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Uses of Computer and its Relevance to Teaching and Learning in Nigerian Educational System (Pp 519-528)

Bada, Tayo Abass - Department of Educational Technology, Faculty of Education, Obafemi Awolowo University, Ile-Ife.
E-mail: badatayo2@yahoo.com

Oyewusi Lawunmi - Department of Educational Technology, Faculty of Education, Obafemi Awolwo University, Ile-Ife.

Ojedokun, Olalekan - Institute of Education, Obafemi Awolowo University, Faculty of Education, Ile-Ife.

Adewole, Ajibade - Department of Curriculum and Instructional Technology, Osun State College of Education, Ila-Orangun.

Abstract
This paper examined the uses of computer and its relevance to teaching and learning in Nigerian secondary schools. The need for computer education and its objectives in Nigerian educational system were identified and discussed. The roles the classroom teachers would play and the challenges they would have to face in using computer for instruction were also highlighted. Possible solutions were suggested to ensure successful implementation of computer education programme in Nigerian secondary schools.

Key words: computer education, analog computer, digital computer, hybrid computer.

Introduction

In recent times, the world has witnessed a rapid increase in technological innovations. This era ushered in the advent of the electronic computer system among other modern technologies. At present the computer technology has permeated nearly all aspects of human organizational roles and education. Computer encompasses almost all facets of human endeavours. So much has been written on it and its relatedness to all areas of human disciplines, which include computer/information technology, engineering, agriculture etc. However, much work has not been done on computer and its application and relevance to education. This work aims to fill this gap, as it discusses it importance to the field of education Today, computer technology in schools is one of the most far-reaching and fast growing developments in education. Like maize in a plantation during a storm, countries all over the world are bending towards the fad of computer education (Joseph, 1990; Madu, 1990; Macaulay, 1993).Development in science and technology has brought into lime light the indispensable roles of computer in the area of information technology. It is a new instructional system. The incursion of the electronic computer system into the educational parlance, according to Sherman (2005) provides the wherewithal to solve teaching and learning problems even more rapidly and accurately than hitherto conceived. This has eventually made the computer system the doyen of humanity as it continues to exert greater acceptance. Computer, according to Jayesimi (1985), has become the 'nowology' in our society and possibly futuristic years ahead. In schools, computers are widely used; and the need for computer technology and literacy in the educational system has become more relevant. Computer has been found to be an effective device for presenting an instructional programme. According to McCormick (1993), computers can be used to diversify, develop and improve the pedagogical relation of teaching and learning. Also, technological development can only be enhanced through proper acquisition of scientific knowledge: which can only be realized through relevant training in Science, Mathematics and Computer Education. It was in this light that the Federal Government of Nigeria launched the National Policy on Computer Literacy at primary, secondary and tertiary levels of education in 1987 with the following general aims: For the computer to transform the school system, as there is increased merger between the computer technology and communication; and To equip the individual or student with thorough understanding of the concept of computer in order to fit in to the next century. The National programme on Computer Education as put in place by the Federal Government of Nigeria was received

with open arms and regarded as a technological innovation in educational practice in Nigeria institutions of learning. Computer Education was perceived as a new instructional system that was designed to improve the quality of teaching and learning and to aid technological and socio-economic development. This was further corroborated by the then Federal Minister of Education, Professor Jubril Aminu in his address to the Ad-hoc Committee on computer Literacy in Nigeria that the objectives of the nation's Computer Education programme, among other things, were as follows: To bring about a computer literate society in Nigeria within a short space of time; To enable the present generation of school children at all levels, appreciate the potentials of the computer; and To enable them to be able to use the computer in various works of life and later occupation. With these laudable objectives, all state governments throughout Nigeria follow the Federal Government policy to introduce Computer Education and Literacy in secondary schools in 1997 with the following general objectives: To bring about a computer literacy in each state in Nigeria; to develop the use of computer as teaching tool in all subject areas and to familiarize students with the use of computer technology; to enable the present generation of school children at the secondary school level appreciate the potentials of the computer and be able to utilize the computer in various aspects of life and later occupation; and to expose the teachers and the students to the latest scientific knowledge and skills. From the foregoing, based on the importance of computer to learning, introducing it into the Nigerian educational system can be said to be a step in the right direction.

Conceptualizing Computer

The computer is a technological innovation under the control of stored programme that can perform some of the intellectual roles of man even beyond human capability.

It is a power-driven machine equipped with keyboards, electronic circuits, storage compartments, and recording devices for the high speed performance of mathematical operations. Reith (1993) defines computer as an electronic device which stores information on disc or magnetic tape; analyses it and produces information as required from the data on the tape. Sharing the same view with Reith (1993), Kingsley (1995) sees computer as a device that accepts data in one form and processes it to produce data in another form. Adekomi (2001) defines computer as a combination of related devices capable of solving problems by accepting data, performing described operations on the data, and supplying the results of these operations. Hence,

computer could be said to be a man-made machine made up of electronic components that operates information at a very high speed to produce results that are meaningful to the user. It is basically a processor of information. Computer is a machine designed to make life easier due to its speed, accuracy, ability to store large quantity of information and to carry out long and complex operation without human intervention. Computers, irrespective of type and size have five basic parts namely, Input Unit, Memory Units, Control Units (CU), Arithmetic and Logic Units (ALU) and Output Units. Both ALU and CU are joined into one piece of hardware known as the Central Processing Unit (CPU)which is the brain of the computer. According to Adekomi (2001), the primary functions of computers are:

Imputing and storing information, Processing information, and Out putting information

Computer has specially designed languages for operations. These are FORTRAN, COBOL, BASIC, ALGOL, PL/I and PASCAL. The computer accepts data through its input devices such as the screen, mouse, light pen, scanner, microphone, joystick and the like. It processes data, stores it and outputs it through the output devices which include the printer, loud speaker, computer output, microfilm and others. The basic types of computer are the analogy, the digital and the hybrid. The analogy computers are used for measuring changes in continuous physical or electrical states. These include speed, pressure, voltage, length, volume and temperature. The digital computers perform calculation by counting number precisely while data are represented by discrete states of the computer electronic circuitry. Digital computers convert data to binary form. The hybrid computers represent a combination of digital and analog computers and known to have found much application in control and feedback processes. Innovations appearing today indicate that the word is dependant on computer technology (Ajibade, 2006). The computer is not only a game or word processing and accounting alone, it is a great learning tool for adults and little ones, nursery school pupils and secondary school students, graduates and post graduate students.

The Need for Computer Education in Nigeria Secondary Schools

The world is advancing at a rapid rate. Events have moved to the electronic stage with the computer at the enter. This development has brought a lot of innovation and revolution into teaching and learning. The 3R's which forms the nucleus of the old system of education has witnessed series of literacy reforms. The world is now in the age of information technology or computers age, hence, there is a need to keep abreast of time. One of the ways of

achieving this is through the introduction of computer education in our institutions of learning. Computer education is the effort or the ability to make the generality of the people computer literate. Computer literacy means ability to tell the computer what you want it to do and understand what the computer says. To be computer literate amounts to be able to read, write and speak the language of the computer (Ajibade, 2006).Computer education encapsulates computer literacy, Computer Assisted Instruction (CAI), and Computer Appreciation. Among the terms used to describe computer in a learning environment are Computer-Based Education (CBE), Computer Managed Instruction (CMI), Computer Supported Learning (CSL), Computer Assisted Learning (CAL), Computerized Instruction (CI), Computer Assisted Teacher (CAI) and the like. In addition, the need for computer education in Nigerian secondary schools lies in the potentials of computer instructional purposes and its utility value. The computer is a tireless, relentless, evaluating teacher which has several modes of instruction at its disposal such as sound, sight and tough. According to Baugher (1999), in Language, a computer can present words to be spelled, sound to be made, instructions to be followed, images and symbols to be responded to by touching. Computer can be used to evaluate student's performance and direct student backward, forward and sideways for appropriate learning activities. Its patience, memory and endless capacity for details are assets that defy competition from ordinary teacher. Taking an unequivocal stand with Baugher (1999), Elkhalm (2000) says that 'computer might also be used to handle the extremely complex programmes that are necessary for more individualized learning. The computer can present diagnostic test, provide branched progrmames to accommodate individual needs, and furnish prescriptive assignments that might refer the student to a textbook, a laboratory experiment or a consultation with the instructor. Fajola (2001) assets that the computer is diligent and consistent in its mode of operation, as it does not suffer from tiredness or lack of concentration like human beings. Computer performs multi-functional roles in teaching and learning processes at all levels. At the primary and secondary levels of education students can explore and generate learning through computer programme. At the tertiary level, computer can be used to store the daily or weekly observation of experiments in science. It can be used to mix colour, separate colours, scan, draw, design various things and create charts and graphs for instructional purposes (Ajibade, 2006). According to Adekomi (2001), information can be stored in manual files in the computer magnetic disc and retrieved when needed. The computer can provide a convenient technique for designing and developing a course of

instruction. It can equally provide dynamic interaction between students and instructional programme not possible with most media. Other potentials of computer in instruction identified by Abimbade (1997) are:

- Computer helps students to learn at their own pace. It produces significant time saving over conventional classroom instruction.
- It allows students' control over the rate and sequence of their learning. It gives appropriate feedback.
- It promotes individualized instruction through personalized responses to learner's action to yield a high rate of reinforcement.
- It provides a more positive affective climate especially for slower learners. It provides appropriate record-keeping and thereby monitors students' progress.
- It puts more information in the hands of teachers.

Novelty of working with a computer raised students' motivation. It provides reliable instruction from learner to learner regardless of the teacher/learner at any time of the day and location. It directs instruction to learners. It provides instruction at comparable expenses to other media.

The Role of the Teachers in Using Computer for Instruction

According to Kersh (1995), the classroom teacher will never be replaced by programme of self-instruction. Rather, he will be freed to guide the learning of his students in ways that only a human being can. In using computer for instruction, the teacher's role is hypothesized as changed basically from that of informer to learning facilitator. His duty of delivering lectures changes to that of guide and problem solver. In the words of Johnson (1992), the instructor is freed from time-consuming chores as compiling, administering and marking tests, has time to work individually with the subjects. At the schools, the instructor is the manager of the learning process. The instructor decides when the students use the terminal, read the textbook, or work with laboratory equipment. This is to say that the teacher is relieved from pure informative tasks. He could dedicate himself to the processing of this information. The teacher's roles in using computer for instruction are further conceptualized as spending his time in leading group discussions and in working with students individually and in small groups using laboratory work where applicable. The teacher is not a spectator of incomprehension but guides the students in the multitude of diversified documents to make relevant choices. He is a guarantor of assimilation as well as facilitator to help learners use and access knowledge in computer education. Hence, the

teacher's attitudes, beliefs and preferences will be changed and be adapted. According to Jenks (1996), the objectives of Computer Education are not determined by student's needs, interests or hope alone. The goals are agreed upon in consultation with the teacher. The students and the teacher together decide what the student should learn and ascertain the students' goal can best be achieved. Computer as an entity is not totally independent. To achieve the set objectives of using computer for instruction, the teacher should check what each student is doing, and equally reconsider with the student the goals, methods content, level and pace. Where a student with low ability tries a difficult material, it is imperative for the teacher to decide the possibilities of doing so. The teacher should discuss the method and content of such difficult material with the students to enable such students understand the content of the material. Benmaman (1992) asserts that teachers and their assistants have the responsibility to help each student find the best way to learn, to help them with their work, to check their work and to guide them to more effective learning. Sharing the same view with Benmaman (1992), Wynn (1999) says that the teacher cannot be removed from effective instructional positions he occupies irrespective of the level of the technology because of the paramount role he plays in teaching and learning processes. The scope and quality of teacher's contribution to teaching and learning process should be considered in introducing a new technology to instruction. The teacher is a significant figure in education advancement. No educational system can rise above the level of its teacher.

Challenges of Computer Education in Nigerian Secondary Schools

As excellent and important the computer, it has not really gained its root in our Nigerian schools, let alone the entire society. Its impact is not strongly felt by all, especially by our students. This is because there are some challenges facing its implementations in our society. Some of the challenges are listed below. The challenges of computer education are both educational and administrative. The prominent among the administrative problems is cost. Over the years, the cost of computer has been on the high side. This has been a deterrent to the adoption of computer for instructional purposes in most Nigerian secondary schools. Coupled with this is the exorbitant price of software; it follows the same pattern as that for the hardware. Where attempts are made to purchase computers for instructional purposes, the costs of installation, maintenance and replacement are unavoidable. The depressed economic situation of Nigeria has incapacitated the government to fund education effectively. The meager funding of education in Nigeria coupled

with low technological level has been an impediment to the provision of instructional materials and use of computers for instruction in Nigeria at all levels of education. In addition, death of trained personnel militates against the use of computer for instruction. Experts with the technical know-how of computers are few except the computer dealers who are profit conscious. Hence, there are no computer operators, keypunch operators, analysts, computer scientists, computer engineers and technicians to operate service and develop computer course ware for use on a large scale in education (Salisbury, 1998). Another impediment to use of computer in the classroom could be attributed to the syndrome of resistance to change among the Nigerian teachers. They view the use of computer for education as a means of displacing them from their cherished job rather than an instructional material to enrich teaching and learning. Also, they regard the use of computer as an increase in their tasks in the classroom without adequate compensation, hence the prayer for premature death for computer education. Closely related to resistance to change is the problem of poor technological development in Nigeria. Nigeria is a developing country where the rate of illiteracy and poverty is high among young and old. A large number of Nigerians are ignorant of the tremendous advantages of technology. Commenting on the level of technological development in Nigeria, Akinyemi (1988) says that the state of Nigeria's development will probably exacerbate the degree of frustration that Nigerian students are likely to experience on computer education. In addition, dearth of instructional facilities militates against computer education in schools. Facilities such as adequate air condition, appropriate computer environment and building are not provided. Furthermore, electricity which is the primary source of power supply to the computer is not stable. There is epileptic power supply and incessant power surge when there is light. This causes damages to the computer system. Besides, the cost of generator is skyrocketing. Coupled with this, is the scarcity of computer spare parts and the exorbitant cost of maintaining and using the computer for problem-solving and information storage.

Some Suggestions

The government should employ applicants with Bachelors of Science and Computer Education to teach the subject in our secondary schools. The parliamentarian should pass a bill on stabilizing the price of computers in the market to make it easier for people to acquire at a reduced price. Computer spare parts should be imported to repair the damaged ones. The government should provide enough funds for schools to purchase computer for

instructional purposes and make available suitable computer environment in our secondary schools. Conferences, workshops and symposium should be organized to train people and enlighten them on the need for computer education. Curriculum developers should make Computer Education one of the core subjects to be offered in secondary schools. The State Ministries of Education through their Local Inspectors of Education (LIE) should monitor the implementation of Computer Education programme in Nigerian secondary schools.

Conclusion

The world is a global village. The present age of technological advancement has brought changes into virtually all human endeavour including the teaching and learning processes. Acquisition of computer literacy skills as well as good face-value certificate in Computer Education is a sin-qua-non for all and sundry. This is also the case for the Nigerians. Promotion in places of works and securing a well paid job are all attached to computer literacy, hence the society should get more enlightened through Computer Education.

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