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INFLUENCE OF COMPUTER ASSISTED INSTRUCTION ON TEACHING AND LEARNING OF COMPUTER SUBJECT IN SECONDARY SCHOOLS IN ENUGU EAST L.G.A OF ENUGU STATE

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Abstract: This study investigated the influence of Computer Assisted Instruction on teaching and learning of computer subject in some selected secondary schools in Enugu East L.G.A of Enugu State. The investigation was directed in the angle of the effect and challenges of the teaching with the software package (classnote.ng). The study adopted a descriptive survey design with the population as all the teachers in the private schools in Enugu East L.G.A. The sample size was selected randomly from the five selected private schools in Enugu East L.G.A. The instrument for data collection was questionnaire and the method of data collection was statistical mean. After the analysis, the study found out that, the items that were used to indicate the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State were accepted. This shows that there is relationship between the software package (classnote.ng) and learning outcome. Again, the items that were used to indicate the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State were accepted. This shows that there is justification for the challenges heighted. Thus, the study concluded that despite all of the challenges facing computer assisted instruction, still its benefits outweigh its setbacks. And one of the first steps in designing an effective CAl program is to do so with these obstacles in mind. There is an urgent need for our secondary school science teachers to be skilled and knowledgeable with the new technological devices for usage in their classrooms/laboratories in order to meet the global technological developing demand of the world.

Keywords: Computer Assisted Instruction, Learning Outcomes, Educational Technology, Classnote.ng, Teacher Training

Introduction

Background to the Study

Education have been identified as the process of teaching, training and learning to improve knowledge and develop skills, attitudes and morals. It is used to prepare an individual's abilities for future benefits in life properly channeled. In other words, education helps a person to develop his/her talent fully, prepares him/her to be a responsible citizen and give him the stimulus and opportunity for cultural enrichment of his/her life. The global use of computer-based facilities makes education incomplete without basic ICT skills for teachers in the delivery of educational contents.

The growing infiltration of computers and the internet has deeply altered how organizations and markets operate, and the education system is not exempted. For instance the U.S. Department of Education in their presentation states that technology "has the power to transform teaching by ushering in a new model of connected teaching. This model links teachers to their students and to professional content, resources, and systems to help them improve their own instruction and personalize learning."[1] It is not surprising, then, that the use of technology in the classroom has been the subject of growing interest among both academic researchers and policy makers. The term, Computer Assisted Instruction (CAI), is viewed as an automated instructional technique in which a computer is used to present an instructional programme to the learner through an interactive process. Audu and Agbo (2019) view CAI as an instructional technique in which the computer instructs the students and the computer contains a stored instructional programme designed to inform, guide, control and test the students until a prescribed level of proficiency is reached. Sharma (2017) understands CAI as an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. Eyo (2018) posits that CAI as a self-learning technique, usually off-line or online using the computer as a tool to facilitate and improve instruction. Thus, concept of CAI is simply the type of instruction aided by a computer controlled display and a response entry device which uses a combination of text, graphics, sound and video to enhance the learning process through interaction, to achieve certain instructional goals/objectives and improve educational outcomes.

In the concept of teaching and learning, it is a situation that explain the techniques or procedures used by the instructor (teacher) in the course of the teaching and learning process in order to accomplish the desired educational outcome outcomes. Previously, the general definitions of teaching involved "the purposeful direction of the learning process" and "one of the major teacher class activities" (together with planning and management). Diverse representations of teaching have been established by experts in education, all of which are envisioned to stand-in classroom learning. Thus, all the process of leaning revolves around behavioural systems; information processing (cognitive domain), personal development (effective domain), and physical/social interaction (psychomotor domain) are the three taxonomy of teaching/instruction. The above models were he proposition of Joyce, Weil, and Calhoun (2019) which they used to identify as representing the great majority of instructional approaches. However, the precise type or measure of learning that is intended varies across each model. Therefore, we must be careful while determining on the "best educational practices". This point is frequently omitted; discussion of best practices then becomes a debate about desired outcomes rather than a discussion of how to achieve them. The unification of the educational content through Computer Assisted Instruction through programming language becomes paramount.

Again, the teachers are important instruments in education. They are the joint on which the educational process hangs on. They can influence the teaching-learning outcomes either positively or negatively. They determine the quality of instructional delivery and also influence quality education when it comes to implementation of the curriculum and educational policies (Ofojebe & Ezugoh, 2021). Teachers can

only effectively integrate technology in their instruction if they are themselves knowledgeable about the technology (Buabeng-Andoh, 2021). Part of the drive towards greater use of modern technology in education is equipping teachers and learners of today with skills that will enable them to use such technologies that will expose them to experiences that will help them to think and act globally (Laleye, 2019).

Statement of the Problem

To establish a problem for this study, Okebukola (2013) postulated that CAI can be applied to all levels and forms of education, from pre-school to professional school and even in many employment areas. It can also be used in a wide range of fields including all the main disciplines in elementary and secondary school. Edutech202 (2012) summarized the characteristics of CAI to include learner controlled instruction, prompt feedback to the learner, self-pacing, adaptability of instruction, multiple-user approach and random access facilities. CAI uses diverse applications to present topics, test students' understanding, receive immediate feedback and summarize students' performance.

Previous effort to inquire on the effectiveness of Computer-Aided Learning (CAL) has examined interferences strategies of Computer Assisted Instruction (CAI) in the delivery of education contents and programme with vastly different features and has documented both positive and negative results on students' short-term academic outcomes (Bulman and Fairlie, 2016; Escueta et al., 2017). In spite of differences in their main findings, these papers inversely tend to share similarities in the type of outcomes analyzed. Prior investigation as pointed by Escueta et al. (2017) offers that most of the accessible evidence focuses on the effects of CAL on short-term academic achievements, that is, scores from school tests administered in the months following exposure to education technology. Therefore, little is still known about the long-term consequences of CAL on both human-capital accumulation and labor outcomes.

The fact that Nigeria's education system is still characterized by a few high performing and many low performing schools is not acceptable to stakeholders in the education sector (Okebukola, 2019). The situation needs to be improved so that the country can compete with its peers in all global competitive academic standards. In this regard, CAI possess powerful features to support a boost in schools performance through a shift from teacher centred to student-centred learning, and likewise make the learning environment more engaging for teachers and learners (Olabiyi, Aiyelabowo,& Keshinro,2018).

In other to assess this, the following research questions were formulated to guide the study

1. What is the effect of the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A?
2. What are the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A?

Conceptual Review

Computer Assisted Instruction

Computer Assisted Instruction is defined as an instructional method, using both traditional computers such as laptops and desktop computers and mobile devices such as tablets and smartphones to offer instructional content to enhance student's skills, knowledge, or academic achievement. In particular, CAI is a recommended method for using technology

for mathematics instruction for students with LD (Fitzgerald, Koury, & Mitchem, 2018). CAI can be used separately or as a supplementary tool when combined with traditional teacher-directed instruction (TDI) (Devisir & Kalaimathi, 2016) and is commonly delivered in modes such as drill and practice, tutorials, and simulations (Bhalla, 2013). Findings from previous studies have indicated that CAI can be a valuable supplementary teaching method for students who are struggling to learn mathematics including students with LD. For example, CAI provides students additional practice opportunities with immediate feedback (Bouck & Flanagan, 2019), helps them to develop a more positive attitude toward learning mathematics (Adcock et al., 2019), and allows teachers ways to tailor instruction to meet individual student needs (Slavin & Lake, 2018).

As technology evolves, a new type of CAI, using mobile devices such as tablets and smartphones can be considered for instructional purposes to deliver instruction. CAI delivered via mobile devices in special education settings has dramatically increased in a short amount of time because of their beneficial features for students with disabilities (e.g., the availability of downloadable inexpensive apps, the touch screen feature) (Nirvi, 2011). Moreover, researchers have recently reported the potentially promising effects of mobile devices on both academic learning and engagement of students with disabilities (Ok & Kim, 2017). However, solely using computers and mobile devices does not guarantee improved student mathematics outcomes. Instructional design variables embedded in software and apps should also be considered. It is becoming increasingly clear that technology, in and of itself, does not directly change teaching or learning. Rather, the critical element is how technology is incorporated into instruction

The introduction of information and communication technologies (ICT) has significantly changed the educational landscape globally (Thang & Wong, 2010). The advent of computer- based learning has necessitated the shift in instructional methods from traditional methods to computerized methods of instruction in developed nations. In Nigeria, computers are used not only as a means of helping schools for analyzing data, it is also a pervasive tool toward optimizing student's learning (Gambari, Shuaibu,& Shittu, 2013). Bawa and Moyijo (2015) noted that educational needs have grown beyond the competence of teachers alone, thus there has been growing emphasis on the quality of teachers, teacher education programmes and availability of training and development facilities in all educational planning and development in Nigeria.

Computer-assisted instruction (CAI) significantly enhances the teaching and learning of computer subjects in secondary schools in Nigeria by providing interactive and personalized learning experiences. CAI facilitates engagement through multimedia content, enables self-paced learning, and helps educators tailor instruction to meet individual student needs. Additionally, it can improve access to resources and knowledge, fostering better understanding of complex concepts in computer science. However, the effectiveness of CAI depends on factors such as infrastructure, teacher training, and students' access to technology. The integration of CAI into the curriculum can lead to improved academic performance and increased interest in computer studies among students.

Classnote.ng

Classnote.ng is an online platform designed primarily for Nigerian students, offering educational resources, notes, and tools to facilitate learning. Its key

characteristics include a user-friendly interface, a wide variety of educational materials across different subjects, and features that allow for sharing and collaboration among students. The platform aims to enhance academic performance by providing easy access to study resources and networking opportunities among learners.

Classnote.ng covers a wide range of subjects typically included in the Nigerian educational curriculum. Some of the main subjects include: Mathematics, English Language, Biology, Chemistry, Physics, Further Mathematics, Economics, Government, and Literature in English, Accounting, Geography, and Computer Science. These subjects cater to various educational levels, including secondary and tertiary education, providing students with notes, past questions, and other resources to support their learning.

Theoretical Review

Dual-Coding Theory of Learning

The theory of dual-coding hypothesis was proposed by Allan Paivio in 1971 at the University of Western Ontario from the theory of cognition. Paivio in his attempt, he employed the notion that the creation of mental images facilitates learning in the development of this theory. Incoming information is organized such that it can be used, stored, and retrieved for later use using the mental codes corresponding to various representations. When recalling information, one can use both verbal and visual codes.

Dual coding is the concept of employing various stimuli to assist learners better to encode knowledge in their brains, making it easier to recall it later. The two basic forms of stimuli used in the aspect are visual and verbal. Our working memory, which is a section of our short-term memory that temporarily handles and retains information, directly encodes visual information and processes it in a synchronous manner. This implies that we can recover the data regardless of the sequence in which we initially viewed it. You should be able to visualize the dog, the person walking, and the sunflowers all at once.

We must process the information as it is presented to us since verbal information is sequential; unlike visual information, which we may instantly absorb numerous things at once. Verbal stimuli are therefore less effective than visual stimuli, especially when we are trying to encode vast amounts of information. Dual coding theory suggests that by using both visual and verbal cues, we can more effectively keep information in our long-term memory.

The likelihood that a stimulus will be remembered improves when it may be coded in two different ways. In addition to text-based information, ICT resources are those that also comprise one or more media, such as graphics, video, animation, images, and sound, according to Fetterman (1997). He noted the following four crucial aspects of audiovisual media:

- Audiovisual systems are computer controlled
- Audiovisual systems are integrated
- The information content must be represented digitally
- The interface to the final presentation of media.

Although using printed or spoken words is the primary way for conveying information as words are simple, easy and cheap to utilize (Jabbour,2012), however audiovisual presentations can encourage learners to engage in active learning representing the materials in words and in pictures and by mentally making connections between the pictorial and verbal representations. Clark &Mayer (2016) opined that words alone may encourage learners especially those with less experience or expertise-to engage in shallow

learning such as not connecting the words with other knowledge.

Empirical Review

Laleye (2019) used a quasi-experimental pre-test-post-test design to find out the efficacy of a computer assisted instructional package (CAIP) on students' performance in basic science in Ondo State, Nigeria. Two secondary schools were purposively selected and assigned to experimental groups 1 and 2 in equal numbers. Students in experimental group 1 were exposed to CAIP individually and experimental group II in cooperative groups. An equivalent school was selected as the control. The results of the analysis revealed that students taught with the developed package performed significantly better than their counterparts taught with the conventional method of instruction.

Eyo (2018) conducted a study that investigated the effects of a computer assisted multimedia instructional (CAMI) package on secondary school students 'achievement in biology in two educational zones of Niger State, Nigeria. The sample comprised of 364 students (206 boys and 158 girls) selected from six senior secondary schools in two educational zones. The samples were divided into an experimental group and a control group. The experimental group was taught using a CAMI package while the control group was taught using lecture method. The findings of the study showed that students in the experimental group achieved significantly better than their counterpart in the control group.

Busari, Ernest and Ugwuanyi (2016) carried out research on the effect of CAI on senior secondary students' achievement in chemical reaction and equilibrium in Egbeda local government area of Oyo State, Nigeria. The instrument used in the study was the chemical reaction and equilibrium achievement test (CREAT). The students' scores from CREAT were collected and analyzed using mean and standard deviation to answer the research questions. The results showed a significant difference between the mean achievement of students taught chemical reaction and equilibrium using CAI and those taught using a conventional teaching strategy. Thus the students taught using CAI performed better than their counterparts.

Adeshina and Hanna (2016) also carried out a study that investigated the effects of CAI on independent learning skills of economics students in secondary Schools in Kaduna State, Nigeria. A two by two pre-test, post-test quasi experimental control group design was adopted. A targeted population of twenty three thousand four hundred and sixty (23,462) public senior secondary students (SS2) in twelve educational zones of Kaduna State was used. The results revealed that students taught with the use of CAI performed significantly better than those taught without CAI.

Samaila et al., (2016) conducted research on the development of computer aided instruction for effective teaching for use of electrical and electronic devices at the Nigeria Certificate in Education (NCE) technical level in north eastern Nigeria. CAI was tested by using it to teach an experimental group (S1), while control group (S2) was taught using the lecture method. The results of the study revealed that there was variation between the mean scores of students taught about the use of electrical and electronic devices using CAI and students taught using the lecture method. The CAI was found to be effective in teaching use of electrical and electronic devices.

Methods

The study adopted descriptive survey research design. This process includes decision on data collection, the approach to method, the item to be measured and

method of data analyzes. In order to do justice in this work, the researcher employed descriptive survey method to elicit the essential data.

The population for this study consists of all the teachers in private secondary school in Enugu East Local Government Area of Enugu State. The sample of the study 50 teachers which was randomly obtained from the five selected private secondary school in Enugu East Local Government Area of Enugu State.

The method of data collection through a structured questionnaire. The soft copy of the questionnaire (instrument) was distributed to the same number of teachers that made the sample of this study. The teachers were instructed to provide their responses to the items outlined in the questionnaire. The questionnaire was returned via their whatsapp platform and email address, after completion, from the respondents.

The responses from the questionnaire was analyzed using simple mean for answering of the research questions. The study will use four Likert-scale and the frequency was used to determine the extent of the agreement and disagreement in each of the questionnaire

Data Analysis

This section shows the data presentation and analysis. The returned rate of the 50 distributed questionnaires was 47 which are the 95% of the sample size.

Q1: What is the effect of the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A?

Table 1.1 Mean rating on the effect of the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A

S/N	ITEM STATEMENT	SA 4	A 3	D 2	SD 1	FX Total	X	Decision Rule U=2.5
1	The software package of classnoote.ng provides user-friendly interface	7	0	20	20	47	1.9	Rejected
2	The software package of classnoote.ng allow for sharing and collaboration among students	30	17	0	0	47	3.6	Accepted
3	The software package of classnoote.ng enhance academic performance by providing easy	37	10	0	0	47	3.8	Accepted

	access to study resources and networking opportunities among learners	
	Grand Mean	3.0

Field Source: 2024

In table 1, in investigating the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State, item 1 with mean score of 1.9 rejected that the software package of classnoote.ng provides user-friendly interface. Item 2 with mean response of 3.6 also accepted that the software package of classnoote.ng allow for sharing and collaboration among students. Item 3 with mean score of 3.8 accepted that the software package of classnoote.ng enhance academic performance by providing easy access to study resources and networking opportunities among learners.

The grand mean of the items of the above research question showed 3.0 which is above 2.5 cutoffs for the decision rule. This shows that the items that were used to indicate the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State were accepted.

Q2: What are the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A?

Table 1.2 Mean rating on the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A

S/N	ITEM STATEMENT	SA 4	A 3	D 2	SD 1	FX Total	X	Decision Rule U=2.5
1	Encouraging students to actively use the platform and interact with the content is essential but can be a challenge	7	0	20	20	47	3.8	Rejected

2	Technical challenges such as website performance, user interface, and mobile optimization need constant attention	30	17	0	0	47	3.6	Accepted
3	Users might worry about the security of their personal and academic information	37	10	0	0	47	3.8	Accepted
	Grand Mean						3.7	

Field Source: 2024

In table 2, in investigating the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State, item 1 with mean score of 3.8 accepted that encouraging students to actively use the platform and interact with the content is essential but can be a challenge. Item 2 with mean response of 3.6 also accepted that Technical challenges such as website performance, user interface, and mobile optimization need constant attention. Item 3 with mean score of 3.8 accepted that Users might worry about the security of their personal and academic information.

The grand mean of the items of the above research question showed 3.7 which is above 2.5 cutoffs for the decision rule. This shows that the items that were used to indicate the challenges associated with teaching with software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State were accepted.

Conclusion

Despite all of the challenges facing computer assisted instruction, still its benefits outweigh its setbacks. And one of the first steps in designing an effective CAl program is to do so with these obstacles in mind. There is an urgent need for our secondary school science teachers to be skilled and knowledgeable with the new technological devices for usage in their classrooms/laboratories in order to meet the global technological developing demand of the world. Even though computer use in the classroom is still in its infancy in Nigeria, its overall effectiveness needs to be enhanced by better hardware and software as well as greatly increased availability of each.

More research is needed to discover the most effective strategies for their use. The rate at which computers will be used to enhance education in science and in other fields, depends mainly upon the federal and state government monetary commitment, followed by the willingness of individual schools to provide good in-service programs. Since science education of the future will certainly incorporate computer use which could be individually or in groups for cooperative learning. Teachers should review the entire computer program, the online activity (Web link) or game to students and how they may enhance instruction.

Recommendation

In order for CAI to be an effective classroom tool, these recommendations are preferred

1. All teachers should be prepared to learn how to use this teaching tool in an effective manner

even though it often takes time, but the effort is worthwhile;

2 Also, computers must become an integral part of the classroom. The full potential of CAI cannot be realized if the computers are only used once a week;

3. The software must be designed so that the students is in control of the computer, not the other way around;

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