AVAILABILITY AND UTILIZATION OF COMPUTER FOR TEACHING AND LEARNING SCIENCES IN SECONDARY SCHOOLS IN ISI-UZO LOCAL GOVERNMENT AREA OF ENUGU STATE

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Abstract

The use of computer and its accessories in teaching apparently facilitates both the effort of the teacher as well as the learner, as the entire world is said to have been globally connected. It then follows that the connectivity has no exception. Science students in secondary schools are presumably supposed to be the benefactors of these computers. This study is designed to find out the availability and use of computers in secondary schools for teaching and learning of sciences in Isi-Uzo Local Government area of Enugu state. It adopted a descriptive survey research design and four research questions guided the study. Eight teachers and one hundred and sixty (160) students randomly selected were used for the study. The instrument for data collection was check-list and questionnaire. The findings of this study revealed that computes are not available for teaching and learning of science, even the few ones available are not properly utilized. Furthermore, the study indicated that the science teachers do not sufficiently possess the needed skills to manipulate the computer. Recommendations were made based on the findings

Education is the key to sustainable national development. It is also the pivot of the whole social, political, economic and technological system of any society. No nation can boast of being democratic, self reliant and buoyant, without integrating technology in their educational system.

This generation is known as the computer age, implying that it is the age (period) of introducing computer in virtually every fields of human endeavour. Today's child lives in a technological world, a world of technological revolutions. The child watches films, listen to radio, watches television and video, uses CD, VCD and DVD (Adewunmi, 2004:75). He also explains that the child has become influenced in various ways by these media programmes that he will wants to experience these new patterns of communication in his class especially with computer which presents instructions in multimedia.

Computer is a powerful machine with various uses in education. It is an electronic device used in accepting data, processing data, storing data and producing large amount of information. It is a machine specifically designed for the manipulation of coded information, an automatic electronic machine for performing simple and complex operations far beyond the capacities of man (Peter, 2007: 19). Nwafor (2007:121) defines computer as an electronic machine that accept data through input devices, processes it and provides result through output device that appeal to the senses of hearing and sight and can help the teacher teach effectively by increasing the level of interaction in an otherwise boring yet necessary lesson.

With the advent of computers and technological advancement like the internet, the face of education in the world is gradually changing just as Phadke (2008:65) opined that "there is a definite change in the entire teaching - learning process, involving sciences in schools in Nigeria"

The importance of computer in education cannot be over-emphasized. The use of computer can help to resolve the academic difficulties of the student and improve their study habit. Better study habits and study skills lead to better achievement scores. Computer can be used to present instruction directly to students in this mode the computer engage in activities radically associated with teachers and tutors. It presents instruction, provide instructional activities or situations, quizzes or otherwise receives instruction from learners evaluate learners response, provides feedback and determines appropriate follow-up to activities.

The introduction of computer into teaching and learning has made both students and teachers overcome the re-occurring problem of conventional methods of teaching and learning in science education. The key premise for science education has been to involve young minds in activities that arouse curiosity, generate interest in research, invention and innovation and creativity. In this regard, Abidi has this to say

> *Several studies reveal that computer-based teaching of sciences can provide immense possibilities for the acquisition of science process skills such as observation, measuring, classification, inferring, predicting, using space/time relationship, communicating, questing, controlling variable, formulating hypotheses, defining operationally experimenting and interpreting data (Abidi, 2006:24).*

Another study by (Aparna, 2002:125) reveals that computer is an instructional alternative to the teacher. Fafunwa (1982:172) defines teaching as a conscious and deliberate effort by a matured or experienced person to impact knowledge to immature or less experienced persons with the intention that the latter will learn or come to believe that he is taught on good grounds. Looking at the definition above, teaching in the formal sense goes beyond imitation and observation.

In education sector, information, communication and technology (ICT) in which the use of computer is incorporated remains the key factor that blends both teaching and learning. In view of this, World Bank (2002:34) affirms that ICT holds out the opportunity to revolutionize pedagogical methods and expand access to equal education system. Going by this, there is the need to brace up to the new challenges and systems of education through the provision and utilization of ICT in schools.

Purpose of the Study

The main purpose of this study is to ascertain the availability and the use of computers in secondary schools for teaching and learning of science in Isi-Uzo Local Government area of Enugu State.

Specifically, the study sought opinion of respondents on the extent of availability and usability of computer for instructional delivery.

Research Questions

The study was guided by the following research questions -

1. To what extent are computers and their accessories available for teaching and learning of science?
2. To what extent are the available computers utilized for teaching and learning of science?
3. To what degree do the problems encountered effects the teaching and learning of science?
4. What computer skills do science teachers sufficiently possess?

Methodology

The study adopted a descriptive survey research design. This involves collection of data using questionnaire for the purpose of describing and interpreting existing conditions or qualities regarding a given population (Anakwe and Ozigbo (2002:85). The design was considered

suitable going by the nature of the study. The area of the study is Isi-Uzo Local Government Area of Enugu state.

The population for the study was made up of all the SS II science students and their teachers in the area. Therefore, the entire population was 160 students and 8 teachers.

Random sampling method was used to select four secondary schools out of eight co-educational public schools in Isi-Uzo L.G.A. Furthermore; an intact class of SS II science students was randomly drawn from each of the sampled schools. Each intact class contained an average number of forty students; hence the sample size of the study was one hundred and sixty (160) students and eight teachers.

The instruments for data collection were checklist and questionnaire. The checklist consists of computer and computer accessories which the respondents were expected to tick the items that are available in their schools while the questionnaires consist of items in which the respondent were expected to indicate the availability, extent of use of computer and accessories, and degree to which they possess computer skills. The instrument has four clusters, each cluster directed to answering one research question. The first, second and third clusters were answered by the students while the forth cluster was answered by the teachers. The instruments were validated by the experts the questionnaire were personally administered by the researchers to the respondents and collected on the spot. 168 copies of completed questionnaire were used for data analysis.

Checklist was used to answer question one. Items that have percentages of 40 -100 were considered Available (AV), while those that are less than 40 were considered not available. Means were used to answer research questions two, three and four. 4 points rating scale was employed with rating of very high extent (4), High Extent (3), Low Extent (2) and very low Extent (1). Items that have means from 2.50 - 3.49 were considered very high extent (VHE), 1.50 - 2.49 were considered High Extent (HE), 0.50 - 1.49 were considered Low extent (LE) and 0.00 - 0.49 were considered Very Low Extent.

Results

The results are presented and discussed with respect to the research questions. They were presented in table 1 -4

Research Question 1: To what extent are computer and computer accessories available for teaching and learning of science?

Table 1: Available Computer/Accessories for Teaching Science

S/N	Computers/ accessories	Frequency	%	Responses
1	Adobe flash	02	1.25	NA
2	Adobe page maker	02	1.25	NA
3	Adobe Photoshop	02	1.25	NA
4	CD writer	02	1.25	NA
5	Cable satellite	03	1.87	NA
6	Corel Draw	02	1.25	NA
7	Dream wearer	02	1.25	|NA
8	Digital camera	04	2.50	NA
9	External CD Rom	05	3.12	NA
10	Freehand Drawing	02	1.25	NA
11	Internet	00	0.00	NA
12	Uninterruptible power supply (UPS)	35	21.87	NA
13	Joy stick	04	2.50	NA
14	Light pen	02	1.25	NA
15	Macro media	00	0.00	NA
16	Palm top	68	42.5	AY
17	Personal laptop	06	3.75	NA
18	Power point projector	00	0.00	NA
19	Printers	08	5.00	NA
20	Scanner	02	1.25	NA
21	Personal computer	06	3.75	NA
22	Speaker	03	J 87	NA
23	Television	00	0.00	NA

Key: NA = Not available, AV - available

Table 1 show that out of 23 computer/accessories listed; only palm top was available for teaching science.

Research Question 2: To what extent are available computer resources utilized for teaching science?

Table 2: Extent of Utilizing the Available Computer

S/N	Computer/Accessories	Mean	Decision
1,	Adobe flash	0.08	VLB
2	Adobe page maker	0.08	VLB
3	Adobe Photoshop	0.08	VLB
4	CD writer	0.08	VLB
5	Cable satellite	0.11	VLB
6	Corel Draw	0.08	VLB
7	Dream wearer	0.08	VLB
8	Digital camera	0.16	VLB
9	External CD Rom	0.28	VLB
10	Freehand Drawing	0.08	VLB
11	Internet	0.00	VLB
12	Uninterruptible power supply (UPS)	1.38	LE
13	Joy stick	0.16	VLB
14	Light pen	0.08	VLB
15	Macro media	0.00	VLB
16	Palm top	JU38	LE
17	Personal laptop	0.32	VLE
18	Power point projector	0.00	VLB
19	Printers	0.40	VLE
20	Scanner	0.08	VLE
21	Personal computer	0.32	VLB
22	Speaker	0.11	VLE
23	Television	0.00	VLE

Keys: VHE: very high extent, HE: high extent, LE - low extent, VLE: very' law extent

Table 2 above shows that uninterruptible power supply (UPS) and palm top were used to a less extent, while the adobe flash, Adobe page maker, Adobe photo shop, CD writer, cable satellite, Corel Draw, dream weaver, digital Camera, external CD Rom, Freehand drawing, Internet, Joy Stick, Light Pen, Macro media, personal Laptop, Power Point projector, printer, Scanner, personal Computer, Speaker and television were used to a very low extent.

Research question 3: - What are the problems encountered with the use of computers in teaching and learning of science?

Table 3: Problems Encountered in Teaching and Learning of Science with Computer

S/N	Problems	Means	Decision
1	Teacher qualification	2.34	HE
2	Functional computer system	3.16	VHE
3	Poor Computer Laboratory Facilities	2.04	HE
4	Lack of coherent Instructional Plan for ICT	2.22	HE
5	High cost of ICT resource	1.85	HE
6	Efficient manipulation of the system	2.36	HE
7	Power supply	1.86	HE
8	Security of the system	3.24	HE

Keys: VHE - very high extent, HE = high extent, LE - low extent, VLE = very low extent

From table 3, it is observed that teachers and students encounter some problems to certain degrees. The teachers' qualification, poor computer laboratory facilities, lack of coherent instructional plan for

ICT, high cost of ICT resources, efficient manipulation of the system, power supply were all observed to be in a high extent. While problem of functional computer system and security of the system were in a very high extent.

Research Question 4: What computer skill do the science teachers sufficiently possess?

Table 4: Computer Skill Possessed by Science Teachers

S/N	Computer skill	Mean	Decision
1	Booting the system	2.35	HE
2	Computer Appreciation	2.32	HE
3	Knowledge of operating windows	1.26	LE
4	Application of Microsoft word	1.35	LE
5	Application of Microsoft Excel	1.34	LE
6	Application of Microsoft power point	1.06	VLE
7	Application of Corel Draw	1.05	VLB
8	Power point presentation	1.20	VLE
9	Application of Free hand drawing	0.05.	VLE
10	Application of dream weaver	0.20	VLE
11	Knowledge of scanning	1.12	VLE
12	Knowledge of printing some document	1.34	LE
13	Application of Adobe Flash	0.06	VLE
14	Application of page maker	1.22	VLE

Key: VHE - very high extent, HE = High extent, LE - low extent, VLE = very low extent

Table 4 above shows that teachers posses to a high extent the skills of booting the system and computer appreciation. They also possess, though to a low extent the knowledge of operating computer window, application of Microsoft word, Microsoft excel, and have the knowledge of printing some document. However, the teachers posses to a very low extent, the skill of applying Microsoft power, Corel draw, power point presentation, free hand drawing, dream weaver, scanning, use of Adobe flash and page maker.

Discussion

The finding that the computer and its accessories for teaching science were not available conform the earlier observation made by Salau (2001: 58) when he noted that the introduction of computer studies could be hindered by inadequate human resources and physical facilities. Out of 23 items needed for effective teaching of science, only palm tope were available for teaching and learning of science. The few computer/ accessories available like UPS, printers are not frequently used as most of them are packed at a place because of insecurity, inability to manipulate and lack of other accessories. Packing these computers/ accessories at a place without proper utilization is equivalent to not having them at all. This falls short of Ekoko (1996: 121) who believes that ICT materials like projectors, chalkboards, computers etc have improved the quality of education in many aspects such as quick understanding of the lesson.

The findings from research question two show that the available computer resources were properly utilized as instructional delivery which facilitates instructional exchange and interaction between the teachers and students, lesson presentation and effective storage and retention of information. This is contrary to the previous works and literature on the utilization of ICT in implementing teacher education programme as stipulated by Geoghegan, (1994: 73) who states that ICT has the potential to offer basic support to the teaching materials.

The study also revealed that the teachers and students are deficient in the required computer

skills. Teachers ought to master the basic skills in computer operation to be able to utilize it well in science classroom. This is in line with Adewoyin (2008) and Zubaru (2008) who states that the extent to which teachers integrate ICT in their teaching and students' learning is related to several factors among which knowledge and competence are as well as teachers' ability and willingness to integrate ICT into their teaching.

Finally, the study also shows that some science teachers are neither qualified to teach the students nor they possess the required ICT knowledge. There are some technical problems emanated from functioning of the system, efficient manipulation of the system, security, and storage of the facilities. Lack of coherent instructional plan, high cost of ICT resources and poor computer laboratory facilities are other problems encountered in teaching and learning of science with computer. Inadequate and irregular power supply is another serious problem. Computer is an electrical equipment that requires electricity for operation. Most of these schools in Isi-Uzo Local Government Area are located in rural areas where there is no electricity facility. However, in areas that are a bit developed, the electricity supply is not regular, and this problem reduces the life span of hardware, and militates against effective usage of computer in schools.

Implication of the Findings

Most schools do not have computer and its accessories for teaching and learning science neither do the teachers are professionally trained to handle and operate the system. This, of course, will make them unwilling to integrate computer technology in teaching science subjects.

Conclusion

Computer is a very powerful tool for both students and teachers to improve teaching and learning outcomes. Effective utilization of computer and its accessories by teachers and students will help impact positively on their academic performance and will also help them fit into this 21st century technological world.

Recommendations

From the result of the study, the following recommendations are made

1. State government in conjunctions with the local government should provide computer and its accessories to the various schools in their locality for teaching and learning of science.
2. Wealthy individuals and cooperate organization should assist in the provision of ICT and ensuring improve power supply
3. Secondary schools should organize series of computer literacy workshops for training and retraining of teachers and students to meet up with the changes arising from newer computers, software and hardware.
4. There should be computer instructional resources centre services in the colleges.

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