

Perception of Students and Teachers towards Computer Aided Instructional Materials on Learning Outcomes in OGOJA LGA, Nigeria

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ABSTRACT

The focus of the study was to investigate perception of students and teachers towards computer aided instructional materials on learning outcomes in Ogoja LGA, Nigeria. The study adopted the descriptive survey design with two research questions formulated to guide the study. The population of the study comprised of all 1200 teachers and student Ogoja LGA. A sample of 130 respondents were drawn (80 students and 50 teachers) for the study. The simple and stratified random sampling techniques were adopted for the study. The research instruments used for data collection was a structured questionnaire tagged “Perception of Students and Teachers Towards Computer Aided Instructional Materials and Learning Outcomes (PTCAIMLOQ)”. The questionnaire has two sections A and B. Section A required respondent’s Bio-data such as gender, school and Local Government Area. Section B consisted of twenty (20) item statement on perception of computer assisted aids on learning outcome. The instrument was validated by three experts, two in Measurement and Evaluation and one in Educational Management respectively. The reliability obtained for the sub scales of the instrument ranged from .78 - .89 which indicates that the instrument was reliable for data collection. The data collected were analyzed using simple percentages and bar charts. Results revealed that computer-aided instruction material improved students’ and teachers learning outcomes among in Secondary Schools. It was recommended that students and teachers should be sufficiently equipped with computer education to teach and learn. The need to enhance computer use in the teaching and learning process was also recommended.

Keywords: Perception, Computer Aided, Instructional Materials, Learning Processes.

INTRODUCTION

Today at the Secondary School level, lecture method is widely being used in passing instructions. But this method is not effective in explaining abstract concepts. There is a need for using different media for providing effective instructions in secondary schools. Computer is one of the effective media. It can present a wide variety of stimuli through graphics, text, colour and sound in a most friendly manner. Animation makes the instructional material quite interesting. Computer has the potential to enhance teaching and learning process in schools; especially for subjects that deals with abstract concepts, figures and diagrams. It is on this note that Jignesh, (2013) stated that computer has the potential to present effective instructional materials through combination of graphics, text, colour, sound, 3-D pictures, animation.

The teaching and learning processes used in education and the resource requirements are rapidly changing in this era of globalisation. Various learning environments are being developed to increase the teaching and learning effectiveness. These developments go through a period of trial and error before taking firm roots in the teaching and learning process. This underscore the need for Computer Assisted Instruction (CAI). CAI is an interactive, instructional technical process whereby a computer is used to present the instructional materials and monitor the learning that takes place under a teaching learning environment. It uses a combination of text, graphics, sound and video in the learning process. It is especially useful in distance learning situations. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum. One of the ways of providing effective instructions through computer is through computer Aided Instructional Materials (CAIM). CAIM provides a lot of flexibility to the students. The student can take his own time to learn. The student can chose content, sequence and the difficulty level of the instruction that they require. The computer becomes an interesting interactive medium. Most topics in the secondary schools especially in the sciences are abstract in nature requiring imagination. And figures given in the textbooks do not form proper concepts in the minds of the students (Khan, 2005). Computer Aided Instructions therefore helps the students through animation, 3-D figures and moving objects for making objects clearer.

Kinya (2018) carried a study investigated how the use of Computer Aided Instruction (CAI) affects students' achievement, self-efficacy and collaborative skills in learning Chemistry when compared with the use of Conventional Instructional Methods (CIM). The study adopted quasi experimental design, based on Solomon Four- Group, The study sample comprised of 174 Form Two Chemistry students from the four sampled schools. The study involved two Experimental groups which were taught through CAI method (use of tutorials, simulations and drill and practice applications) and two Control groups which were taught through CIM (non- computer aided methods) on the topics "Atomic structure, Periodic Table and Chemical families" for six weeks. Data was collected using three instruments namely; Chemistry Achievement Test (CAT), Students' Self-efficacy Scale (SSES) and Classroom

Observation Schedule (COS). Each of the instruments was administered before and after exposure of treatment (CAI) to both experimental and control group. Pilot testing of the treatment instrument, CAT, SSES and COS was done in two secondary schools in Maara Sub-county having the same characteristics as the sample schools. The reliability coefficients of the CAT and SSES were estimated using Cronbach's Alpha Coefficient and an alpha coefficient of 0.720 and 0.884 was obtained respectively. The researcher administered the CAT and SSES instruments with the assistance of Chemistry teachers in the sampled schools while the COS was utilized by the researcher. Data was analyzed using both descriptive and inferential statistics. The differences between the group means was analyzed using t-test, Analysis of Variance and Analysis of Covariance. The statistical significance was tested at $\alpha = 0.05$. The study revealed that, the students who were taught chemistry with CAI obtained higher chemistry achievement scores, higher self-efficacy scores and higher collaborative skills scores than the students who were taught with CIM. The study further revealed that girls obtained higher chemistry achievement scores and also higher self-efficacy scores than boys when taught with CAI. The study further revealed that chemistry teachers faced some challenges including inadequate ICT resources when employing CAI in classroom instruction. The findings of this study would be beneficial to chemistry teachers in adopting instructional strategies that would help improve students' achievement, self-efficacy and collaborative skills in chemistry. In addition, the findings would be valuable to all stakeholders concerned with the enhancement of learning chemistry.

Computer and instructional materials being used as both tool and method are effective for students for concentration on the course of understanding lesson, synthesizing and improving positive thoughts for the course. Instructional materials make the topic clearer and more lasting by making the abstract a concrete (Demirel, 2004). So especially for teaching abstract concepts like in the science education courses, it is very important to use visual materials for students to understand the lesson better and for improving positive attitude towards the lesson.

In recent times, computer aided instructional materials are being used in every field and students are mostly immersed in technological tools like computers and television. As a result of supporting instructional materials with different sounds, images and simulations, more lasting pleasurable and effective learning occurs. The learning outcome is the result of seeing immersion with 83%, hearing with 11% smelling with 35% touching (Dermici, 2006). This implies that Technological developments have resulted in a big gap between the ways or methods of teaching at school and of getting information in society in the last quarter of the 20th century. Because most of the students get the information via visual content sources like computers and televisions, which are used in daily living, it is difficult to teach any subject to students using traditional methods (London, 2005). Nowadays, it has been seen that visual materials are used everywhere and students are in the effect of technological tools like television and computers. As a result of supporting instructional materials with different voice, image and animations, more permanent, pleasurable and effective learning occurs (Demirel, 2004, Demirel & Yagci, 2006).

CAI is the use of computer in educational and instructional activities. Computers, which are described as the most effective and personal learning tools, are used in order to keep in with technology and to be in line with the today's standards (Yenice, 2003). The advent of Information and Communication Technology (ICT) has brought the concept of computer Assisted Instruction (CAI) in the classroom. Computer aided instruction is a kind of instruction that exploits computer software to assist teacher s teach information or skills related to a particular topic (Roblyer, 2004). Thus students can interact directly with lessons programmed into the computer system. In other words, very recently, traditional approaches to teaching and learning of various subjects in schools have been challenged by new and innovative approaches based on the latest advances in computer and internet technology. The vast resources and opportunities that computers and internet provide have brought about new tools, approaches, and strategies in teaching and learning. Presently technology has a great influence on the educational practices in the classrooms in which Computer Aided Instruction (CAI) is very much in use now to enhance instruction and transfer the focus from the teacher to the students in the learning process.

Smaldino and Molenda (2005) informed that many teachers are often faced with problems and difficulties in teaching school subjects mainly due to shortage of instructional media, student's lack of understanding of the basic concepts of the subject, student's incomplete work and negative learning attitude. Researchers have shown that students also tend to find learning much less interesting than any other non-science/computer subject. Thus teachers need to find interesting strategies and tools to make teaching and learning more effective and interesting to the students.

Normally the conventional method used by teachers in teaching different subjects is by using instructional materials such as the card board paper, graph board, text books and ruler, and delivery of content by chalk and talk approach. This conventional method is time-consuming. The graph board in the classroom is also static, small scaled and often distorted. Teachers spend a lot of time sketching graphs on the graph. In addition, visualizing learning is also a problem to some students because not much time is spared by teachers for application and problem solving, which cannot be solved with paper and pencil alone (Harvey and Demana, 1995). Since the topic needs visualization for student's understanding in classroom, the application of computer aided instruction (CAI) can be utilized to help students learn more effectively than teaching which involves only the conventional method. The problem involving the low usage of computer aided instruction (CAI) in teaching is mainly due to the fact that teachers lack knowledge and skills in using the computer aided instruction (CAI), lack of training in using computer aided instruction (CAI) to enhance teacher efficiency.

OBJECTIVE OF THE STUDY

The aim of this study is to examine exception of teachers and students towards computer Aided Instructional materials on the learning outcome in schools. Specifically, the study intends to:

1. Examine the perception of students on the use of computer aided instructional materials on learning outcomes.
2. Determine the perception of teachers on the use of computer aided instructional materials on learning outcomes.

RESEARCH QUESTIONS

Research questions include the following;

1. What is the perception of students on the use of computer aided instructional materials on learning outcomes?
2. How does the perception of teachers on the use of computer aided instructional materials influence the learning outcomes of students?

RESEARCH METHODOLOGY

The study adopted the descriptive survey design with two research questions formulated to guide the study. From a population of 1200 respondents, a total of 120 respondents were sampled (80 students and 50 teachers) were used for the study. The simple and stratified random sampling techniques were adopted for the study. The research instruments used in the collection was a structured questionnaire tagged “Perception of Students and Teachers Towards Computer Aided Instructional Materials and Learning Outcomes (PTCAIMLOQ)”. These questionnaires were for teachers and students and educational achievement test. The questionnaire was made up of two sections A and B. Section A required respondent’s Bio-data such as gender, school and Local Government Area. Section B consisted of twenty (20) item statement on perception of computer assisted aids on learning outcome. The instrument was validated by experts in measurement and evaluation and educational management respectively and the reliability ranged from .78 - .89 which indicates that the instrument was reliable for data collection. The data collected were analyzed using simple percentages and bar charts and the result is presented below.

RESULTS AND DISCUSSIONS

The result of the study were analysed research questions by research question as presented below

Research Question One: What is the perception of students on the use of computer aided instructional materials on learning outcomes?

TABLE 1

Results of student perception of the use of computer aided
Instructional materials on learning outcomes (N=80)

S/N	Items	Agree	Disagree
1.	The study of computer poses problems to many students today?	61(76%)	19(24%)
2	Computer can be used to facilitate teaching and learning	72(90%)	8(10%)
3	Age is a limitation to the use of computer in sec. Sch.	36(45%)	44(55%)
4	The male like working on computer more than the female	41(51%)	39(49%)
5	Regular access to computer improves students' performance.	57(71%)	23(29%)
6	Students interest can be developed on the use of computer if teacher put more effort	55(69%)	25(31%)
7	There are periods in a week where computer classes are taught	37(46%)	43(54%)
8	The teacher competent in using the computer to teach	36(45%)	44(55%)
9	The use of computer in learning makes the subject boring	36(55%)	44(45%)
10	Constant interaction with some computer programmed software improves my ability	49(61%)	31(39%)
11	A long duration period of time in learning computer improves the student performances	62(78%)	18(22%)
12	Students perform better without using computer programmed instruction in teaching	56(30%)	24(30%)
13	Computer is my best subject	47(59%)	33(41%)
14	I can operate computer alone without the guide of anyone	42(53%)	38(47%)
15	Parent appreciate taking their children to computer established schools	35(44%)	45(56%)
16	The Computers in the computer laboratory are not enough for JSS 3 classes	56(70%)	24(30%)
17	The use of computer to solve questions takes time	35(70%)	45(56%)
18	Solving question on computer system is a difficult task	50(63%)	30(37%)
19	The student like studying computer aided instruction because it is interactive	35(44%)	45(56%)
20	Materials should be made available for each student in computer classes	61(76%)	19(24%)

Table 1 revealed the result of the perception of students on the use of computer aided instructional materials on learning outcomes. With a total of eighty (80) respondents sampled for the study 61(76%) of the students responses agreed that the study of computer poses problem to many students today, while only 19 (24%) disagreed with the view, 72(90%) of the respondents revealed that computer can be used to facilitate the learning process, while 8(10%) disagree, 36(45%) agreed that age is a limitation to the use of computer to study, and 44 (55%) of the student respondent disagreed, 41(61%) agree that males like working on computer than females in learning process, but very few of 39(49%) were of different opinion. while majority of the respondents 57(71%) believed that regular access to computer improves students performances and 2 (29%) disagreed, 55(69%) of the responses agree that

their interest can be developed on computer through if the teachers put more effort, while 25(31%) disagreed with the view, 37(46%) of the respondents agree that there are periods in a week where computer classes are being taught by the student, and the remaining respondents 43(54%) disagreed, 36(45%) responses agree that teachers competent in teaching the computer will make them understand better, while 44(55%) of the respondents disagree with the assertion, 36(55%) of the responses agree that the use of computer in learning makes the subject boring, but 44(45%) of them disagree with the view. and 49(61%) of the respondents agree that constant interaction with some computer programmed software improved their ability. while the remaining respondents 31 (49%) were of different opinion, 62(78%) of the students responses agree that a long duration periods of time in learning computer improves the students performances in the class, and 18 (22%) disagree, 56(70%) agree that students perform better without using computer programmed instruction in teaching, while 24(30%) disagree. and 47(59%) agree that computer is their best subjects, and 33(41%) disagree, 42(53%) agree that they can operate computer alone without the guides of anyone, while 38 (47%) were of different opinion, 35(44%) believed that their parents appreciate taking their children where computer established schools and 45(56%) disagree, 56(70%) of the students respondents agree that the computers laboratory are not enough for JSS 3 classes, while only 24 (30%) disagree with the view, 35(44%) stated that the use of computer to solve question takes time, while 45(56%) disagree. Also, most of the respondents 50(63%) agree that solving questions on computer system is a difficult task, while the remaining respondents 30(37%) disagreed, 35 (44%) agree that the students like studying question on computer system because it is interactive, while very few of 45 (56%) were of different opinion. Finally, 61(76%) of the respondents believed that computer material should be made available in the classes for student use, While 19 (24%) disagree.

Research Question Two: What is the perception of teachers on the use of computer aided instructional materials on learning outcomes?

TABLE 2

Results of teachers perception of the use of computer aided

Instructional materials on learning outcomes (N=50)

S/N	Items	Agree	Disagree
1	Teaching computer classes with the use of computer aided instructional Materials is the best	40(88%)	10(12%)
2	Traditional method of teaching computer in school is more preferable	30(55%)	20(45%)
3	The students enjoy computer classes more than other subjects	30(55%)	20(45%)
4	Both traditional methods and conventional should be maintained in teaching computer classes	30(51%)	20(49%)
5	It is hard to teach without the use of computer instructional material	10(30%)	40(70%)
6	Students hardly cope without the use of computer aided instructional material in learning	20(40%)	30(60%)
7	The use of computer aided instructional materials encourage students to ask question during computer classes	20(46%)	30(54%)
8	Computer aided instructional material help broaden students knowledge	20(45%)	30(55%)
9	The teacher demonstrate practical's example with the use of computer aided instructional material	30(55%)	20(45%)
10	The teacher enjoy teaching computer classes with computer aided instructional material	30(61%)	20(39%)
11	The use of computer aided instructional materials should be encouraged in all secondary schools.	-	50(100%)
12	The students enjoy using computer aided instructional materials to study during computer classes.	40(70%)	10(30%)
13	Teaching styles really improves the student interest with the use of computer aided instructional material	40(80%)	10(20%)
14	The use of computer aided instructional material make student more friendly with the subject	40(88%)	10(12%)
15	The students have no phobia on the subject since there is computer aided instructional material	40(90%)	10(10%)

From Table 2 above, it can be seen that with 50 respondents while 40 respondents (88%) of the teachers' responses agreed that teaching computer with the used of computer aided instructional materials is the best, only 10(12%) disagree with the view, 30(55%) reveal that traditional method of teaching computer in school is more preferable, while 20(45%) disagree.

Also, most of the respondents 30(55%) agree that their students enjoy computer classes more than other subjects, while 44(55%) of the respondent disagree, 30(51%) agree that both traditional and conventional method should be maintained in teaching computer classes, while very few of 20(49%) were of different opinion, and 10(30) believed that it is hard for them to teach without the use of computer aided instructional material, while 40(70%)

disagree, 20(40%) of the respondents agree that students hardly cope without the use of computer4 aided instructional material and 30(60%) disagree with the view, 20(46%) of the respondents agree that the use of computer aided instructional material encourage their students to ask question during computer classes, while the remaining respondents 30(54%) disagree, 20(45%) respondents agree that computer aided instructional materials help broaden the students knowledge, and 30(55%) of the respondents disagree with the assertion. The above table noted that teachers demonstrate practical example with the use of computer aided instructional materials 30(55%) respondents agree that, but 20(45%) of them disagree with the view, 30(61%) of the respondents agree that teachers enjoy teaching computer classes with the use of computer aided instructional materials, while the remaining respondents 20(39%) were of different opinion. The table above also reveal that 50(100%) of the teachers respondents agree that the use of computer aided instructional materials should be encouraged in all secondary schools, and none of the respondents disagree with the view, 40(70%) respondents agree that their students enjoy using computer aided instructional materials to study during computer classes, and 10(30%) disagree, 40(80%) agree that teaching styles really improves the students interest with the use of computer aided instructional materials, and 10(20%) disagree, 40(88%) respondents believed that the use of computer aided instructional materials make students more friendly with the subject, while 10(12%) of the respondents disagree, 40(90%) of the teacher respondents agree that their students have no phobia on the computer classes since there is computer aided instructional materials, while only 10(10%) disagree with the view.

Discussions of findings

The findings revealed that in secondary schools, all of the microcomputers are gathered in one room and so access is often a problem. The effective use of microcomputer lies at the heart of using it for the education of students today. Teachers cannot ignore the vast potential that microcomputer offers in the teaching and learning, but if this potential is to be realized then it is vital that problems of access and teachers' confidence are addressed. The following conclusion can be drawn from the information gathered in this study.

1. Teachers have favorable attitude towards the use of computers in teaching based on what they know about computers.
2. The computer machines in schools are not adequate in meeting the demands of explosion in students' enrolment.
3. Teachers are not technically equipped to carry out routine maintenance of computer machines.

Implication of the findings on educational management

The study was anchored on constructivism based learning theory which considers view learning as an active process of knowledge construction by learners. CAI is linked to constructivist theory in that students in CAI classrooms are at the center of the learning process and that are actively involved in constructing knowledge rather than being passive recipients of instruction.

For improved students learning outcomes to be realized, the instructional methods used by the teachers have to succeed positively in enhancing learning of administrative courses. In learning teaching, the instructional methods play a major role in determining the students' success in learning outcomes. According to Abdous and Yoshimura (2010) research indicates that the content delivered in a computer based instruction is more effective than that presented in conventional classrooms. This implies that the experience and training that the teacher has, determines how effectively the teacher will use the teaching approach.

The implication of findings for teaching should concern those in education who believe in the improvement of instruction with the use of computer. In view of the overall favorable attitude of teachers and their perception concerning the usefulness of computers in teaching, the integration of practical utilization of computer aided instruction will go a long way in making the subject interesting to students. Mere increasing the exposure of students (in training) and teachers to computers may not guarantee improvement in instructions as computers are hardly used in the teaching. The continuous use of computer in secondary schools may be jeopardized, as teachers cannot carry out preventive maintenance on the machines.

Computer Aided Instruction (CAI) as an instructional technique based on the principle of programmed instruction that makes use of a combination of tutorial, computer simulation activities and drill and practice programs. CAI has an outstanding role in instructional technique for classroom instruction as it provides an interaction between an individual learner and the computer, and is able to display the instructional material just as it happens in the tutorial system between the teacher and the individual learner. In addition, CAI facilitates the learning by providing individualized instruction, effective interaction with the learner and immediate feedback. More importantly, it has a strong implication in educations as it tends to support learners both cognitively and affectively.

Recommendations

Based on the findings of this study, the following recommendations are presented;

1. Installation of computer facilities in the science laboratories of secondary schools for both the teachers and the students would enhance teacher effectiveness in the classroom.

Compulsory computer education for the secondary school teachers in government secondary schools would encourage teacher computer appreciation effectiveness; and to enhance teacher job performance.

2. Supply of different types of computer systems to secondary school such as desktop, laptop, pagers and palmtop would enhance the job performance of teachers and improve the academic performance of students.
3. Computer literacy skills should be encouraged through motivation both extrinsic and intrinsic motivation such as promotion reward, award, praises etc to encourage non-computer literate teachers to become computer literate.

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