

Information Communication Technology (ICT) Utilization for Instructional Delivery in Teaching-Learning Process in Nigerian Educational System

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Abstract— Information communication technology (ICT) has been recognized to be a very powerful tool in education reform. The use of ICT, particularly a computer stimulates a new atmosphere where teachers and students could utilize modern ICT resources for effective instructional delivery during teaching-learning process in order to promote students' academic achievement. The curriculum of schools ought to be computer based to enable ICT utilization to be achieved. ICT policies need to be formulated and planned to complement and support curricula with technologies infrastructure. This paper therefore, discusses the need to achieve effective instructional delivery at all levels of education through the use of ICT. The paper also examines the concepts of ICT, need for ICT in schools, and ways of integrating ICT in teaching. The major constraints to the utilization of ICT in schools are highlighted and recommendations that will help in its' effective utilization in teaching and learning process at all levels were made.

Keywords: Education, Instructional Delivery, ICT, Utilization, Teaching-Learning Process, System

Introduction

The importance of Information communication technology (ICT) to teaching-learning process cannot be underestimated in the sense that the use of ICT in teaching and learning is a relevant and functional way of providing education to learners in order to assist them in imbibing the required capacity for the world of work (Kosoko-Oyedeko & Tella, 2010). Ajayi (2008) posited that with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore. Rosen and Michelle cited in Aduwa-Ogiegbaen and Iyamu (2005) affirm that the role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy.

For instance, the Federal Government of Nigeria (2001) has put in place a policy document entitled the National Policy for Information Technology. The policy clearly spelt out the ICT vision, mission and policies for Nigeria. Also, FGN (2004) acknowledge the importance of using ICT in improving knowledge and thus states in the national policy that government shall provide necessary infrastructure and training for the integration of ICT in advancing knowledge and skill in the modern world. (FRN, 2004) It is assumed that federal government policy has been implemented.

In view of the importance attached to ICT, relevant authorities in Nigeria have made the acquisition of basic ICT skills and capabilities part of national minimum standards for certification and practice at both Nigeria certification in education, and degree in education. The relevant authorities include National commission for colleges of education (NCCE), National University Commission (NUC) and Teacher Registra-

tion Council. In the word of Njoku (2006) these developments are the strongest indication that the era of teachers without ICT skills are gone. If a teacher is to function effectively, and meet the challenges of the 21st century, the teacher education process must make adequate provision of individualized computer training for would be teachers, so as to help teachers in school system to acquired ICT skills which will help them for effective instructional delivery as well as facilitating teaching and learning. No wonder, Iwiyi (2007) pointed out that computer acquisition and use is an important aspect of the teaching and learning process.

Thus, ICT has been recognized to be a very powerful tool in education reform () in the sense that there has been a tremendous transformation in the education sector as a result of rapid advances in Information and Communication Technology (ICT). It has radically influenced the way knowledge and information are generated, developed and transmitted. ICT has also reduced the entire world into a global village and replaced the use of physical strength in performing task with automation. Teachers, teacher trainer and educationists who are not familiar with ICT would find themselves threatened by professional obsolescence (Adewoyin, 2009). Since education is perceived generally as an instrument par excellence for effecting social changes.

The integration of ICT to education empowers learners, teachers, educators, managers and leaders to use ICT judiciously and effectively for expanding learning opportunities and ensuring educational quality and relevance (Ministry of Education and Vocational Training (MoEVT), 2007). Successful integration of ICT into the classroom depends on the ability of teachers to structure the learning environment from non-traditional way, to new technological pedagogy (Kyriakides,

Demetriou & Charalambous, 2006). Therefore, the use of ICT in education is the bedrock of knowledge that would enable any country to contribute both to achieving Education for All (EFA) goals and reducing the digital divide world towards the aim of globalization.

Statement of the Problem

It is unfortunate that most teachers today do not have technological training to guide themselves and their students in the use of computers to enhance their learning achievement, in spite of the importance of ICT for teachers in improving knowledge. With this regard, ignorance of teachers' ICT skills needed for effective instructional delivery could be caused by the dearth of ICT facilities in most institutions- for the training of students; the high cost of computer and teaching aids ownership is a major constraint to acquisition of the items; access to affordable and reliable internet connectivity is only available in a few institutions, facilities and offices, mostly in the urban areas. Even then, power fluctuations have considerably reduced the reliability of the access and inadequate bandwidth also makes access difficult (Aimola, 2010).

Aduwa-Ogiegbean and Iyamu (2005) noted that many developing countries, especially in Africa, are still low in ICT application and utilization. The truth of the matter is that non-integration of and poor access to Information Communication Technology (ICT) in Nigerian schools and some developing countries in Africa seem to be affecting ICT utilization at all levels of education thereby jeopardizing achievement and competitiveness globally (Adenuga, Owoyele & Adenuga, 2011). This is invariably jeopardizing the quality of fundamental objectives of education and vision, mission and policy of ICT as stated in the National Policy of ICT (2001) since majority of teachers in Nigerian schools do not have fundamental knowledge of ICT skills.

Research has also shown a slow access to basic ICT equipment, has affected low utilization of internet and computers in schools in Nigeria (Osakwe, 2010); poor access to quality of Instructional Technology (IT) poor achievements in school subjects as in Botswana (Lauglo, 2004; Ogwu & Ogwu, 2010). However, emphasis has been only on the importance of ICT, barriers and Instructional Technology utilization as it influences performance. However, there is a dearth of research investigating the use of ICT for instructional delivery in teaching-learning process in Nigerian educational system. Hence this study intends to fill this gap.

Literature Review

Information and Communication Technology (ICT) is a set of activities which is facilitated by electronic means such as processing, transmission and display of information (Rodriguez & Wilson, 2000). Ozoji in Jimoh (2007) refers to ICT as the handling and processing of information (text, images, graphics, instructions, etc) for use, by means of electronic and communication devices such as computers, cameras, and telephone. Information communication technology is the new communication and computing technology used for creating, storing, selecting, changing, developing, receiving and displaying many kind of information (Adewoyin, 2009).

Information and communication technology (ICT) in education, EdTech, learning technology, multimedia learning,

technology-enhanced learning (TEL), computer-based instruction (CBI), computer managed instruction, computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), flexible learning, web-based training (WBT), online education, online learning, virtual education, virtual learning environments (VLE) (which are also called learning platforms), m-learning, and digital education.

According to Adewoyin (2009), ICT is classified into three groups namely: (i) those that process information e.g. computer (ii) those that disseminate information e.g. communication i.e. electromagnetic devices and system and (iii) those for presentation of information e.g. multimedia. Obi (2002) in her view describe ICT as a technological tools and resources used to communicate, create, organize, disseminate, store, retrieve and manage information. In this study ICT does not only mean computers, it has to do with technological tools. These technological tools according to Chika (2008) include computers, the internet, broadcasting technologies (radio and television) and telephone.

A good number of researches have shown that the quality of learning and teaching can be significantly enhanced when ICT is approached and utilized as an intellectual multi-tool. Teaching is an attempt to assist someone to acquire skills, attitudes, ideas, appreciation and change behaviour. The teacher's job therefore is to influence desirable changes in the behaviour in learners through the use of hardware and software such as video, computer, internet, radio. Learning on the other way is a process of gaining knowledge or acquiring skills or having understanding a new thing and have a better way of carrying it out.

When ICT combines with internet, it creates a channel for students to obtain a huge amount of human experience and guide students to enter the global community. In this way the students not only can extend their personal view, thought, and experience, but also can learn to live in the real world. According to Goktas and Yildirim (2003), as cited in (Bhukuvhani, Zezekwa & Sunzuma, 2011), ICT helps students to learn and teachers to perform their teaching profession more effectively. However, Bhukuvhani et al. (2011) noted that despite the abundance of ICT tools, effective use of them is a critical issue. In addition, Ezeani and Ishaq (2013) stated that poor performance of students in the field of ICT could be as a result of teachers' non utilization and application of appropriate ICT tools in classroom instruction.

Ochuku, Amakaino and Chamberlain (2013) identified some constraints to effective utilization of ICT include poor perception and conservative attitude of lecturers on the use of ICT for instructional delivery, shortage of qualified staff with capacity in ICT applications, lack of training and retraining of staff and students in ICT applications and inadequate time allocated to ICT instruction and applications among others. However, the utilization of ICT is determined by its integration and accessibility in the curriculum. Meanwhile, the integration of ICT into education is still a critical issue (Bhukuvhani, Zezekwa & Sunzuma, 2011) that needs an urgent attention.

Many researchers have argued that ICT integration

into the curriculum could be made efficient for utilization through financial and technological support such as: equipment upgrading; regular maintenance; and teacher preparation (Gahala, 2007; Hitch, 2007; Staples, Pugach, & Hims, 2005; Ogwu & Ogwu, 2010). A good deal of research has shown that effective integration of ICT into various subject areas in the curriculum supports instructions and learning (Olakulehin, 2007); empowers learning towards development (Osakwe, 2010); deepens students' content knowledge and supports the development of complex thinking skills (Light, 2009); makes learning faster, interesting, and for accessing and retrieving information quickly (Gahala, 2007; Salle, 2006); prepares students for innovative and productive activity (Ogwu, & Ogwu, 2010; Urdzina-Deruma & Selvaha, 2007). Hence, the need for integration of ICT could enhance learning and knowledge as well as provide foundation for operational excellence in a globalised world.

In some advanced countries of the world, such as China and Japan, integration of ICT into some school subjects in the curriculum has brought changes, development and efficiency into their system. The Federal Government of Nigeria (FGN) has spent billions of naira in building ICT laboratories and equipping them with ICT facilities in some schools in Nigeria (Waziri, 2006). The policy on ICT has been developed which aims at empowering the youth with ICT skills and preparing them for global competitiveness and also encouraging capacity building of ICT in the country's schools. The utilization of ICT has also been made mandatory at all levels of educational institutions through adequate financial provision for tools and resources.

Purpose of the Study

In spite of the effort of the Federal Government of Nigeria in promoting ICT integration into teaching and learning in Schools, the attainment of objectives of ICT in these schools seems to suffer some defects as observed from poor performance in ICT utilization among students in institutions. This problem could also be as a result of poor accessibility of ICT resources by the students. If ICT tools are adequately accessed, they will be utilized for both academic and non-academic activities. This will bring about high degree of infusion into the various subjects in the curriculum of Schools. Hence, the purpose of this study is to examine the importance of ICT facilities being utilized to deliver instruction during teaching-learning process in Nigerian Schools.

Significance of the Study

The utilization of ICT in the teaching and learning process in Schools has been an issue that needs to be assessed in order to determine the extent to which ICT integration has impacted on knowledge delivery. Therefore, the study will be significant to students, teachers, policy makers, literature, theory and practice of ICT.

Need for ICT Schools

There is widespread belief that ICT can and do empower teachers and learners, changing teaching and learning processes from being highly teacher-dominated to student-centred. The result of this transformation will automatically be increased learning gains for learners, creating and allowing for opportunities for the development of their creativity, problem-

solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills (Trucano, 2005). In the 21st century, there are basic skills and competencies which an individual is expected to possess for optimal functioning and survival in the digital age. These skills are centred on the effective utilization of ICT in learning and performing other daily routine activities, thus making room for lifelong learning. This being the case, no effort should be spared in making sure that Nigerian classrooms are ICT driven through its integration in instruction.

Two things are involved when we talk about integration of ICTs in effective instructional delivery in order to prepare the pre-service teacher to use technology in teaching. The first is general computer literacy (operating system, word processing, spreadsheet, and database) and telecommunication. The second is professional literacy- a basic understanding of how computer and related technology can be used in education, as well as specific novice skills for integrating technology into the curriculum at the grade level and in subject pre-service teachers plans to teach (Willis, 2001). A combination of computer literacy and professional literacy in a conducive-learning environment will invariably enhance the performance of the learner. Attainment of enhanced learning is highly dependent on the will and competencies of the teacher in performing his duties. Given the role education plays in the development of any nation, Kwache (2007) notes the indispensability of the school in the growth of an ICT learning culture of any country. He maintains that the school should offer efficient leadership in ICT integration through research, modelling of effective integration of ICT and provision of opportunities for professional development of citizens of a country. The teacher education institutions such as the colleges of education as we have them in Nigeria should play a leading role in this regard.

Constraints to the Integration of ICT in Teaching and Learning

Despite the important role and obvious need for the integration of ICTs in teaching and learning, many factors constitute constraints to its use at the college of education level in Nigeria. Such factors include epileptic supply of electricity throughout the country, limited and inadequate ICT facilities (Abolade & Yusuf, 2005; Ajayi, 2008; Issa et al. 2011; Oye et al., 2011; Onwuagboke, Singh & Onwuagboke, 2014). Other factors include lack of technically experienced lecturers, inadequate course content and Lack of access to ICTs in trainee teachers' field experience (Abolade & Yusuf, 2005).

Other factors identified by Ajayi (2008) are lack of support for the integration of ICT in teaching, lack of internet out lets in the classrooms (Onwuagboke, Singh & Onwuagboke, 2014) and expensive nature of ICT resources (Issa, et al. 2011; Oye et al. 2011). With the Nigerian Communication Commission supply of laptops to lecturers in the colleges of education, the stage was set for integration of ICT by the lecturers in their teaching. However the lack of internet connectivity in the schools especially in the classrooms (Arikpo, et al 2009), poor supply of electricity as well as lack of the technological pedagogical content knowledge required for teaching with technologies invariably rubs these schools of the benefits of ICT

enriched learning.

The Way Forward

For effective instructional delivery at all levels of Nigerian educational system, the groundwork should be done at teacher training institutions. Teaching of methods course in the colleges should be integrated with the ICT course so as to enable the teacher trainee to acquire the ICT skills of teaching alongside the methods of teaching through modelled examples by teacher educators. This integrated approach has been empirically found to yield better students' achievement (Garba, Singh & Yusuf, 2013) than the stand alone ICT courses as prevalent in the Colleges of education in the country.

The Federal Government of Nigeria should wake up from slumber and vigorously pursue the faithful implementation of her policies as it concerns ICT in education. More especially as stated in Section 11 subsection 102 (d) of the National Policy on Education that "Government shall provide facilities and necessary infrastructure for the promotion of Information and Communication Technology at all levels of education" (FRN, 2004:53).

A review of the 2001 ICT policy should be carried out after assessing the success or failure observed in implementing the policy through research so as to ascertain what is lacking in its implementation after more than a decade of its operation. This is so recommended in view of the findings by Adesina et al. (2014) that teachers' awareness of the existence of ICT policies and initiatives is lacking. This assessment will no doubt strengthen the policy as well as make room for more focus on its implementation.

In the appointment of leadership personnel of Colleges, government should make it a point of duty to include proficiency in the use and exemplary attitude towards ICT as criteria for such leadership positions. As it is usually impossible for one to give out what he does not have, appointing leaders who lack competence and interest in ICT will further deteriorate situation. This will help to empower people who are enthusiastic about ICT to strive to reposition the Colleges for the attainment of the benefits of ICT in colleges and eventually translate same to other schools.

Conclusion

In conclusion, the role of ICT in the 21st century classroom has been variously stressed. The colleges of education system being the sector that is responsible for training teachers for Nigeria's basic education should be responsive to the demands of teacher training in this milieu. The benefits accruable to the education industry if ICT is effectively integrated in instruction at all levels are enormous and yet to be realized. Seamless integration of ICT in instructional delivery has the potential of facilitating instruction while at the same time enhancing learning amidst other benefits. The potentials of ICT can be harnessed for the benefit of Nigerian educational system if recommendations made in this paper are given a trial among other initiatives as this is not exhaustive but basis for further initiatives towards achieving effective instructional delivery in Nigerian Colleges of Education.

Recommendations

Based on this study, the following recommendations are made for effective learning using ICT:

1. The Federal Government of Nigeria should integrate ICT in teacher preparation curriculum.
2. Improve students' access to ICT by providing adequate state-of-the-art ICT facilities such as: LCD monitors, multimedia projectors, interactive whiteboards, speakers, desktop and laptop computers, UPS systems, internet facilities, among others for usage.
3. Problems deterring ICT usage should be addressed such as poor electricity supply, to encourage the frequent use of ICT in the teaching and learning process.
4. Monitoring of the state of ICT facilities in Nigerian Schools should be carried out to determine those facilities that need to be replaced or upgraded for effective instructional delivery.

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