

## INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND THE RESTRUCTURING OF PRIMARY SCHOOL SYSTEM IN NIGERIA: PROBLEMS AND PROSPECTS

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### ABSTRACT

*This paper is designed to look into the major emerging issues in the application of ICT for restructuring primary education in Nigeria. The paper examines the Concept of ICT, ICT Policies in Nigeria, ICT Initiatives and Project Aimed at restructuring Primary Education, Potentials of ICT for Restructuring Primary Education in Nigeria, Factors Constraining Effective Utilization of ICT in Primary Schools and the Prospects of ICT in Nigerian Primary Schools. Based on the conclusion drawn the following recommendations were made: there is the need to provide basic infrastructures for the introduction and implementation of ICT in primary schools and there is the need for government to review the national policy on education to ensure effective implementation of ICT especially at the primary school level.*

**Keywords:** Information Communication Technology (ICT), Primary Education, Primary School System.

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### Introduction

The various applications of ICT have a revolutionary impact not only on education but also on how we see the world and how we live in it. ICT is becoming the driving force for effective and efficient operations of trade and commerce, government, medicine, education, human resources development, agriculture, national security and other areas of human endeavour. The need for technological innovation has brought about communication revolution and rapid development of technological application in teaching and learning (Njamanze, 2010).

A colossal look at the present state of education in Nigeria revealed that education is in exigent need of restructuring to proffer solutions to the age-old question about teaching and learning (education) because of the boundless increase in the present technological development and its societal impact. For an organization like school to survive and achieve its aims and objectives, there is the need for information and

communication technology (ICT) that will be put in place in order to help in the process of teaching and learning, the belief here is that through the system of ICT children from primary, post primary and even tertiary institutions will acquire a lot of knowledge and skills that will lead not only to educational development but national development.

The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy (Rosen and Well, 1995; and Thierer, 2000). Most experts in the field of education agreed that, when properly used, Information and Communication Technology hold great promise to improve teaching and learning in addition to shaping workforce opportunities. There is no doubt that computer can aid the instructional process and facilitate students' learning. Many studies have found positive effect associated with technology aided instruction (Burnett, 1994, and Fitzgerald and Warner, 1996).

According to Ken (1996) and Nobel (1998), the use of technology especially in the educational sector has increased in the recent years, these increases have introduced a lot of changes in the area of education with the introduction of names like: virtual education, diploma mills, virtual universities, electronic universities, virtual and cyber space institutions. Many educational institutions the world over and Nigeria in particular are driven to use newly found alternative fast track diplomas and non-traditional paths. This development despite the fact that it is in line with technological advancement and is advantageous comes with its attendant problems.

Optimizing ICT for restructuring education requires an understanding of its concept, aims and objectives, modes of application, problems and prospects. This paper is however designed to look into the major emerging issues in the application of ICT for restructuring primary education in Nigeria.

### **Conceptual Clarifications**

For the sake of clarity and easy understanding of this paper it is of great importance to start with a conceptual clarification of the concepts of information and communication technology. Information and communication technology is a three worded concept that need to be explored.

**Information** is a concept which is used to mean many things to many people. For instance, according to Henry (1978) information refers to selected data which has been processed to become meaningful. It is also related to facts which can be gathered through such ways as observations and reading. On his part, Akanni (1987) defines information as data that have been processed into a form which is meaningful to the recipient and which is real or perceived valuable in current or perspective decisions and actions.

**Communication** is the process of transmitting message or information from one person to one or more persons. Phillips (1975) on his part sees communication as sharing messages, ideas, data etc to produce a degree of understanding between the sender and the receiver.

**Technology** according to Hornby (2000) is seen and defined as scientific knowledge used in practical ways. It is the application of scientific knowledge to solve practical problems. Operationally, therefore, the word "technology" is used in the generic sense, to mean, all forms of know-why and know-how which enables production to proceed (Bamiro, 1998). As a consequence of this wide definition, technological capability build-up lies not only, in the generation of scientific and technological knowledge (involving the introduction of new and improved techniques of production) to be applied in the solution of well-defined problems in certain areas of production, but also in the used of new or improved organizational and management methods.

**Information and Communication Technology** is an umbrella term that includes all the technologies for manipulation and communication of information ICT encompasses any medium to record information. Information and Communication Technology is the technology that deals with the study, design, development, implementation, support and management of computer-based information system that is used to acquire, convert, store, protect, process, distribute and retrieve information according to the users' requests (Akinnuwesi, Adedoyin and Adegoke, ND). The World Bank defines ICTs as "the set of activities which facilitate by electronic means the processing, transmission and display of information" (Rodriguez and Wilson, 2000). ICTs "refers to technologies people use to share, distribute, gather information and to communicate through computers and computer networks" (ESCAP, 2000). ICTs can be described as a complex varied set of goods, applications and services used for producing, distributing, processing, transforming information- (including) telecoms, TV and radio broadcasting, hardware and software, computer services and electronic media" (Marcelle, 2000). OECD definition quoted by Curtin (2002) defined ICT as "a set of activities, that facilitate by electronic means; the capturing, storage, processing, transmission, and display of information" (p. 4). It is also defined by the United Nations Scientific, Educational and Cultural Organization (UNESCO, 2005a) as the combination of the computer, telecommunication, and media technologies.

ICT in this context refers to the process of processing, maintenance, management, dissemination of information and the use of all forms of computers and computer based tools to mediate information. ICT include hard ware, software, e-learning and all forms of media employed in transmitting audio, video, data or multi-medias that are used in acquiring processing, storing and distributing information.

## **ICT Policies in Nigeria**

Information and communication technologies (ICTs) are diverse set of tools and resources used to communicate, create, disseminate, store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. Nigeria is a country of over 130 million people and it is considered a major hub for commerce, culture and education in Africa (Sheyin, 2009). Therefore, it is no surprise that Nigeria is leading the way in the development of ICT infrastructure and training.

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 institutions towards policy reform and the development of effective national ICT4D policies for rapid replication of best practices. 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.

At present, there is increasing interest in how computers and the Internet can improve education at all levels, in both formal and non-formal settings. The use of computers and the Internet is still in its infancy in developing countries due to limited infrastructure and the attendant high costs of access. In order to fulfill the Vision 2020 of Nigeria, the educational system has to be transformed and driven by ICT. Thus ICT is an increasingly influential factor that could facilitate and speed up the transformation expected in education.

Nigeria started implementing its ICT policy in April 2001 after the Federal Executive Council approved it by establishing the National Information Technology Development Agency (NITDA), the implementing body. The policy empowers NITDA to enter into strategic alliances and joint ventures and to collaborate with the private sector to realize the specifics of the country's vision of, "making Nigeria an IT capable country in Africa and a key player in the information society by the year 2005 through using IT as an engine for sustainable development and global competitiveness." This vision is yet to be fulfilled.

Outlined below are some of the objectives of Nigeria's ICT policy:

1. To ensure that ICT resources are readily available to promote efficient national development.
2. To guarantee that the country benefits maximally, and contributes meaningfully, by providing the global solutions to the challenges of the Information Age.

3. To empower Nigerians to participate in software and ICT development.
4. To encourage local production and manufacture of ICT components in a competitive manner.
5. To establish and develop ICT infrastructure and maximize its use nationwide.
6. To empower the youth with ICT skills and prepare them for global competitiveness.
7. To integrate ICT into the mainstream of education and training.
8. To create ICT awareness and ensure universal access in promoting ICT diffusion in all sectors of national life.
9. To create an enabling environment and facilitate private sector (national and multinational) investment in the ICT sector.
10. To encourage government and private sector joint venture collaboration.
11. To develop human capital with emphasis on creating and supporting a knowledge-based society.
12. To build a mass pool of ICT literate manpower using the NYSC, NDE, and other platforms as a train-the-trainer scheme for capacity-building.

### **ICT Initiatives and Project Aimed at Restructuring Primary Education**

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. 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 (FRN), as revised in 1998 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 centers of excellence on ICT. The document 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).

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 Commission, National Colleges of Education Commission, National Board for Technical Education, Education for All, Universal Basic Education, etc.).

However several initiatives by government agencies and the private sector to introduce and promote ICTs in education are underway. According to Sheyin (2009), there are presently at least 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.

The drawback to these programmes is the generally sporadic and insufficient supply of electric power in the urban areas. At the primary school level, Nigeria's objective

for primary education does not elicit the knowledge of ICT; however, emphasis is placed on:

- i. Widening access to basic education.
- ii. Eliminating present inequalities in the enrolment between the urban and rural populations.
- iii. Ensuring greater retention in schools.
- iv. Ensuring long-term permanent literacy for those children who have completed the programme.

While ICT knowledge is not evoked in the vision set for primary school pupils, it is abundantly clear that government's new policies and programmes in the telecommunications and ICT policy sectors do address the problem otherwise.

According to Agyeman (2007), with the introduction of computer studies in the UBE curriculum coupled with the energy problem motivated the government to embrace the US\$100 XO laptop computer project for Nigeria's 24 million public primary school children.

ICT has transformed education in Nigeria and made it more interactive. It has empowered teachers/students practically and theoretically in the use of technological facilities. ICT enhances efficiency in a work place, it increases the speed of communication around the globe and it is helping teachers and students to keep up-to-date academic communication in Nigeria (Njamanze, 2010).

### **Potentials of ICT for Restructuring Primary Education in Nigeria**

ICT has a lot of potentials for restructuring of primary education in Nigeria some of these potentials include:

Firstly, Information and communication technology in primary school has the potential for restructuring the tools and environment for learning as it: allows materials to be presented in multiple media, motivates and engages students in the learning process, fosters inquiry and exploration, and provides access to world wide information resources, among others (Haddad, 2003). However, researches have been inconclusive on the expectations regarding the value of ICT (Carnoy, 2004; Trucano, 2005).

Secondly, Information and communication technology in primary school has the potential for restructuring the quality of students' learning 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).

Thirdly, Information and communication technology in primary school has the potential for restructuring and empowering the learners with information technology awareness and skills which are essential for success in the contemporary knowledge economy (Kante, 2003).

Fourthly, Information and communication technology in primary school has the potential to provide new frontiers for providing access to basic education for disadvantaged children and youth excluded from the formal school system. As modern ICTs are attractive to children and youth, 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 (Fillip, 2002).

Fifthly, Information and communication technology in primary school has the potential to 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).

Last but not the least, Information and communication technology in primary school has the potentials for the sensitization of Nigerians, particularly educational stakeholders on the nature and aspects of the educational reforms, the resources and needs for its proper implementation, and the evaluation of the reforms, among others. It is possible to promote institutional linkages, collaboration between various stakeholders, and dissemination of information on educational reforms through ICT.

### **Factors Constraining Effective Utilization of ICT in Primary Schools**

Many factors are constraining the effective utilization of ICT programmes in the restructuring of primary schools in Nigeria some of these factors according to Jurich and Thomas (2002) and Phillip (2002) are:

1. The low percentage of teachers who have ICT knowledge; A look at the of teachers teaching in the primary school, it is obvious that majority of them are not computer literate or ICT compliant as such cannot handle issues relating to ICT in primary schools.
2. The price of computer hardware and software continues to drop in most developed countries, but in developing countries, such as Nigeria, the cost of computers is several times more expensive.



3. In Nigeria, a formidable obstacle to the use of information and communication technology is infrastructure deficiencies. Computer equipment was made to function with other infrastructure such as electricity under "controlled conditions". The absence of electric power grids in most parts of the country and in most primary schools even in cases where there is adequate telecommunications coverage.
4. The lack of requisite telecommunications infrastructure capable of transporting multimedia messaging.
5. Nigeria does not only lack information infrastructure, it also lacked the human skills and knowledge to fully integrate ICT into primary education. There is acute shortage of trained personnel in application software, operating systems, network administration and local technicians to service and repair computer facilities. (Okebukola, 1997).
6. According to Salomon (1989), there are clear indications from many countries that the supply of relevant and appropriate software is a major bottleneck obstructing wider application of the computer. Software that is appropriate and culturally suitable to the Nigerian education system is in short supply.
7. Uneasy access to computer equipment and other accessories at institutional and personal levels due to locations of cyber cafés in commercially profitable communities to the detriment of semi-urban or rural communities government authorities and school administrators to implement the ICT policy in the primary education sectors.
8. Lack of financial resources at government and individual level to provide ICT equipments for schools and individual to ensure its effective utilization especially in the primary schools.
9. The rate of corruption in the country is such that the little amount of money budgeted for education in general and procurement of ICT materials for schools are being diverted for personal use by those in position.
10. In Nigeria there are few Internet providers that provide Internet gateway services to Nigerians. The few reputable companies, which render reliable services, charged high fees thus limiting access to the use of the Internet.
11. Insecurity coupled with political, religious and ethnic crises in Nigeria is a factor militating against effective implementation and utilization of ICT in

primary schools in Nigeria. The constant crises in Nigeria with little or no security of lives and properties tend to discourage foreign investors from investing on ICT in Nigeria.

12. Last but not the least, on her part, Njamanze (2010), stated that some pertinent issues are yet to be resolved in the use of ICT in teaching and learning in Nigeria. They include; Poor infrastructural support, Lack of basic ICT knowledge, Ignorance about its importance and Lack of governmental support in funding technology programmes in tertiary institutions in Nigeria, among others.

### **Prospects of ICT in Nigerian Primary Schools**

There are numerous and good prospects for the use of ICT in restructuring primary schools in Nigeria. The following major areas suggest the range of applications that computer can serve teachers and learners in Nigeria.

1. Computer can enhance educational efficiency. The efficiency in teaching various subjects could be improved. For instance, many primary school teachers are already teaching large classes of students. In this situation, students no longer receive the much desired individual assistance. It is possible to use carefully prepared computer programs to ensure that learners are accurately and systematically instructed.
2. Computer can enhance problem-solving skills of the learners by focusing on thinking skills especially in subject such as mathematics.
3. Computers can serve administrative functions. They can replace the laborious exercise of filing papers in filing cabinets and shelves where records accumulate dust over a long period of time.
4. Computers can be use for budget planning, accounting for expenditure, writing correspondences and reports, assigning students to classes, reporting students' progress and testing students and scoring tests which help to reduce paper work.
5. Computers can be used for individualized learning in primary schools in Nigeria. Due to large classes and differences in individual learning style and pace, microcomputers will enable the student to progress at his or her own pace and receive continual evaluation feedback and corrections for errors made. In this way, computers allow the development of partner-like interactive and individualized relations with the user.

6. Sixthly, Computers can play the role of the tutor and present the learner with a variety of contents and symbolic modes.
7. Computers can change current pedagogical practices in primary schools in Nigeria, which depended heavily on the traditional teaching methods. It is universally accepted that computers allow more independent exploration, more personally tailored activities, more teamwork, and more significantly, less didactic instruction. The role of the teacher, therefore, changes from information dispenser to that of information manager, from authoritative source of information to a guide of self-propelled exploration (Smith, 1989).
8. Computers will offer the Nigeria teacher improvement in the techniques of research. The cumbersome exercise of searching by hand through the library's card catalog or periodical indexes can be made easier by typing few key words pertinent to the research topic into a computer and the researcher can receive extensive list of related sources of articles in books and journals in just a matter of minutes.

### **Conclusions**

There is no doubt that teachers and students in secondary schools in Nigeria will have incredible resources available if they have access to the Internet. By integrating information and communication technology into secondary school curriculum, a fundamental shift in the way teacher teach and students learn will be evolved this is because Information and communication technologies offer veritable tool for restructuring of the primary school system in Nigeria. The value of ICT at all level of education is globally recognized. Despite the potentials possessed by ICT in restructuring primary education system in Nigeria, however, there are certain factors that are militating against the effective implementation of ICT for the restructuring of primary education in Nigeria which tend to create a big gap in ICT skills between average Nigeria student and teaching staff and students and teaching staff of comparable economies around the world (Aniebonam, 2007).

### **Recommendations**

Despite the fact that the implementation and effective utilization of ICT in primary schools is hampered by a lot of factors, all hope is not lost. It is in line with this assertion that the following recommendations were made.

- Government should provide a continuous and on the job training of teachers in ICT and computers through workshop, seminars and symposium.
- Government should provide and set up the requisite telecommunications infrastructure capable of transporting multimedia messaging.

- There is the need for the adoption of ICT international standard and its inclusion in the in the Nigerian curriculum especially at the primary school level.
- There is the need for the government to develop and train ICT expert who will work in partnership with educators and teachers.
- There is the need to provide basic infrastructures for the introduction and implementation of ICT in primary schools.
- There is the need for government to review the national policy on education to ensure effective implementation of ICT especially at the primary school level.
- There is also the need for government to ensure effective monitoring and inspection of ICT materials and programmes in schools.
- There is the need to promote the establishment of centres of excellence in this networking area.
- There is the need to develop the culture and practice of new technologies within the society in general and the university in particular.
- There is the need to set up a highly profitable inter-university Internet network to facilitate the exchanges, the video-conferences and the distance education.
- In other to access these new education means, it is necessary to: strengthen the tertiary institutions potential in competent human resources and equipment of the new information and communication technologies.

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