges facing ICT Utilization in Nigerian Tertiary Education
The challenges facing the adequate utilization of ICT in Nigerian tertiary education can be broadly grouped into four. These are: Inadequate Infrastructure, Inadequate Skilled Manpower, Resistance to Change and Inadequate Funding.

Inadequate Infrastructure
Tertiary institutions in Nigeria lack adequate ICT infrastructure to effectively tap into the opportunities offered by the cyberspace.

Personal Computers (PCs) are available in most Nigerian tertiary institutions, but they are not readily accessible to students because of the low computer (PC): student ratio which is averagely put at about 1 to 40. In most cases, the basic software needed for practical works are not available and where they are available, they are not accessible because of the low ratio. There is also the lack of CAI and other specialized software to support some areas of teaching learning and research.

Internet connectivity is available in most tertiary institutions in Nigeria, but in most cases the bandwidth subscribed to (which determine speed of access) is too small to support any meaningful academic activity during peak period. Some institutions have subscribed to Virtual Library sites whereby members can access electronic academic materials such as journals. Also some institutions have CD-Rom collections on specialized fields, but the currency of the information on the CDs cannot be guaranteed as no effort is made to update them

Whereas ICT infrastructures like multimedia projectors are available in Nigerian tertiary institutions to support teaching, learning and research, other infrastructures like Interactive White Boards and mobile devices are lacking.

Inadequate Skilled Manpower

Inadequate ICT technical personnel is a major problem in Nigerian tertiary education. The reason for this can be ascribed to the lucrative job opportunities available to ICT professionals outside the academics. The situation has made institutions rely on commercial private ventures to provide support for the few ICT facilities available. The support offered is in most cases are commercial and lack academic content.

As a way out of this challenge, some universities like Bells University of Technology, University of Nigeria and Namdi Azikuwe University are in partnership with private organizations like AFRIHUB for ICT technical manpower development.

Resistance to Change

There is the concern of faculty members not willing to take the "soft" approach to teaching and learning. Rather, they stick to the traditional hard "approach". Report from OECD (2005) gave reasons while faculties resist e-learning.

- That e-learning development, with its standardization aspects, might conflict to some extent with the professional culture of academic, based on autonomy and reward system often based on research.
- Concern about intellectual property rights and shared rights between faculty, institutions and technologies.

Funding

This is the major challenge confronting the acquisition and utilization of ICT in Nigerian tertiary education. Most institutions solely rely on their proprietor for funding and the bulk of such fund goes to servicing the overhead cost.

Since no clear sustainable business model has yet emerged for commercial provision of e-learning, and failures have been more numerous than success, (OECD, 2005), institutions are not willing to invest the little fund available to them on e-learning project.

Recommendations

The target of tertiary education in Nigeria should be e-learning. For Nigerian tertiary education to be effective, the following recommendations are made:

a. There is the urgent need for infrastructural upgrade and funding of research work. Institutions should exploit alternative source of funding for ICT infrastructure development. Some of these sources are:

- Collaboration with private organizations for provision of infrastructure and manpower development.
- Collaboration on the use of private organizations' ICT infrastructures for training of staff and students and for research purposes.
- Harnessing the opportunities offer by ICT for commercial purposes.

b. Tertiary institutions should begin to adopt the use of open source software, which are available for free.
c. Encourage the development of in-house software for CAI and LMS
d. There is the need for tertiary institutions in Nigeria to recruit a broader range of staff to complement ICT academic staff, such as technologist, instructional designers and learning scientists.
e. Collaboration among institutions. This will enhance sharing of knowledge, technology and personnel. It will also improve the quality of curricula and promote good practices.

With the present situation of tertiary education in Nigeria, where institutions are yet to fully come to term with the reality of e-learning potentials, and that there is no clearly defined sustainability model to support it, there is a case for continued government and its agencies support for ICT acquisition and utilization in the following areas:

- Encouraging the dissemination of good practices to simulate innovation, avoid wasteful duplication of efforts, and scale up successful experiments.
- Encouraging appropriate staff development, in order to ensure progress at institutional level.
- Supporting research and development on learning objects and other promising innovations such as open educational resources or the use of visual simulation tools, and ensuring their relevance to staff and students.
- Promoting collaboration between ICT providers and institutions, and supporting public-private partnerships, in order to keep costs at reasonable level.

Conclusion

Allover the world, the use of Information and communication Technology is changing the face of teaching, learning and research. Nigerian educational system cannot afford to take the back seat. Nigerian tertiary education need to fully utilize ICT resources to make education widely available and accessible at reduced cost.

For ICT to be fully utilized, the challenges listed in this paper must be overcome. This paper has also made a case for government and its agencies continued intervention in certain areas in order for the quest of Nigerian educational system to fully adopt ICT is achieved.

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