The Role of Information and Communication Technology (ICT) in Teachers' Education in Nigeria: Challenges and The way forward

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ABSTRACT

This survey takes a look at the role of ICT in Teachers' Education in Nigeria. Its major aim is to appraise the challenges faced by ICT in teachers' education and profer the way forward. The design for the study was survey method using interview. The population for the study was all 1400 education students of Federal College of Education, Zaria where 50 pre-service teachers were purposively selected. The instrument is a questionnaire on availability and utilization of ICT facilities for pre-service teachers in the study area. The instrument was validated by experts and pilot tested with a reliability coefficient of 0.65. Data collected were analyzed using simple percentage. The result indicates that 40% of pre-service teachers have their personal computers and 30% of the lecture rooms have ICT facilities. Based on the results, it is recommended that, government should make ICT facilities available for pre-service teachers training. Also, all lecture classrooms should be well equipped with necessary ICT facilities for proper training of teachers.

Keywords: *Pre-service Teachers, Teacher Education, ICT*

INTRODUCTION

Information Communication Technologies (ICT's) according to Adeyemo (2010) a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information. These technologies according to him include computers, the internet, broad casting technologies (radios and television) and telephony. ICTs according to United Nations Development Programme (UNDP) are basically information- handling tools- a varied set of goods, application and services that are to produce, store, and process, distribute and exchange of information. Kazu and Yavuzalp (2008) report that the potentials of Information and Communication Technology (ICT) to facilitate students learning, improve teaching, enhance institutional administration had been established in literature. Levy and Murmane (2001), Salganik (2001), Euridice (2002), Adeyemo (2010), Bell, R. and Bell, L. (2003) were of the opinion that the ability to use and apply information and communication technologies (ICT) gadgets is recognized as one of the key competencies necessary for effective teaching and learning situation. Many scholars (Bell, R. and Bell, L. (2003); Adeyemo, 2010) have recognized the potential of ICT to enhance teaching and learning, this has call for the need to integrate ICT in teachers' education curriculum. Teachers' education are the processes by which men and women are prepared for work in schools for the purpose of imparting knowledge, skills and favourable attitudes

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(Abubakar and Dantani, 2005). The definition above indicates that men and women are prepared to impart knowledge to the learners and cultivate favourable attitudes in the learners. Furthermore, teachers' education can be viewed as a type of education which is carefully designed to prepare and groom those who teach or will teach or will provide relevant professional service to schools, colleges and relevant originations. The purposes of teacher education as provided in the National Policy on Education (FGN, 2007) are to:

1. Produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;
2. To encourage further the spirit of enquiry and creativity in teachers;
3. To help teachers to fit into the social life of the community and society at large and to enhance their commitments to national objectives;
4. To provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation not only in the life of their country but in the wider world and
5. To enhance teachers commitment to the teaching profession.

From the above it can be said that teachers' education aims at helping the child to study and identify his needs and how to meet up those needs through education. The above purpose of teachers' education can be achieved if ICT is fully integrated into teachers' curriculum. The teacher training programme that aims at aiding teachers to be creative can be fully achieving using ICT. This is because ICT can assist the learners to make use of their senses and participate in the learning process. It is based on the above that this study was designed to survey the availability and utilization of ICT facilities by pre-service teachers in Federal College of Education, Zaria.

Advantages of ICT for Teaching and Learning

Benefits of ICT to teachers' education are enormous; several studies have highlighted the importance of ICT in empowering teachers and enhancing learner's achievement. Adeyemo (2010) and Onasanya, Shehu R., Oduwaye and Shehu L. (2010) identify the following objective of the application of ICT in teaching and learning:

i To provide basic computer literacy skills relevant to respective disciplines.
ii To provide basic computer literacy skills
iii To improve students' motivation
iv To improve communication skills
v To improve higher order thinking skills
vi To provide content (e.g. CD- ROM, www etc)
vii To support teaching methodology (e.g. group work tools for group assignment on the internet).
viii To improve course management (both in the regular curriculum and in distance education).
ix To collaborate in online teaching and learning with other faculties and students from around the world.

Osborne and Hennessy (2001) report that ICT enhances the effectiveness of information presentation and stimulates student's interest. Moreover, Selinger (2004) claims

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that ICT can improve the quality of education because multimedia context helps to illustrate and explain difficult concepts in ways that were previously inaccessible through traditional teaching resources and methodologies. Similarity multimedia approach such as interactive CD Rom, power point presentations and graphic software had been successful in generating conceptual understanding in students. The use of ICT has greatly transformed the outcomes of teaching and learning experiences in classrooms. It does not only supplement and/ complement teachers' instructional processes but also offers unlimited access to knowledge and information that is readily available through the internet (Nneji, 2012). Gilmore (1995) opines that teachers who uses computers in teaching were found to increase their confidence level in teaching and assist them in classroom management.

Yu (1998) used a computer assisted instruction and finds that it increases students performance and attitudes towards science. Similarly, Cooper and Bona (2002) report evidently that pleasure and variety kept students engaged and motivated. They made conclusion that if ICT is carefully planned and pedagogically implemented, it can support relationship and motivation that in-turn support long lasting engagement and learning. McKinnon, Nolan and Sinclair (2000) find that students in their experimental group became enthusiastic computer users and performed significantly better compared to those in the non-experimental group. Similarly, Adeyemo (2010) in a survey on the impact of ICT on teaching and learning physics reports that, out of 25 secondary schools that were involved in the study 9.43% teachers ask students to browse on the internet, 2.83% have used over-head projector and 1.87% makes use of CD-ROM containing educational topics. He concludes that school administrators, and government at all levels need to come to rescue of the schools by providing those facilities as most of the schools are without the computers.

Applications of ICT in the Teaching and Learning Process

Information and Communication Technologies (ICT) such as data loggers, the internet, modeling, simulations, CD ROMs, and Spreadsheets are commonly used in classrooms (Brooks, H. and Brooks, P., 1996; Rodrigue, 1996). It is also possible that the interactive illustrations and links found in CD ROMs could help students to contemplate the symbolic world of equations and formula, the macroscopic world of practice of every day substance and laboratory practices as well as the microscopic world of elementary particles (Brooks H. and Brooks D., 1996). Simulations, often found in CD-ROMs, also used in the development in science and social science concepts depend on graphical data (Trumper 1994, Lazarawitz and Huppert, 1993). Kinzie, Straus and Foss (1993) and Straus and Kinzie (1991) demonstrate that a simulation of a frog dissection is as potent as a real dissection in terms of promoting learning about frog anatomy and dissection procedures.

Some of the many motives for using practical work in science and technology classrooms relates to the perceived ability of practical work to illustrate or confirm scientific theory and its ability to help distil insight into scientific phenomena (Hodson, 1988). Others believe that practical work provides a more meaningful learning experience in comparison with rote learning (Hodson, 1988). Many of these beliefs and perceptions are being

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narrowed in the cited potential of CD-ROMs. There is a belief that the interractiveness and animations found in CD ROMs will provide meaningful learning environments that could help distil insight into particular phenomena while providing sub-service theory being taught in the classroom. For example, numerous visualization techniques are available that allow students to play back and analyze the motion objects. Another good example of technology is the use of television; there are many great educational films available nowadays that could be purchased for use in classrooms, Documentaries from TV or special programs on public television could also be taped and use for learning in class. The benefit of bringing this technology into the classroom is for the students to be able to learn about the topic from someone else other than their regular teacher. Use of overhead projector instead of chalk board is another important application of ICT in education. This allows teachers to type up notes, sketches, diagrams that he would then give to students and their transparencies. When it is time to teach or lecture on the material, the learners can follow alone on their sheet while also looking at the image being projected. A good application of this is in the teaching of DNA replication. The teacher can distribute the diagram of the process to teach students. In addition, the teacher can make a transparency of the diagram and charts and display it in the classroom. This is much easier than drawing the diagram on the chalk or white board and asking all the students to copy.

Computers could be used specifically for classroom instruction as in the case of CD ROMs that explore such topics as human anatomy. These programs generally provide highly a visual interactive component to a lesson. The premise of the study is that ICT facilitates high quality learning and teaching; that students engagement in technology using available technologies has the potential to enhance the learning of difficult topics. ICT ensures quick and easy access to superior photographs such as that of animals, plants etc, images, diagrams and other two dimensional (2D) representation along with three dimensional (3D) simulations, animations, and video clips for teachers and students. Computer modeling of 3D objects, scientific processes and concepts are all examples of learning and teaching objects that are now available (Oakes, 2009).

Multimodal representation is part of science and technology discourse (Jaipal, 2009). Graphs, tables, diagrams, flow charts, animations and simulations are part of the repertoire of practice with scientific meaning dependent on the reader's ability to make sense of different semiotic modalities both singularly and in conjunction with text. Emerging knowledge and understanding in biological sciences can be represented in a wider range of formats.

METHOD

A survey was conducted using 50 pre-service teachers in Curriculum and Instruction Department of Federal College of Education, Zaria, which were purposively selected. The survey was carried out using a questionnaire on the availability and utilization of ICT facilities by pre-service teachers. The instrument was validated by two experts, one in Computer Science Department of Federal College of Education (FCE), Zaria and the other in Computer Education of Ahmadu Bello University, Zaria. Their observations were

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significant and were adequately implemented by the researchers. The correction was made as pointed out. The instrument was pilot tested at Kaduna State College of Education, Gidan Waya in Kaduna State and the reliability coefficient was found to be $r = 0.65$. The instrument was administered on the participants by the researchers. Data collected were analyzed using simple percentage.

RESULTS AND DISCUSSION

Table 1: Summary of Results on the Survey of the Availability and Utilization of ICT Facilities by Pre-service Teachers at Federal College of Education, Zaria

Utilization Items	Percentage
Pre-service teachers with personal computers	40%
Pre-service teachers with Handsets with Internet facilities	70%
Lecture rooms with ICT facilities	30%
Lecturers with personal computers and	95%
Teachers that have access to computer and internet outside the school settings	70%
Teachers that ask students to do some assignments on the internet	80%
	Response
Does the department have laptops, LCD projector, video recorder and talking books?	Yes
Does the department have overhead projectors?	Yes
Do your teachers ask you to browse on the internet?	Yes

The results on table 1 indicates that less that half of the pre-service teachers have personal computers which is inadequate. The result is in agreement with the work of Adeyemo (2010) who reports the poor state of ICT facilities and the application of such by physics teachers. He further reports that only 9.43% teachers asked students to browse on the internet and 2.83% have used over-head projector. In his concluding remark, Adeyemo (2010) proposed that school administrators and Governments at all levels should come to rescue need by providing those facilities for effective training of pre-service teachers. Therefore integrating ICT to teacher education and providing such to the schools will be a welcome development in Nigeria for effective training of pre-service teachers. Regretably, personal observation of the researchers show that in all the classrooms surveyed only few were with ICT facilities. The other ICT facilities are in the store.

Challenges in Using ICT in Teaching and Learning

There are many challenges being faced by teachers in using ICT to teach. These challenges range from inadequate or limited infrastructural facilities, difficulties in infusing ICT use in the curriculum to lack of appropriate teachers' development programmes.

(i) Existing courses in the curriculum on ICT are inadequate to facilitate student-teachers' acquisition of necessary ICT related skills so that they can be more competent when teaching courses in the classroom using ICT devices.

(ii) Shanghold (1991), cited in North Central Regional Educational laboratory, (2003) notes that the challenges of technology integration into the education sector is more of human than it is technological. Al-Oteawi (2002) points out teacher's lack of computer competences as their main challenge to the acceptance and adoption of ICT in teaching and learning in developing countries.

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(iii) Eres (1987) observes amongst other factors that militate against the use of information technology in developing countries as cost factor, problems of foreign exchange required for the purchase of computers, insufficient standard library information, inadequate and unreliable telephone network systems, shortage of manpower, low prestige of information professionals, difficulty in recruiting specialist and lack of continuing education.

CONCLUSION

The use of ICT in teaching and learning courses in schools as reveal by this study is incontestable. ICT, when properly used can assume the role of the teacher and could help teachers to achieve the objectives of whatever they want to teach their students. It reduces teachers' talk time and the exaggeration of facts which are sometimes boring to the students and stressing the teachers' energy excessively. In conclusion, therefore, this study is of the opinion that ICT has the potential to foster teaching and learning. Hence, for effective training of pre-service teachers, ICT facilities are necessary. Based on this, it is recommended that teachers should be made to integrate ICT based methodology into the teaching process through the use of ICT tools. All classrooms should be well equipped with necessary infrastructure such as projectors, slide screens, among many others. All students should have access to media laboratories, so that they can use itmeaningfully and appropriately. There is the need also for training workshops fto be organised for teachers to share experiences and incorporate same to ICT.

Provision of motivation for teachers (monetary and non-monetary) should be made available by appropriate relevant authorities. Sensitization of stakeholders about ICT to be incorporated into Teachers' Education Curriculum should be made a priority. Policy makers should provide additional planning time for teachers to experiment the teaching of subjects with new ICT based approaches. This may be attained by reducing the teaching load of teachers. The use of internet should be made compulsory to all staff and students in schools. Special funds or professional recognition for innovative uses of technology in teaching should be given to specific teachers, schools and colleges. ICT education should be made compulsory for all teachers and students apart from the ones they study in General Studies Education (GSE).

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