

EFFECT OF COMPUTER AIDED LEARNING (CAL) PACKAGE FOR INDIVIDUALIZED HISTORY INSTRUCTION IN NIGER STATE SENIOR SECONDARY SCHOOLS

By

Adamu Zubairu Evuti

*General Studies Department
Federal University of Technology
Minna – Nigeria*

Abstract

The research work investigated the effect of a computer-aided learning (CAL) package for individualized History Instruction in Niger State Senior Secondary Schools. It further investigated the gender differences in the achievement of the subject. A total of 120 students were randomly selected from four secondary schools in Paiko Local Government Areas of Niger State for the study. They were divided into two groups as experimental and control. The experimental group was taught using the conventional method of teaching a long side with instructional materials computer Aided Learning (CAL) package for individualized history. While the control group was taught using the conventional method of lessons of forty minutes in three (3) weeks. A pre-test was administered before the teaching started and post-test was given at the end of the treatment. A t-test statistics was used to analyse both students performance and participation. Result showed that experimental group were more active during lesson and also had performed better than control group. Based on this, the research concluded that instructional materials should be used not only in teaching of history but also recommended them for other subjects taught at secondary school level. Also stakeholders in educational sector especially the Ministries should make funds available for the purchase of instructional materials for teachers to use. Further research should be carried out using gender difference.

Introduction

This study is aimed at determining the effect of Computer-Aided Learning (CAL) package for individualized History instruction in Niger State Senior Secondary Schools.

History is generally accepted to be the study of the past, present and future events (Zubairu 2004). History is viewed as a tool through which all the events of the past are taught in our schools (Ajayi, 1999). This justifies the saying that it is “the key to recall the past events”. More so that it has become the only accepted means to acquire the events of the past example either through oral traditions which is verbal or through a written document.

The effects of Computer-Aided Learning as one of the educational instruction materials are very essential in every classroom in the educational system. Students of today are encouraged to assume an increasing responsibility for their own learning. The effect of a Computer-Aided Learning gives each student the opportunity to see practically what the teacher is discussing or teaching. Empirical evidence provided same fact to show that several forms of media, including a Computer-Aided Learning have been found to be useful in teacher education and training. Experiments on the effectiveness of media and technology in schools was conducted in English-speaking countries such as; Australia, Canada, the United

States of America. Using Computer Aided, Learning has been found successful and rewarding. As early as (1999) May and Lumsdaine have this to say "one of the major conclusions of previous research is that computer aided learning of all variation and qualities have proved to have value for teaching at all school levels, especially at Secondary Schools and in all subjects. Other research findings tend to support the above mention view. For example Wilber Scharam (2000) came with the convincing evidence that there is hardly any subject matter which could not be taught effectively using a Computer Aided learning Gross 1977, Fleming (1978) and Agun (1979). The concept of educational technology is gradually being understood by educational planners and institutions in Nigeria today. This is as a result of the fact that more students are being exposed to the use of a Computer-Aided in teaching and learning and eventually about technology of development. Infact, the more one realizes its systematic and wider scope in all stages of education, be it formal, informal and non-formal in addition, Computer-Aided Learning has become a useful tool in hands of teachers, especially for demonstration and illustration, while at the same time, the teacher keeps full control over the class.

Instructional materials are devices which present a complete body of information and largely self supporting rather than supplementary in the teaching and learning process.

Hale (1970) reported that the use of Computer in teaching history being one of the science subjects offered at the Senior Secondary School level, could best understood by the student if the teachers of history effectively utilize the use of educational instructional materials, which include a computer. (Nwosu, 1979) reported that instructional materials have been used since primitive man draw in the sand, on the walls, or constructed or carved on the wood or rock in order to capture the reality of discussion on teaching. Computer-Aided Learning have always helped in illustrating and conveying ideas. Experiment and research studies have proved that through appropriate use of a computer aided learning, subjects like history can be taught more effectively. It must however be born in mind that instructional materials should be used when and only when they help to facilitate learning. A lot of students failed history both at the secondary and senior secondary certificate examination levels (SSCE) (NECO, 2003). This is probably due to lack of proper mastery of the subject by the learners right from the very beginning. It may also be as a result of inadequate exposure or non-exposure to learning the history in practical or concrete way from the on set. It might also be due to ineffective use of instructional materials especially the visual ones, one of which this research is particularly focusing attention on.

Research studies in history indicate that attitude, motivation and interest of the learner are factors of crucial importance determining his achievement. It would therefore be necessary for the teacher to be aware of the practical consequence of all negative attitudes to supply the necessary motivation and to develop the enthusiasm learner will need to learn history. In the researcher's opinion, a Computer-Aided Learning appears to be the best motivators that may make students learn best and faster. A lot of teachers of history in almost of all the Nigeria schools only depend on the "chalk and talk" method of teaching, which is very 'teacher centre' instead of the learner-centred approach. The "chalk and talk" method of teaching is rather abstract to the students and makes learning a very ordous task for the learners. The method is very much opposed to piaget's development psychology. Piaget (1984) placed emphasis on the activity learned/practical classroom techniques for active learning. According to him, students learn better when exposed to see objects or

action practically. The secondary education caters for children who are normally between the ages of twelve to fifteen years. It is on this level of education that the rest of the education system is built. Hence the secondary level is the key to either success or failure of the whole system (National Policy on Education (1981). The need therefore for solid foundation becomes a more apparent task and absolute necessity.

Goft (1979) has stressed the importance of the senses in the selection and instructive of learning method in his conclusion that 75% of what we learn is through sight, 13% through hearing and 6% through touch, 3% through taste, and 2% through smell.

Research findings by Onyegbu (1999), Ayogu (2000) Ikwuke (2005), Nwaorgu (2005), Gambari (2005) and Dantala and Zubairu (2006), have shown that transparencies which are visual materials contribute to learners understanding, factual learning and permanence of learning than motivation and interest. Transparencies motivate students to learn and widen their experience which makes them to participate fully in the learning process. Transparencies are instructional materials that employ the stimuli of sight and hearing. They are used to stimuli of sight and hearing. They are used to depict motion and sound on screen Onyegbeu (1999) and Ayegu (2000) observed that motion and sound attract the viewers, and held their attention, making learning more meaningful and permanent.

It is believed by the researcher that about 80% of what they see is retained almost permanently throughout life. This is thus supporting the position and effects a Computer Aided Learning could have on the teaching of history. To make effective use of this tender age, rewards of successful future on learning and proper understanding, the foundation must be solidly laid here to rectify the perennial problem of failure. One of the ways to do this is through the use of visual instructional materials such as computer aided learning (CAL). This empirical research aimed to portray some ways of reducing the learning problems in history, through the use of visual instructional materials, particularly a Computer Aided Learning (CAL).

Backgrounds

Nigeria in recent times is witnessing technological changes especially in the area of information processing. Computer and other information processing devices had brought visible changes in all spheres of life. For instance, computer has now revealed new ways of looking at and solving problems. Thus, the educational environment according to Awotua-Efebo (1998) has not been spared by the impact of these changes.

Computer has been defined in so many ways by different authors. Barker (1987) defined computer as an extremely versatile teaching aid. According to him, it is essentially a tool (Machine) used to facilitate and aid information processing tasks that would normally be difficult (or impossible) for people alone to perform. Awutoa-Efebo (1998) define computer as an electronic devices, operating under the control and instructions called programs, stored in its own memory units, that can accept data (input), process data, produce results of the processed data (output) and store it for future use. According to him, the word computer is used to describe a collection of devices that function together as a system. Infact some of the most useful applications of the computer are those in which it is used to aid the implementation of a human learning and training task.

The ability of computer to process information in many ways makes it a

potential, teaching and learning aid. In the current dispensation of computer age, it has become an important teaching and learning aid to both teachers and learners. The computer has been in use in developed countries of the world for instruction. It could also be to teach all school subjects. According to Ezeliora (1997), the use of computer in the process of teaching and learning has become wide spread in the educational institutes with the development of Micro-computers. Various computers aided learning (CAL) packages had been developed and used in various subjects and fields of study. These includes: science, mathematics, geology, astronomy, music, drama, dance, history, religion, military training, medical application etc.

In 1997, Barker developed a computer package for history instruction. Although he did not name it, the system he developed could only perform two simple functions: ability to retrieve details of events that took place within a given data, alternatively, given a description of an event, the system could retrieve its data and any other relevant information.

One of the earliest (CAL) packages for the interactive teaching of geography was a system called "SCHOLAR". It was developed by Carbonell 1970 as a dialogue programme that was designed to teach students a number of geographical facts (Barker, 1987). Similarly advancement in technology had made it possible to use computer for history instruction.

History is an account of events systematic account of the origin and progress of the world, a nation, a cause of events and a life story. The B.B.C English dictionary (1992) defined history as the events of the past. Some of the problems students do ace in the study of history are their inability to remember important historical facts or information after the lesson. Facts like dates, names of places or personalities, and to arrange events chronologically. Although not all dates and names are important, some are very important if it marks the time of the happening of a major event. For instance, 1st October 1960 is a date that is very important in Nigeria history. It was the date Nigeria got her independence and it is measure the economic, political and social- cultural development of the nation. It is therefore important for students to know the date and what it stood for, because they are future leaders of the country. Another date that in important in the world history September 11, 2001. the ugly event that happened aroused the security consciousness of U.S.A. in particular and the world in general.

Computer is regarded as an ill purpose machine that is useful in all spheres of life (Ezelire, 121997). The question now is, could computer be used for history instruction? Moreover, if so, could it be used to minimize resolve the problems associated with the teaching and learning of history? It is in an attempt to answer the questions that this research is aimed at the development and use of a computer aided learning software package for individualized history instruction.

According to Barker (1987), there are three major areas of educational endeavours in which the instructional potentials of a computer is likely to have significant impact. These include:

- (a) Conventional instruction
- (b) Open and distance learning
- (c) Industrial training

Conventional instruction refers to the type of teaching and training that takes place in the schools, collages, universities and other instructional centres. In open/distance learning, students are given access to the learning/training resources available at one or more self study centres. There are usually no scheduled classed or formal periods. The students attend the study centre that is convenient to them.

Industrial training refers to the training given to people that work in industries (Barker, 1987).

In the reaching and learning process both teachers and computers assist the learners. The computer could be used to programme school lessons. The programmer, who is a specialist in the field, does the programming. The programmed lessons are stored in the hard disk of the computer or as a package on the diskette. In whatever means it is stored, the learner can go through the lessons several times at his/her own pace.

It was stated by Udousoro and Abimbade (1997) that, students taught mathematics and physics with computer achieve better cognitively than those taught without the computer. It is a good learning material, and with it a teacher or instructor could teach as many students as possible without over working himself. Computer aide learning (CAL) is the general term used to describe virtually any learning activity that is promoted by a computer or in which a computer is involved.

Computer serves as instructional aid that could stimulate certain sense organs to some sensation, for instance seeing and learning. It could also accompany or even replace oral presentation in the classroom. It is because of these reasons, that this investigates the effect and use of a computer aided learning package for individualized history instruction in Niger State Secondary Schools.

Statement of the Problems

Despite the relevance of history to man, developments and society, its teaching and learning are faced with many problems, such as:

1. Law enrolment of students in history at the senior school certificate examination (SSCE), Ndagi (2001) Lawal and Yusuf (2003)
2. Student's ability to remember what has been learnt.
3. Poor performance of students at the senior school certificate examination WAEC chief examiners report (May/June, 1997, 1998).

Objectives

The objectives of the research is to develop a computer aided learning software package for individualized history instruction in Niger State Senior Schools with a view to:

- i) Improve students understanding and performance.
- ii) arouse and maintain students' interest in the study of history.

Research Hypothesis

The following null hypothesis were formulated

H₀₁: There is no significant difference between the mean score of students taught history with computer software package and those taught with traditional method female students taught history with computer software package.

Significance of the Study

The findings could encourage the school management, the curriculum planners and schools administrators to provide adequate instructional materials such as computer aided learning package for effective classroom teaching and learning. It will enable the teachers history to appreciate the significance of computer aided learning i in the teaching and open up a venue for further research study.

Research Design

The research design used for this study is the pre-test- posttest control group design random sampling of Kerlinger (1973) and Tuckman (1978). Both the experimental and control groups were first pre-tested.

Sample and Sampling Techniques

The target population for this study was all the senior secondary one (SS1) History students Niger State, Nigeria. The sample for research study was made up of 120 students (60 males and 60 females) from six secondary schools randomly selected across the three educational zones of Niger State. Three of the six randomly selected schools were used as experimental group and the other three as control group. Day secondary school (DSS) Tunga, Government Model School (GMS) Bida, and Muazu Ibrahim Commercial Secondary school (MICSS), Kontagora formed the experimental groups, while Day Secondary School (DSS) Minna, Army Day Secondary School (ADSS), Bida and Day Secondary School (DSS), Zungeru formed the control group. From each of the school a total of 20 (10 male and 10 female) SSI students were randomly selected. A schematic presentation of the selected schools is given below.

Fig: 3.3 Format for pretest – posttest design:

Table 3.1 Schematic Presentation of the Selected Schools:

Group	Schools	Zone	Male	Female	Total
Experimental	GMS Bida	A	10	10	20
	DSS Tunga	B	10	10	20
	MICSS K/gora	C	10	10	20
Control	ADSS Bida	A	10	10	20
	DSS Minna	B	10	10	20
	DSS Zungeru	C	10	10	20

All the schools selected for the study were government owned and funded co-educational secondary schools. The officers of the State Ministry of Education also supervised the selected schools.

Research Instrument

The research instrument used was the research made History Achievement Test (HAT). Designed and named by the researcher and also employed as a pretest and posttest in the study. The instrument is a twenty item multiple choice achievement test. Each test item had five options (A-E) and only one of the options was correct. Each correct answer carried five (5) marks. The test items adequately covered the treated topics.

Validation of Test Instrument

Three research instrument (HAT) used for this study was validated by two senior lecturers of History Department, Niger State Ibrahim Badamasi Babangida University Lapai (IBBUL) the subject officer of history at National Examination Council (NECO) headquarters Minna. The reliability shows that the test instrument is good enough to be use for this research.

Method of Data Collection

The data obtained for this research was from the result of post-test which

they were scored according to HAT marking scheme. The scores here formed the basis of data for testing hypothesis for this research.

Method of Data Analysis

The scores of the students in both groups for the pretest and posttest were collected and arranged in frequency distribution table. Means, standard deviation and T-test statistics were used to analyse and to test the hypothesis formulated, the level of the significance adopted for the analysis was $P < 0.05$ this level of significance form the basis for retaining or rejecting each of the hypothesis.

RESULT

Table 2: t-test result for pretest of experimental and control groups:

Variable	N	DF	x	SD	t-Value Calt	P	Remarks
Experimental group	60	118	4.133	1.420	0.26ns	0.731	Not significant
Control group	60		4.067	1.339			

source: Field Survey 2008

ns - Not Significant at $P > 0.05$

The result in Table 3.2 indicates that there is no significant difference at 0.05 level of significance between the pretest mean scores of the experimental and control groups ($t=0.26$, $df = 118$, $P.0.05$). This means that students in the experimental and control groups were at the same entry level with regard to academic ability before the topics in History were presented to them. Their mean scores were statistically the same.

H(0)1 there is no significant between the mean scores of students taught history with computer aided learning (CAL) software package and those taught without.

To test this hypothesis is the pottest means scores of the experimental and control group were computed and compared using the t-test statistic.

The result is shown in Table 3. Table 3 t-test comparison of the post-test means scores of the experimental and control groups.

Table 3:

Variable	N	DF	X	SD	E-Value Calculated	P	Remarks
Experimental group	60	18	12.67	2.256	13.83x	.0006	Highly significant
Control group	60		7.717	1.563			

Source: Field Survey 2008

Significant at $P < 0.05$

The result (of the t-test analysis) in table 3 shows that there was significant difference between the posttest mean scores of the experimental control groups at 0.05 level of significance ($t=13.83$, $df = 118$, $P < 0.05$) hypothesis 1 was therefore rejected. This means that there was a significant difference at 0.05 level of significance between performances of student taught with computer software and those taught without it. Student taught with software performed better than those

who were taught without software. Hence, the CAL software enhance the learning of History.

Performance of Male and Female Students in the Experimental Group on the Posttest Hypothesis 2:

H(0)₂ There is no significance between the mean achievement scores of male and female History students taught history with the computer aided learning software.

To test this hypothesis, the posttest mean scores of male and female students in the experimental group were computed. The analysis was carried out using the t-test statistic and the result shown in table 4. table 4 t-test comparison of the posttest means scores of male and female history students in the experimental group.

Table 4:

Variable	N	DF	X	SD	E-Value Calculated	P	Remarks
Experimental group	30	58	12.733	2.434	0.34	0.389	Not significant
Control group	30		12.533	2.129			

Source: Field Survey 2008

Ns – Not Significant at $P > 0.05$

From the result in table 4, it can be seen that, there was no significant difference between male and female history students in the experimental group at 0.05 level of significance $t = 0.34$, $df = 58$, $P > 0.05$). Null hypothesis 2 was therefore not rejected. The performance of the male and female history students in the experimental group were equally enhanced by the use of the computer aided learning software. Hence, the CAL history software was gender friendly.

Discussion of Result

From the result in the table 4, there was no significant difference between the performance of male and female students that were taught History with the computer software package. The male and female students performed equally well.

The result is constantly to the findings of spender (1995), Kirk (1992) who concluded that the role and performance of girls in electronic media and the computer is not encouraging. Also, Nye (1991) in Krender and Broihier (1992) observed that, male students found computer to be more interesting than females. However, Shuaibu and Amehi (1982) concluded that female students performed better in integrative processes than their male counterpart. The result also agrees with the findings of Abdullahi (1981) and Fuller (1982) in Gambari (2004) and Sander and Bett (1980) in Fagbemi (2004) who found that gender did not influence student's performance in computer/sciences generally.

Contributions of the Study to Knowledge

Computer is a technological information processing device which can be used to present instructional events that are designed, developed and produced for individualized learning situation (Ezeliora, 2000). Also Onsanya, (1996) observed that the computer has been found to be the most suitable, reliable and versatile medium for individualizing instruction. It is able to deal on individual bases with a number of students simultaneously.

This research study has therefore:

- a) Exposed secondary school teachers to the use of CAL package as a meaningful strategy for classroom instruction.
- b) Shown that CAL is an effective strategy for classroom instruction which could improve performance of students. This is in view of the fact that the research was only for a short period, if it was a longer period, the effect would have been pronounced.

Conclusion

The aim of this research is to determine the effect of a researcher's developed computer aided learning software package. The result of the study revealed that students taught with the CAL package scored significantly higher in the History Achievement Text (HAT) than those taught without it. The package had the same effects on both male and female students. The study had also shown that, CAL package provided an effective teaching strategy that leads to understanding, meaningful learning, and improved performance.

Recommendations

The importance of computer in teaching school subjects, especially difficult concepts, that are too abstract cannot be over emphasized (Chukwu et al, 2003). It had been provided beyond reasonable doubt that CAP packages are a better approach to embark upon by teachers for meaningful learning.

From the findings of the study, it is therefore recommended that;

- i) The use of computers for teaching and learning in our schools should be encouraged. In addition, computer education should be made compulsory for teachers and students in all levels of education. To achieve this, curriculum designers should include the use of computers for teaching and learning into school curricular, especially the use of CAL packages, computer modeling, CAL simulation and so on.
- ii) History teachers should develop various computer packages so as to cover the periods they sometimes lose on official assignments (such as supervision and marking exercise, during and after NECO, WAEC and NTI examinations).
- iii) The government should motivate teachers by raising their status and increasing their monthly payment. This will encourage them to stay in the profession, and also discharge their duties effectively.

REFERENCES

- Abba, I. (2003). The role of information and communication technology in the effective teaching of Integrated Science: A suggested model. Science Teachers Association of Nigeria. 44 Annual Conference proceedings, 163-166.
- Abimdade, A (1998): Information and communication technology (ICT) in the learning environment. 39th Annual conference proceedings of science Teachers Association of Nigeria, 334337.
- Adamu, M.M. (1994): The teaching of history in secondary schools. Problems and prospects. A paper presented at the 38th Congress of the Historical Society of Nigeria, ABU Zaria.
- Ajayi S.A. (1994): Towards ameliorating students poor performances in History. The role of the History Teacher and his working techniques. A paper presented at the 38th Congress of the Historical Society of Nigeria, ABU Zaria.
- Anotau – efebo, E.B. (1998): Teachers' attitude towards the use of computers in the

- teaching learning environment (in press).
- Ezeliora, B. (2000): Role and Importance of Computers in the Nigerian Educational system. *Journal of the Nigeria, Teacher today (TNNT)*, 8 (1 and 2) 196-199.
- Fagbemi, P.O. (2003): Determining the effect of self-instructional computer based package on social studies achievement among senior primary school pupils in Niger State, Nigeria. Unpublished M. Tech Thesis Federal University of Technology, Minna.
- Gambari, A.I. (2003): Developing and Investigating the effects of a computer aided learning (CAL) software for individualized learning of Physics in the Senior secondary school in Niger State, Nigeria. Unpublished M. Tech Thesis, Federal University of Technology, Minna.
- Onasanya, S.A. (1995): Computer and classroom instructional journal of education media and technology (JEMT).
- Onwubiko, K.B.C. (1973): *School Certificates History of West Africa, Book II*, Africana Educational Publishers.
- Shuaibu, M.J. & Ameh, C (1982): Sex differences in the performance of science process skills. *Nigeria Education Forum*, 5(2) 157-163.
- West African Examination Council (WAEC) (1997): *Examiners report on History subject Lagos: WAEC.*
- West African Examination Council (WAEC) (1998): *Examiners report on History subject Lagos: WAEC.*