

THE STATUS OF COMPUTER EDUCATION AND SCIENCE LEARNING IN PLATEAU STATE SECONDARY SCHOOLS: A CASE STUDY OF PLATEAU STATE CENTRAL SENATORIAL DISTRICT

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Abstract

The study was conducted to examine the status of computer education and science learning in plateau state secondary schools. It adopts a survey design in which a 15-item computer education and science learning questionnaire (cesleg) was constructed to ascertain the availability of computers and manpower, knowledge of computer science and the impact of computer-aided instructions (cai) on science learning in secondary schools. The findings show that the number of computers in secondary schools and the manpower for teaching computer science as a subject are grossly inadequate, the basic appreciation and knowledge of computer principles are still lacking in the students and cai-related software for science learning are yet to be put in use.

Introduction

In this age of information and communications technology (ICT) where the whole world seem to be reduced to a global hamlet, no country desires to be mapped out of the relevant hamlet. Information and communications technology is therefore indispensable for any country that must belong to the global hamlet. According to Rahman (2002), a large number of developing countries have lagged behind in ICT due to their inability to use ICT resources. These resources include computer systems. In Nigeria, as in other developing countries of the world, the populace must be educated in the use of the computer to be able to communicate and relate effectively with the rest of the world.

In the context of this research, ICT focuses on the enhancement of students' performance in school subjects through the use of computer-aided instructions (cai). Therefore the knowledge and skill acquisition of computer is necessary as a fundamental of ICT. Information and communications technology can then be said to be the application of computers and telecommunication technologies to improve learning by the student. It is the correlation of computer with communications.

The awareness of computer education in Nigerian secondary schools began about 15 years ago. The national policy on computer literacy enacted and launched in 1988 by the federal government of Nigeria (Abimbade, 1999) offers the following as some of the curriculum content drawn out to achieve the objectives of computer literacy in secondary schools:

- i. A basic appreciation of how computer works;
- ii. Understanding of basic principles of operating a computer; and
- iii. Hands-on experience using pre-programmed packages which are relevant to the interest of the students as teaching aids in different subjects.

In his keynote address to the 43rd Science Teacher Association of Nigeria's Annual Conference and Inaugural Conference of CASTME Africa in 2002, Nigeria's Honorable Minister for Education, Professor A. B. Borishade stated that the Ministry for Education in Nigeria 'Introduced Computer Studies in Secondary Schools by the year 1990'. Having traversed slightly a decade into the world of computers in Nigerian secondary schools two paramount questions Science, Technology and Mathematics Education (STME) stakeholders must pry into and find solution to are: What is the status of computer in our institutions of learning? And; has ICT facilitated the learning of STM in schools?

This work therefore looks into the status of computer education in Nigerian secondary schools and the journey so far of computer-aided instructions in the secondary school especially in the learning of science. Are there enough teachers of computer science as a subject and computer systems in our secondary schools? Have pre-programmed packages, that is CAI, which are relevant to the interest of students been used to facilitate science learning? Mulemwa (2002) posits that cai provides quality STME and improves learning thereby increasing interest and understanding. The student becomes an active participant in the use of CAI to understand STM.

Sampling technique and sample

The stratified random sampling technique, being judgemental, was employed to choose three (3) out of the five (5) local government areas (L.G.AS) constituting Plateau State central senatorial district in Nigeria and four (4) secondary schools from each of the three chosen L.G.AS. The criterion guiding the choice of three L.G.AS is the proximity of the LGAS to the researchers and the criterion governing the selection of the secondary schools is the date of establishment of the schools which should be beyond 1990 when computer education was introduced in nigerian secondary schools.

Instrumentation and instrument administration

A 15-item computer education and science learning questionnaire (cesleq) was constructed by the researchers and validated by experts. Cesleq was designed to ascertain the availability of computers and manpower, knowledge of computer science and effect of cai on science learning in nigerian secondary schools.

The researchers personally administered cesleq to ss3 class students and retrieved it on the spot. A total of 240 sample was involved (20 students from each of the 12 secondary schools used). Ss3 class students were used as it was thought that the students would have been concluding their study on computer science as a subject and other science subjects.

Data analysis and discussion

The 15-item cesleq is as below:

1. Do you offer computer science as a subject in your school? Yes [] no []
2. How many computers do you have in your school?
3. What do you use the computer for in your school? For learning [] nor for learning []
4. How many students offer computer science as a subject in your class?
5. How many teachers in your school teach computer science as a subject?
6. List down at least 5 major hardware components of a computer system.
7. What is the relationship between keyboard, central processing unit and monitor of a computer system?
8. What is the relationship between the hardware and software of a computer system?
9. List three software packages or applications you know.
10. What is a high level computer language?
11. From the following statements, tick that which you are sure is true about the state of science learning in your school: We have used the computer in learning
 - A. Physics
 - B. Chemistry
 - C. Biology
12. From the statement(s) you ticked in question 11 above, write down the computer program(s)/ software(s) or package(s) you used in the learning of the subject(s) you ticked.

13. Have you ever used the computer for other things apart from the learning of the subject(s) you ticked in question 11 in your school? Yes [] no []
14. Mention what you used the computer for in question 13
15. What sort of games have you ever played on the computer in your school?

Items 1-3 were used to find out the availability of computers in the secondary schools. The mean statistic was administered on item 2 while the percentage was administered on items 1 and 3. Items 4 and 5, which ascertained the availability of manpower, had the mean statistic administered on them. Items 6-10 were administered to test the knowledge of computer science as a subject. The percentage was administered on each of these items according to the number of correct or wrong answers supplied. That is, an item is rated correct when the supplied answer is completely right. Otherwise it is wrong. Items 11-15 ascertained the effect of CAI on science learning. The percentage was administered on the items.

Availability of Computers

All the respondents (100%) offer computer science as a subject in school. On the average, each school used in the study had four (4) computers. While 65% of the respondents indicated that the computers were used for learning, 34% responded that the computers were not used for learning. 1% did not respond. From the analysis it is clear that the number of computers in secondary schools is grossly inadequate since, on the average, ten students are attached to a computer. In an ideal situation, a student should work on a computer.

Availability of Manpower

On the average each school has one (1) computer science teacher that teaches computer science as a subject to an average of forty (40) students per class. This contradicts the provision of the National Policy on Education (1985) which specifies a ratio of 1:30 (that is, a teacher to 30 students in a class).

Knowledge of computer science

On item 6 of cesleq, 63% of the sample responded correctly while 37% responded incorrectly. Only 45% responded correctly to item 7. 55% responded wrongly. In response to item 8, 10% correctly answered and 90% wrongly answered. 28% responded rightly to item 9 while 72% responded wrongly. 23% responded correctly to item 10 with 77% responding incorrectly. On the average, 33.8% responded correctly to the test of knowledge of the subject. From the secondary school curriculum content as stipulated by the national policy on computer literacy the basic appreciation and understanding of the basic principles of computer still lag in the students.

Effect of CAI on science learning

12.9%, 15.4% and 12.9% of the respondents indicated that they have used the computer in learning physics, chemistry and biology respectively. 55.8% did not respond to item 11 implying that they had not used computer to learn science. In contrast to the claim by those that indicated they used the computer in learning science none of them could write the computer software(s) or package(s) they used in learning the science subject(s). This signifies that those that indicated they have used computer in learning the three science subjects did so in error. In spite of 58% agreeing to have used the computer for other things apart from learning of science only 5% mentioned that they used the computer for playing games. Even the games that were played on computer by the 5% that mentioned playing games on computer were not CAI-related games for science learning. This was attested to by the response on item 15 of cesleq where all the games indicated were only application games on windows 98 operating system. From the above findings CAI-related software such as learning ladder (an interacting science learning package) and encyclopedia of science are not being used in the schools for science learning.

Conclusion and Recommendation

The use of computer can lead to improved student performance on thinking logically, formulating problems, solving procedures and understanding relationships. However, this research piece has shown

that in Plateau State secondary schools the objectives of the curriculum content of computer education in secondary schools are still far from being attained. The researchers, therefore recommend that a drastic measure be taken by the Nigerian government to address the lapses this work has unveiled, if the nation must catch up with ICT.

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