

Full Length Research Paper

ICT and higher educational system in Nigeria

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This paper examines the integration of ICT in higher education in Nigeria. The possibilities and reach of information technologies can tear down territorial boundaries and make available equal information and knowledge of different categories as soon as necessary data are fed on the website. Nevertheless, Nigeria as a nation is yet to take full advantage of the possibilities of ICT-driven education. This paper highlights the challenges of ICT-driven education in Nigeria, the journey so far and the relevance of ICT in the nation's higher educational system. Recommendations made include adequate funding of ICT-driven initiatives in the education sector and a sound policy environment which encourages investment in ICT.

Key words: Higher education, ICT, relevance, challenges, Nigeria.

INTRODUCTION

It is very clear that the possibilities and reach of information technologies can tear down territorial boundaries and make available equal information and knowledge of different categories as soon as necessary data are fed on the website. Consequently, the field of educational research, students and other educational providers are able to exchange knowledge, research findings and opportunities through publications and other outlets available in countries around the world (Jegede, 2002). Information Technology is a computer-based technology for the storage, accessing, processing and communication of information. In effect, IT involves the devices to capture, process, store and retrieve information. It also involves devices for transmitting the information by digital or analogue means (telecommunications) until the information gets to the end-users. Information Technology encompasses a wide range of technologies like telephone, computer word processing applications, web browsers, and servers, and full text document databases and mainframe computers (Okonkwo and Afolabi, 1998).

As we enter the exciting and challenging ICT period in Nigerian educational system, we must assess how far we have gone, what we know or have as well as what we do

not. We must be objective and realistic about our achievements, and take a fresh look at where we are going and where we should be.

Up to the late eighties, management of information within the Nigerian educational system was basically manual. Information on foreign educational opportunities, programmes and materials was available to a few only through personal contacts and/or the few existing government policies.

In 1989, the National Universities Commission (NUC) introduced the computerised Management Information System (MIS) to Nigerian Universities. This was occasioned by the joint conference organized by the NUC and the British Council in Kaduna in 1987. In conjunction with Overseas Development Administration (ODA), the project officially took off in 1989 in four pilot universities namely: University of Ilorin, Lagos, Nigeria (Nsukka), and Federal University of Technology, Minna (Mackemanim, 2005).

METHODOLOGY

A survey method was used in this study, with the interview as the

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dominant survey instrument. Data were collected from a simple random sample of 90 respondents. The respondents, who were IT specialists were married men, women; and young adults not below the age of 21 years, and were stratified and drawn from three areas in Ilorin Metropolis. These included: The University community, Ministries and Private Organisations. Thirty respondents were interviewed from each of the designated areas. The data collected were analysed qualitatively as shown in the results below:

RESULTS

The researchers tried to find out various ICT initiatives in Nigeria from the participants and found that presently, there are at least nine ICT-for-education initiatives at various stages of development or implementation by various educational agencies and the Ministry of Education. They include:

1. The Nigerian Universities Network (NuNet) project;
2. The Polytechnics Network (PolyNet) project;
3. The School Net project;
4. National Open University of Nigeria (NOUN) project;
5. National Virtual (Digital) Library (NUC)
6. The Nigerian Education, Academic and Research Network (NEARNet);
7. The Teachers Network (Teach Net) project;
8. National Virtual Library (Ministry of Science and Technology);
9. National Information, Communication and Education programme of the Presidency (Mac-Ikemenjima, 2005).

A few of these initiatives are discussed as follows.

The virtual library initiatives

The library of today should not merely store documents and preserve them; it must also devise means by which the contents of such documents can be rapidly and effectively transmitted for use (Okonkwo and Afolabi, 1998; Ogunsola, 2004). The use of Internet has revolutionised access to information for libraries, educational agencies and individuals. The Internet and its technology (e.g. e-mail, World Wide Web, FTP: File Transfer Protocol, Usenet and Telnet) continue to have a profound effect in promoting the sharing of information especially in the academic world.

In developed countries, Learning Resource Centres now contain learning materials published on CD-ROM and most Colleges and Universities are connected to the Internet. These technologies have the potentials to develop "Virtual Campuses" and "Virtual libraries" and thus increase students' access and participation (Daniel, 2000).

The need for a virtual library system has become a most urgent necessity in the Nigerian universities and colleges. The library as the life blood of higher education institutions can benefit tremendously from the facilities

provided by the ICT. The university libraries can be transformed into a new information services unit, providing electronic cataloguing, electronic inter-library loan, and electronic circulation functions. But it must be realised that many university libraries in Nigeria are yet to take advantages of this modern ICT development (Daniel, 2000).

Nigeria Universities Network (NuNet)

In 1995, the NUC made proposals for connecting all Nigerian universities to the Internet through Nigerian Universities Network (NuNet). The concept of NuNet is to provide connections to all Nigerian Universities and University Centres in one national computer network (Internet) with a gateway at NUC. However, there is no Internet gateway in Nigeria yet, so the Internet Service Providers (ISPs) in Nigeria make use of external gateways located in countries like UK, US, Italy and South Africa to carry out Internet services (Mac-Ikemenjima, 2005).

By way of leap-frogging the sector towards the development goals, *former* President *Olusegun Obasanjo of Nigeria* said agencies such as the National Communications Commission (NCC), National Information Technology Development Agency (NITDA) and National Airspace Research Development Agency (NARDA), similar to the U. S. National Aeronautic and Space Administration, NASA have been set up to "give direction to the industry". There is also the e-Nigeria initiative project which the *immediate past* President said would be faithfully implemented to connect communities and vital government agencies and institutions in a synergy that would see smooth flow of information. The e-Nigeria initiative follows recommendation from the World Summit on Information Societies (WSIS). Most importantly is the ambiguous programme to link all Nigerian Universities to the internet. The *former* President's speech perhaps represents the first policy from the administration on ICT aimed at pushing the country towards meeting the Millennium Development Goals (*Miebi, 2006*).

Be that as it may, Nigeria is still not there yet. The road map to an ICT Eldorado, especially in the higher education sector, is still as hazy as a mid-December harmattan weather. This road map is not without some challenges. Before delving into these challenges, the paper now examines the relevance of ICT in the education sector.

The relevance of ICT in education

ICT-driven education is electronic mode of knowledge sharing and transmission, which may not necessarily involve physical contact between teacher and student. The concepts "computer-aided teaching" and "computer-aided learning" have given birth to computer-aided

instruction, which represents a combination of both teaching and learning. Access to instruction through the internet is flexible, ensures broad viability and availability of educational opportunities. It is cost effective system of instruction and learning, materials can be accessed irrespective of time and space (Jegade, 2002).

The Information and Communications Technology (ICT) is the technology that has brought excitement to teaching, learning and research. It has become a major educational technology. In its simplest form, it can be used to prepare and reproduce handouts or make presentations of learning materials as slides in lecture rooms. At a higher level, ICT could be used in such instructional modes as e-learning.

For Nigerian educational institutions, the development in the use of ICT provides an opportunity to overcome the perennial problem of non-availability of staff, books and even the lack of equipment in the laboratories (Massaquoi, 2006).

Some of the strategies for promoting technology in education include the rapid deployment of ICT infrastructure, training of teachers to use ICT and the provision of varied learning resources and services. ICT can be used as a tool in higher education management to track students and faculty as well as in the classroom to facilitate teaching and learning.

More importantly, perhaps, ICT allows Nigerian academics to participate actively in global research networks. As at today, 84% of journal articles and 97% of patents currently come from industrialized countries (Massaquoi, 2006). By making use of the internet to conduct research, publish articles, and exchange ideas, Nigerian faculty will be better able to apply up-to-date approaches and findings toward local development challenges.

The advantages of ICT-driven education are of course enormous. As earlier indicated, the technology enables poorly resourced institutions to overcome two of their major problems: staff scarcity, lack of textbooks and journals. With ICT, it will be possible to save on the amount of physical contact between staff and student and hence enable the former to reach more students. This will enable institutions to efficiently and effectively utilize the existing staff. The use of ICT in learning will provide access for students to training resources on the internet. But more importantly over a period of time, staff members may convert their lecture notes to e-content and make them available to students.

There are several stages/formats for the use of ICT in teaching. At the lowest end, one can use the computers to prepare and print lecture notes which are circulated to the students. This can be done in MS Word format or MS Power Point handouts. At the higher level, staff can create and mount their own electronic content in any of the following formats:

a) **Content on Media:** This is content organised into

logical units and made available in portable media such as CD ROMS. The content may have limited interactivity built into it. Graphics, animations, audio and video forms of content can be included.

b) **Content on Intranet:** Any content on CD can be made available within an intranet .as a shared resource. The presentation of such content is largely similar to the one above but limited asynchronous interaction can be enabled by e-mail.

c) **Content on Web:** This kind of content is similar to the one in (b) but is accessed using web browsers and therefore can be available on the internet. There is a constraint on this for most Nigerian institutions whose connection to the internet is very slow.

Challenges to ICT education in Nigeria

ICT has a key role to play in enabling the education industry to manage complex information flows and to integrate them towards effective educational planning and development. Although ICT holds great potentials in supporting and augmenting existing educational as well as national development efforts in Nigeria, several challenges remain. These challenges include:

1. Resistance to change from traditional pedagogical methods to more innovative, technology-based teaching and learning methods, by both students and academics. The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the Internet and procurement of computers is rather slow in some instances, and in others there are no aids or support by the government at all (Albirini, 2006).
2. Inadequate ICT infrastructure including Computer hardware and software and bandwidth/access.
3. Lack of qualified ICT personnel. Most institutions lack computer literate teachers and ICT experts that would support and manage the Internet connectivity and/or application of computing in the teaching-learning process. The cost of equipment in a country like Nigeria with a battered economy and seriously devalued currency is enormous. However, it should be noted that the problem might not be the funds nor the technology but rather the will on the part of government and/or the governors of education (Itegeboje and Okubote, 2002).
4. Nigeria lacks the necessary infrastructural facilities to benefit from ICT. Again, most of the ICT infrastructures such as internet, telefax, e-mail are dependent on NITEL (Nigerian Telecommunications Limited), NIPOST (Nigerian Postal Agency) and PHCN (Power Holding Corporation of Nigeria) services. These services are epileptic in delivery and attract unbearably high bills. In connection with inadequate infrastructure, the authors surveyed the

access of staff to computers in a faculty of education. In particular, the survey enquired into staff/computer ratio. A total of five departments were considered. The number of staff with computers in their offices in four out of these five departments is quite low, as low as 1:5, that is one computer to five staff members. The ideal staff-computer ratio should be 1:1 which will enable staff to use ICT as a tool for delivery of education. Sadly, no university in Nigeria, as at today, has this ideal ratio.

1. The overall educational system is under funded (Taiwo, 2004) therefore available funds are used to solve more urgent and important survival needs by the institutions. Development and subsequent operation of ICT require huge financial investment in, and commitment to, the acquisition of necessary facilities and their maintenance.

2. The over-dependence of educational institutions on government for everything has limited institutional ability to collaborate with the private sector or seek alternative funding sources for ICT educational initiatives (Yusuf, 2005).

There is lack of skilled manpower to manage available systems and inadequate training facilities for ICT education at the tertiary level. This apparent lack of the required degree of sophistication and information management expertise on the part of the end-users of ICTs (students, staff and researchers) would make it difficult to effectively-harness the opportunities offered. Another survey study was carried out by the authors on 38 lecturers who were regular users of a university "Compunet". The study focused on assessing their computing skills and the areas of application of the computing systems. The results of the survey indicated that only eight (8) of the users could operate the computer systems unaided. Twenty six (26) of them have been able to access relevant reference materials for paper publishing, while only four (4) have published internationally through the Internet. Majority of them have received and sent social and academic messages through the e-mail services. These results emphasize the need to train lecturers in the use of the internet for the accruable benefits of carrying out viable studies/researches and publishing with international outlets. If this training is extended to students, it could result in increased access to educational opportunities.

1. Ineffective coordination of all the various ICT-driven education initiatives.
2. Lack of sound policy initiatives.

This list is not exhaustive but represents the major problems faced in the development of ICT -driven education in Nigeria. The authors are of the belief that when adequately addressed, the chances that ICT education will thrive in Nigeria will increase dramatically.

RECOMMENDATIONS

The following key points may be considered as recommendations for the development of ICT -driven education in Nigeria:

1. Adequate funding is necessary for tertiary education in general and development of ICT in particular. To this end, government should increase funding for the entire educational sector;
2. In addition to improved funding by the government and revenue generation drives by individual institutions, government needs to implement policies which will draw the private sector into ICT development. Government should work with the private sector and civil society to ensure affordable and sustainable access to ICT infrastructure;
3. Tertiary-level administrators should also look beyond the state for investment in ICT. As done in China, banks and other enterprises could be encouraged to see the development of ICT in higher institutions as investment targets. With adequate funding by government and private institutions including NGOs (Non-Governmental Organisations), there would be adequate provision of the required ICT infrastructure and facilities for effective academic globalization.

The authors recognize the efforts of a mobile phone company, MTN Nigeria. The University of Lagos, already boasts of a Virtual library, courtesy MTN Nigeria. Many international funding agencies like Carnegie Corporation of New York, Ford foundation and Rockefeller Foundation should be approached in the general development of ICT in Nigeria. Such assistance would complement the efforts of the Nigeria government in order to leapfrog the higher educational institutions to the global information environment;

1. A policy environment which encourages investment in ICT should be put in place including tariffs on import of ICT infrastructure, in order to promote affordability and wide range usage at all levels of the educational system. The issue of a realistic national information and communication infrastructure policy is one that should no longer be allowed to linger unresolved. Nigeria needs a goal-oriented policy as well as well-thought-out plans and strategies to harness the potential of information communication technologies for our educational development;
2. ICT -driven education has great potentials to assist achieve Nigeria's goal to achieve education for all by the year 2015 and therefore should be maximally harnessed in every possible way. ICT education should be included in the educational curriculum including the provision of necessary infrastructural support and massive training and deployment of skilled manpower into both secondary and tertiary institutions;

3. Young software developers should be trained and supported with the necessary equipment to develop nationally usable e-education software; and
4. Government and Managers of Tertiary institutions should set up ICT Research institutes in Nigeria. There should be linkages between Universities, Polytechnics, Colleges of Education, Research Institutes and Government agencies. In addition, government should introduce monitoring bodies which are made up of experts in ICT development.

CONCLUSION

Education is the cornerstone of sustainable development. It contributes to building a modern and thriving society and empowers communities and citizens to fully participate in development and prosperity.

While the right to education is recognised as fundamental for each citizen, access to it is not guaranteed. In the developing world, Nigeria inclusive, the essential building blocks for educational systems are suffering from deficiencies. ICT can help respond to these challenges and create the environment that is conducive for effective and quality educational systems. Toward this end, ICT-supported education should be high on the agenda of the Nigerian government. In order to reach the Millennium goal of "Education for All", ICTs should be integrated in our national educational systems at all levels and should serve as a major wake-up call to Nigerian government and stakeholders and all other people working on the educational challenges in the country to stop talking and start acting.

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