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## ENHANCING POLYTECHNIC EDUCATION THROUGH ICT: PROBLEMS AND PROSPECT IN NIGERIA

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### ABSTRACT

*Information and communication technology (ICT) is the bedrock of technological development now a days and one of the effective method of sharing knowledge and dissemination of information. The paper is the document base analysis which the history of polytechnic education, ICT and teacher education, e-learning and student education were discussed. It examines some problems of ICT in polytechnic education as well as the prospect of ICT education. Finally, recommendations were given on how to achieve a successful ICT implementation in our polytechnics education.*

### INTRODUCTION

Information and communication technology (ICT) have the potential for increasing access to and improving the relevance and quality of education. They greatly facilitate the acquisition and absorption of knowledge, offering developing countries like Nigeria unprecedented opportunities to enhance educational systems, improve policy formulation and execution as well as widening the range of opportunities. ICTs are a potentially powerful tool for extending educational opportunities, both formal and informal.

However, a simple definition where given as - ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email, robots. So ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is also concerned with the way these different uses can work with each other. tutor2u, (2010).

In this world of information technology, academicians, students and educational administrators cannot do without e-Education, therefore the need to know, to learn and to practice is inevitable. E-Education (electronic education) is the terms commonly used in our current educational systems, in addition to e-learning, e-teacher and many to come.

Campbell, (2001) stated that, e-teachers are the new generation of teachers who will work in an Internet environment in both regular and virtual classroom situations. While, e-learning is learning that takes place as a result of experiences and interaction in an Internet environment. And e-education involves e-teaching and e-learning along with the various administrative and strategic measures needed to support teaching and learning in an Internet environment. Polytechnic education and ICT are inseparable and the only way is to accept and implement in full capacity by introducing CAD-CAM computer drawing studio, access to virtual library, inter café and many more.

### ***Historical Perspective of Polytechnic Education***

Nigeria's first institution of higher learning according to Odeyimi (2000), was the Higher College Yaba which was opened in 1930, but it began operation in 1934 to provide instructions in medicine, engineering, agricultural and teachers' training at sub-degree level. Later in 1952, Nigerian College of Arts, Science and Technology was established with branches in Ibadan, Zaria and Enugu to provide Diploma courses in Accountancy, Surveying, Architecture, Estate Management, Pharmacy, Secretary Ship and Teachers' Training.

Technical Institutes at Enugu and Kaduna (1958), Ibadan (1960), Auchi (1964), were later established and upgraded to Colleges of Technology in the mid-1960 following the demand for intermediate and higher technical personnel needed for post-civil-war reconstruction and rehabilitation work, as well as to respond to the wealth arising from the oil boom. Oyedemi (2002) asserts that the number of these institutions rose from nine in 1973 to twenty-seven in 1985. The colleges metamorphosed into polytechnics in 1987, as a result of government's decision to institution. By the year 2002 there are about 48 polytechnic in Nigeria. Today polytechnic education provides the bulk of technicians, technical personnel both intermediate and higher officers. The polytechnic education in Nigeria is structured in four years duration of two years National Diploma (ND) and two years Higher National Diploma (HND) with a mandatory one year industrial attachment between ND and HND.

### ***ICT and Teacher Education***

The academic landscape in Nigeria includes the teaching and learning process, along with the educational programs and courses and the pedagogy or methodology of teaching; the research process, including dissemination and publication; libraries and information services; including higher education administration and management Beebe (2004). The integration of Information and Communication

Technologies (ICTs) in higher education programs has been the topic of a good deal of debate.

Unquestionably, ICTs has impacted on the quality and quantity of teaching, learning, and research in teacher education. Therefore, ICT provides opportunities for student teachers, academic and non-academic staff to communicate with one another more effectively during formal and informal teaching and learning Yusuf (2005). In the same vein, teachers need training not only in computer literacy but also in the application of various kinds of educational software in teaching and learning Ololube (2006). Furthermore, they need to learn how to integrate ICTs into their classroom activities and school structure. The quality of teachers is known in virtually all countries to be a key predictor of student learning Ololube (2000).

According to Aminu (2003) Information and Communication Technology (ICT) have become the key tools and had a revolutionary impact of how we see the world and how we live. The phenomenon has given birth to the contemporary e-commerce, e-pension, e-medicine; and e-education. The concept of computer-aided teaching and computer-aided learning has given birth to computer-aided instruction, which represents a combination of both teaching and learning. Changing roles of teachers and the classroom environment with the advent of e-learning make the entire system of education new and very challenging. Campbell, (2001). *Teachers do not necessarily mind change, what they do mind is being made to change and become e-teachers in the new e-education environment.*

### ***E- Learning and Students Education***

The American Society for Training and Development defines e-Learning as the use of Internet and digital technologies to create experiences that educate our fellow human being Horton (2001). The European e-Learning Action Plan defines e-Learning as the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well

as remote exchanges and collaboration COM (2001). E-Learning is changing the relations between teachers and students. The advent of ICT and eLearning are helping to move the usual central role of teaching to the new central role of learning and establishing with that a new paradigm.

In this new stage, the teacher can be seen more as a learning guide or a learning facilitator, rather than the usual 'knowledge' authority or information transmitter. Otherwise, with ICT, students tend, in general, to have a more active, motivated, and innovative and self-regulated learning role. E-learning can give students much greater control over their own learning experience while giving e-teachers an opportunity to further meet the needs of individual students in a digital age Layton (2000); and Wallhaus (2000).

### ICT AND POLYTECHNIC EDUCATION

Each era of socio-technological change is subsequently marked out as a data base for improvement into subsequent ages as can be observed in the sequence below:  
 Stone Age Iron Age Renaissance or Middle age Industrial Revolution and presently the information era of globalization.

One factor is in the increasing rapidness of these transitions and cost effectiveness of technological changes. For example, observed data on a letter from London to Nigeria in the context of world communication.

MAILED	POST	TELEX	FAX M/C	E-MAIL
Minimum time	8 – 10 days	2 minutes	30 secs	¼ sec

Source: Olaguke and Alausa 2009

When effectively integrated into a high-quality learning environment, researchers have demonstrated that ICT can help deepen students' content knowledge, engage them in constructing their own knowledge, and support the development of complex thinking skills (Kozma, 2005; Kulik, 2003; Webb & Cox, 2004).

There are several ICT for education initiatives in Nigeria. These initiatives are either being undertaken by government, civil society or the private sector. It is very important that these programmes are developed to ensure coordination between government, non-profit and private institutions towards policy reform and the development of effective national ICT for development policies for rapid replication of best practices. Presently, there are about nine ICT education initiatives at various stages of development being

carried out by the education coordinating agencies of government and the ministry of education.

They include:

1. The Nigerian Universities Network (NU Net) Project
2. The Polytechnics Network (Poly Net) Project
3. The School Net Project
4. The Nigerian Education, Academic and Research Network (NEAR Net)
5. The Teachers Network (Teach Net) Project
6. National Open University
7. National Virtual (Digital) Library (Ministry of Education/ NUC)
8. National Virtual Library (Ministry of Science and Technology/NITDA)
9. National Information, communication and education programme of the presidency (Sheyin 2009)

### ***Problems of ICT in Polytechnic Education***

Nigeria as a nation came late and is still slow in the use of ICT in almost all sectors of the nation's life Yusuf (2005). There are many problems faced as per as ICT and Polytechnic Education are concern, these include: The academicians (i.e. lecturers/instructors), Government, administrators, Institutions (i.e. Schools), Students and general public on lack of awareness on the importance of ICT. The need today is moving from "Learning to use ICT" to "Using ICT to Learn", Bevernage, Cornille, & Mwamiki, (2005).

One of the major barriers to ICT education identified by Hirschbuhl (1994), was the fear some staff felt when faced with stepping outside their comfort levels and they were not willing to take the risk. Rutherford and Grana (1995) also focused their research on academic staff fear in the face of technology. They identified nine areas that could prevent staff from making changes that would enable them to integrate technology into their teaching:

1. Fear of change
2. Fear of time commitment
3. Fear of appearing incompetent
4. Fear of techno lingo
5. Fear of techno failure
6. Fear of not knowing where to start
7. Fear of being married to bad choices
8. Fear of having to move backward to go forward
9. Fear of rejection or reprisals.

Abidoye and Ayelaagbe (2006) highlight the following as challenges of utilizing ICTs facilities: Lack of teacher's confidence and Teacher's Computer anxiety, Lack of access to resources, Resistance to change and Negative attitudes, No perception of benefits, Impact of public Examinations, Age difference etc. For the government side problems faced are inadequate infrastructure for the support of ICT, Inadequate funding of Polytechnic education, Low

lecturers/teachers motivation, low level of power supply.

While in the other hand management's 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 Albirini (2006).

Lack of qualified ICT personnel, in most institutions there is inadequate computer literate lecturers/teachers and ICT experts that would support and manage the Internet connectivity and/or application of computing in the teaching learning process.

Now a day's subject/courses like Technical Drawing, Architecture, Engineering Drawing, Geometrical Drawing, and Design in general move from drawing tables to computer using CAD-CAM (Computer assisted design and computer assisted manufacturing) in which we lack adequate or no equipment at all and insufficient qualified lecturers. The over-dependence of educational institutions on government for everything has limited institutions' ability to collaborate with the private sector or seek alternative funding sources for ICT educational initiatives.

### ***Prospect of ICT Education***

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 lecturers/teachers with the means to take into account individual needs of students, especially while using web based technology. 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, Oxfam Education Report (2002). In

addition to that, the use of new multimedia technologies and Internet will improve the quality of teaching learning related activities and it enhances performance of lecturers in time of course materials delivery and provides maximum attention to students as they could meet through email feedback facility or otherwise.

Learning of CAD-CAM for both lecturers and students will open the door to current world of innovation and fashionable Industrial Design.

## CONCLUSION

For a qualitative education ICT education should be in full practice in the polytechnic education system. Also, it is very essential to make a joint responsibility of all the stake holders such as lecturers, students, educational administrators, and parents on crating awareness campaign on the importance of ICT in our educational development. In conclusion, the paper highlights on the role of information and communication technology and directly affects education in general and polytechnic education in particular and recommendations were made.

## RECOMMENDATIONS

Problems of ICT in polytechnic education can only be over come through adequate planning and proper implementation. These include:-

1. Provision of CAD-CAM computer studio, to enable both lecturers and students to have intensive training.
2. Adequate power supply or alternatively shift from electricity power supply to solar power and energy alternative to avoid frequent power failure.
3. Provision of infrastructure (cyber centres), institutional network (LAN, WAN, Wi-Fi), systems and applications (Internet, e-

learning, education portals, etc.), digital library.

4. Government should increase funding for the entire educational sector with particular emphasis on ICT.
5. A policy environment which encourages investment in ICT should be put in place including tariffs on import of ICT infrastructure, in order to promote affordability and wide range usage at all levels of the educational system.
6. A forward – looking National Policy on e-education is in place (as part of a revised National Policy on Education).

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