CHALLENGES TO COMPUTER-BASED SCIENCE INSTRUCTIONS IN SCHOOLS AND ENHANCEMENT STRATEGIES

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Abstract

Quality science education in consonance with the contemporary world issues is what any nation desires for her citizens. Modern life activities are now dominated by technology. Teaching and learning of science subjects in schools has also become computer- led. However, this is not the case with many developing nations, for instance Nigeria where textbook and theory-oriented instructions are still dominating classroom science instructions. This paper identifies some of the challenging factors to the use of computers and computer-based systems in Nigerian primary and secondary school science instructions. This is with a view to sensitizing science education stakeholders on the need for remediation since Nigeria's science education programme should be in consonance with the contemporary world science education programmes. Such factors as teachers' skills in the use of computer, provision of computers to schools, funding computer-based science education, power supply, administrative bottle neck, monitoring and supervision among others are seriously challenging computer-based science instructions in Nigerian schools. Suggestions on enhancement strategies towards tackling the challenges were articulated.

Introduction

Science education has become recognized as the pivot on which any nation's technological development hangs. Technology has today taken over almost all aspects of human lives like feeding, clothing, shelter, transportation, communication, social interactions, health-care services, leisure as well as education.

After the Stone Age or since the scientific and industrial revolution that started in Europe hundreds of years ago, the world had passed through many other ages till the present age of computer (Okebukola, 2002). This age of computer is concerned with the use of computer-based systems to retrieve, store, process and transmit information in and from diverse sources. It is the age that so far features the highest and fastest information dissemination through internet and other computer-based systems (Mohammed, 2008). Computer-based systems disseminate quantitative, qualitative and most current information. Thus, computer-based systems can easily keep students abreast with the most current information, especially now that scientific information can change even before it circulates. In

effect, the role of computer in teaching and learning is rapidly becoming so important and widely adopted issue in the contemporary science education policy (Rosen and Well, 1995; Thierer, 2000). Another researcher pointed out that computer illiteracy is now regarded as a new illiteracy. On realizing the importance and or advantages of the use of computer-based systems in learning, most students today rely more on seeking and getting information through internet services than dependence on library, textbooks and teacher-made notes. These facts necessitate a strong need to equip schools with computer-based facilities for teaching and learning.

Although, today computer system is employed in science curriculum implementation in classrooms in many countries of the world, unfortunately, its use is very minimally applicable to science instructions in most Nigerian public schools. This is a problem and has to be seriously addressed as Nigeria has to be responsive to the dynamics of social changes in line with the contemporary world issues. Worried by the situation, this paper tries to identify some of the factors militating against the use of computer systems in teaching and learning of sciences in Nigerian schools with a view to sensitizing the governments and other science education stakeholders for solution.

The need for computer-based science instruction in Nigerian schools

Education, especially science education is the only means of achieving social changes in consonance with the contemporary world issues. As already mentioned, computer has taken over the operations of most world business sectors including science teaching and learning in schools. Computer-based systems provide learners with the most current information which libraries, textbooks and teacher-made notes cannot provide. Nigerian students are therefore not benefiting maximally in science instructions. Nigerian educational institutions have to produce science students whose proficiency and efficiency is comparable to others for marketability in the world job market as computer literacy is fundamental to securing jobs today. Just as Kalusi (2003) observed, mere literacy or academic knowledge is no longer a guarantee for job security. If our science education system continues to be plagued with textbook-driven and lecture-oriented instructions, Nigeria is not being part of current world science educational practices.

The effect of globalization is today mandatorily forcing all nations to queue up in contemporary world issues including science educational programmes. Nigeria cannot be an exception. Many studies have reported positive effects associated with computer aided instruction (Burnett, 1994). Nigerian youths who do not want to or cannot further their education after secondary school education need some computer literacy to secure middle manpower jobs or establish on their own. This is because present day job seekers need to be computer literate. Computer-based science instructions have the potentials to enrich skills, motivate and engage students in learning and make them part of the world that is fast becoming a global village. There is no quality education today without computer literacy.

Challenges to using computers in science instructions

Nigeria as a nation would like her science education programme to be comparable to that of the developed nations of the world. For employing computer-based facilities in science instructions however, the following factors pose challenges.

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not being sent for refresher courses or in-service training on computer usage. Worse still, computer-illiterate teachers are still being produced and turned into the teaching service by teacher producing institutions. The government is busy promulgating laws and policies, the political class is busy working out their allowances and some science education stakeholders are complaining of the poor state of the science education system but taking no action for remediation.

8. **Lack of monitoring and supervision**

It appears that that there is no government agent at local, state and federal government levels responsible for monitoring and supervising how computer programmes are being practised in schools with a view to providing feedback to government and computer education policy makers. No system including education can function very well without monitoring and supervision.

Suggestions on enhancement strategies

On personal opinion, the following approaches could be of help to reducing the challenges facing the use of computers in science curriculum implementation in schools.

1. Teacher computer literacy

Almost all the current serving science teachers in schools are computer illiterate, many of them may be reluctant to acquire computer literacy, and they should not be left that way. They should be compelled though with encouragement to go for in-service training for acquiring some basic computer literacy packages. This is not for their benefit but for the benefit of Nigerian children they are teaching and whose future is in their hands. They should be certificated at the end of the training and those who could not pass the evaluation test should be laid off from teaching service.

2. Review of science education curriculum

To avoid or minimize turning out science education graduates without some computer literacy, science education curriculum has to be reviewed to include some basic computer courses. The computer courses which science education students do in General Study (GS) courses are not enough for them to teach science education with the use of computer systems in schools. Too much emphasis being are laid on such methods of teaching courses like curriculum development and science instructions, Psychology of science teaching, philosophy of science, sociology of science etc. Basic computer courses have to be built into the methods of teaching science.

3. Provision of computer systems to schools

One of the greatest educational problems in developing countries, Nigeria inclusive is that almost everything about education in public schools is left for the government only. This cannot be easy with respect to the current demands on science education. There needs to be organizations whose responsibilities are to ensure quality science education in the country. In developed countries, there are such bodies like Usaid, UNICEF etc that take some responsibilities in education. Science education stakeholders in Nigeria like Science Teachers Association of Nigeria, (STAN) should make impact in such areas like providing computers to schools and as well appealing to local and international bodies, rich individuals etc to help in the provision of science instructional equipment like computer systems to

1. **Teacher computer literacy**

Majority of the current servicing science teachers in the primary and secondary schools were trained and employed before the issue of use of computer technology in school subject instructional processes became popular in schools. Still, most of them appear to be reluctant to take pains on self-update or self-training on educational innovations like the use of computers for instructions. Therefore, competent teachers to use computers for science instructions are lacking in schools. According to Carlson and Firpo (2001) and Okebukola (1997), teachers need effective tools, techniques and assistance that can help them produce computer-based products.

2. **Government's commitment to computer education policy**

Nigeria developed a national policy on computer education in 1988 with among other objectives, to encourage teachers develop a sense of rapport with computer usage, appreciate its potentials for tackling teaching and learning challenges and to entrench computer culture that permeates all activities in institution of learning (Abimbade, Aremu and Adedoja (2003). Since then, there are no appreciable evidences that serving teachers are being sent for in-service training based on computer skill acquisition. It then appears that Nigerian government is not committed to computer education programme. Policy formulation without action cannot produce result.

3. **Provision of computer systems in schools**

Solomon (1989) asserted that there are clear indications from many countries that the supply of relevant and appropriate software is a major bottle neck obstructing wider application of the computer in science instructions. This is very true with Nigeria. But up till today, computer systems are not available in most public schools. In schools where computer studies are being thought at all, it is only in theoretical terms and by computer incompetent teachers who only attempt with difficulty, to teach what is in the time-table and in school curriculum..

4. **Funding computer-based science education**

Computer-based education is really costly. To provide computer systems to all students and other facilities like internet to all schools really requires much money which the government can hardly accommodate within the education budget.

5. **Power supply**

Computer systems cannot work without power. Nigeria is this time passing through a period of virtually no power supply. Its solution appears even not to be near.

6. **Computer system repair competence**

The use of computers in business sectors including education is relatively new in Nigeria. Many people have not yet acquired technical skills to repair simple faults in computer systems. To use computers by teachers and students who are incompetent computer system users would result in frequent repairs and there will be need for ready repairers.

7. **Administrative bottle neck**

The governments, political class and science education stakeholders appear to be paying lip services to quality education in this country. Since the promulgation of computer education policy in 1988 till date, many schools are still without computers, serving teachers are still computer illiterate indicating that they are

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