
ROLE OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) IN TRANSFORMING EDUCATION SYSTEM IN NIGERIA.

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Abstract

This paper presents the role of ICTs in transforming Nigeria's Education Systems (NES). The paper highlights on a positive shift in using ICT to improve the quality of teaching and learning through activities such as intensive ICT skills training to teachers, increase in ICT equipments and applications in schools. The paper first provide some of the challenges of integrating ICTs in education followed by its full actualization.

Keywords: *ICT; education; educational transformation.*

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. ICT has become an imperative driver of daily life and economic movement. 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.

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 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.

ICT in education in national curricula

Curriculum that includes courses on basic computer skills and that which uses ICT for the instruction of other subject areas is typically a reflection of policies advocating ICT in education. The early integration of ICT into primary and secondary curricula through formal recommendations is an important lever to ensure children and adults will develop digital literacy, not only for general life and work skills but also to empower youth in their ongoing education throughout secondary, post-secondary and tertiary education levels. While it is evident that curriculum cannot be implemented prior to the integration of the vital infrastructure,

recommendations for ICT in curriculum can play an important role in promoting its use at the school level. In addition to the instruction of basic computer skills or computing, ICT is used to support teaching other subjects to enhance or expand student learning opportunities and may include i) mathematics; ii) natural sciences; iii) social sciences; iv) reading/writing and literature; v) second languages, among others. National curriculum may be explicit about which subjects are to be supported by ICT; however, curricula may also be explicit about the level of education, number of hours per week, or about the types of ICT used.

State Of The Art

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.

The Importance of ICT in Education:

The UNESCO report of 2018 acknowledge that ICTs can be leveraged to accelerate the achievement of the targets of the Education 2030 Agenda, by

combining the views of policy makers, academics, and the private sector. ICTs promote student-centred learning and appear to be speeding the rate of educational change in all learning institutions (Barakabitze, 2014). It is worth noting that student' perceptions change when they are continually exposed to the capabilities of ICTs. Yet, the more they become positive towards ICT use, the more likely that student can develop better skills on ICT use and be encouraged to engage themselves in deeper forms of learning . Over the past years, primary, secondary, and high level institutions in Nigeria are witnessing a paradigm shift brought about by the use of ICTs. As such, learning institutions have seen ICTs as an indispensable tool in the teaching and learning process (Barakabitze, 2017).

Role of ICT in Transformation of educational System

Education around the world is experiencing major paradigm shifts in Higher Educational practices of teaching and learning under the umbrella of ICT enabled learning environment. Whereas learning through facts, drill and practices, rules and measures was more adaptive in earlier days, learning through projects and troubles, inquiry and design, discovery and invention, creativity and diversity, action and reflection is perhaps extra fitting for the present times. The major hallmark of this learning shift is from teacher centered to learner focus paradigm. During the last three decades, the modifications in Higher Educational environment have been phenomenal. The model, focus, function of the learner and technology has been changed drastically from conventional instruction to virtual learning environment as depicted below.

Transformation in Teaching-Learning Environment:

Model	Focus	Learner	Technology
Conventional	Teachers	Inactive	Chalk & Talk
Information	Students	Active	Personal Computer
Knowledge	Group	Adaptive	PC+ Network

Shifting the stress from teaching to learning can create an extra interactive and engaging learning environment for teachers and students. This new environment as well involves a transform in roles of both teachers and

students. The role of the teachers will change from knowledge transmitter to that of facilitator, knowledge navigator and sometime as co-learner. The new role of teachers demands a fresh way of thinking and understanding of the innovative vision of learning process. Students will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others (Resta, 2002). ICT provides powerful tools to support the shift from teacher oriented to learner oriented paradigm and new roles of teacher, student, curricula and new media. The major moves have been described in a tabular form below.

<i>Transformation in Teachers' Roles :</i>	
Conventional	ICT Supported
Source of Knowledge	Guide & Facilitator of Knowledge
Organizer of Learning	Creator of Learning Environment
Forever Expert	Traitor & Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Deductive/ Expository	Interactive/Experiential/Exploratory
<i>Transformation in Learners' Roles :</i>	
Conventional	ICT Supported
Inactive Learner	Active Learner
Reproducer of Knowledge	Producer of Knowledge
Reliant Learner	Self-directed Learner
Introverted Learner	Shared Learner
<i>Transformation in Curricula & Delivery :</i>	
Conventional	ICT Supported
Learning Facts	Inquiry Based
Reproduction Teaching Exercises	Authentic Learning
Rigid Delivery (Fixed Time & Space)	Open & Flexible Delivery (Any Time & Anywhere)
Single Path Progression	Multi Path Progression
<i>Transformation in Media Applications :</i>	
Conventional	ICT Supported

Single Sense Stimulation	Multi-Sensory Stimulation
Single Media Application	Multimedia Application
Deliverance of Information	Exchange of Information
Monologue Communication	Dialogue & Collaborative
Non digital Resources	Digital Resources

All these changes are taking place in learning and teaching, which demand a new learning environment to effectively connect the power of ICT to improve learning. ICT has the potential to change the nature of Higher Education: where, when, how and the way learning takes place. It will facilitate the emergence of responsible knowledge society emphasizing lifelong learning with meaningful and enjoyable learning experiences.

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 is 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.

Conclusion

As we become more and more supported by ICT, teaching and learning will not be the same as before. We will have to make use of the rich and thrilling opportunities offered by the new technologies in Education to reach our

training goal and mission. One of the objectives of the present paper is to provide better accepting and appreciation of the role of ICT in teaching and learning system. Several viewpoints of integrating ICT in teaching and learning system have been discussed. Learning is not a transfer of knowledge, rather an active construction. This paradigm shifts give the students an entirely new role that was not earlier described in the transmission model of teaching.

Recommendations

1. 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.
2. Access to stable power supply must be put in place by the government. This will enhance universal access to ICT.
3. 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.
4. . 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.
5. The government should promote her partnership with ICT organizations like CISCO, Microsoft Corporation, Intel Corporation, and SchoolNet to enhance its full actualization.

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