Strengthening the Nigerian Higher Education System Through the Use of Information Communication Technology

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Abstract

This paper examines the roles of (ICT) in higher institutions of learning. It discusses the impact of the Nigeria National Policy on Information Communication Technology on the Nigeria Education System. The paper also considers the level of adoption of (ICT) in Nigeria Higher Education System and identifies the constraint to (ICT) integration in Nigeria Higher Education System. The paper highlights recommendation on how to migrate the effects of the constraints identified in order to increase the level of (ICT) in Nigeria Higher Education System. The paper concludes that the increase in the level of (ICT) implementation will substantially strengthen the Nigeria Higher Education System.
Key words: Higher education, ICT, Nigeria

1. Introduction

Education is an instrument that is used worldwide for transformation of the various sectors in any nation. The roles being played by education in economic, social, political and technological development cannot be over-emphasized. Educational program is provided to help all students attain the basic knowledge, skills, abilities, understandings and attitudes that will enable them to become worthy human beings and effective member of society. (Osuala 2004). In developing countries, education is also linked to whole batch of indicator of Human Development Indices (HDI). Education of women influences the health of children and family size.

The experience of Asian economies in particular in the past two decades has demonstrated the benefit that public investment in education can bring. In richer countries, education is seen as important not just in the early years, but also in later life. As the peace of technological change quickens and as the work force in many riches countries grows older, education offers a way to improve and update the skills and capabilities of the work forces.

The limitless roles of education in the life of any nation require an educational system that can accommodate all categories of learners. This indicates that all citizens must have equal access to education. However, there are a lot of constraints on delivering education to all people that needs it. In developing countries, there is frequently shortage of qualified school teachers. People are living in scattered communities in rural areas and most of them do not have enough resource to buy books and teaching materials. Developing countries are not also exempted from the problem of higher cost of education. The cost of university education has risen sharply, and students are increasingly expected to meet all part of the cost directly. Student who are already in full-time employment find it difficult to take part in university course offered at conventional times of day (Frances and Kaija 2004). Employer of labour who intends to train their staff may be unable to do so because of the cost of taking people away from their main job in order to attain training courses. They are therefore eager for more efficient and flexible way to deliver information to employees.

Considering the constraints enumerated above, Information Communication Technologies could be used to address most of the problems. Milken Exchange on Education (1999) defines ICT as computer based tools used by people to work with the information and communication processing needs of an organization. It encompasses the computer hardware and software, the network and other devices (video, audio, photographic camera e.t.c.) that convert information (text), image, sound, image motion and so on into common digital form. According to Yusuf (2005), ICT utilization is the presentation and distribution of instructional content through web environment or (e-teaching) system offering an integrated range of tools (standalone computer instruction, CD ROM amongst others) to support learning and Communication Technology. Information and Communication Technologies are electronic technologies used for accessing, processing, gathering, manipulating and presenting or communicating information. It comprises software, hardware and even the connectivity (Anderson & Baskin, 2002)

According to Newhouse,(2002).There are three main rationales for ICT in schools: one concerns the organizational productivity of the school, and the other two focus on the needs of the students: technological literacy and support for their hearing. The three rationales could be only achieved in an educational system that adopts the maximum usage of ICT.

Roles of ICT in Higher Institutions of Learning

The use of ICTS in higher institutions of learning is paramount to the success of the various programs being run by these institutions. Therefore, effective and efficient utilization of the technology is required. Differences exist on how ICTS is used in schools and higher education system. Schools make use of ICTS in a class that is physically present while universities deliver courses to many different locations. Higher institution of learning requires the use ICTS in order to address the question of time and location. Lower school students usually do most of their formal studying in school while a growing minority of students in higher institutions studies off campus.

According to Frances & Kaija (2004), application of ICTS as a teaching tool in universities could be streamed into tree broad categories. Many conventional universities in rich countries use computers in the way school do - as a teaching tool to improve the teaching methods. In addition many traditional universities offer a mix of delivery methods. Generally, the goal is to widen access and tap into market that cannot easily be reached with more traditional approaches. Some offers the same course online and in classroom, other use a hybrid mix of electronic and traditional method of delivery. Some universities set-up satellite campuses with broadband likes on which students, young and mature, who live in small towns and who could not travel to a large campus can learn partly at a distance. Distance courses allow a university to reach students in remote parts of the country or abroad.

There are four distinct characteristics of computer technology which have clear implication for using computer in classrooms: logical programming, interactive control, graphics and audio output and information processing. These characteristics could be used to support students and teachers in improving learning outcomes and increase productivity. The degree to which each of these should be applied depends on an array of variables such as the developmental age and personal characteristics of the students, the characteristics of the learning environment and the nature of the curriculum content (Newhouse 2002).

ICTS has positively influenced the teaching and learning process in many ways. Some of which are highlighted as follows.
- ICTS application has changed the emphasis of the curriculum from content-based to competence and performance -based. The new curriculums make provision for access to variety of information sources, form and types. They are students -centred, problems- centred and inquiry-based (0liver, 2002).
- ICT has changed how students learn by providing sample opportunity for students to learn from sources of their choice. They are free to determine from whom they intend to learn. This is in

accordance with constructivism learning theory which is based on the fact that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is process by which this knowledge construction is supported rather than a process of knowledge transmission.

- The scope of when and where student learns has also been widened by the use of ICTs. It has made it easy for student to learn at will and at different locations. Just in Time (JIT) delivery of education has been made possible. Many employees are now able to learn at their work place or at home. Far distance is no longer a barrier to students learning because networks are capable of covering every part of the world.
- The technologies allow student to receive feedback, refine their understanding, build new knowledge and transfer from school to non-school settings (Committee on Developments in the Science of Learning, 2000).
- ICT has increased student's productivity because computer applications provide tools to support student in completing the lower-level task so that they can focus on the main purpose of the activity. Word processor, graphic packages, database package, spreadsheets and other software support the performance of students (Newhouse, 2002.
- Computer tools allow teachers to consider providing a range of activities to assist student to become critical thinkers, designers and problems solvers. (Committee on Development in the Science of Learning, 2000).
- ICTs help to increase learner's independence and provide supports for collaborative and cooperative learning.
- The use of ICTs helps in overcoming physical disabilities. The variety of input and output devices available provide the opportunity for students who are physically challenged to be involved in the same learning activities as for other students. For some students, computer provides the only environment which they can manipulate and the only tools that reduce their levels of disability. Modifies keyboard and mouse-drivers may be used to allow extremely handicapped students to use regular software packages.
- ICT provide greater access to information, leading to increased interest in teaching and experimentation. (Cradler & Bridgforth, 2002).
- Availability of and numbers of teachers has greatly improved through the used of ICT. Workplace trainers, mentor, specialist from the work place and others now have the opportunities to take part in teaching.
- ICT has minimized the time spent by teachers in non-teaching task such as planning, testing, marking and recording. It also help to improve quality of task performed through the use of application package in storing student marks, course planning, instructional materials, creating test, marking test, student records and reports, and computer manage learning (CML).

Considering the above enumerated roles of ICT in educational system, it is clear that the strength of a nation's higher education system depend largely on the level of ICT adoption. In view of this, the Nigeria government has made many attempts to develop ICT and facilitate its usage in the various sectors of the national life most especially education system.

Nigerian Education System and the National ICT Policy
In realization of the immense benefit of ICT, the Nigerian government has developed various strategies for increasing the use of ICT in the country. The most prominent of these strategies is the National Information Technology Policy, tagged "USE ICT" developed in 2001. One of the major objectives of the policy is the restructuring of the education system of al 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 to education at all levels.

Another strategy to be used in line with the policy involve developing relevant IT curricula for the primary, secondary and tertiary institutions based on the appropriate national syllabus and other global

certification syllabi; to tie into key elements of government's Universal Basic Education (UBE), the digital virtual library scheme and establishment of virtual university system.

The policy also intend to establish facilities for electronic distance learning networks and ensure effective internal connectivity to provide opportunities for educationally disadvantaged areas of educationally disadvantages areas to educationally leapfrog into the modern era. In addition, the IT policy will also encourage IT companies with appropriate incentives to compel them to invest in education and training through certification for tax rebates.

Furthermore, the IT policy emphasized promotion of ''Train the trainers'' scheme through the use of existing establishments such as the National Youth Service Corps (NYSC), the National Directorate of employment (NDE) to boost capacity building in IT. Other strategies included in the policy include, empowering IT institutions and development centres to develop IT capacities, facilitating the growth of public private partnership in IT development and collaborating with international agency using "Transfer of Knowledge Through Expatriate Nationals"(TOKTEN) program.

Implementation of the Nigerian national IT policy led to the establishment of the Nigerian Information Technology Development Agency (NITDA). The Nigerian Communication Commission (NCC) also established the Digital Bridge Institute, Abuja to complement the promotion of ICT in Nigerian, According to Rufai, 2012, Federal Government of Nigeria has recorded some achievements in the area of developing a National policy on ICT in education, use of radio for literacy project and application of ICT to Distance Education and Open Learning among others. Despite the achievement, much grounds need to be covered in the implementation of ICT in Nigerian higher institutions of learning.

Adoption of ICT in Nigerian Tertiary Institutions
Empirical students have confirmed that lack of computer skills exits among faculties in Nigeria. As such they are unable to incorporate the benefits of computer technology into their teaching, research and services to the university community, Less than 12percent of the Nigeria Academic curricula have digital content. This technology deficiency translates into a major handicap in effort to bridge Nigeria digital divide (Aniebonam 2008).

According to Yoloye (1990) in his findings, it was discovered that educationist at the University of Ibadan have positive attitude towards computers. However, the study revealed that educationist at the University of Ibadan level of computer usage is very low. There is also wide gap between implementation and requirements outlined in the Nigeria computer education policy. (Jegede and Owolabi, 2003).

In a study conducted by Okon and Jacob (2002), on the use of ICT by academics in selected universities in Nigeria, they found that 61.30per cent of the respondents professed to use computers in their teaching and research works, which showed that the extent of computer usage was high. However, the findings indicated that the use of computers by academics was more on statistical analysis than on teaching. This implies that even though, ICT utilization was found to have existed, in universities, it has been of more benefits to other areas especially research than teaching and learning situations in the classrooms.

Furthermore, Oduwole, et al (2003) in their studies discovered that students constitute the major category of user s of electronic services in the university libraries surveyed. Adomi, etal (2003) also reported that 77.8percent of the coustumers of cyber cafes were students. Considering the level of adoption indicate by the empirical studies highlighted above, it is clear that the level of ICT implementation in Nigerian Universities is very low and this is inimical to the development f these institutions.

Constraints to ICT Integration in Nigerian Higher Education System
According to Angaye (2012), the growth of Nigeria must be hinged on technological capability and capacity of the citizens and technical prowess must be matched with business skills. This assertion can

only be realized if the ICT integration in the education system meets the global standard. It is obvious that the present state of ICT in education in the country is very low and in acceptable. Azuh (2012), reported that Nigeria is not harnessing the latest technology for productivity enhancements, as demonstrated by its low rating on ICT penetration of 112th position for ''Technological Readiness'' Index. Johnson (2012) also confirmed that personal computer (PC) penetration in Nigeria is one of the lowest in Africa. Despite the fact that the countries have a youthful population that is IT savvy and hungry to not only consume, but also to create content over electronic media.

One of the major factors that affect ICT integration in Nigerian Universities is funding. The initial development costs of ICT are typically higher, and the level of cost recovery may be low. Consequently, most institutions are not usually encouraged to commit huge resources to the use of ICT. Other problems are lack of hardware, in-appropriate software, and lack of personal access to the use of computers by teachers and students (BECTA, 2004). Out of a student population of 1.4million scattered in 37 state universities, 37 federal universities and 50 private universities, less than five per cent have access to personal computers in Nigeria (Johnson 2012).

Most of the higher institutions in Nigeria lack basic ICT infrastructure to optimally utilize the benefit of cyberspace. Personal computer (CPS) are available in most of these institutions, but they are not readily accessible to students because of the low computer (PC) : student ratio which is averagely put at about 1 to 40. Internet connectivity is available in most tertiary institution in Nigeria, but in most cases the bandwidth subscribed to is too small to support any meaningful academic activity during peak period.

There is lack of adequate manpower for the design operation and maintenance of ICT facilities in their institutions. Many schools make their choice of hardware based solely on the price and securing of large number of workstations. The priority may be to purchase the largest amount of hardware for the least price with the little reference to why hardware is being purchase (Newhouse 2002). Most of these institutions rely on commercial private venture to provide support for the few ICT facilities available. The support offered in most case are commercial without much academic content. (Achimugu, Oluwagbemi and Oluwaranti 2010).

Many teachers lack the knowledge and skills to use computers and in addition are not enthusiastic about the change and the additional learning associated with bringing computers into their teaching programmes. Poor economics condition and their effect on middle level manpower stand a major barrier to the implementation of ICTs in higher education, Even an average middle income earner can not avoid basic technological communication gadget. This has made the integration of necessary on-line resources (e-mail, world-wide-web e.t.c) into higher education most difficult (Ifinedo & Ololube, 2007).

The constraints enumerated above, has adversely affected the Nigerian education system. Therefore there is a need for adopting appropriate measure to remove them. Obviously, the Nigerian higher education will be further strengthened if these constraints are adequately tackled.

2. Conclusion

It is obvious that ICTs has numerous positive impacts in all facets of human endeavors and educational system is not an exception. Information communication technology has transformed teaching and learning in a wonderful way which led to increased efficiency and effectiveness. Barrier to distance learning in education has been broken. The scope of when and where students learn has been widened and the form of instructional delivery has changed. In order to add more strength to the capacity of Nigeria Higher Education System, appropriate measure must be put in place to increase the level of ICT implementation in Nigeria higher institutions. This will enable the educational institutions to contribute meaningfully to the realization of the country vision 20-20-20.

3. Recommendation

Many constraints to the implementation of ICTs in Nigeria higher institutions has been identified in this paper. Therefore these constraints must be mitigated to further strengthen the sector. Mandatory training and re-training on ICT programme must be regularly organized for lectures and student. This will provide them with practical and functional knowledge I computer, internet and associated areas of ICT.

Personal access for teachers to a computer for the purpose of presentation and planning is one of the strongest influences on the success of ICT training and subsequent classroom use. In this regard, all stakeholders must work together to increase availability of computers and ICT facilities. Adequate funding must be provided for these higher institutions to acquire necessary materials and facilities for ICTs in their institutions. Government at all level must implement UNESCO recommendation on funding educational system. This will enable the management of these education higher institutions to procure quality and reliable ICT hardware and software.

To achieve Nigeria national aspirations and vision to be a digitally connected knowledge-based society, our student and youth must have increased access to ICT. Public –Private-Partnership with original equipment manufacturers (OEMS) currently being pursued by the federal government must be supported and nurtured to maturity.

Hardware for ICTs should be purchase on the ground of its practical suitability to the environment in which it is to be used. In addition to this, highly skilled technical support personnel should be employed in various higher institutions for installation and regular maintenance of ICTs facilities. Regular and reliable power supply must be provided for higher institutions to support and prolong the life span of the ICT equipment.

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