

## EDUCATION AND INFORMATION COMMUNICATION TECHNOLOGY (ICT) IN NIGERIAN EDUCATIONAL SYSTEM: THE JOURNEY SO FAR

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The term, *information and communication technologies* (ICT), is defined by (UNESCO 2006) as forms of technology that are used to transmit, store, create, share or exchange information. This broad definition of ICT includes such technologies as: radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software, as well as the equipment and services associated with these technologies, such as video as well as the equipment and services associated with these technologies, such as video conferencing and electronic mail. Lending his voices Boritz, (2000) posits that ICT is the emergence of tools of microelectronic and telecommunications that are used in the automatic acquisition, analysis, storage, retrieval, manipulation, management, control, movement, display, transmission, reception and interchange of quantitative and qualitative data.

According to Sulaiman (2010), the elements of ICTs include communication media (e.g. radio, television), information machine (e.g. computers) and telecommunications technologies and equipment (e.g. satellite, fibre optic cables, phones and facsimile machines). Telecommunications infrastructures in particular have turned out to be the driving forces of ICTs because they have the ability to link all various ICT elements together irrespective of locations and to provide a converging platform for them all.

Information and communication technologies (ICTs) have greatly accelerated the process of globalization in recent decades. According to Bon (2010) ICTs have increased world productivity and global trade, facilitated business and industry growth, and enhanced education and research collaboration. Countries are benefiting enormously from ICTs through innovation, communication and access to global information. ICTs are key to ensuring an inclusive global knowledge society. Not all parts of the world have benefited equally from ICTs however. Whereas many industrialized countries and countries in transition have built up their knowledge economies, most developing countries, particularly in Africa, remain on the underprivileged side of the digital divide, as the disparity between countries or regions in access to ICTs is called (Davison et al, 1999; Norris, 2001; Qureshi, 2006). The idea is that narrowing the digital divide will lead to poverty reduction through economic growth.

### **ICT in Education**

Information and Communication Technology (ICT) in education has been continuously linked to higher efficiency, higher productivity, and higher educational outcomes, including quality of cognitive, creative and innovative thinking (Adeosun, 2010). ICT is seen as key tools in acquiring processing and disseminating knowledge (Adedoyin, et. Al 208). It offers increasing possibilities for codification of knowledge about teaching activities through

being able to deliver learning cognitive activities anywhere, anytime (Larsen and Vincent-Lancrin 2005).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). A great deal of research has shown the benefits of ICT to quality of education (A-Ansari, 2006). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearte, 1999); Lemke and Coughin, 1998; Yusuf, 2005).

In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must include the knowledge and effective use of ICT skills. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing countries, especially in Africa, are still low in ICT application and use (Aduwe-Ogiegbean and Iyamu, 2005).

#### **Nigeria and ICT in Education**

In general Ogunsola and Aboyade (2005) observed that Nigeria had a late start in the use of computers, but the growth in their use has been quite remarkable. The computer installations are widely distributed in universities, government departments and agencies, banks, commercial establishments, and industries. The private sector is also not left out in this information technological revolution. ICT use in education specifically is at a particularly dynamic stage in Africa and indeed in Nigeria. New developments and

announcements are happening on a daily basis somewhere on the continent and in the country.

As this paper looks at the status of ICT in Nigerian education/education system this section will be based majorly on, and borrow copiously from the "Survey of ICT and Education in Africa: Nigeria" a Country Report by Agyeman (2007). This is in addition to other relevant information and data that may be useful.

The Ministry of Education created its ICT department in February 2007, notwithstanding several government agencies and other stakeholders in the private sector having initiated ICT-driven projects and programmes to impact all levels of the educational sector.

The National Council on Education coordinates planning, policy, and finance for the education sector under the federal government. The Council consists of the Commissioners and Ministers of Education and the Joint Consultative Committee on Education. Education administration responsibility is shared with the federal government across the federation by the different administrative structures as follows:

1. Primary level; local government
2. Secondary level: state governments
3. Tertiary/university level: federal government

The Federal Ministry of Education employs several national organs for its standards maintenance role in the specialized aspects of education. These include:

1. The Federal Inspectorate Service
2. The Nigerian Educational Research and Development Council
3. The Science Equipment Centre
4. The School Broadcasting Unit

Primary and secondary educations are both six years, and tertiary education may take one to four years depending on the qualification sought. The nine-year compulsory education is a combination of the primary education of six years and three years of junior secondary school education.

### **Education Policy**

Nigeria's objective for primary education does not elicit the knowledge of ICT. Emphasis is placed on:

1. Widening access to basic education
2. Eliminating present inequalities in the enrolment between the urban and rural populations
3. Ensuring greater retention in schools
4. 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.

### **ICT Policies**

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 (NNPIT 2001). 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 and 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.

### **Current ICT Initiatives and Projects**

Nigeria's education ministry is yet to design its ICT policy for education. The Ministry's ICT department was created in February, 2007. However, several different initiatives by government agencies and the private sector to introduce and promote ICTs in education are underway.

### **ICT in Primary Education**

The energy problem motivated the government to embrace the US\$100 XO laptop computer project for Nigeria's 24 million public primary school children. The government has ordered one million on these laptops, which can be cranked and do not need external power supply, for the primary school children. The laptop has in-built wireless networking, uses a 512 MB flash memory without a hard disk, and has two USB ports to which more memory or devices could be attached. It has a new user interface known as Sugar, and comes with a Web browser and a Web processor.

Considering the telecoms and energy problem it may require a countrywide extension and provision of wireless Internet facilities by the private mobile operators, like MTN, accompanied by the provision of alternate sources of electricity to enable optimum usage of the laptops by Nigerian elementary schools. The laptops are yet to appear in the country as experts continue to debate the appropriateness of that ICT approach for Nigerian primary schools; opinions oscillate between establishing computer laboratories for all schools and instituting probably unsustainable child-per laptop ownership schemes.

Some private elementary schools, however, have computer laboratories, especially those located in the high-class zones of the big cities.

### **ICT in Secondary-Level Education**

During the 32 ministering council meeting of the National Council on Education in 1987, the Federal Government of Nigeria decided to introduce computer education into the nation's secondary school system. This was followed by the inauguration of the National Committee on Computer Education the same year. The functions of the committee include "planning for a dynamic policy on computer education and literacy in Nigeria as well as devising clear strategies and terminologies to be used by the federal and state governments in introducing computer education" (Nigerian Tribune, April 11, 1988).

The general objectives of the policy include:

1. Bring about a computer literate society in Nigeria by the mid-1990s.
2. Enable present school children to appreciate and use the computer in various aspects of life and in future employment. (Report on National Committee on Computer Education, 1988).

According to the National Computer Policy (1988), the first objective is to ensure that the general populace appreciates the impact of information and computer technology on today's society, the importance of its effective use, and the technologies that process, manage, and communicate the information. The second general objective is to ensure that the people of Nigeria will know how to use and program computers, develop software packages, understand the structure and operation of computers and their history, and to appreciate the economic social and psychological impact of the computer. The modalities and the strategies for achieving the stated objectives include:

1. Training teachers and associated personnel

2. Hardware facilities
3. Curriculum development
4. Software developments and evaluation
5. Maintenance of hardware and peripherals

According to Jegede and Owolabi (2003) the policy recommends a continuous evaluation of progress. The starting point of this evaluation is to compare school practice with policy stipulations. This will provide a framework for policy revision. A wide gap between this policy and practice has been reported.

#### **SchoolNet Nigeria Initiative**

According to SSNG (2001) SchoolNet Nigeria is a non-profit organization created to address the use of ICT in Nigerian secondary schools with support of several government ministries. SchoolNet Nigeria (SNNG) is the leading national organization engaged in the effective and sustainable deployment and use of Information and Communication Technology (ICTs) to enhance teaching and learning in the primary and secondary education sector. SchoolNet Nigeria embodies a partnership between a diverse range of public and private sector interests in order to mobilize Nigeria's human and financial resources for the purpose of transformation of the education system in Nigeria into one, which participates in and benefits from the knowledge society. Through its programmes, SchoolNet Nigeria works to develop Nigerians who not only have access to information and knowledge, but also use them for positive development of themselves and community.

SchoolNet Nigeria was however officially launched in September 2001 at a

well-represented stakeholder workshop, held in Abuja, Nigeria, and funded by the Education Trust Fund. In this process, it managed to gain much needed credibility through its consultative approach, and gained political support for its establishment.

Our core activities are in the areas of:

1. Implementation and support and co-ordination of ICT development projects in education for national and state level projects;
2. Provision and support of technology solutions for schools, particularly lower-cost and scalable solutions;
3. Develop local, state-wide and national ICT in education capacity;
4. Implement training for educators to use technology to enhance teaching and learning;
5. Address the shortage of technical ICT skills;
6. Support and facilitate the development of education content particularly local content, for use by learners and educators;
7. Promote collaboration among educators and learners;
8. Assess the functionality and impact of ICT-based learning opportunities and resources in the classroom to encourage systemic improvement in the education system;
9. Create an awareness of the use of ICTs in education (through press, conferences, seminars, electronic media and the internet), leading to grassroots demand and adoption and at all levels of the education system;
10. Introduce the integration of Project based learning as well as ICTs in schools curricula
11. Develop partnerships in support of ICTs in education;

12. Provide strategic guidance and support, policy development in the area of ICTs for education in order to create an enabling environment.

In a bid to achieve its objective, SNNG's approach is to occupy the important role of Corporate Social Investment (CSI) Implementation Partner in the education sector for corporate organizations. The drive to achieve this objective has led to the establishment of mutual business relationship with stakeholders in the education sector of Nigeria and international communities, thus positioning as a partner of choice. These stakeholders include the Federal Ministry of Education, State Ministries of Education, Education Trust Fund, NCC, NEPAD and World Bank amongst others. The strategic partnership with these stakeholders ensures that SNNG activities are within government policy and implementation framework.

Since inception of operation in 2001, SNNG has worked as a Corporate Social Investment (CSI) Implementation Partner of several organizations such as MTN Foundation, Multichoice, Intel, World Bank and Microsoft to mention a few.

Another initiative is that of Zinox11 Computers, a private computer company, in collaboration with Microsoft, is set to revolutionise ICT usage in education from the primary to the university level. Zinox's strategy is targeted at students, lecturers, and the institutions themselves. The company provides the computers at highly discounted prices and hopes with government support to achieve 75% ICT application in Nigerian schools by 2010. First Bank of Nigeria is bankrolling the project. ICT labs are set up for schools that repay in two to three years. Lecturers repay the cost of their laptops in one year.

The ICT revolution has also registered corporate backing not only with computer companies like Zinox but also with the banks. Over 80 schools have benefited from the Zenith Banks ICT for Youth Empowerment Scheme. The scheme focuses on assisting Nigerian youth to bridge the digital divide through early introduction to ICT. Each school receives a minimum of 10 computers.

To encourage the use of ICT, the bank organizes an annual ICT empowerment forum for youth that attracts about 2000 secondary – and tertiary –level students. The bank distributed 100 personal digital assistants (PDAs) to the first 100 students to arrive at the venue in 2006.

#### **ICT in Tertiary-Level Education**

The National Universities Commission (NUC), the government agency responsible for registering and regulating universities has prescribed PC ownership for universities as follows:

One to every four students, one PC to every two lecturers below the grade of Lecturer 1, one PC per Senior Lecturer, and one notebook per Professor/Reader.

While some universities, like the Nnamdi Azikiwe University, have achieved a better ratio for their faculty, the same cannot be said for the PC-to-student ratio. However, some universities have made giant strides in campus-wide area networking and e-learning course deliveries.

The Obafemi Awolowo University (OAU) boasts of having the best-developed ICT system in the country with its own VSAT access to the Internet and a campus-wide intranet. OAU has embarked on the progressive application of ICT to all its functions and services – academic, research, and administrative. The OAU has more

than 6,000 users on more than 1,000 computers distributed in 15 computer laboratories across the campus.

Meanwhile among the universities, the University of Jos (UNIJOS) is blazing the trail for content development and e-learning in addition to campus networking, UNIJOS, in collaboration with AVOIR (African Virtual Open Initiatives and Resources) and the Carnegie Corporation (USA), has developed e-learning programmes for several departments. Open notable achievement is the medicine by e-learning Web site of the Department of Anatomy of UNIJOS that permits students to undertake virtual electronic dissections – a phenomenon believed to be the first of its kind in medical training worldwide. Under a collaborative programme, lecturers from the Universities of Oxford and Cambridge have facilitated courses as part of the ICT initiative sponsored by A.G. Leventis.

The authorities in other universities have organized study tours to the OAU and UNIJOS sites as part of preparation activities towards the implementation of their own laboratories and campus networks.

The National Open University of Nigeria (NOUN), established in 2002, has created 27 study centres across the country. NOUN's dream is to establish study centres not only in each of the 36 states of the federation but also at local government area in order to make tertiary education available to all citizens. Each NOUN study centre is a computer laboratory/cyber café equipped with a minimum of 25 computers in a local area network (LAN) configuration (Ambe-Uva, 2006). The centres are yet to be connected to NOUN's REPRODAhq (repository, reproduction, distribution and administration headquarters), through a wide area network

(WAN), to enable the mainstreaming of the following activities:

- a. Training and learning
- i. Assessment and testing
- ii. Interactive sessions
- iii. Communications (e-mail, chat, forums)
- iv. Internet access
- v. Access to virtual library
- vi. Other computer applications

NOUN uses the WAN to deliver learning courses to all the study centres. NOUN's ICT applications presently cover:

- i. Management of student records (on-line application, admission, registration, and exam procedures).
- ii. Learner management system (e-learning and the virtual library).
- iii. Communication (e-mail, SMS,, video-conferencing and internet)
- iv. Delivery of the human resource and finance courses. The pdf files of these two courses are already available on-line. The goal of NOUN is to use the REPRODAhq to eventually reproduce all course materials in electronic form.

### **National University Commission (NUC) Quality Support Mechanisms**

#### **(a) Virtual Library**

A bold step towards ensuring quality of university education is the virtual library project initiative. The project which is ICT based and now its first phase of implementation will improve the quality of teaching and research in institutions of higher learning in Nigeria through the provision of access to current books, journals and other information resources held by global network of on-line libraries, promote scholarship, research and lifelong learning through the establishment of permanent access to shared digital archival collections, and provide guidance for academic libraries on applying appropriate technologies in the production of digital library resources.

### **VIHEP**

The Virtual Institute for Higher Education Pedagogy (VIHEP) is another initiative of the National Universities Commission aimed at improvement of the quality of teaching and learning in Nigerian universities. The Institute is an on-line site where participants are able to update their knowledge and skills in educational delivery using Internet protocols as platform.

The Institute which is with nine-module training programme has the following objectives:

- i) To provide academic staff in tertiary institutions in Nigeria especially universities with Internet-based training on modern methods of teaching and learning higher education.
- ii) To enhance the knowledge and skills of academic staff on such issues as (a) teaching of large classes; (b) effective utilization of limited resources; (c) modern methods of assessment and evaluation of student performance; (d) basic guidance and counseling techniques; (e) basic skills of curriculum development; and (f) techniques for writing grant winning proposals.
- iii) To share experiences among academic staff in Nigerian universities on best practices in university teaching and how to deal with such academic vices as examination malpractice, cultism and plagiarism.

Acquisition of basic ICT skills and capabilities have recently been made mandatory as part of the national minimum standards for teacher education at the Nigeria Certificate of Education and first degree in education levels. Also, some universities in Nigeria have made ICT skills a requirement for continuing and graduating students. Thus, the teacher education colleges have also been impacted

by the current ICT revolution. The Federal College of Education (FCE) in Omoku has 130 computers in three e-learning classrooms each with 30 computers and a cyber café with 40 work stations.

### **National Research and Education Network (NIREN)**

A National Research and Education Network (NIREN) is a specialized internet service provider dedicated to supporting the needs of the research and education communities within a country (Wikipedia 2012). It is usually distinguished by support for a high-speed backbone network, often offering dedicated channels for individual research projects. NIRENs are usually the places where new internet protocols and architectures are introduced before deployment within the Public Internet. Two examples of these protocols are IPv6 and IP multicast. Two examples of architecture are client/server and Cloud computing.

At a Workshop on Strategies for ICT Development and Access to More Affordable Bandwidth for Universities, Research and Higher Educational Institutions in Nigeria organized by the Association of Vice-Chancellors of Nigerian Universities (AVCNU) on 28<sup>th</sup> February, 2008. It was agreed that ICT is essential for supporting the Development and sharing of online information and e-resources, supporting collaborative research among Nigerian Universities, Research and Higher Educational Institutions (in addition to collaboration research with others); turning point online courses and sharing expertise; sharing of experiences and best practices and providing opportunities for Student and Staff exchange.

The Workshop therefore resolved to establish a National Research and Education Network (NIREN)

According to Chafe (2009) the proposal intends to create a broadband network by leasing capacity from existing backbone infrastructure owners and organizing the leased capacity to form a virtual private network, connecting all institutions together and supporting the deployment of teaching, learning and management tools and applications. The increasing capacity availability on the fibre optic networks – which support the transfer of high volumes of data – will be leveraged to create a NUBNET (Nigerian Universities Brandband Network) connection for effective management and centralized support.

The Proposal is to be planned for the Research and Education community in Nigeria, but to start with the Federal Universities. Other universities and institutions are to join as and when they are ready.

The Proposal has the following 5 components:

1. Provision of Broadband Connectivity
  - a. A high –speed mesh network for Universities and eventually other research institutions
  - b. A high-speed internet access via marine cable
  - c. Capacity building
  - d. Operators’ workshop
  - e. End-user buy-in
  - f. Regulations workshops
  - g. Government stakeholders’ workshops
  - h. User community training for staff and sensitization for students
2. Power plan for the network infrastructure
3. Provision of more and cheaper bandwidth
4. Provision/development of ICT application:
  - a. Enterprise wide anti-span & anti-solution
  - b. E-courseware
  - c. E-library
  - d. Video conferencing
  - e. Voice over Internet Protocol (VIP)

- f. Subscription to e-journals
- g. Staff student management & administration etc.

Eko-Konnect (2012) states that the largest challenges for NIREN formation are the social-reengineering tasks that need to be done to generate a true demand for a true NIREN, which is a necessary condition for achieving the socio-economic benefits that NIRENs are expected to achieve. Also other major challenge consists of a coherent technical training program that would enable Higher Education Institutions (HEIs) to truly own and administer their networks. Additionally, most of the institutions may not know of the existence of the other, or that of the ICT Forum and its objectives, most of these organizations particularly the research institutions and other tertiary institutions may not have any knowledge of an NIREN, its purposes or benefits and there was no means of teaching these identified organizations except to physical visits.

#### **Microsoft and CISCO Interventions**

In 2003 Microsoft and the Nigerian government signed a three-year agreement intended to enable Nigeria to deploy ICTs in order to accelerate economic growth. This partnership is to help Nigeria build its software development industry as well as streamline the governments use of Microsoft software tools. It is intended to stimulate the private sector and increase Nigeria’s global competitiveness. To this end Microsoft will provide support to the Computers for All Nigerians initiative and will produce their software in three local languages, Hausa, Igbo and Yoruba, by the end of 2007.

Further, Microsoft has signed an MOU with the Educational Trust Fund (ETF) under the Microsoft partners in Learning Programmes (PL) to develop the ICT skills of teachers, Microsoft and ETF are also jointly building a teacher-

training methodology that will become the future standard for schools countrywide. The two parties hope to bring technology to bear on primary, secondary, and tertiary education through these agreements. Accordingly, NIJIDA is offering free training on Microsoft products to ICT staff in government and public enterprises.

The government has also acquired Microsoft products for free distribution to these enterprises. Another agreement is between the two parties focuses on cyber crime detection and prevention. The MOU stipulates that Microsoft will share information and train and build capacity of Nigeria's law enforcement agencies to fight other crime. The agencies will also benefit from training sessions for law enforcement officers and representatives, sponsored seminars, information for successful enforcement and access to Microsoft's technical expertise. Nigeria's Economic and Finance Crimes Commission is the government involved.

Partnership with CISCO is also being promoted. The company seeks to provide the necessary services to telecom operators to grow their voice and data services and has established 22 CISCO training academies all across Nigeria, with the intention of expanding further training facilities and academies in the country to increase access to education. As at 2006 there were 1,320 students in training in these institutions.

Following a series of workshops studies and meeting, 11 African universities and institutions, supported by the Partnership for Higher Education in Africa (PHEA), concluded that insufficient amounts and high cost of internet bandwidth were common problems that adverse affected teaching, learning and research (Bandwidth Consortium, 2007). The problem also limited ability of sub-Saharan institutions to interact and collaborate with the global

academic community. They decided to cooperate in solving that shared problem, by aggregating their bandwidth needs and forming a bandwidth purchasing consortium.

With support from four major U.S. foundations that are members of the PHEA, the African Bandwidth Consortium (BWC) project was launched in 2005. The BWC Project was first hosted by African Virtual University (AVU) in Nairobi and some still refer to it as the AVU, BWC. In mid 2007, the International Development Research Centre (IDRC) in Nairobi kindly accepted hosting responsibilities of the BWC as a stop-gap measure. The Nigria ICT Forum of Partnership Institutions assumed hosting responsibilities for the BWC, effective from November 1, 2008.

### **Status/Challenges Facing ICT in Nigerian Educational System**

Notwithstanding the great stride Nigeria seem to have made the adoption and use of ICTs in her educational system is still rated low (Goshit 2006). NEPAD has also scored the level of African continent students' experience with ICTs and their proficiency in using them very low. Fifty-five percent of students within Africa, including Nigeria, Algeria, Burkina Faso, Cameroon, Republic of Congo, Egypt, Gabon, Lesotho, Mali, Mauritius, Mozambique, Rwanda, Senegal, South Africa and Uganda (who are participating in the first phase of the NEPAD e-Schools initiative), stated they had no experience at all in using computers (Aginam, 2006).

On July 17, 2011, the President, Dr. Goodluck Ebele Jonathan GCFR created a new Ministry of Communication Technology, which was charged with producing an ICT policy. The new Hon. Minister of Communication Technology, Mrs. Omobola Johnson formed an ad hoc committee on August 25, 2011, to harmonize the various laws dealing with ICT. The 55 paged documents was finally harmonized

on January 8, 2012. It is good to have a harmonized ICT policy but we should also look at ways to surmount the obstacles to the implementation of the policy.

According to Akpodiete (2012) in Section 3.1, of all the 12 objectives of the Policy, there is no mention of education. Many schools are ill-equipped. Even in section 4.5 of the document, it will be good to add the need for a benchmark to properly evaluate ICT Curricula. He suggests modifying section 4.2 (iv) to read “Education, Research and Development” changing it from RAD to ERAD or READ. There should also be a provision for the licensing of ICT practitioners. The current situation is porous and anyone can claim to be an ICT engineer or worse an ICT Expert. This is indeed too good for our country.

Adomi and Kpangban (2010) came up with several factors causing the low rate of ICT adoption and application in Nigerian secondary schools. The factors can be seen in Table 1, which is based on a survey of factors associated with low ICT application in Nigerian secondary schools, as perceived by 176 people in two states of Nigeria: 9 schools in Edo State with 84 respondents and 6 schools in Delta State with 92 respondents, Of the 176 teachers, 97 were male and 77 female. The study settings and subjects were selected through purposive sampling methods.

**Table 1: Causes of Low Level of ICT Application in Nigeria High Schools**

Causes of Level ICT Application	No	Percent
Limited/poor information infrastructure	112	64
Lack of inadequate ICT facilities in schools	108	61
Frequent electricity interruption	101	57

Non integration into the school curriculum	98	56
Poor ICT policy/project implementation strategy	94	63
Inadequate ICT manpower in the schools	91	52
High cost of ICT facilities/components	83	47
Limited school budget	78	44
Lack of limited ICT skills among teachers	71	40
Lack of poor perception of ICTs among teachers and administrators	70	40
Inadequate educational software	62	35
Poor management on the parts of school administrators and government	5	3
Lack of maintenance culture	3	2
Lack of interest in ICT application/use on the part of students	1	1

N = 176 several factors

These factors are not just specific to secondary students. To substantiate the lack of poor perception of ICTs among teachers and administrators even in the Universities, Akpodiete (2012) reported his observation when he recently, lectured law classes at a University in Nigeria where surprisingly enough most of the lecturers (including the VC) were computer illiterates. That was in 2011. We all know that it is not uncommon to see the lecturers submitting their exam questions to the business centre for typing. Leading of course to leakages or “expos”. It may appear unusual to some colleagues when one gives students assignment to be submitted via e-mail and required them to conduct research using the internet. Akpodiete (2012) insisting that the main obstacles to integrating ICT into the school’s curriculum are the outdated lecturers

and even anachronistic VCs who have no ICT knowledge themselves.

### **Conclusion**

Commenting on the adoption and use of ICT Philip Emeagwali remarks: "Africa must get on board... Right now! ... Africa will be either on to the Information Age or off to the dark Agricultural Age ... Africa is suffering from knowledge apartheid that forces its children to eat the crumbs from the dinner table of the information-affluent nations".

To bridge the digital divide, Akpodiete (2012) suggests that we need to massively invest in ICT literacy program similar to adult education program. In a dog post by someone named Nick Ikeame), two things are need for real change in education: "one, for the technology, to become increasingly ubiquitous and as "invisible" as a light bulb (for many teachers any kind of classroom use of ICT remains exceptionally daunting) and that may take a generation and two, fir educational administrators and policy-makers to find ways to accommodate the implications of the learner-centeredness involved. "The technology is there but do we have the will power in Nigeria to adopt and implement it. For example, it may be necessary to make it mandatory for teachers' to present their lessons or lectures in PowerPoint and provide electricity during class?"

Considering the present status of ICT in Nigerian educational system and the various efforts that are being made to make it real, one may say that Nigeria is almost on board the ICT train Nigeria is indeed advancing towards proper integration of ICT into her education. It is however, truthful that Nigeria is doing this at a slow pace. More work is need and all hands must be on deck.

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