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COMPUTER EDUCATION PROGRAMME IN AN ERA OF ECONOMIC UNCERTAINTIES

Timothy Ekpo; Imaobong Anthony Ofana &Idorenyin Uwem Enyong
Department of Business Education
Faculty of Vocational Education, Library and Information Science
University of Uyo, Uyo

Abstract

The integration of Computer Education into the curriculum of higher education has added more advantages to school leavers and graduates of Computer Education as it makes them job creators and not seekers. This paper therefore seeks to highlight the need of Computer Education Programme in an Era of Economic Uncertainties. It examines education as an instrument for empowering youths with skills and knowledge. The paper also elaborate on the following headings: The concept of a computer; computer in the instructional delivery process; factors hamper Computer Education in Nigeria are all examined in this paper. It also expatiates on the need for Computer Education in Nigerian schools. Prospects of Computer Education in the era of uncertainties in Nigeria. Recommendations to further enhanced Computer Education in an era of uncertainties in Nigeria, suggestions were made for effective implementation of Computer Education programme in Nigerian schools.

Introduction

Technology is advancing at an ever increasing rate, transforming the nature of learning and work. Widening inequality threatens to further disrupt our systems and to leave a large part of the world behind as a result, our political systems are increasingly facing an isolationist backlash. Change is happening at a disorienting pace and our institutions can barely keep up with these dynamics.

Computer is a very important aspect of Information Communication Technology (ICT). The government of Nigeria recognizes the importance of ICT in education. According to the Federal Republic of Nigeria (FRN, 2004) in its education policy document, Government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world. The integration of computer into the educational sector in Nigerian schools will in no small measure help in the production of school leavers who will serve as job creators instead of job seekers.

Education is an instrument for empowering young people with knowledge and skills, which provide opportunity for them to access productive employment (National Planning Commission, NPC, 2013). In recognition of the need for education, the FRN (2013) in its education, noted that education is that process concerned with the transmission of worthwhile values, skills and knowledge suitable for developing learner's potentials for national development. Anaduaka and Okafor (2013) noted that the major goal of education in any nation is to prepare its citizens for responsible and productive adult life, in order to be able to function honestly, efficiently and effectively in the society which they live. For any nation to be able to prepare its citizens for responsible and productive adult life, entrepreneurship must be taken into account, of which Computer Education is a major component.

Computer according to Ikekonwu (2009) is an automatic machine that follows instructions stored within it to capture, store, process and display information. Computer is said to be multimedia because it can present mixtures of different modes of communication; video, still pictures, graphics, texts and sounds (Nwafor, 2007). Computer can assist a teacher in delivering instruction and in such situation; it is referred to as Computer Assisted Instruction (CAI). Computer Assisted Instruction is an automated instructional technique in which a

computer is used to present an instructional programme to learners through an interactive process (Ajelabi, 2002). CAI is learner-centered and activity-oriented.

Computer Education is the effort or the ability to make the generality of the people computer literate. Computer literacy, on the other hand, means the ability to tell the computer what you want it to do and understand what the computer says. To be computer literate implies the amounts to be able to read, write and speak the language of the computer (Ajibade, 2006). Computer Education encapsulates computer literacy, 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), CAI, among others. In addition, the need for Computer Education in Nigerian schools lies in the potentials of computer instructional purposes and its utility value.

Teaching is the process of imparting knowledge, experiences, attitudes, and skills to the learner. Offorma (2006) defined teaching as a systematic activity deliberately engaged in by somebody to facilitate the learning of the intended worthwhile knowledge, skills and values by another person and getting the necessary feedback. Learning, on the other hand, is a process of acquiring experiences, knowledge, skills and attitudes. It is a permanent change in behavior which can be as a result of experience. Ngwoke (2004) defined learning as a process which causes a change in behavior of an individual. Learning occurs when students have achieved what they were taught. For instance, Achievement in physics Education can be improved with the use of ICT equipment and facilities in teaching and learning. This statement was supported by Anene (2005) who argued that achievement is qualified by measures of students' academic standing in relation to those of other students tested with the same instrument. Indeed, the need to improve teaching and learning led to the introduction of the use of ICT in teaching and learning.

Concept of a Computer

The computer is a technological innovation under the control of stored programme that can perform some of the intellectual roles of a 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. Adekemi (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 Adekemi (2001), the primary functions of computers are list in prose.

1. Imputing and storing information.
2. Processing information.
3. Out putting information.

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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 analog, the digital and the hybrid. The analog 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 dependent 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.

Computer in the Instructional Delivery Process

Computer is a very important aspect of ICT. Akudolu (1996) defines computers as electronic devices that can store, process, disseminate and retrieve large volume of information with great speed and accuracy and it is the best educational technology medium for individualizing instruction. Asogwa (2009) observes that the learner interacts directly with the computer programmes, and the computer assesses the learner's progress and suggests ways for improvement. The versatility of the computer makes it to be seen as a useful tool that can relate to many aspects of life through communication as well as a useful tool in teaching and learning (Johnson, 2010). Some of the types of computer technology that can be used in the education process are given below:

1. **Interactive whiteboards:** In the modern classrooms, interactive whiteboards have replaced the chalkboards. By using the whiteboards, teachers easily connect to their computers and share files and presentations with students. Besides, teachers and students can control the board, move objects and write text with their fingertips. This makes learning exciting.
2. **Electronic Learning (e-learning):** E-learning, according to Sarojini (2007) has been variously defined but one thing that is common to all the definitions is the term technology. E-learning involves a learner using a variety of computer and networking technologies to access training materials. It is education offered using electronic delivery methods such as CD-ROMS, video conferencing, websites and e-mails to facilitate learning through the use of computer based devices. It is also known as on-line learning (Oyelami, 2008). One major advantage of e-learning is that students can stay at home and receive lectures, do examinations and receive their results on-line without face to face interaction with teachers or examiners. Distance is therefore, not a barrier to both students and researchers in this kind of technology. Highlighting the importance of Information Communication Technology vis-à-vis electronic learning, Enemuo and Onwuka (2006) opine that Information Communication Technology has become a cardinal tool of government and organizations. It is now almost imperative for policy makers to focus on e-health, e-commerce, e-finance, e-government and e-education as catalyst for all development agenda.
3. **Software:** Software refers to materials on which some information is recorded, stored and preserved. Software holds or carries instructional content. Examples are recorded tapes, compact disk, video compact disk, flash drive, digital video disk, etc (Asogwa,

2009). Computer technology allows students to use different software such as word processing that helps students with typing and publishing papers and spreadsheet for calculation. There is graphic software for drawing and painting and there are education software such as interactive educational software that uses drills and practice, Encarta kids, typing tutor, among others. They all enable students to learn course materials, do assignments and engage in other educational processes at their own pace.

4. **The Internet:** Students have benefited a lot since the inception of the internet. The internet provides a great deal of access to information on various areas of human endeavour. It is a computer-based global information system that has tremendously enhanced communication among people from different geographical locations. The internet enables students to download useful academic materials that are up-to-date for their projects and research works. Tinio (2011:8) observes that, "networked computers with internet connectivity can increase learner motivation as it combines the media richness and interactivity of other Information Communication Technologies with the opportunity to connect with real people and to participate in real world events". The internet is so important and useful. Teachers can use the internet to connect to their students while they are at home. Teachers can create blogs for the purpose of posting assignments for absent students.

In spite of the innumerable benefits of using the Computer in Education, as discussed above has some factors that hamper Computer Education integration into teaching and learning in Nigerian schools. These factors are discussed below:

1. **Lack of ICT Compliant Teachers:** The fact that most teachers lack the skills and knowledge to teach computers in schools is a global phenomenon. This problem is, however, worse in the developing countries. For instance, in rural part of Nigeria, majority of teachers do not know how to operate a computer, let alone teach others using the computer system. This is in line with the observation of Onwuka and Ekwekwuo (2014) that most schools teachers are not computer literate. They further lamented that this is a problem because there is no way a teacher without the knowledge of computer can help the students in that regard. In a case study research on primary school competence and confidence level regarding the use of Information Communication Technology in teaching practice conducted in five European countries, Peralta and Costa (2007) found out that technical competence influenced Italian teachers' use of ICT in teaching. In Syria, teachers' lack of technological competence has been cited as the main barrier (Albirini, 2006). In a research carried out in Australia, Newhouse (2002) found out that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. The situation is even worse in Nigeria going by a research conducted by the Global Information Technology in 2004 using the Networked Readiness Index (NRI) to measure the degree of preparation of a nation to participate in and benefit from ICT development. Nigeria was ranked 88th out of 104 countries covered. In 2005, the same research was repeated. This time, out of 115 countries covered, Nigeria ranked 90th. United States of America topped the list, followed by Denmark, Iceland, Finland, Canada, Taiwan, Sweden, Switzerland and United Kingdom in that order (Ejionueme, 2012). According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. To integrate Computer Education into the Nigerian schools is a good idea but the major barrier is lack of competent teachers to handle a wide range of varying computer applications for various purposes.

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2. **High Cost of ICT Facilities:** Prohibitive prices of computer resources have made it impossible for many schools to have enough for both teachers and students. In the rural areas, most of the schools do not have computer at all. This is a very big obstacle to the integration of Computer Education into the teaching and learning in various schools. This problem is exacerbated by lack of fund and poverty in the land.
3. **Lack of Appropriate Software:** The development of appropriate software for the teaching and learning is another factor militating against the integration of Computer Education. In other words, software that is appropriate for curriculum is in short supply.
4. **Inadequate Power Supply:** The functionality of the computer is dependent upon the availability of electricity. Unfortunately, power generation in Nigeria has not been stable and reliable over the years. This is a great obstacle to the realization of the integration programme.
5. **Poor Policy Implementation:** According to the Fatemi (1999) in (National Policy on Education, NPE, 2004:15), "Government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world." This policy statement is indeed a far cry to what obtains in Nigerian schools today. No special training for manpower development in the knowledge of ICT and no enabling environment for integration of Computer Education skills into the educational system in Nigeria.
6. **Lack of Technical Support:** Nigeria lacks skilled man power to handle technical issues when things go wrong while using computers. There is acute shortage of trained personnel that can easily intervene or render support with regard to repair and maintenance of computer equipment. This can be frustrating to the teachers whenever the need for these trained personnel arises.

Providing solutions to the above named challenges will go a long way in ensuring of physics education graduates who are skilled in the use of ICT for production purposes, drawing, programming and invention of new issues in physics education.

The Need for Computer Education in Nigerian Schools

The world is advancing at a rapid rate. Events have moved to the electronic stage with the computer at the center. 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.

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 programmes 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 Adekemi (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.

In the face of the serious growth of unemployment in Nigerians today the need for Nigeria to seek avenues for self-employment and self-fulfillment is now compelling. In other words, Nigeria can no longer rely on the labour market to provide jobs. Invention of alternative source of employment in form of self-employment otherwise called entrepreneurship is greatly needed is very important to the future of Nigeria economy. It is a must now, judging by the figure that graduates yearly from the institution of higher learning. In the last few years, more than 70% of senior secondary school leavers find it difficult to gain admission into higher institutions while over 60% of graduates are not able to get employment immediately because they are relatively unskilled (Millennium Development Goal document, 2005). This is usually because these graduates go into small scale and sometimes, large business enterprises without been adequately prepared to face the challenges of entrepreneurship. Part of the problem is the nature of the education system, which tends to produce job "seekers" instead of "job creators". To be able to produce job creators there is the need to infuse the spirit of entrepreneurship through Computer Education into the mode of instruction of Computer Education teachers which will facilitate the emergence of entrepreneurial Computer Education students.

Other potentials of computer in instructional delivery identified by Abimbade (1997) are:

1. Computer is an instrument for technological advancement and economic growth in the twenty-first century.
2. Computer helps students to learn at their own pace.
3. Computer produces significant time saving over conventional classroom instruction.
4. Computer allows students' control over the rate and sequence of their learning.
5. Computer gives appropriate feedback.
6. Computer promotes individualized instruction through personalized responses to learner's action to yield a high rate of reinforcement.
7. Computer provides a more positive affective climate especially for slow learners.
8. Computer provides appropriate record-keeping and thereby monitors students' progress.
9. Computer puts more information in the hands of teachers.
10. Novelty of working with a computer raised students' motivation.
11. Computer provides reliable instruction from learner to learner regardless of the teacher/learner at any time of the day and location.
12. Computer directs instruction to learners.
13. Computer provides instruction at comparable expenses to other media.
14. Computer equips students with current trends in technological advancements.
15. Computer improves education efficiency. Through the use of ICT in teaching and learning of Computer Education, carefully prepared computer packages can be used to ensure that learners are properly instructed. Software can be developed to teach certain topics.
16. The use of ICT facilitates students paying attention in the class.

Prospects of Computer Education in the Era of Uncertainties in Nigeria

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1. Using Computer Education enhances skills, aptitude and attitude. It provides students with the opportunity and motivation to:
2. Work creatively and independently.
3. Develop research, analysis and critical thinking skills.
4. Be able to work on unfamiliar environment and respond to the unexpected events.
5. Better understand their own capabilities and traits in the use of ICT and to enhance their confidence in their own abilities.
6. Foster business and financial knowledge and understanding.
7. Empower the students to seek out and take advantage of other sources of information; (Osuala 2004).

Conclusion

In the words of Asiriuwa (2005) science and technology is central to education and necessarily concerned with teaching or training of individual in order to acquire systematic skills, knowledge, attitude, and the application of the skills in the society. In spite of the benefits of computer to man and society, the education system has continually turned out graduates with skills and attitude that are neither needed in the modes of production, nor saleable in the limited industrial commercial establishments. This is because these products did not practice the right skills while in the senior secondary schools. This has continuously led to mass unemployment of school leavers, with the attendant problem of increased economic social and moral vices. The goal of education is entrepreneurship, and the development of entrepreneurial skills can be achieved through active learning of process skills such Computer Education (Iyekekpolor 2007). The acquisition of professional qualification in a subject like Computer Education equips an individual with skills to be self-employed, because of having acquired entrepreneurial and/or process skills. Functional Computer Education emphasizes applicability or transferability of the acquired knowledge to the immediate environment. This is the purpose of Computer Education as stated in FRN (2013) in its education policy document, which includes the acquisition of appropriate skills and development of the society.

Recommendations

Considering the inexhaustible benefits of using computer technology in the teaching and learning in schools, the following recommendations are made:

1. Seminars and workshops should be organized regularly for teachers at all levels on how to use computer technology in the classroom.
2. The three tiers of government should encourage the integration of computer skills into the teaching and learning of all subjects as stipulated in the National Policy on Education. They can do this by providing adequate computer technology facilities and constant electricity in all schools at all levels in Nigeria.
3. Graduates of Computer Engineering should be employed to provide support with regard to repairs and maintenance of computer technology facilities in the various schools in Nigeria.
4. Government should, in addition to providing adequate security in all the schools to safeguard the computer facilities, set up task force that will monitor the use of the computer facilities to ensure total compliance.
5. The government should employ applicants with B.Sc. (Ed.) and B. Ed. Computer Education to teach the subject in our secondary schools.
6. The government should provide enough funds for schools to purchase computer for instructional purposes and make available suitable computer environment in our secondary schools.

7. Conferences, workshops and symposium should be organized to train people and enlighten them on the need for Computer Education in an era of uncertainties as we are in Nigeria.
8. Curriculum developers should make Computer Education one of the core subjects to be offered in secondary schools with its practical applications as the priority not the theoretical aspects only.
9. The State Ministries of Education through their Local Inspectors of Education (LIE) should monitor the implementation of Computer Education programme in Nigerian schools.

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