

ICT and Quality Teaching and Learning for National Development

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Abstract

This paper is concerned with roles of information and communication technology (ICT) in promoting quality teaching and learning for national development. Therefore, the paper suggests that; integrating ICT in teaching and learning process increases research and development, increase access to and improve the relevance and quality of education which in turn will improve human capital development. In addition, the paper also identifies some of the ways how integrating ICT in teaching and learning will improve national development, for instance, to integrate ICT into all the process of research and development in our institutions of learning and the country at large, integrating ICT right from foundation schools. The paper again states that; ICT integration in teaching and learning process is affected with numerous problems such as; shortage of technically experienced ICT teachers, inconsistent power supply, high cost of ICT equipment etc, while the paper recommends that; government of Nigeria should try to improve power supply or it should provide other alternative source of electrical energy, adequate funds needs to be provided by the government to procure ICT equipment's, teachers needs to acquire adequate knowledge on ICT integration in teaching and learning process in order to produce educated generations that will help in national development of Nigeria.

Keywords: Roles of ICT, Integration, Challenges of, Teaching and Learning, National Development,

Introduction

The main purpose of this paper is to examine the roles of ICT in teaching and learning process for national development. If educational institutions have to ensure that their students leave the institutions as individuals with confidence and capable of using new technology creativity and productivity. Then their teachers should have the competence to integrate the emerging technologies and the digital content with all their operations (Arora, 2016). Worldwide, educational systems are under great pressure to adopt innovative methodologies and to incorporate Information and Communication Technologies (ICT) in the teaching and learning process to prepare students with the knowledge and skills they need in today's world of work in order to contribute to national development. (Leach, 2008) It seems that, the teaching profession is shifting from teacher-centered, and lecture-based instructions to student-centered interactive learning environments capable of allowing students to learn by themselves while teachers serve as mentors, coaches, or facilitators guides to the students. ICT integration is understood as the usage of technology for educational processes like transacting curricular content, students working on technology to do different tasks and developing technology supported products, providing assessments and institutional development (Mikre, 2011). Today a variety of ICT can facilitate not only delivery of instruction but also learning process itself.

Moreover, ICT can promote international collaboration and networking in education and professional development. There is a range of ICT options from Video/conferencing through multimedia delivery to websites which can be used to meet the challenges teachers face today. In fact, there has been increasing evidence that ICT may be able to provide more flexible and effective ways for lifelong professional development of teachers (Kwache, 2005). Undoubtedly ICT has brought about many challenges and opportunities for education. The educational system needs to come to terms with these new challenges and take full advantage of the opportunities.

The policy makers in Nigeria as elsewhere in the world are more conscious more than ever about the roles of ICT in teaching and learning process in order to promote national development. The use of ICT in schools is crucial for social change and national development worldwide (Leach, 2008). Similarly, ICT plays a major role in the developing countries to go through economic, political, social and cultural development. This implies that ICT has impact on how teachers teach and students learn, and how people live, do business and communicate in the day to day activities. It provides opportunities to stimulate learning and increase motivation that enables teachers and students to interact productively with neighboring communities and global economy in a wider and higher scope. ICT has tremendous potential to change the way of life, prepare students for the workplaces, improvement of educational systems and attainment along with how people access and process information for national development.

ICT as Medium of Teaching and Learning

Information and communication technology (ICT) is a term which is currently used to denote a wide range of services, applications, and Technologies, using various type of equipment and software, often running over telecom networks (Heathcote, 2000). Telecom service used together with computer hardware and software from the basis of a range of other service , including email, the transfer of files from one computer to another, and in particular , the internet, which potentially allows all Computers to be connected, thereby giving access to source of knowledge and information stored on computers worldwide (Heathcote,2000). Its Application includes videoconferencing, distance learning, management information system, stock taking; technologies can be said to include a broad array ranging from old technologies such as radio and TV to new ones such as cellular mobile.

ICT is basically a tool. It can be hardware (such as computers, digital cameras), software (such as Excel, discussion forums), or both. In the educational context, it mainly refers to various resources and tools (software) presented on the computer. However, it is certainly a useful tool that enables us to link various learning communities together in new and different ways (Taylor, 2000). Research made by Roblyer, Edward & Havriluk, 2004 has indicated that, the use of ICT can support new instructional approaches and make hard-to-implement instructional methods such as simulation or cooperative learning more feasible. Moreover, educators commonly agree that ICT has the potential to improve students' learning outcomes and effectiveness if it is properly used (Wang, 2001). ICT as Medium of Teaching and Learning refers to the tool for the purpose of teaching and learning itself. More than three decades ago, computers and related information technologies were introduced to education system for direct teaching and learning purpose. It started with Client Access License (CAL), Computer Based Training (CBT), Common Air Interfiles (CAI), then moved to Multimedia courseware and finally to Web Based instruction & Computer Mediated Communication (CMC) system. Using CAI for drill and practice of basic skills can be highly effective according to a large body of data and a long history of use (Kulik, 1994).

Students usually learn more rapidly, in courses that use computer assisted instruction (CAI). This has been shown to be the case across all subject areas, from preschool to higher education, and in both regular and special education classes (Arora, 2006). Effective instruction requires presenting information, guiding the learner, practice, and assessment of student learning. The use of a computer to provide any combination of these factors may be termed computer-assisted instruction. It should be noted that there is no requirement that the computer provides all of these elements. Rather, any combination of these can be appropriate computer intervention in the learning process. Interactivity, flexibility and learner control is the hallmark of these technologies (Kumar, 2015).

The application of educational technologies to instruction has progressed beyond the use of basic drill and practice software, and now includes the use of complex multimedia products and advanced networking technologies. Today, students use multimedia to learn interactively and work on class projects. They use the Internet to do research, engage in projects, and to communicate. The new technologies allow students to have more control over their own learning, to think analytically and critically, and to work collaboratively. An increasing body of evidence suggests positive results of the ICT integration with teaching and learning (Alessi and Trollip.1985).

The Emerging Methods of Information and Communication Technology (ICT) Integration

Several Studies carried out by; (Bello, & Aderbigbe, 2014; Kumar, 2015; Mikre, 2011; Tinio, 2002;) have shown the emerging methods of ICT integration in teaching and learning process and suggest the following:

- I. E-learning:** - Is a learning program that makes use of an information network such as the internet, an intranet Local Area Networking (LAN) or extranet Wide Area Networking (WAN) whether wholly or in part, for course delivery, interaction and/or facilitation. Web-based learning is a subset of e-learning and refers to learning using an internet browser such as the model, blackboard or internet explorer.
- II. Blended Learning:** - Refers to learning models that combines the face-to-face classroom practice with e-learning solutions. For example, a teacher may facilitate ss student learning in class contact and uses the model (modular object-oriented dynamic learning environment) to facilitate out of class learning.
- III. Active learning:** - Internet Communication Technology (ICT) -enhanced learning mobilizes tools for examination, calculation and analysis of information in order to provide a platform for student inquiry, analysis and construction of new information. The learners therefore, learn as whenever they do appropriate work on real-life problems in-depth. Moreover, ICT makes the learning less abstract and more relevant to their life situations. In contrast to memorization-based or rote learning, that is the feature of traditional pedagogy; ICT-enhanced learning promotes learner engagement. ICT-enhanced learning can also be 'just-in time' learning that the learners choose what to learn when they need.
- IV. Collaborative learning:** - ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modeling real world interactions, ICT-supported learning provides opportunity to work with students from different cultures, thereby helping to enhance learners teaming and communication skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding

the learning pace to include not just peers but also mentors and experts from different fields.

- V. **Creative learning:** - ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the duplication of received information.
- VI. **Integrative learning:** - ICT-enhanced learning promotes a thematic integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines, and between theory and practice, which characterizes the traditional approach.
- VII. **Evaluative learning:** - ICT-enhanced learning is student-directed and diagnostic. Unlike static, text or print-based education, ICT-enhanced learning recognizes the presence of different learning pathways to explore and discover rather than merely listen and remember.
- VIII. **U-Learning:** - (i.e. Ubiquitous learning) is based on ubiquitous technology. The most significant role of ubiquitous computing learning in u- learning is to construct a ubiquitous learning environment, which enables anyone to learn at any place at any time.

The importance of Integrating ICT into Teaching and Learning Process

Integrating ICT into teaching and learning process has a lot of advantages for the teachers, learners and nation at large. ICT has the potential for increasing access to, and improving the relevance and quality of education, hence it is important as it provides opportunities to be extended to marginalized, rural and scattered populations, people traditionally excluded from education due to cultural and social reason such as girls, women, persons with disability, the elderly and others who for the cost of education or time constraints are unable to enroll in school for education (Oxfam Education Report, 2002)

The use of ICT for learning will culminate in students' use of internet which will help them to be able to type work (such as assignments, projects, etc), search the internet for information and use spell checks to improve on their spoken and written English. The use of ICT will prop students to look for more information at a wider range than books. With the right investment in hardware and software and teacher professional development, teachers will be moved to a higher stage of integration of ICT into teaching and learning. With the use of ICT, students will be able to catch up with class work even outside school hour (Kwace, 2005).

In order to fit into the new economic order, it is necessary for Africa, Nigerian institutions, and individuals alike to develop a society and culture that places a high value on education and training. Thus ICT based technology like e-learning has great potential to supplement traditional learning. This is so because ICT enhanced learning can provide new opportunities to explore high level cognitive activities such as autonomy, creativity, problem solving and team work while providing teachers with the means to take into account individual needs of students, especially while using web based technology. Accordingly, and in addition to some of the importance mentioned above, some of the definite and specific reasons for implementing ICT based technology for teachers and learners are:

- a) New ICT facilities allow students and teachers to control, manipulate, and contribute information to learning and teaching environments as interactive books, journals and the like are usually made available via Internet.
- b) The use of new multimedia technologies and Internet will improve the quality of teaching-learning related activities not only in Nigeria but Africa sub-Saharan region as well.
- c) As a social process it will facilitate interaction and collaboration not only among learners but among teachers both at local and global levels.

d) It will give opportunity to individuals, who might wish to combine work and learning at their own pace, irrespective of location,

e) It promotes human resources capable of responding to the demands of the new world economy that is supported and driven by ICT.

Thus, with the evolution of the new ICT, education institutions are able to provide a flexible and more open learning environment for students and teachers alike. In Nigeria, indications have shown that, with increasing number of school enrollments at all levels of education, distance or blended learning has continue to grow, which calls for immediate technology support (Kwache, 2005).

Integrating ICT in Teaching and learning and National Development

National development involves the total transformation of society, making humanity the focus of the development drive and seeking to develop man's potentialities in a total sense. It includes reduction of poverty, wealth creation, equitable distribution of wealth, provision of more job opportunities, ensuring nutrition and health, housing, social security and welfare (Emeh and Ogaboh, 2010).

Mohd (2006) observed that national development is the growth of a nation in terms of unity, education, economic well-being, and mass participation in government. He sees it as a total experience in advancement and establishment of a maintenance culture in all areas of social, economic, cultural and political life of the citizens of that society. From these definitions, one could easily infer that national development is all about how a nation's resources are harnessed for the development and betterment of the citizenry. This implies that there is a link between education and national development. Therefore, the following are some of the ways in which integrating ICT into teaching and learning will enhance national development.

1. To integrate ICT into the process of research and development in our institutions of learning and the country at large. Involvement of ICT into the development of research will improve the capacity of labour and its efficiency and therefore, improve the nation's economy.
2. Integrating ICT right from i.e Nursery, Primary, Secondary to the tertiary institutions is one of the best ways to improve the quality of our education from beginning to the top. According to Kumar, 2015, one of the reasons why the standard of teaching and learning in our schools has fallen down is lack of incorporating contemporary or modern methods, ideas etc. into the teaching and learning process. Improvement in quality of our education will enhance national development ICT boasts knowledge, skills and competence of the labour force which are the most important ingredients used for the development of any given nation.
3. Full utilization of ICT into the management and administrations of our educational institutions. When ICT is fully used in this capacity it will help to reduce the cost of management and administration of our institutions of learning especially with current economic crises in Nigeria.
4. Using ICT as a means of employment or job creation opportunity to the students who have just graduated from schools. This is more concern in the entrepreneurship development programs. The knowledge and skills of ICT should be utilized in our small scale business activities learned by students in the tertiary institutions. This will help to reduce the level of unemployment and provide more income as well as reduce the level of poverty to our people. In addition, integrating ICT into the teaching and learning process provides students with new and adequate knowledge, skills and competence that will help them secure jobs in the highly competitive

labour market not only in Nigeria but in other countries. And their performances will be recorded under the Nigeria's National Income or G.N.P (Gross National Product).

5. The opportunity cost of time, energy and other resources will be regained if ICT is incorporated as a new way of sending and receiving information on students in our schools. For example Sa'adatu Rimi College of Education (COE) Kano is currently working out the ways of how students of the college will have information on their results (examination) online. This great development will help to reduce the students hardship in accessing their results.
6. Innovations and inventions can be harnessed if ICT is involved in teaching and learning to the students in the Polytechnics and Universities of technology in Nigeria. ICT based technology is more efficient than any other source (i.e analog and digital based). In view of this our students will explore more and perform better using ICT based technology in their studies. It will make them more scientific, innovative, and creative and enhance national development.

The problems militating against ICT integration in Nigerian Education

Despite the above important role played by ICT integration in teaching and learning process, Nigeria as a nation was late and is still slow in the use of ICT in almost all sectors of the nation's life (Yusuf, 2005). Accordingly, the most common problems associated with the effective ICT integration are:

- A. Shortage of qualified ICT personnel. Most institutions have shortage of computer literate teachers and ICT experts that would support and manage the Internet connectivity or application of computing in the teaching and learning process.
- B. Cost of equipment. The cost of equipment in a country like Nigeria with a battered economy and seriously devalued currency is enormous.
- C. Management's attitudes. The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the Internet and procurement of computers is rather slow in some instances, and in others there are no aids or support by the government at all.
- D. Inconsistent power supply in most of the parts of the country and also inadequate telephone lines particularly in the rural areas.
- E. Non-inclusion of ICT programs in teachers' training curricula or at the basic levels of education. There seems to be no clear and definite policy or curriculum for all levels of the Nigerian education system.

Conclusion

The importance of assimilating ICT into teaching and learning process contributes towards improving research and development, developing human resources, reducing waste and cost of production, minimizing unemployment rate and poverty level which in turn leads to national development. ICT incorporation into teaching and learning process is bedeviled with numerous problems such as shortage of qualified ICT personnel, high cost of procuring ICT equipment, poor management's attitudes, inconsistent electric power supply, etc. Therefore, these stand as a stumbling block to the national development.

Recommendations

The paper recommends that for proper and effective ICT assimilation into teaching and learning process for national development the followings need to be provided:

- i. Continuous and periodic training of teachers on computers and ICT skills acquisition should be provided to boost ICT integration in teaching and learning process.
- ii. Government at all levels should make ICT a matter of priority and provide funds specifically for procuring of ICT facilities.
- iii. The adoption of ICT international standards and its inclusion in the Nigeria curriculum and in particular in the teachers' education curriculum.
- iv. There is a need for the Nigerian government to address seriously the issues of the erratic electricity power supply, while schools wishing to adopt the integration of ICT in their teaching and learning process should as a matter of urgent procure a generator that can supplement Power Holding Company (PHCN) for supply of power.
- v. The development of rural infrastructure by the government of Nigeria should include ICT. Rural areas should also have ICT centres readily available. This will help students and other people to access knowledge even when they are in the rural areas.
- vi. Government of Nigeria should also try to find other sources of power apart from hydro-electric. Other sources of energy e.g solar, steam e.t.c should be developed by the government in order to produce enough electricity for ICT equipments.
- vii. Public, private partnership investment in ICT should be encouraged by the government to connect all areas where ICT network has not reached at affordable cost.

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