

COMPUTER EDUCATION: A NECESSITY FOR INFORMATION AND COMMUNICATION TECHNOLOGY

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Abstract

This paper highlighted the meaning and the importance of Computer Education and Information and Communication Technology in Nation building. The historic advent of Computer Education and ICT is also discussed, including the problems of computer education and their remedies. The needs for government established agencies to enhance Information and Communication Technology are highlighted.

According to British Educational Council of Teachers' Association (BECTA) (2004), Information and Communication Technology (ICT) are the computing and communication facilities and features that variously support teaching, learning and a range of activities in education. The activities of ICT include the use of computers, projectors, televisions, internet facilities, broadcast materials, compact Disc-CD-ROM (i.e Read f Memory) etc in teaching and learning as well as for storing, and analyzing information. ICT also includes videoconferencing, email to support collaborative writing and sharing of resources and integrated learning system. Computer education has been recognized by many educational institutions in Nigeria as the best alternative to educational development because of its application to teaching/learning and in solving other educational problems.

Computer is an automatic electronic machine that follows instructions stored within it to compute, store, process data and display

information with human intervention. According to Afolabi (2001), computer is an electronic device that is capable of solving problems or manipulating data by accepting data from outside as input and performing prescribed operations, be it mathematical or logical on the data and producing the result of the processed data to users as an output. Douglas (2005) defined computer as an electronic device which accepts data as an input, processes such data in order to generate useful result. Ngwu (2003) opined that among other things, computer education provides easy access to information to both teachers and learners, individualized instruction, vast learning opportunity to students, make learning more flexible and interesting and facilitates distance learning through internet services.

Objectives of Science, Technology and Mathematics

The philosophy of the national policy on science and technology according to Ngwu (2009), is aimed at developing the people and creating a mass awareness of the people to embrace science and technology. These objectives include:

- a. To increase public awareness in science and technology.
- b. To direct the science and technology efforts of the nation along well-defined national goals e.g. self-reliance.
- c. To promote the translation of science and technology results into goods and services.
- d. To increase and create output in science and technology as bases of the nation.

Computer plays a crucial role in information communication technology which according to Arsomwan and Omeiza (2007) is changing how people work, play, learn, travel and transact business. Douglas (2005) pointed out that if computer education is fully integrated into Nigeria education system it will foster the achievement of the following:

- i. Flexible learning: Computer education gives foresight to learners by making learners to know when, how and what to learn.
- ii. A veritable platform for quick exchange of ideas, learning, sourcing and teaching strategies among teachers and student especial in science based courses.
- iii. With knowledge of computer, discussion, presentation and seminars are held across international boundaries via television, teleconferencing, video conferencing and media conferencing.
- iv. With the aid of computer education, distance learning can easily be implemented through the use of internet.
- v. Computer education helps to educate individuals through computer aided instruction (ACT) and computer Aided learning (CAL), data analysis, storage and retrieval in education.

Ebenehi (2004) defined computer education as education about computer, either in a wider or specific sense.

- a. Wider sense: Computer education is education about the computer that is focused on both the manufacturing technology and usage.
- b. Specific sense: Computer education means a focus of training directed at an aspect of computer, e.g. computer literacy education which deals with knowledge of how to use the computer.

History of ICT and Computer Education in Nigeria

An information Technology revolution in Nigeria actually established its root in the early seventies when the computers came into Nigeria.

When computer was introduced into Nigeria, it was confined to certain big firms and industrial establishments. It started to have a pride of place in the educational institutions and business centres in the 1990s. Many institutions began to establish computer centres.

The computer centre of University of Jos for instance was founded in 1991.

Computer education was introduced into the Nigerian education system in the late 1980s based on the recommendation of the 32nd ministerial council meeting of the National Council on Education in 1987 (Afolabi, 2001 and Yusuf, 2005). According to Arosamwan and Omeiza (2007), before 1988, offerings in Computer Science were envisaged strictly for tertiary level of education. That is, only the Universities, Polytechnics and Colleges of Education were expected to teach courses in Computer Science and produce graduates in that discipline. Afolabi (2001), claimed that this resulted to:

- (a) Very few Nigerians having access to tertiary education and only a negligible percentage of this number were admitted into department of Computer Science. Thus, only few Nigerians were trained in computer technology; and
- (b) Societal demand for computer literate Nigerians far outstripped the level of production of this cadre of manpower.

In an attempt to solve these problems and many others, the federal government of Nigeria decided to formulate a computer policy which will not only address the need for more awareness but also ensure that sound basis of

computer education and utilization is laid. In line with this, according to Afolabi (2001), government in 1988 decided to start its pilot program in the Federal Government Colleges and the armed forces secondary schools in line with the recommendations of the committee on National Policy for Computer Education in Nigeria. Training programs were also conducted for 197 teachers from the schools in the pilot.

Computer education was introduced to bring Nigerian children into contact with the computer so that they could use it, appreciate its potential, understand how it works, and learn to apply the knowledge and skills to solve emerging problems. The computer systems were introduced into the Federal Unity Schools throughout the Federation in 1989, (Arasomwan and Omeiz, 2007). The revised National Policy on Education (2001) gave prominence to computer education because it was made pre-vocational and vocational elective at the junior and senior secondary school levels, respectively (Afolabi 2001; Jegede and Owolabi, 2003). Though, many educational institutions in Nigeria are already having computer studies as part of their academic program, most of them are too theoretical in nature to impact meaningfully to the society.

Later the advancement in research and development in the computer-based networking system resulted in the creation of internet which is a network of computers. Afolabi (2001) described internet as “a network of computers”. According to Afolabi (2001), the communication technology in Nigeria is beginning to witness the phenomenon of cybercafes in major cities for access to the internet under the regulation of the Nigerian Communications Commission (NCC). He (Afolabi, 2001) further stated that the first

Nigeria’s website, a company known as TRIDAS international was opened on November 10, 1995. It later started providing users information in Nigeria on the World Wide Web (www).

Later in 1997 the Nigeria University Commission (NUC) started providing e-mail services to the Universities through the Nigerian University Network. There was development and launching of the National Information Technology Policy in 2001. Now, some organizations, individuals, government establishments, few private and government primary and secondary schools as well as tertiary institutions have computers linked to the internet.

The Benefits of ICT in Teaching and Learning

Reglin (1990) studied the effects of Computer Assisted Instruction (CAI) on the teaching of Mathematics on a sample of 53 students. His finding include that the students who used computer to solve a matrix problem performed better than students who used conventional method in solving the same problem. Owen and Waxman (2000) made a study on a sample of 231 students grouped into two categories, one group used Computer Assisted Instruction (CAI) while the other group did not use CAI, in solving a mathematical problem. They found out that computer when used in teaching and learning mathematics encourages students’ problem solving ability. Other benefits of ICT as pointed out by Lawal (2003) are:

- a. Students can make use of ICT to get facts for their classroom assignments or add more to the facts given by the teacher.
- b. Through the internet (ICT) students have access to the latest scientific discoveries. This is due to the fact that the use of computer and internet has reduced the world to a global village where information

- available in one part of the world can be obtained in another part with ease.
- c. Using ICT reduces stress of going to libraries in search of facts. Books are converted to CD ROMS to solve problem of acute shortage of books.
 - d. Using ICT saves time and energy of students and other researchers.
 - e. Doctors now use computers for medical diagnosis and tests of patient's samples. Computer Aided Tomography Scanner helps doctors to make photographs of internal body organs.
 - f. Registration online is made possible through internet services in our educational institution. This includes SSE, JAMB, NECO, etc.
 - g. Bank transactions are made easy through ICT internet services.

This includes transferring and receiving money through bank payments.

Problems of Computer Education Nigeria

Computer education as a science education has many uses in terms of functionality, effective curriculum and implementation of policies. Hence, Jegede (1991) asserted that science education and science teaching in Nigeria have gone skewed, static and insensitive and must be fixed through a more responsive curriculum, relevant, appropriate and transferable skills from the classroom to real life world experiences.

Some of the numerous problems facing computer education in Nigeria include:

1. **Insufficient Funding of Computer Education**
The funds often provided for Computer Education by government to procure and maintain the machines and other instructional materials for teaching and learning are grossly inadequate. Federal and State governments do not make

enough budgetary allocations to tertiary institutions offering computer studies. The same is applicable to secondary schools.

2. **Insufficient Computer Instructors**

Computer instructors are inadequate in institutions of learning due to the few computer teachers available in the computer field of specialization. Most of the few available ones are not well equipped with the proper orientation. The absence of experienced computer education teachers makes the achievement of computer education objectives difficult.

3. **Poor Design Implementation of Curriculum**

Computer Education curriculum is not designed to meet the need and the technological changes of the world. The curriculum has not been formally introduced in the school system. It is so narrowed that it was made an elective subject in junior secondary school as one of the prevocational subjects.

4. **Non-Inclusion of Computer Studies as Examinable Subject**

Up till now, computer studies have not been included even in the junior secondary school examination. Even those offering computer science as their discipline do not take the subject as one of the subjects in Joint Admission and Matriculation Board examinations and this has been a big problem hindering the achievement of computer education objective.

5. **Inadequate Motivational Incentives**

Computer educators are not adequately motivated in term of conditions of service and welfare packages. They are denied of in-service training which will help them to up-date their knowledge, skill and improve

on their method of instruction to meet the emerging society and need, since computer is so dynamic and has innovations always. This makes the qualified teachers of computer education to resign and look for job in other lucrative areas.

6. Students' Background

Computer studies are not taught in most of our primary and secondary schools. This has contributed to lack of basic knowledge of computer education/studies in primary and secondary schools. Thus, students in tertiary institutions and universities find computer education very difficult and hard to understand and difficult to apply when the need arises.

7. Inadequate Power Supply

Epileptic power supply is one of the problems of computer education. Computer machine cannot work without power supply. In some rural areas there is no electricity and this affects the smooth running of the program in the schools where computer system and studies are available.

Conclusion

The following remedies are recommended based on the discussion in this paper. That computer education should be properly funded by the government and the other agencies that are concerned. The National Computer Education Curriculum for primary schools which was developed by the Nigerian Educational Research and Development Council (NERDC) in 2002 should be revisited. The NERDC should be formally implemented and monitored, so that qualitative learning can be achieved so that the nation should not be left behind from technological knowledge and advancement by the rest of the world.

Conferences, seminars, workshops and the like should be organized for computer teachers. These will help them to acquire the knowledge, skills and perspectives that will improve instructional effectiveness and greater competence in information and communication technology. From the discussion so far, it is obvious that computer education is the bedrock of information and communication technology (ICT). Introducing computer education into the education institutions especially starting from the primary to higher institution will go long way in eradicating computer illiteracy in the nation. The effort of government and indeed, all stakeholders is needed in this regard in terms of infrastructures, equipment and manpower development through seminars. Any nation backward in information and communication technology in this modern age is indeed bankrupt.

Recommendation

The following recommendations are hereby suggested in order to improve computer education and ICT:

1. The federal and state governments should make enough budgetary allocation to schools offering computer studies for the procurement of more computers and maintenance of nonfunctional parts and out dated equipment.
2. All tertiary institutions in the country should be encouraged to offer courses on computer science. This will go a long way to increase the number of computer instructors as more people will be interested in computer science.
3. Computer education curriculum should be revisited and be designed in a way that it should meet the need of the society. It should be formally implemented in the school system. It should be made a compulsory subject starting from the primary school and not an elective subject

- again so that every student will have the grip of computer knowledge. The interest of the learner will be widened for learning.
4. The national examination bodies like West African Examination Council (WAEC) and the National Examination Council (NECO) should include computer studies as one of the subjects to be taken in the examination.

CASTME (1988), Stated the following as the objectives of ICT in Nigeria:

- a) Preparing students to live in a world increasingly rich in information.
- b) Using development in ICT effectively in the classroom.

As pointed out by Oyedokun (2006), in the recognition of the role of ICT in the nation's development, Isoun in his keynote address to the 44th STAN annual conference highlighted government effort toward ICT development as:

- (i) Launching of the National Telecommunication policy (September 2001), which led to the advent of Global System Mobile net (GSM) in Nigeria.
- (ii) Development of a comprehensive science and technology policy (2001).
- (iii) Development and launching of National Information Technology policy (2001).
- (iv) Establishment of the National Information and Technological Development Agency (NITDA) 2001.
- (v) Launching of the Nigerian satellite system program by the National Space Research and Development Agency (NASRDA) 2001.

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