

The Role of ICT in Teaching and Learning in Nigeria

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Abstract

This study deals with the role of information and communication technology (ICT) in teaching and learning in Nigeria. The levels of education covered were the secondary and tertiary education. The descriptive method of research was used since it pertains to the prevailing conditions. To gather pertinent data, set of questionnaire was administered to the respondents. The data obtained from respondents were tabulated and treated statically using percentage, means and weighted average score. The analyses of the data generated the following results: the respondents were not frequently exposed to ICT. The use of ICT in teaching and learning among teachers and students in the secondary and tertiary institutions is still low and in some cases absent. The respondents, in general, encountered problems regarding the use of the various forms of ICT in teaching and learning. As for the measures that may be implemented to enhance the role of ICT in education, the respondents strongly recommended compulsory institutionalization of ICT usage and compliance among teachers and students alike.

Keywords: Teaching, Learning, ICT compliance, Students and Institution

INTRODUCTION

We live in an era of information explosion. Once there was famine of information today, we are drowned in the deluge of information. Information and Communication Technology (ICT) is a catalyst agent. ICT has initiated new possibilities into the classroom. The marriage between education and Internet technology has made a deep impact on perspectives about teaching and learning. Technology, today, has revolutionized in such a way that the methodology used by educators to teach a foreign or secondary language has changed. In fact, the relationships between teachers and students have undergone a phenomenal change. (Barad, 2009). The role of the teacher, the nature and context of learning, as well as the function and relative importance of course content have all been challenged and redefined. Therefore, technophobic teachers have no place in this new world order.

Technology or multimedia is not a teaching method or theory, but rather it is a tool that aids educators by improving access to different types of media already in use. Technology is used to simulate real-life situations and helps learners to have control over the learning process (O'Leary, 1998). Therefore, there must be complementary relationship between ICT research and Learning, to create a successful learning environment (Carol, 1996). Krashen (2007) claims that using computers for Free Voluntary Surfing will encourage students to wander through the Internet and read what interests them. Krashen also claims that it will result in higher levels of literacy. Computer assisted language learning provides new opportunities for learners to engage in active communication that facilitates the development of second language competence (Peterson, 2005). Multimedia-assisted language learning and Internet-based instruction contribute to EFL students' cross cultural competence (Kim, 2005).

Computers enable learners to work at their own pace. (Hoven, 1999). This research paper aims at sharing practical experiments with ICT in Teaching and learning.

Information and Communication Technology is taking the centre stage in the scheme of things globally. Indeed, it has reduced the world to a global village by playing a key role in both developed and developing economics, thus has become a vital element in the development of educational systems. ICT today plays a vital role in improving the quality of education in any country where it is put into proper and effective use.

In any teaching-learning situation, learners are more likely to respond more positively to the communicative mode of learning.

ICT Literacy reflects the need for students to develop learning skills that enable them think critically analyze information, communicate, and collaborate the essential role that technology plays in realizing these skills in today's knowledge-based society(Kay and Honey,2005).

The impact of ICT on teaching-learning at all levels of education is gaining global acknowledgement, and so the system of education in Nigeria must not lag behind.

A paradigm shifts from the teacher-centered and talk method of teaching, to a more student-centered method of indirect explanation through demonstration by the use of ICT. According to Perren (2008) "adequate teaching requires both a sufficient number of teachers to man the schools and minimum level of efficiency in their teaching, With the emergence of Information Communication Technology (ICT) in the 21 century , alternation is being shifted to e-learning globally.

Nigeria, as a nation, has recognized the potentials of information and that of information and communication technology in the school system. This is evidenced in the educational reform policies aimed at integrating the use of ICT, particularly the computer, in the Nigerian school system. The first national programme was the Federal Government 1988 policy document, National Policy on Computer education (FME, 1988). The document emphasized the need for primary school pupils to be introduced into basic computer skill, the use of the computer to facilitate learning, and rudimentary use for text writing, computation and data entry. For secondary schools the goals were as identified for primary schools, but to be pursued at a higher level. The additions were the organization of curriculum for secondary school students on

computer education, and the decision to use the unity schools as the pilot institutions for computer education. The tertiary institutions were also required to teach computer science as a subject discipline, and also integrate it in school administration and instructions. Other components of the document include; equipment requirement, teacher training, and specific recommendation on different tertiary institutions. However, as noted earlier, the implementation was not effective.

The national policy on education (NPE), as revised in 1988 and 2004, re-emphasized the need for the integration of ICT in the Nigerian education system. For instance, the 2004, 4th edition, again emphasized the need for the introduction of information and communication technology into the school system. This is an acceptance of the need to go beyond computer to the level of ICT, and also the need for infrastructure.

The first holistic attempt at introducing ICT in all facets of the country's life was the approval by the federal Government of a national policy on ICT. The Nigerian national policy for information technology (FRN, 2001), recognized the need for ICT to be used for education, and three major objectives among several objectives emphasized the need 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 centres of excellence on ICT. The documents specifically noted the need for "Restructuring the education system at all levels to respond effectively to the challenges and imagined impact of the information age and in particular, the allocation of a special IT development fund for education at all levels" (p.4).

To achieve these objectives, nine major strategies were outlined, these include: making the use of ICT compulsory at all educational institutions, developing of ICT curricular for all levels of education, using ICT in distance education, and ICT companies' investment in education, Others include giving study grant and scholarship on ICT, training the trainers' scheme for Youth Corp members in ICT, ICT capacity building at the zonal, state, and local government levels, establishing private and public dedicated ICT institutions, and working with international and domestic initiatives to transfer ICT knowledge. However Yusuf (2005) noted in his analysis of the Nigerian national policy for information technology (FRN, 2001) that the policy was inadequate for positive impact on the Nigeria education system. This, he noted, stems from the fact that the philosophical frame of reference is market driven, and that there is little emphasis on the integration of ICT in instruction.

It should be noted that none of the policy documents, national policy on computer education (FME, 1988), national policy on education (2004, 4th ed.) and the Nigerian national policy for information technology (FRN, 2001), recognized the need to use the computer or ICT to provide access to education for people with disability. This underscores a major inadequacy in the policy document. In addition, strategies outlined in the documents were not followed.

Another significant document on ICT was the Federal Ministry of Education (FME, 2004) Ministerial Initiative on e-Education for Nigerian Education System. Unlike the previous documents, the initiative was drawn based on input from major educational and human

development commissions and board (National Universities Commissions, National Colleges of Education, Education for All, Universal Basic Education, etc). Also, for the first time, the need to integrate ICT in special education, particularly for people with disability was emphasized. However, the document could not be implemented because the minister who initiated the document was removed. Thus signaling the death of eth document which was meant to leapfrog the Nigerian educational institutions into ICT complaint ones. Since then, no national documents had been developed on the integration of ICT in Nigerian educational institutions.

Statement of the Problem

One of the most important reasons for using ICTs in the classroom is to better prepare the students to catch up with the global trend in which computers, internet, social media and related technologies are used to replace previous analogue-based activities. ICTs can help to improve the quality of education by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training.

Although there have efforts to integrate ICT in teaching and learning process in Nigeria, many obstacles to its realization still exist. Equipment may not be placed in easily accessible locations. Hardware and software often pose problems for teachers in the classroom. Teachers may lack the time and the motivation to learn technology skills. Yet, teachers readily admit that they are not making as much use of technology as they could. Although ICT is prevalent in Nigeria, only a few among teachers and students have access to ICT based education, ICTs are transformational tools which can promote the shift to a learner-centered environment. The question how is how. ICTs can be harnessed to improve the efficiency and effectiveness of teaching and learning in universities and secondary schools? What are their roles in education at all levels? ICT transcends time and space therefore its importance in teaching and learning cannot be overemphasized.

Theoretical Framework

This study is based on constructivism theory of learning pioneered by Bartlelt in (1932) and developed by Good and Brophy in (1990). Thin learning theory is based on the fact that learners construct their own reality or at least interpret it based upon their perceptions of experiences, so an individual's knowledge is a function of one's prior experiences, mental structure and beliefs there are used to interpret object and events .hence, constructivism promotes a more open-ended learning experience, where the methods and result of learning are not easily measured and may not be the same for each learner. This theory is suitable for this study as opened by (Perkins, 1991, p. 21 in Schwier, 1998).

“...information processing models have spewed the computer model of the mind as an information processor. Constructivism has added that this information processor must be seen as not just sulfating data, but wielding it flexibly during learning-making hypotheses, testing tentative interpretations, and so on”

Purpose of Study

The purpose of this study is to examine the role of ICT in teaching and learning in Nigeria.

Specifically, the study intends to:

1. Determine the availability of ICT system for the teaching and learning in selected institutions.
2. Examine the ICT attitude/awareness among teachers and students in teaching and learning.
3. Determine the relationship between ICT, teaching and learning.

Research Questions

The following research question will be answered to obtain result of the study:

1. Are there ICT system for teaching and learning in Nigerian schools?
2. What are the attitude of teachers and students in the use of ICT?
3. What is the relationship between ICT, teaching and learning?

Research Design

The study employed survey method. This enabled the researcher to take a study of sample opinion from a population in order to know their major characteristics which can be generalized to the whole population.

Research Population

The population for this study comprises teachers and students randomly selected, from each of the following institutions/secondary schools

1. University of Port Harcourt Choba Rivers State.
2. Rivers State University of Science & Technology, Nkpolu Rivers State Port Harcourt
3. Rumuokwuta Girls Secondary School Port Harcourt Rivers State.
4. University of Port Harcourt Demonstration Secondary School Choba Port Harcourt.
5. Ologbo Premier College Choba Port Harcourt Rivers State.

Study size and sample techniques

A sample-size of two hundred (200) respondents representing two percent (2%) of a population size of ten thousand (10,000) was randomly drawn from the entire population since it is not possible to study all the members of the research population.

Procedure for data collection and analysis

Data for this study were collected through questionnaires administered to respondents from the sampled population.

Researchers divided themselves among the schools and institutions and ensured that the administered questionnaires were retrieved on the spot. The study used simple percentage

method in the analysis of collected data. Figures were put in tables to analyze research questions and their (mean) weighted average of response, rates were also generated.

Results

Table 1: Shows the data on the Availability of ICT Infrastructure/Usage.,

ICT Infrastructure/Usage	Mean	Description	Remarks
• Are ICT facilities available in your institution?	2.97	Slightly available	1
• Are they accessible?	2.93	Seldomly available	2
• Are there trained staffs to handle the ICT Systems in your institution?	2.63	Sometimes available	3
• The ICT Systems are in bad shape.	2.54	Slightly serious	4

Table 1 above shows that the ‘availability of ICT System for teaching and learning’ ranked first with a weighted average of 2.97. Second was ‘Are they accessible?’ with an average of 2.93. Further results show that trained staff to handle the ICT are sometimes not available which was 2.63, and the fact that the ICT system are slightly in bad shape was 2.54. The reason for acceptance is because their resp 2.54.

Table 2: Shows data on ICT

ICT Attitude/Awareness among students	Mean	Description	Remarks
• Not all students are computer literate	2.83	Strongly agreed	1
• Students should be computer literate to enjoy ICT-based teaching and learning.	2.79	Recommended	2
• The use of ICT systems in teaching and learning with ICT is relatively new.	2.78	Slightly serious	3
• Do you think that the use of ICT System enhances learning?	2.21	Slightly recommended	4

From table 2 above, the ICT attitude/awareness described as ‘not all student are computer literate’ ranked first with a weighted average of 2.83, and students should be computer literate to enjoy ICT-based education was 2.79. However, ‘learning with ICT is relatively new’ has a weighted average of 2.78, while the ICT attitude/awareness described as ‘Do you think that the use of ICT system will enhance learning?’ ranked lowest. We can glean from the above data results that ICT attitude/awareness among students is not positive, as such is a reflection of the fact that despite government effort, many students still not computer literate and as such do not know the importance of ICT in education.

Table 3: Shows data on Computer compliance/competence.

Computer compliance/competence.	Mean	Description	Remarks
• Are the teachers trained by the institutions on ICT?	2.97	Slightly agreed	1
• Are they competent ICT users and confident in using it to teach students?	2.77	Relatively in doubt	2
• Do teachers have enough time to use ICT to teach literature?	2.74	Seriously recommended for more time	3
• Do you think ICT System enhances the teaching process?	3.58	Recommended	4

Table 4. Shows data on Suggested Roles of ICT in teaching and learning.

Roles	Mean	Description	Remarks
• ICT boosts teaching profession	4.04	Strongly recommended	1
• It enhances the quality of students' learning	3.89	Strongly recommended	2
• Provides basic education for disadvantaged children	3.78	Recommended	3
• Ensures access to quality education by disable students	3.78	Recommended	4

As shown in the table 4 above, the gains of using ICT are described as follows: “ICT boosts teaching profession”, ranked first with a weighted average of 4.04; followed by “It enhances the quality of students’ learning” with the weighted average of 3,89; “provides basic education for disadvantaged children” gained a weighted average of 3.78; “ensures access to quality education by disable students had a weighted average of 3.78 respectively. It can be gleaned from the table that using ICT in education is no longer new among teachers and students; and should be encouraged

Table 5. Shows data on Obstacles to the use of ICT in teaching and learning.

Obstacle	Mean	Description	Remarks
• Lack of training for teachers	2.29	Serious	1
• Lack of necessary ICT infrastructure	2.28	Serious	2
• Lack of motivation for teachers	2.01	Slightly serious	3
• Lack of awareness among teachers and students about the importance ICT in education	2.00	Slightly serious	4

The obstacles described as “Lack of training for teachers” ranked first with a weighted average of ranked first with a weighted average of 2.29 second was “Lack of necessary ICT infrastructure” with an average of 2.28. Further, results revealed that respondents were not motivated and also lacked the awareness about the importance of ICT in education. The results also revealed that the identified obstacles were described as slightly serious.

Summary of Results

The results of the study are summarized as follows:

- Levels of access to ICT are significant in determining levels of use of ICT by teachers (Mumtaz, 2000). From our findings, it is not necessarily the case that an institution with low access does not have enough equipment, it may be that the amount of equipments is adequate but inappropriately organized in the institution. This is the case in the University of Port Harcourt. Equipments should be organized in a way to ensure maximum access for all users.
- There is a close relationship between levels of awareness and confidence which themselves can enhance students' interest in ICT. For example, this can affect students' attitude and the amount of personal access to ICT that student has (Ross et al 1999). For lack of computer literacy as student's amount of interest can mar the interest to ICT-based education. This and other collaborated research results are the bane of ICT-based education in Nigeria.
- Teachers are sometimes unable to make full use of ICT technology because they are not computer complaint, therefore not competent to prepare materials for lessons, especially where this involves online or multimedia content. Time is also needed for teachers to become better acquainted with hardware and software.
- A very significant factor in the engagement of ICT in teaching and learning is the role it plays, and students who engage in ICT-based teaching and learning are better than those that are not ICT complaint or competent (Dawes, 2000; Russell and Bradley 1997).
- Inappropriate training styles result in low level of ICT use by teachers. (Veen 1993).
- There is a shortfall in the number qualified staff to handle the ICT equipment. This scenario slows down ICT-base teaching and learning.
- Our result reveals that ICT can be of immense importance in the education of disabled persons.
- Lack of infrastructure, training and the absence of incentives to motivate teachers and encourage them in ICT-based teaching are some the factors militating against the undisputed roles of ICT in education which teachers are champion.

The results of our study are discussed as follow:

The Role of ICT in Education

From our results and findings, the potentials for information and communication technology to improve the quality of instruction, transform the school, improve school management, increase access to education and improve teacher education, among others, have been emphasized in several studies, Information and communication technology has the potential for enhancing the tools and environment for learning as it allows materials to be presented in multiple media, motivates and engages students in the learning process, foster inquiry and exploration, and provides access to worldwide information resources, among others (Haddad, 2003). However, researches have been inconclusive on the expectations regarding the value of ICT (Carnoy, 2004; Trucano, 2005). Below are some of the roles of ICT in teaching and learning based on pertinent results:

Boasts the Teaching Profession

First, ICT can be relevant in the teachers' professional development, to make them guides to sources of knowledge. Teachers in contemporary knowledge society require large, rich, and easily accessible-knowledge base which can be provided through ICT technologies that support teacher professional development (Gallimore and Stigler, 2003). Teachers need to be life-long learners to keep abreast of new knowledge, pedagogical ideas, and technology relevant to successful implementation of Nigerian educational reforms. Through the digital libraries, virtual institutions, and other internet resources teachers can easily have access to relevant and current resources in their areas. Thus, they must be competent in the use of ICT to husband its potentials. This is supported by the result of the response on the perceived role of ICT in teaching profession with the highest response rate of 4.04 percent. This is in agreement with previous research findings which assert the role of ICTs in teaching profession (World Bank, 2003).

Enhances the Quality of Students' Education

Secondly, the quality of students' learning will be enhanced through their access to the needed content through ICT facilities (especially, the internet). Information and communication technology can enhance learning by doing, and increase the information available to learners, thereby engendering collaborative learning (World Bank, 2003). Information and communication technology can also empower the learners with information technology awareness and skills which are essential for success in the contemporary knowledge economy (Kante, 2003). This point is collaborated with the response rates of 2.83 and 2.79 which strongly agreed that not all students are computer literate and strongly recommended that students should be computer literate to enjoy ICT-based learning.

Provides basic education for disabled/disadvantaged children

Thirdly, ICT provides new frontiers for providing access to basic education for disadvantaged children and youths excluded from the formal school system. As modern ICTs are attractive to children and youths, they provide unmatched learning opportunities for them to learn within and outside the formal school system. They are powerful motivational tools for learning through games, exploration, collaboration, and learning work-related skills (Phillip, 2002). Distance learning enhanced through ICT can provide flexible learning opportunities with collaborative aspects and rapid communication among learners and between the learners and academic mentors (World Bank, 2003).

Also, ICT can provide opportunities for individuals with disabilities to have access to quality education, (one of the basic goals of the Nigerian educational reform). They can be relevant as assistive technology, adaptive technology, and as a tool for knowledge and support (Jurich and Thomas, 2002). Assistive ICT encompasses not only computerized technology but also a powered wheel chair with voice command and other computer technologies which can increase mobility for persons with severe neuromuscular limitations. Adaptive ICT include key-boards

with colorful keys for persons with learning disabilities, voice recognition, and the accessible web accessibility option initiative of the W3 Consortium which are designed to provide web access for people with disability. Thus, ICTs are opening new doors for people with disability to have enhanced access to education in conventional and distance education settings (Jurich and Thomas, 2003).

Conclusion

The study sees teachers as catalysts for the integration of technology through ICT. According to Watts-Taffe et al (2003), if the encouragements and necessary technological support are available from institutes, developing an ICT class will be easier for them. These can be in form of training, incentives and motivation. The main responsibilities of these teachers will be changing their course format, creating and explaining the new assignments, and arranging for the computer lab through their technology-learning specialists or assistants. There must be ICT infrastructure on ground for this to be achieved.

Secondly our findings show that ICT offers more students the opportunity to explore beyond the mechanics of analogue course contents allowing them better understanding of concepts. The use of ICT changes the teaching and learning relationship. According to Reid (2002) teachers using ICT reported that the relationship between teachers and learners is sometimes reversed with regards to information technology. This relationship boosts students' interest and confidence when they are able to help teachers with technical issues in classroom. Therefore, ICT changes the traditional teacher-centered approach and requires teachers to be more creative in customizing and adapting their own materials. This invariably has a positive impact on teaching and learning processes.

Thirdly, despite government's effort towards the realization of ICT-based education in Nigeria, there is a wide gap between awareness and knowledge. Many teachers and students are not computer literate, and as a result could not harness its value in education. This gap must be bridged through vibrant and wide-spread awareness campaign on the need for ICT knowledge among teachers and students.

Fourthly, It is interesting to note from this study that ICT-based education by its nature is of immense benefit to learners with disabilities. It is heart-warming as this will close the gap created by bodily deformation in effort to teach them in the class with normal learners. With ICT the disabled and disadvantage learners can do quite a lot independent of class teacher and other normal co-learners.

Lastly, it is imperative from our study to point out that the need for ICT infrastructure should not deemphasize the misnomer of underutilized ICT equipment available. This was the case in some of the institutions in this study. In some cases, it is the issue of non-availability of operators or technicians or that of wrong placement of these equipments such that their potential uses are ameliorated. This should be a warning to institution administrators to ensure that provided equipments are installed in positions and places that maximize their users.

Recommendations

Based on the findings of the study, it is recommended that:

- That training and retraining of teachers in the use of ICT Systems should be regularly organized by the institutions to enhance teaching and learning process in class. It will also improve teachers' competence and confidence in handling the ICT class.
- The students must be required to be ICT compliance so as to make the use of ICT in the classroom to be easier for teachers. According to (Castro et al 2011) based on learning through ICT, students are more capable of using information and data from various, sources and critically assess the quality of the learning materials,
- The institutions where ICT Support Systems are used in the teaching and the learning should be provided with the needed hardware and software to ensure that both teachers and students enjoy the class without hitches.
- Adequate effort should be made to ensure that the ICT facilities are provided to all teachers and students to enhance teaching and learning process.

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