



Educational Policy on Information and Communication Technology in Teaching and Learning At Rufus GIWA Polytechnic, OWO.

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Abstract

Information and Communication are making dynamic changes in the society today. They influence majorly all aspects of life and most of the influence affects more and more at schools, because Information and Communication Technology provides both the students and teachers with more opportunities in adopting teaching and learning style to individual's need and the society at large. Information and Communication Technology plays significant roles in presenting equalization strategy for developing countries, the reality of the digital divide and the gap between those who have access to and control technology and those who do not make a huge difference in the use of Information and Communication Technology. The study seeks to determine the availability of information and communication technology knowledge and skill acquisition among the students, identify hindrances in utilizing ICT facilities in teaching and learning process in Rufus Giwa Polytechnic. In examining this, the study dwells on Technological Pedagogical and Content Knowledge (TPACK) theory and also adopts both primary and secondary sources of data. The study uses descriptive survey design for a robust discussion. The study reveals in finding that students cannot learn efficiently through Educational Technology skills very well and apply them in the society if there are not adequately equipped ICT facilities in the schools, viable environment and well trained teachers to implement this in classrooms. The work recommends that the state government, through the ministry of Education, Science and Technology should make increased subvention for Rufus Giwa Polytechnic solely for the purpose of Information and communication technology.

Keywords: Policy, Information, Communication, Technology, Teaching and Learning.

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I. Introduction

Information and Communication Technology (ICT) is making dynamic changes in the society. It influences all aspects of human life. Information and communication technologies (ICT) provides new opportunities for education and training, as they enhance learning and teaching, and facilitate collaborations, innovation and creativity for individuals and organizations (Ala-Mutka, Punie & Redecker, 2018). Although often used as an extension of other teaching tools, the use of ICT has the potential to open opportunities of new ways of doing things, thus developing creativity in learning. Furthermore, ICT use has been found to be associated with creativity, (Gorbi, 2013). Thus, the use ICT can support development of public policy for

educational change that promote creative and innovative school (and university) environment (Cachia, Ferrari & Punie, 2011).

An education system that harmonizes with the changing world needs and has a fruitful look at the sciences will provide diverse training and learning experiences to support the learners' creativity and academic ability. In fact, such an education system is more able to provide better thinking skills and ability in learners as the system prepares them for better understanding of the world and the need for constructive innovations (Payne Young, 2009). The application of teaching and learning methods that promotes deep and active learning and creativity in learners is the emphasis of the educational system of the present age.

A number of scholars have suggested that there exists a strong relationship between learning and creativity and in fact Gordon (2005) states that creativity can be considered as a sub-type of learning. Higher education, as a social institution must function according to the needs of the community, i.e., should nurture individuals that they educate to be creative and thoughtful with high academic ability. To achieve this objective, the traditional teaching methods (lectures, chalkboard system, etc.) do not have the required effectiveness, but implementation of ICT related learning system and in teaching-learning process could be a way to realize this goal (Zare, Sarikhani, Salari, & Mansouri, 2016).

Information and Communication Technology: An Overview

Information and Communication Technology has been defined by many from different perspectives. According to Ifueko (2010), ICT is the digital processing use of electronic Computers. It comprises the storage, retrieval, conversion and transmission of information. It is an umbrella term that includes any communication devices or application encompassing radio, television, cellular Phones, computers and network. Tinio (2002), states the potential of ICTs in increasing access and improving relevance and quality of education in developing Countries. In as much as development is concerned, technology is now a trend of religion that is sweeping across the World like wild fire. It is transforming the global village in its entirety.

The origin of ICT was initially conceived as an electronic number crunching machine. While the ancestry of computer-based ICT can be traced to Charles Babbage Analytical Engine of 1834, but the first true computer was built in the early 1940s by Howard Alken at Harvard. These first generation computers used Vacuum tubes (Values) in their circuits. They made use of punched cards, store information in memory, and could understand symbolic languages. These first generation ICT-Based computers were building, considering expensive and rather unreliable. The first ICT-based computers were superseded by the transistorized second generation computers (1959-1964) which were smaller, faster and more reliable than their predecessor. The global envisaged was the creation of a set of connected network that would act as a coordinated whole from this rather, limited use for military research, internet has grown to a gigantic global mechanism for dissemination and accessing information through a maze of electronic telecommunication and network. Moreover, it features comprehensive information on all aspects of arts, education, science and technology as well as coverage of politics, recreation, entertainments, sports, shopping and employment opportunities, (Edoka 2000).

Teaching is a systematic, rational and organized process of transmitting knowledge, attitude and skills in accordance with professional principles. Teaching is said to be a complex task, it involves all those activities and processes through which people learn useful and worthwhile ideas, and skills. It is a veritable instrument of social human efforts towards transferring values from one who is more knowledgeable to one who is less knowledgeable (Ejili & Anyanwu 2012).

According to Ugwu & Onwukwe (2013), use of modern communication technology assisted institutions in communication; it is one very important human activity in which all action depends. Without communication therefore, the components of educational technology will not work. Instructional materials refer to the human or non-human materials and facilities that can be used to ease, encourage, improve and promote teaching and learning activities. They are materials used in the process of passing knowledge. Without communication in ICT, there cannot be teaching and learning, all the activities in which we share our experiences, feelings or knowledge, teachers cannot teach the learner the way they will understand and experience knowledge and skill. Recently in e-learning (Electronic learning), Zinox technologies embarked on a project across 40 institutions of higher learning with the sole aim of training Nigeria undergraduates to internationally acceptable standards. This is coming on the heels of digitizing the nation by the year 2020. The project was taken to the nooks and crannies of most of the nation's institution of higher learning, hence the establishment of digital parts in these institutions.

Historical Development of Polytechnic Education in Nigeria

According to Nigeria's latest National Policy on Education (2004), basic education covers nine years of formal (compulsory) schooling consisting of six years of elementary and three years of junior secondary education. Post-basic education includes three years of senior secondary education. At the tertiary level, the system consists of a university sector and a non-university sector. The latter is composed of polytechnics, monotechnics, and colleges of education (Adegbite, 2007).

Ukpai (2008) noted that polytechnic education is a type of education resulting in the acquisition of practical and useful skills. This type of education, according to the Federal Republic of Nigeria (FRN), is given after the second six years of formal schooling, it is the education at the tertiary level represented by 4 in the 6:3:3:4 system of education as stated in the National Policy on Education (NPE). There will be political stability, full employment and abundant wealth creation, void of cultism and violence as well as bribery and corruption.

In pre-independent Nigeria, the training of technical personnel was largely a private arrangement by companies and organizations. This effort was augmented by the government in 1952 when it established the Yaba Higher College of Nigerian of Arts, Science and Technology, which had branches in Enugu, Ibadan and Zaria. Technical institutions were also established at Enugu and Kaduna in 1958, Ibadan in 1960 and Auchi in 1964. In 1987, the colleges became polytechnics.

Decree 33 of 1979, which gave legal power to the establishment of Polytechnics in Nigeria, among other things, states that the main purpose of polytechnic education is to produce middle-level manpower to manage the nation's economy. To Idoko (2005), these Polytechnics are to engage in researches suitable for developing human and material resources needed by the nation's industries and economy.

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Objectives of Technical/Polytechnic in Nigeria

The aims and objectives of technical education have been articulated by the National Policy on Education (1998 revised) as follows:

- (i) To provide trained manpower in applied science, technology and commerce particularly at sub-professional grade;
- (ii) To provide technical knowledge and vocational skills necessary for agricultural, industrial and economic development;
- (iii) To provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man;
- (iv) To give an introduction to professional studies in engineering and other technologies;
- (v) To give training and impart the necessary skills leading to the production of craftsmen, technicians and other enterprising and self-reliant; and
- (vi) To enable young men and women have an intelligent understanding of the increasing complexity of technology.

In line with the above objectives, the polytechnics were established to provide full-time and part-time courses in technology, applied science, commerce and management and in such fields of applied learning relevant to the needs for the development of Nigeria in the areas of industrialization; agricultural production; distribution; research and development; and adaptation of techniques (Decree No. 33). From the foregoing, there is no doubt that the Polytechnics were established with a deliberate policy of enhancing the technological development of the country, which is a solid educational foundation.

The Role of ICT in Education

The role of ICT in education is generally to familiarize with the use and working of computers, related social and ethical issues; ICT has enabled learning through multiple intelligence as it has introduced learning through simulation games, this enables active learning through all senses. (Odia, 2007). ICT now plays a major role in education: learning and research in general, agriculture, health, and commerce and even in poverty alleviation by generating or creating new jobs and investment opportunities. This declaration and indeed other opinions shared by others points to conclusive evidence that ICT has some real and material application for countries like Nigeria because countries can leverage ICT to totally transform and modernize their economy.

Papert (2002) noted that ICTs are powerful enabling tools for educational change and reform when used appropriately, it helps expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process concerned to real life.

1. In Nigerian Educational system, ICT has helped to increase access and improving the relevance and the quality of education. It greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution and widen the range of opportunities for business and the poor.

The new communication tends to reduce the sense of isolation, and open access to knowledge. This is enhanced because ICT provides access anytime and anywhere by making possible asynchronous learning online courses, materials, for example accessed 24 hours a day, 7 days a week. ICT based educational delivery like educational programming broadcast over radio and television also dispenses with the need for all learners and the instructor to be in one location. In addition, certain types of ICTs such as teleconferencing technologies enable instructions to be received simultaneously by multiple geographically dispersed learner (Synchronous Learning).

2. In Nigeria Educational System, one interesting thing is that ICT is also a transformational tool that has promoted the shift to a learner centred environment. It has assisted in improving the quality of education and training by increasing learner's motivation and engagement, facilitating the acquisition of basic skills.

The use of ICT tool such as video, television and multimedia computer software that combine text, sound and colourful moving images is used to provide challenging and authentic content that encourage the students to be more involved. More importantly, networked computers with internet connectivity increase learner's motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect the real people and to participate in real world events.

3. The transmission of basic skills and concepts that form the foundation of higher order networking and creation is enhanced by ICTs through drill and practice. Most of the early users of computers were for computer-based learning that focused on mastery of skills and content through reinforcement and repetition.

Aigbeti, A.E (2008), "also indicated that ICT has contributed to effective learning through expanded improving the quality of learning and improving management system.

Jhurree (2005) said that students become more aware about how to learn when using ICT because they must interact with computer. ICT has also changed the relationship between students and Lecturers and has made it open and intimate. It has also helped undergraduates on better communication and access to information. This is due to the fact that there is a national policy supporting ICT in schools. It also helped students' curiosity and motivation that has in turn forced the Lecturers to seek more knowledge.

Considering resources have been invested to justify the place of technology in education, and many research have revealed that benefit and gains can be achieved by students, Teachers and Administrators.

To Hepp (2013), who stated the following reasons as benefits for the application of ICT in education.

a. Acquisition of new skills: Due to the fact that ICTs are the preeminent tools for information processing, new generation need to become competent in their use, should acquire the necessary skills, and therefore must have access to computers and network during their school life.

b. Productivity and Entrancement: schools are knowledge-handling institutions; therefore, ICTs should be a fundamental management tools on all levels of an educational system for classroom to ministries of various government. A quest for quality learning, schools should profoundly revise present teaching practices and resources to create more effective learning environment and improve life-long learning skills and habits in their students.

In order to address the questions of how can ICT be applied to support education change "and "How can its application in education in turn support sustained economic development and social transformation?"

The Technological Pedagogical and Content Knowledge Theory

This study shall therefore, be based on the theory of "Technological Pedagogical and Content Knowledge" (TPACK) developed by Mishra and Koehler (2006). The TPACK framework strives to capture some of the essential qualities of knowledge required by teachers for technology integration in their teaching, while addressing the complex multifaceted and situated nature of teacher's knowledge (Mishra and Koehler, 2006). Researchers argued that computers alone do not make the difference in teaching, rather, the difference is made by the pedagogical methods the teachers use when instructing with computer technologies (Clark, 2001). Therefore, TPACK provides a better feedback for integrating technology in classroom teaching and learning process. Technological Pedagogical and Content Knowledge (TPACK) emerged from understanding the interaction of content, pedagogy and technology knowledge, underlying true meaningful and deeply skilled teaching with technology.

TPACK is the basis of effective teaching with technology and requires an understanding of the representation of concepts using technologies, pedagogical techniques that use technology in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face, such as students prior knowledge (Koehler and Mishra, 2006).

Hence, it's an emergent model resulting from the intersection of technology, pedagogy and content. Schmidt (2009) is an advocate of TPACK theory who sees it as the knowledge required by the teacher for integrating technology into their teaching subject area. The theory can be used to solve the problem of ineffective use of ICT in teaching and learning process, especially in situation whereby teachers lack adequate content knowledge of teaching strategies. The technological aspects are systematically considered in the following ways:

1. Technology Knowledge (TK): understanding technology in a specific subject or discipline;
2. Technological Pedagogical Knowledge (TPK): understanding how technology can shape the ways of teaching;
3. Technological Pedagogical and Content Knowledge (TPACK). This theory further emphasizes on not only the usage of ICT facilities in teaching and learning but also on teachers employing the adequate pedagogical strategies when using the computer. The TPACK theory identifies with teachers acquiring the content knowledge of the technology employed in teaching and hence, using ICT in teaching and learning.

Statement Problem

The major problems confronting teaching and learning process in modern Nigeria, with particular references to computer, cell phones among others includes: Financial constraints, studies have proved that two-third of the teachers and students do not have money to purchase computers. Teaching and theoretical knowledge is another problem. There is a problem of lack of knowledge and as such, it is a serious problem/barrier to the use of computer to promote teaching and learning processes. Non-chalant or improper attention of the Nigerian government ranging from local Government council, State and Federal governments to financially motivate teaching staff, through educational and financial aids, through the provision of computers to them on loan basis and at subsidized rate. The problem of over dependence on fairly-used imported computers is another obstacle confronting teaching and learning processes in Nigeria. Another major obstacle bedevilling the usage of ICT for effective teaching and learning is the lack of service providers in the exploitation of e-learning platform and media education in Nigeria, which includes; inadequate power supply as it brings about digression, failure to achieve the desired goals and objectives in time and inadequacy of well trained personnel to train others and repair the broken down computers for the continuity process, betterment and well-being of Nigerian polytechnic teachers and students in general. There has been a concern over the proper use of ICT facilities and equipment to aid teaching in the educational sector in both developed and developing Nations. A number of studies have showed that few teachers in some institutions facilitate substantial student use of ICT. Therefore, while it is a common knowledge that ICT support for learning is essential, it is important for some scientific study to be conducted to assess its status and use of ICT in Public owned universities and polytechnic. Achieving these developmental ideals and taste of teaching and learning in public polytechnics in Nigeria is very poor and inadequate because, teachers and student have little or no access to ICT-based information and facilities in the institutions not to talk of utilizing them. These have hampered the needed manipulative skills for national and educational development through the teachers and among the students in the polytechnic. The main objective of this study seeks to determine the availability of information and communication technology knowledge and skill acquisition among the students, identify hindrances in utilizing ICT facilities in teaching and learning process in Rufus Giwa Polytechnic.

II. Methodology

This paper adopts descriptive survey research design, which derived data from both primary and secondary sources. The population of the study comprises of 1922 respondents. These possible respondents consist of 356 technologist and 1566 lecturers respectively from the polytechnic. Convenience sampling method was used where the researchers selected 250 participants and structured 4-points Likert-scale questionnaire were designed based on; Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The data was then coded using the statistical package for the social science (SPSS). The secondary sources include relevant textbooks, gazettes and journals were used in a descriptive and analytical manner to complement the data generated from the primary data.

III. Results

The study seeks to determine the availability of information and communication technology knowledge and skill acquisition among the students, identify hindrances in utilizing ICT facilities in teaching and learning process in Rufus Giwa Polytechnic.

To what extent are information and communication technology and facilities made available for institutional purposes in Rufus Giwa Polytechnic?

Table 1.

Mean and standard deviation distribution on the position of ICT in teaching and learning in Rufus Giwa Polytechnic.

S/N	ITEM STATEMENT	X	SD	DECISION
1.	Information and communication Technology resources like internet, computers, projectors, slides, software etc are available in your school	2.78	1.01	accepted
2.	Extent of usage of these information and communication technology resources in your school is appreciable	1.67	0.69	Rejected
3.	Information communication technology resources are adequately funded by ETF, TEDFUND, and private donors etc. in your school	1.62	0.67	Rejected

Field work 2021

What are the hindrances in utilizing information and communication technology equipment and facilities for teaching and learning in Rufus Giwa Polytechnic?

Table 2: Mean and standard deviation distribution on the position of ICT in teaching and learning in Rufus Giwa Polytechnic.

S/N	ITEMS STATEMENT	X	SD	DECISION
4.	The following issues hinder the use of information and communication Technology in teaching and learning in your school; inadequate equipment, power (Electricity supply) incompetent instructor technician	2.60	0.93	Accepted
5.	Poor maintenance culture of information and communication technology resources is hindrance to their utmost utilization	2.59	1.09	Accepted
6.	Poor funding and procurement of sub-standard equipment.	2.93	1.03	Accepted

Field work 2021

IV. Summary

From Table 1, it is evident that Rufus Giwa Polytechnic have adequate information and communication technology equipment and facilities made available for instructional purposes. However, majority of these facilities are not adequately maintained by the TETFUND, ETF, etc thereby making most of them malfunctioned. Invariably, a department could have an ICT that is supposed to take care of the department, computer-based courses having machines that are simply not working well as most of them are in different stages of disrepair.

Most institutions are also faced with the challenge of maintaining and servicing their ICT Parks themselves from their meagre IGR since most educational financiers do not really live up to expectationsto consistently fund these equipment as and when due.

Hindrances / challenges in the use of ICT equipment and facilities for teaching and learning in Rufus Giwa Polytechnic.

Result from table two gives us a particular picture of challenges, problem and hindrances that hamper the effective use of ICT facilities. These problems include power, malfunctioning and badly maintained culture, poor funding and security. These problems have always been there, but they need to be tackled head-long for us to achieve reasonable success in making ICT available for teaching and learning.

V. Conclusion

It has been discovered that the use of ICT in teaching process in public owned polytechnics in Ondo State are not very encouraging due to mostly, the problem of non-availability of financial and intellectual resources for these institutions.

Polytechnics system of education is built on creativity, innovation, technology and enterprise (Awe, J, 2008). These ideals as long as the current technology era is concerned has efficient ICT resources hub that must take its proponents to the next stage of technological gateway.

VI. Recommendation

The federal and state government through the ministry of education should make increased subvention for the public owned polytechnics in Ondo State solely for the purpose of ICT. Such institutions should have and operate statutory and legal accounts solely operated to take care of their ICT needs.

Teachers on the other hand could invite resource persons from outside the polytechnic community to tutor the students in special skills like hardware maintenance and handling. The teacher must not think that knowledge starts and ends with him/her. This is where the teacher consciously and conscientiously recognizes, that he/she may not impact the required knowledge to the teaming students.

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