Information and Communication Technology (ICT) in Nigerian Educational System

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Abstract *In this present age of globalization, information and communication technology has transformed the Nigerian Educational system positively. This paper therefore discusses the correlate existing between information and communication technology and education and the extent to which it has affected the Nigerian system of education. The setback and obstacles to its full actualization is also examined.*

Keywords: *Information technology, ICT, education system, Nigeria.*

1. Introduction

The role of Information and Communication Technologies (ICTs) in the 21st century education system has been described as vital to keeping abreast with rapidly changing technologies. The development of information and communication technology into the Nigerian educational system has come to stay; its importance has been translated into huge potentials in terms of positive outcomes, although investments in ICTs in Nigerian's education system have not yielded much when compared to similar investments made in communication (Atureta, 2011).

The field of education has certainly been affected by the penetrating influence of ICT worldwide. ICT has made impact on the quality and quantity of teaching, learning and research in the institutions using it (Kwacha, 2007). According to Ololube, Ubogu and Ossai (2007), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus has radically changed traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both instructors and learners. ICT has the potential to accelerate, enrich and deepen skills, motivate and engage students in learning; helps to relate school experiences to work places, helps to create economic viability for tomorrow's workers, contribute to radical changes in school, strengthens teaching, and provides opportunities for connection between the school and the world (Davis & Tearle, 1999; Lemke & Coughlin, 1998; cited by Yusuf, 2005).

Adomi & Kpangban (2010) described Information and communication technology (ICT) as electronic technologies used for information storage and retrieval. According to the Online Oxford Dictionary, Information and communications technology or information and communication technology, usually abbreviated as ICT, is often used as an extended synonym for information technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers, middleware as well as necessary software, storage- and audio-visual systems, which enable users to create, access, store, transmit, and manipulate information. In other words, ICT consists of IT as well as telecommunication, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions.

ICT as described by Scott (2002) encompasses a range of applications, communications and technologies which aid information retrieval and research communication and administration. These include online databases, library services and online services and fax machine. It has become a global phenomenon of great importance and concerns in all aspects of human endeavor, spanning across education, governance, business, labour, market, shares, productivity, trade, agriculture, commerce and others. The expression was first used in 1997 in a report by Dennis Stevenson to the UK government and promoted by the new National Curriculum documents for the UK in 2000.

1.1 Integration of Information and Communication Technology into Nigerian Educational System

Nigeria as a nation has recognized the potential of ICT in her educational system. The national policy on computer education emphasized the need for the integration of ICT into the Nigerian educational system. This dates back to the National Policy on Computer Education (FME, 1988) which emphasized the need for primary school pupils to be introduced to the basic computer skills, the use of the computer to facilitate learning and rudimentary use for text writing, computation and data entry. For secondary school, they have related goals which were to be achieved at higher level. The tertiary institutions were also required to teach computer science as a discipline and to integrate it in school administration and instruction. However, the implementation was not effective.

The National Policy on Education (FRN) as revised in 1988 and 2004, re – emphasized the need for the integration of ICT in the Nigerian educational system. This is an acceptance of the need to go beyond computer to the level of ICT also the need for infrastructure. Three major objectives, among others were emphasized in the Nigerian National policy for Information Technology (FRN, 2001). These are to empower youths with ICT skills to prepare them for competitiveness in a global environment, integrate ICT into the mainstream of education and training and establishment of multifaceted ICT institutions as centers of excellence of ICT. To achieve these objectives, nine major strategies were outlined. These include

i. Making ICT compulsory at all educational institutions
ii. Developing ICT curricular for all levels of education
iii. Using ICT in distance education
iv. ICT companies' investment in education
v. Giving study grant and scholarship on ICT
vi. Training the trainers' scheme for youth corps services on ICT
vii. ICT capacity building at the zonal, state and local government levels
viii. Establishing private and public dedicated ICT institutions
ix. Working with international and domestic initiative to transfer ICT knowledge.

1.2 The Role of Information and Communication Technology in Nigerian Educational System

The main purpose of ICT in education means implementing of ICT equipment and tools in teaching and learning process as a media and methodology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues. ICT has enabled learning through multiple intelligence as it has introduced learning through simulation games; this enables active learning through all senses. A renowned Professor Ajayi, G. O. of OAU, Ile Ife, Nigeria, shared the multi-purpose application of ICT as he put it "ICT is now regarded as a Utility such as water and electricity and hence has become a major factor in socio-economic development of every nation. ICT now plays a major role in education, learning and research in general, agriculture, health, commerce and even in poverty alleviation by generating or creating new jobs and investment opportunities…" This declaration and indeed other opinions shared by others point to conclusive evidence that ICT has some real and material applications for countries like Nigeria because countries can leverage ICT to totally transform and modernize their economy.

Tinio (2002) noted that ICTs are powerful enabling tools for educational change and reform. When used appropriately, helps expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life.

In Nigerian educational system, ICT has helped to increase access to and improving the relevance and the quality of education. It greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution and widen the range of opportunity for business and the poor. This new communication tends to reduce the sense of isolation, and open access to knowledge. This is enhanced because ICT provides access anytime and anywhere by making possible asynchronous learning. Online course materials, for example, can be accessed 24 hours a day, 7 days a week. ICT based educational delivery like educational programming broadcast over radio and television also dispenses with the need for all learners and the instructor to be in one location. In addition, certain types of ICTs such as teleconferencing technologies enable instructions to be received simultaneously by multiple, geographically dispersed learners (synchronous learning).

Furthermore, ICT has enhanced access to remote learning resources. Teachers and learners no longer have to rely solely on physical media housed in libraries (and available in limited quantities) for their educational needs. With the

internet and world wide web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day by an unlimited number of people. This is particularly significant for many schools in developing countries and developed countries that have limited outdated library resources. ICTs also facilitate access to resource persons all over the world.

In Nigerian educational system, one interesting thing is that ICTs are also a transformational tool that has promoted the shift to a learner – centered environment. It has assisted in improving the quality of education and training by increasing learners' motivation and engagement, facilitating the acquisition of basic skills. The use of ICT tools such as videos, television and multimedia computer software that combine text, sound and colourful moving images is used to provide challenging and authentic content that engages the students to be more involved. More importantly, networked computers with internet connectivity increases learners motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.

The transmission of basic skills and concepts that forms the foundation of higher order thinking skills and creativity in enhanced by ICT through drill and practice. Most of the early users of computers were for computer-based learning that focused on mastery of skills and content through reinforcement and repetition.

Haddad and Draxier (2002) also indicated that ICT has contributed to effective learning through expanding access, promoting efficiency and improving the quality of learning and improving management systems. According to Obeng (2004), ICT is now regarded as a utility such as water and electricity and hence has become a major role in education, learning and research in general, agriculture, and health and even in poverty alleviation by generating or creating new jobs and investment opportunities.

David (2005) said that students become more aware about how to learn when using ICT because they must interact with computer. ICT has also changed the relationship between students and lecturers and has made it open and intimate. The idea of sharing knowledge and the capability of using new resources for learning are enhanced by using ICTs. It has also helped undergraduates in better communication and access to information. This is due to the fact that there is a national policy supporting ICT in schools. It has also helped students' curiosity and motivation that has in turn forced the lecturers to seek more knowledge.

The benefits derived from ICT use in education are summarized as active learning, collaborative learning, creative learning, integrative learning and evaluative learning. By active learning, ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus provides platform for students' enquiry, analysis and construction of new information. ICT-supported learning encourages interaction and cooperation among students, teachers and experts regardless of where they are. Also, ICT – supported learning promotes manipulation of existing information and creation of real – world products rather than regurgitation of received information. It has also enhanced integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach. By evaluative learning, ICT-enhanced learning is student – directed and diagnostic. Unlike static, text or print-based educational technologies, ICTs allow learners to explore and discover rather than mere listening and remembering.

2. The Journey So Far

In our educational institutions, especially higher institutions, the mode of delivery of knowledge and curriculum are not yet ICT enhanced, though with the development of a National Policy on ICT in Education, Nigeria is predictably a step in the right direction toward improvement for the sector (Atureta, 2011). Factors militating against its full implementation are insufficient numbers of computers, epileptic power supply, problems of internet network failure, lack of ICT knowledge/skills, difficulty in integrating ICT to instruction, scheduling computer time, insufficient peripheral devices, inadequate software, insufficient teaching time, inadequate access, lack of qualified ICT personnel, cost of equipment, management attitude, there seems to be no clear and definite policy and/or curriculum for all levels of the Nigerian education system and lack of technical assistance among others. Okwudishu (2005) indicated that unavailability of some ICT components in schools hampers teachers' use of it. The various challenges that have been raised have to be addressed for Nigeria to make effective use of ICT to enhance her educational system.

Ogechukwu & Osuagwu (2009) suggest that, "ICT is still in the emerging phase in Nigerian educational system". In their article entitled, 'ICT in Education: Achievements so far in Nigeria', which discusses ICT dimensions, its transforming power; status in Nigerian educational institutions, plus limitations to its infusion, both experts say the country is yet to progress beyond the emerging phase of ICT in education which according to them, is only one of four approaches, the goals of ICT in education embraces. These approaches are: emerging, applying, infusing, and transforming. Iloanusi &

Osuagwu said 90% of Nigeria's educational institutions fall within the emerging phase, 7% in the applying phase and 3% in the infusing and transforming phase, with a few other sectors of the economy having progressed beyond this phase.

In addition, Aduwa-Ogiegbean & Iyamu, (2005) noted that many developing countries, especially in Africa, are still low in ICT application and use. Thus, it is believed that in order to emerge beyond the first stage in the last three which are termed the 'functional approaches', a lot of policy implementation and funding is required. Incredibly though, Nigeria is reputed to have an advantage in this 'begging field', as there are many ICT experts of Nigerian parentage in the diasporas, with no knowledge of any concerted effort being made to genuinely attract their potential to accelerate and sustain ICT development in their fatherland. Though government efforts have not gone without much notice toward the implementation of ICT in Nigerian educational institutions, the challenges are there from paucity of funds and lack of access, to unsteady power (not all local ISPs can maintain their boosters for 24-hours without fuel which is costly); and high cost of ownership (with the rapid increase in population and demands across the service sectors, there is the growing realization that in this 21st century, the government of Nigeria alone can no longer fund education and its concerns except by partnering with the private sector).

Special interventions have been made to Secondary and Higher Institutions by government, NGOs banks and several private sector groups. The MTN Virtual Library project embarked upon in key universities in Nigeria for instance, has enhanced research opportunities; the NUC facilitation of the setting up of Network cables, connectivity devices in Federal Universities with free consultancy services to universities and inter-university centers on ICT; plus the Nigerian Communications Commission (NCC) and Education Trust Fund (ETF) geared towards universities and polytechnics, have enhanced learning in several ways.

3. Conclusion

The vision to make Nigeria an ICT capable country in Africa and a key player in the information society by using ICT as an engine for sustainable development and global competitiveness is yet to be achieved; this is because ICT is at particularly a dynamic stage in Africa and Nigeria is not left out.

Several challenges are responsible for its full actualization. These include poor IT infrastructure, inadequate ICT manpower, epileptic power supply and high cost of ICT facilities among others.

4. Recommendations

Based on the discussion in this study, the following recommendations have been made:

1. There must be local manufacturing of ICT materials to reduce the cost of acquiring the software and hardware components. There must be local assembly of hardware and software components with specifications for the content in material and personnel. This will enhance the availability of ICT resources to promote efficient national development.
2. There must be capacity development. That is, at all levels of our educational system, at primary, secondary and tertiary levels, there must be ICT training and re - training, education and usage. This will enhance the maximization of ICT use nationwide.
3. Access to stable power supply must be put in place by the government. This will enhance universal access to ICT.
4. There must be collaboration with international organizations like African Virtual Open Initiatives and Resources (AVOIR) and among tertiary institutions in Nigeria. Universities like OAU and UNIJOS which have gone ahead in ICT applications could be understudied towards implementation in other tertiary institutions.
5. ICT should be made compulsory at all levels of our educational system and the government should assist in acquiring the facilities to aid its effective teaching and learning.
6. The government should promote her partnership with ICT organizations like CISCO, Microsoft Corporation, Intel Corporation, SchoolNet to enhance its full actualization.

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