

INFORMATION AND COMMUNICATION TECHNOLOGY: A TOOL FOR BOOSTING TEACHING AND LEARNING DELIVERY IN TERTIARY INSTITUTIONS IN NIGERIA

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Abstract

The study examined ICT as a tool for boosting teaching and learning delivery in tertiary institutions in Nigeria. It revealed that ICT boosting teaching and learning delivery makes the education system a vital tool for any form of development which has a revolutionary impact on the world and on our lives. Today, ICT has given birth to contemporary e-commerce, e-government, e-machine, e-banking and e-education among others. We recommend therefore that management of Institutions and Organizations should ensure that workable and effective ICT tools are made available in Higher Institutions of Learning. In addition, Tertiary Education Tax Fund should assist to regularly organize seminars, training and re-training programmes involving ICT. Finally, focus should be on the provision of internet services in higher institutions.

Keywords: *Integration, Delivery, Teaching, Learning, Tertiary Institutions*

Introduction

Information and Communication Technology (ICT) has become a veritable tool in the delivery process in teaching and learning in Tertiary Institutions. Dhukate and Bhoite (2015) say Information and Communication Technology (ICT) has become a key tool in acquiring, processing and disseminating knowledge. It has become a very important tool for development of a nation in the 21st century. The revolutionary impact of ICT on all spheres of the society has not spared the educational sector. Andra (2018) wrote that ICT is widely used across various industries, from marketing and telecom to education. For Gerland (2019), ICT is a cluster of associated technologies defined by their functional usage in information access

and communication of which an embodiment is the internet. It is an umbrella name for any communication device or application, encompassing radio, television, cellular phones, power-point, slides, computer networks, hardware, software and electronic mail, facsimile, satellite systems, as well as the various services and applications associated with them (Municipal Research and Services Centre (MRSC), 2019). It has a revolutionary impact on how we see the world and how we live.

Today, the place of ICT in education and the world in general cannot be undermined. Modern day businesses are conducted and facilitated through the use of Telephones, Fax Machines and Computer communication networks through the internet. The integration of ICT tool which are the new approach in the teaching and learning process has given rise to the contemporary e-commerce, e-government, e-machine, e-banking and e-education among others. ICT are tools that comprise electronic devices are utilized for the information needs of institutions, organizations, and individuals. These electronic devices include information machines for example computer, (hard and soft wares), networking, telephones, video, multimedia and the internet. Organizations are now having corporate policies on acceptable baseline for processor speed, the more the speed of the processor, the faster the computer (Zuppo 2016).

According to Armah (2015), this is the era of computers and information technology which has become an enabler of greater convenience. For any nation to boast of educational development, it should be able to boast of a viable and functional information and communication technology driven education in tertiary institutions, especially in this fast changing world where globalization is the order of the day. Institutions should have access to the vast minimum of online information and digital collaboration opportunities. It will boost the transformation and meaningful teaching and learning in institutions.

No doubt, Tertiary institutions play a major role in emerging an ICT philosophy of a country. The school must vigorously control ICT integration through research, demonstrating an effective establishment of ICT and provision of opportunities for professional development. In order to partner the potentials of ICT, most nations have evolved national information and communication technology policies to serve as a framework for ICT integration in all facets of society. African countries, particularly Nigeria, are no exceptions to this practice.

Concept of information and communication technology

ICT is a dynamic field, growing rapidly in breadth and depth. Basic hardware capabilities of ICT, such as computer speed, computer storage capacity, telecommunications bandwidth, and the installed base are all growing rapidly. Information and Communication Technology is an umbrella term that includes any communication device or application encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems as well as the various services and applications. It is the process of conveying information through automated electronics devices, such as computer, television, cell phone, electronic mail among others. United Nations Educational, Scientific and Cultural Organization (UNESCO, 2010) defines ICT as the forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means.

According to Yusuf & Onasanya (2013), Information and Communication Technology (ICT) is a force that has changed many aspects of people's ways of life. Considering such disciplines as medicine, tourism, travel, business, law, banking, engineering and architecture, the impact of ICT in the past two or three decades has been enormous. Information and Communication Technology (ICT) is an indispensable component of the contemporary world. Presently, culture and society have to be adjusted to meet the challenges of the information age. Moreover, most institutions of

learning especially in the developed world use ICT for teaching and learning. If Information and Communication Technology can contribute to universal access to education, equity in education, delivery of equality learning and teaching, Teacher's Professional development and more efficient education management, governance and administration, Government should take a holistic and comprehensive approach to promoting ICT in education. Access, inclusion and quality are among the main challenges that can be addressed.

What then is Education in Teaching and Learning?

Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. Generally speaking education is utilized in three senses: Knowledge, Subject and Process. When a person achieves degree up to certain level we do not call it education Yusuf & Onasanya (2013).

Looking at the role of education in the national building and the population explosion in tertiary institutions, the use of ICT in the teaching and learning process becomes imperative. According to Zuppo (2016), this is because its adoption by teachers will boost effective teaching. Issues like good course organization, effective classroom management, self-study collaborative learning, tax oriented activities, and effective communication between the actors of teaching-learning process and research activities will be boosted by the use of ICT based technology. Teaching and learning has gone beyond the teacher standing in front of a group of pupils and disseminating information to them without the students' adequate participation. We will recall that the outbreak of COVID 19, several institutions had to adopt on-line teaching and learning method to be teaching their students.

ICT in Tertiary Institutions

There are developments in the Nigerian education sector which indicate some level of ICT application in higher institutions' teaching and learning processes. The Federal Government of

Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2013), recognizes the prominent role of ICTs in the modern world, and has integrated ICTs into education in Nigeria. To actualize the goal, the National Policy on Education (2013) sixth edition states that, government will provide basic infrastructure and training at all levels of institutions; computer education has been made a pre-vocational elective and is a vocational elective in tertiary institutions in Nigeria.

The National Universities Commission (NUC), the government agency responsible for registering and regulating universities, has prescribed Personal Computer (PC) ownership for universities as follows: one to every four students, one PC to every two lecturers below the grade of Lecturer 1, one PC per Senior Lecturer, and one notebook per Professor/Reader. Similarly, the National Open University of Nigeria (NOUN), established in 2002, has created over 55 study centres across the country. NOUN's dream is to establish study centres not only in each of the 36 states of the federation but also at local government area in order to make tertiary education available to all citizens. Each NOUN study centre is a computer laboratory/cyber café equipped with a minimum of 25 computers in a local area network (LAN) configuration, NOUN (2017). The centres are connected to NOUN's REPRODAhq (repository, reproduction, distribution and administration headquarters) through a wide area network (WAN) to enable the mainstreaming of the following activities:

1. Training and learning
2. Assessment and testing
3. Interactive sessions
4. Communications (e-mail, chat, forums)
5. Internet access
6. Access to virtual library
7. Other computer applications

NOUN uses the WAN to deliver distance learning courses to all the study centres. Each study centre has facilitators (instructional and

Review of African Educational Studies (RAES) 71

tutorial) and student counselors responsible for guidance and counselling services to the learners. The facilitators and counselors are drawn from within the community or nearby communities. NOUN's ICT applications presently cover:

8. management of student records (on-line application, admission, registration, and examination procedures)
9. learner management system (e-learning and the virtual library)
10. communication (e-mail, SMS, video-conferencing, and Internet) delivery of the human resource and finance courses. The pdf files of these courses are already available on-line. The goal of NOUN is to use the REPROD Ahq to eventually reproduce all course materials in electronic form.

In 2007, NOUN for the first time, receive government budgetary allocation for its programmes. To date, NOUN essentially obtained funding from other sources to mount its programmes and projects. Other government agencies employing ICT bemoan the low levels of government subvention. The NUC started an on-line mandatory continuous professional development (MCPD) programme in pedagogy called the Virtual Institute for Higher Education Pedagogy for lecturers who do not have qualification in education, NOUN (2017).

The British Council has initiated a Digital Library Project (DLP) to assist universities to digitize their libraries. Acquisition of basic ICT skills and capabilities have recently been made mandatory as part of the national minimum standard for teacher education at the Nigeria Certificate of Education and first degree in education levels. Also, some universities in Nigeria have made ICT skills a requirement for continuing and graduating students. Thus, the teacher education colleges have also been impacted by the current ICT revolution. The Federal College of Education (FCE) in Omoku has 130 computers in three e-learning classrooms each with 30 computers and a cyber café with 40 work stations. Microsoft and CISCO interventions have helped several institutions have helped several institutions.

Integrating information and communication technology as a tool in education

It has been demonstrated that integrating ICT into educational systems can increase the quality of education delivery. Use of ICT in education also offers the potential to facilitate greater access to information and services by marginalized groups and communities. In 2002, United Nations Educational, Scientific, and Cultural Organization launched the Asia-Pacific ICT in Education programme which has its main goal to assist in harnessing the potential of ICT towards achieving quality education for all in the Asia-Pacific region. Yusuf and Onasanya (2013) adds that ICT is the integration of data with wired or wireless devices to transforming messages from one point to another across networks linking the various devices to achieve a desired result.

Information and Communication Technology (ICTs) tools play an increasingly important role in the way we communicate, learn and live. United Nations Educational, Scientific, and Cultural Organization considers that ICTs can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development as well as improve education management, governance and administration provided the right mix of policies, technologies and capacities are in place. UNESCO takes a comprehensive approach to ICTs in education. It is through the organizations Inter-sectoral platform that it focuses on the joint work of the Communication and Information.

Gerland (2019), noted that with the integration of ICT, students can independently proceed in mastering teaching materials and also chose the pace of work. The effective integration of ICT in the learning process yields the following: increases student motivation for learning, improves communication of learning goals, facilitates higher-order thinking skills, builds valuable skills that students will use in college and in the workplace, expands students' understanding from novice to mastery among others.

The role of information and communication technology skills in teaching and learning

Learning ICT skills is not sufficient, but using them to improve the teaching and learning environment is the key for pedagogy-technology integration. Understanding the changing role of teachers from instructors to facilitators, teacher-led instruction to learner centered instruction is the key to the successful implementation of pedagogy integration for teacher and learning environment is crucial. Nigerian teachers need to be equipped with the fundamentals of how ICT tools work and to have a sufficient understanding of how the integration of these tools in the effective teaching-learning process can be smoothly facilitated. Effort must be oriented towards changing the teachers' mind-set by developing positive attitude towards ICT applications in teaching and learning.

The role of information and communication technology especially internet in the education sector plays an important role, especially in the process of integrating the technology into educational activities. Education sector can be the most effective sector to anticipate and eliminate the negative impact of ICT. Technology (internet in another side can be the most effective way to increase the student's knowledge.

Being aware of the significant role of ICT (internet) in our life, especially in the educational activities, education authorities should be wise enough in implementing the strategies to empower ICT in supporting the teaching and learning process in the classroom. ICT is not just the bloom of the educational activities, but also it will be the secondary option to improve the effective and meaningful educational process.

Impact of ICT as a tool in tertiary institutions

The interactive way in which information is stored, processed and presented can enable teachers and students explore the model, communicate effectively with others and present information effectively to different audiences. ICT supports education to boost

the successful and ongoing knowledge and skills that will give the students continuous learning if properly designed and implemented. Effective utilization of ICT in institutions means that the teachers should be adequately trained and regularly retrained to acquire the competencies and skills required for effective utilization of ICT. It is not yet certain that ICT is effectively utilized in the teaching and learning in higher institutions.

According to Yusuf and Onasanya (2013), the effective utilization of ICT in education depends on the availability of these facilities and teachers competence in using them. Observation has shown that there are no functional ICT facilities in higher institutions and this hampers the teacher ability to use them for teaching and learning. Also lack of adequate computer literate teachers, irregular power supply and inadequate funding are another set of obstacle militating against ICT facilities in teaching and learning higher institution. Therefore there is need to address such problems by providing adequate ICT tools and training needs in teaching and learning process.

The future scenarios of the political, social, cultural and economic sectors will depend on the contributions of the students of our schools today. More than ever before, education must be visionary and future-oriented, in the face of stunning scientific and technological innovations and changes, unprecedented socio-economic challenges and opportunities, surprising socio-political reforms, and amazing cultural reawakening. In rethinking education to cope with rapid changes at the threshold of the twenty-first century, innovation, technology, and research are indispensable tools of education. Failure to innovate by and large means repeating yesterday's educational programmes and strategies tomorrow, which will only further jeopardize education's reputation as contributor to development efforts. Educational innovations are imperative, and would no doubt be effective if they are research-based and imbued with technology of education (i.e. systematic approach to the

teaching-learning process); and technology in education (e.g. use of hardwares and softwares).

Information and Communication Technology should be effectively utilized to match graduate with the current demands of modern organizations. An elaborate use of ICT in education will, in no small measure, assist Nigeria to achieve her vision 2020. According to Yusuf and Onasanya (2013), ICT include all the electronics means for gathering, processing, storing, sharing and distributing information, knowledge and ideas. Information and Communication Technology has integrated the world into a global village thereby making the processing, production, marketing and consumption of knowledge, skills, goods and services very easy without distance barriers. It encompasses all forms of information delivery systems that use multi-media among others. It is one of the major innovations that are taking place in Nigeria education system, particularly in tertiary education level. The introduction of ICT in teaching and learning methods in Nigeria has affected the whole process of educational service delivery

Why use ICT as a tool in Tertiary Institutions?

Developments in ICT are making information-exchange faster, easier and more cost-effective. These changes have brought about improvements in speed and modes of communication in recent years and are resulting in significant changes in the way we live and work. ICT offers educators the potential to:

1. improve motivation to learn by improving relevance of content and making learning more fun.
2. enable education to be tailored to individual learning needs and abilities.
3. enable locally relevant teaching materials, in local languages, to be created and disseminated quickly and affordably.
4. expand educational opportunities by making education available anywhere, anytime and to anyone.
5. facilitate technology-skill formation, team-work abilities and

other 21st century skills among learners.

6. make education more accessible, using ICT can make education increasingly free of the constraint of distance and make education easier and cheaper to access.
7. improve the quality of education. Use of ICT can change the way we learn-to bring about better learning outcomes.
8. improve learning outcomes by making learning more interactive and getting learners more involved in the subject matter.
9. bring about pedagogical improvements and learner-centered teaching
10. provide conditions that permit and promote lifelong learning
11. increase the effectiveness and efficiency of education planning and delivery.

The right conditions need to be in place, however, before the educational benefits of ICT can be fully harnessed, conditions include:

- political and financial commitment at both government and school levels.
- conducive policy framework and careful planning for integration of ICT into education.
- adequate infrastructure including alternatives to conventional infrastructure such as wi-fi and solar power.
- equipment and ICT tool such as desks, chairs, radios, televisions and computers that are appropriate for local needs and are affordable in the long term.
- appropriate curricula that permit the use of ICT in teaching and learning
- institutional flexibility and monitoring and assessment systems.
- adequate and timely technical support, trouble-shooting, maintenance and repair of equipment in schools and learning centres.

All governments aim to provide the most comprehensive education possible for their citizens within the constraints of available finance. Because of the pivotal position of ICT in modern societies, its introduction into tertiary institutions will be highly valuable or necessary on any political agenda. In any educational system, the level of available resources places a restriction of the degree to which any new subject can be introduced into the school curriculum, especially where only the most basic facilities have so far been provided. The support services necessary for the effective delivery of an ICT-based curriculum should rank high in any set of government priorities. With a broad base of support, ICT in education will not only be in a position to continue its activities but will be able to develop new approaches and strategies. This support is needed now, so as to reach education for all targets by 2020.

Approaches for ICT integration in teaching and learning

In planning for ICT integration in education policymakers in Nigeria would do well to begin by determining the educational purposes that technologies are to serve before they are brought on board. This means clarifying overall education policy as this should serve as the rationale and road map for technology integration. It is important to note that technology is only a tool and as such it cannot compensate for weaknesses in education policy (Haddad, 2007).

Once national education goals have been clarified, policy makers need to decide on what ICT integration approach to adopt. Farrell and Wachholz (2003) found three different strategies being used in Asia Pacific countries which can be beneficial to the Nigerian education system.

Conclusion

ICT has not been fully integrated into the curriculum of primary and secondary education in Nigeria. Not until the national policy on education is revised to fully integrate ICT in the curriculum, the problem will still linger.

Recommendations

- (i) teaching ICT as a subject in its own right, usually beginning at the upper secondary level, to develop a labor force with ICT skills so that the students can have a better understanding at the grassroots;
- (ii) integrating ICTs across the curriculum to improve teaching and learning. This will make it more available and accessible to the students;
- (iii) using ICTs to foster learning anywhere and anytime as part of the development of a knowledge society in which all citizens are ICT savvy. Each of these has different infrastructural, personnel, and management requirements among others;
- (iv) increased government funding to procure and maintain ICT facilities. The government should as a matter of fact increase the budget for the procurement and maintenance of ICT facilities;
- (v) training and retraining of the ICT lecturers for them to be updated with the use of modern facilities; and
- (vi) improvement of public power supply or procurement of alternative power supply to be able to power the facilities as and when needed.

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