

Effect of Computer Aided Instruction on Students' Academic Performance in Teaching Language in Junior Secondary Schools Adamawa State, Nigeria

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Abstract

The study was on how to test students' performance in English and Arabic languages. The study was a quasi-experimental, non-randomized pre-test, post-test, non-equivalent control group design. A stratified random sampling was used to select four schools in Mubi south, north local government areas of Mubi education zone of Adamawa state. The sample of the study comprised of 228 JSS 2 students consisting of 94 male and 134 female students. Two schools were selected as experimental classes while two schools were control classes. The experimental classes were taught with the use of Computer Aided Instruction (CAI), while the control classes were taught with chalk and board. Performance Test for Language Students (PTLS) was used as instrument to collect data. A reliability coefficient of 0.74 was obtained. Data obtained were analysed using mean, related t-test and independent t-test were used for testing null hypotheses 1, 2 and 3. The result obtained revealed that students taught with CAI performed significantly better than their counterparts taught with chalk and board. Among the recommendation is that the use of CAI in Languages lessons should be advocated by the education authorities.

Keywords: Academic, Computer Aided Instruction, Performance, Language, Students' performance, English Language.

Introduction

Human history can never forget the contributions made by technologies in his daily life, especially in institutions of learning where things are invented for necessary need, as many researchers believe that integrating information and communication technology in education supports learners in their own constructive thinking and engages them in cognitive operations (Teo, 2006). Pemberton, Borrego and Cohen (2006) conducted a study on using interactive computer technology to enhance learning and found that the use of Information and Communications Technology (ICT) creates a powerful learning environment and intrinsically motivate students to learn and participate in classroom activities. Therefore, Wright (2008) stated that academic learning accompanied by computer technology offers students much more confidence and interest in the process of exploring and learning

knowledge. In this point one would understand that computer technology is an important tool to support new ways of teaching and learning. It can be used to develop students' skills for cooperation, communication, problem solving and lifelong learning (Voogt, 2008).

Moreover, Mojgan, Simin, Saedah, and Duan cited in Lee (2013: pg.12)

“stated that using computer in second language instruction can improve practices for students through experiential learning, motivate students to learn more, enhance student achievement, increase authentic materials for study, encourage greater interaction between teachers and students, students and peers, emphasize individual needs, escape from a single source of information, and enlarge global like this”.

Based on these reasons mentioned above, learning languages through the use of computer as instructional aid would enhance students' academic performances in writing, accurate pronunciation and other aspects. Similarly, using computers not only increase instructional effectiveness and efficiency, but also promote positive social interactions and enhance students' motivation for learning (Afshari, Bakar, Luan, Samah, and Fooi, 2009). Therefore, Computer Aided Instruction (CAI) system is a computer-based learning system, which particularly designs for helping students in learning process. In its purest form, CAI is carried out by an interaction between an erudite programme and the student(s), with no teacher (human) being involved (Noor, Mohd, Idna & Zulkifli, 2014). Similarly, it can be used to assist instruction, manage instruction and aid design. Abimbola cited in Michael, Omiola, Awoyemi, and Mohammed (2014) stated that the term CAI used to describe the use of computer (s) to provide instruction directly to students in order to simulate teaching and learning process.

Moreover, the following are the benefits of CAI according to Ekiregwo (2001):

1. Automated abilities to give instructions and all for response, feedback mechanism, evaluation and assessment facilities. That is, all coded or programmed are presented in an existing and captivating interphase that is simply beauty to behold;
2. It makes learning exciting, interesting and challenging;
3. It enables the teachers to know the academic strength and deficit of learners;
4. It makes learning flexible for student so that it is possible to work at the individual is speed; and
5. Students can work anywhere if there is computer with or without internet connection.

In addition, Federal Republic of Nigeria (FRN) (2014) emphasis that the curriculum for Junior Secondary Education shall be as:

Basic science and Technology

- i. Basic Science
- ii. Basic technology
- iii. Information Technology.

Moreover, FRN policy 2014 stated that integration of Computer in all subjects in junior secondary education is compulsory as stated in National Policy on Education (2014:24), therefore, no subject (s) at any level that does not need technology to be integrated, and even necessary to use technology in simplifying some of complicated topics to students while using chalk and board of teaching cannot handle it easily.

Statement of the Problem

Based on researches reports lack of modification and restructuring in the conventional approaches to learning languages especially foreign ones make students perform low in their internal and external examinations not because they do not understand the subjects taught by their teachers, but due to communication gaps. Perchance it might be one of the reasons students scored below expectations in all their courses such as: English. Similarly, materials used by English teachers are mostly confined to blackboard and chalk which mostly use teacher centred approaches. These would be among the reasons using of technologies through CAI possibly might increase students' motivation in learning languages via educational software. Therefore, it may bridge the gap of communication between the learner and the tutor.

It is in line with the aforementioned problems that the researchers intend to evaluate the effect CAI on the Students' Academic Performance in English Language in Junior Secondary Schools Adamawa State, Nigeria.

Objectives of the Study

The research was guided with three objectives which sought to:

1. determine the pre-test and post-test academic performances of students taught English Language using Computer Aided Instruction in Junior Secondary Schools Adamawa State, Nigeria;
2. determine the academic performances of students taught English language Computer Aided Instruction and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria;

Research Questions

This study was guided by the following research questions:

1. What are the differences in the pre-test and post-test academic performances of students taught English Language Computer Aided Instruction in Junior Secondary Schools Adamawa State, Nigeria?
2. What are the differences in the academic performances of students taught English language using computer aided instruction and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria?

Research Hypotheses

The following hypotheses were formulated to guide the study.

Ho₁. There is no significant difference in the pre-test and post-test academic performances of students taught English language using Computer Aided Instruction in Junior Secondary Schools Adamawa State, Nigeria.

H₀₂. There is no significant difference in the academic performances of students taught English language via computer aided instruction and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria.

Significance of the Study

This work will benefit; students, teachers, curriculum planners, parents, publishers among others beneficiaries by encouraging them that integrating technology is more effective in teaching and learning, also, it will close the gaps created by poor communication gap either verbally or in writing, as well it will encourage governments at all levels to put more efforts in providing technological equipment (educational software) for teaching subjects especially foreign languages, by doing so it will help students to have confidence in their studies.

Methodology

Quasi-experimental research design was adopted by the researchers, which warrant for pre-test, post-test and non-equivalent control group design. Therefore, two intact classes were used for this research from two different schools. Aliyu (2016) stated that Quasi-experimental research design permits the use of intact classes. It should be noted that the non-equivalent control classes were involved, both classes were post-tested, although experimental or treatment classes were tested twice (pre-/post-tests) to know the level of their understanding and the impact of treatment.

The target population of this study was four thousand six hundred and twenty-five (4625) from junior secondary schools (JSS) II students within Mubi-north and south local government areas. Two intact classes were used with the sample size of one hundred and six (106) from two schools, therefore, fifty-one (51) from experimental group while fifty-five (55) from control group.

The researchers used teacher made test, which named Performance Test for Language Students (PTLS) as instruments for conducting the study. The instrument has two parts, essay and objectives. Five lesson plans were developed for both experimental and control classes, first set of experimental class was taught with CAI (English language), while control class was taught with conventional method. The findings determined the effect of using CAI on students' academic performance in teaching language in junior secondary schools in Adamawa State, Nigeria among the variables.

The researchers used means and standard deviations to answer the research questions, in testing hypotheses, related t-test was used for hypothesis one and independent t-test was used for hypothesis two.

Research Question 1: What is the difference in the pre-test and post-test academic performance of students taught English language using CAI in Junior Secondary Schools in Adamawa state, Nigeria?

Table 1: Descriptive Statistics of Mean and Standard Deviation for Research Question One (pre-test and post-test)

Groups	N	Mean	Mean Differences	Std. Deviation
pre-test	51	36.10	34.78	12.060
post-test	51	70.88		11.719

Table 1 revealed the result of pre-test and post-test for experimental group, the pre-test mean scores is 36.10 while the post-test has the mean scores of 70.88. The outcome revealed the mean differences between pre-test and post-test as 34.78. Based on this, post-test result is far better than the pre-test means scores. Henceforth, using CAI in teaching English Language via CAI has positive effect on students' academic performance in Junior Secondary Schools Adamawa State, Nigeria.

Research Question 2: What is the difference in the academic performance of students taught English language via CAI and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria?

Table 2: Descriptive Statistics of Mean and Standard Deviation for Research Question Two (Experimental and control classes)

Groups	N	Mean	Mean Differences	Std. Deviation
Experimental Group	51	70.88	29.13	11.719
Control Class	55	41.75		09.565

Table 2 revealed the results for post-test for experimental group and control group. The experimental class was taught with English language using CAI obtained the highest mean of 70.88 while students taught with conventional scored mean of 41.75, therefore differences exist between those taught with CAI and those taught with conventional method up to 29.13. Based on this CAI has significant effect on students' academic performance.

Null Hypothesis 1: There is no significant differences in the pre-test and post-test academic performances of students taught English Language in Junior Secondary Schools Adamawa State, Nigeria.

Table 3: Paired summary of Samples t-test on Performances of students taught English Language (Pre-test and Post-test)

Experimental	N	Mean	Mean Dif.	Std. Dev.	Sig. (2-tailed)
pre-test	51	36.10	34.78	12.060	.000
post-test	51	70.88		11.719	

Table 3 revealed the result tested with paired sample t-test, the stated hypothesis there is no significant differences in the pre-test and post-test academic performances of students taught English language using CAI in Junior Secondary Schools Adamawa State Nigeria is rejected. Because of the p-value obtained is 0.000 ($P < 0.05$), therefore, significant differences do exist in the performances of students $P < 0.05$ is less than the alpha value of .05 level of significance, so, using CAI in teaching English language has positive effect on students' academic performance in Junior Secondary Schools Adamawa State, Nigeria.

Null Hypothesis 2: There is no significant differences in the academic performances of students taught English language using CAI and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria.

Table 4: Summary of independent t-test of the Experimental and control Groups

Groups	N	Mean	Mean Dif.	Std. Dev.	Sig. (2-tailed)
Experimental	51	70.88	29.13	11.719	.000
Control	55	41.75		09.565	

Table 4 shown the null-hypothesis which stated there is no significant differences in the performances of students taught English language using CAI and those taught using conventional method in Junior Secondary Schools Adamawa State, Nigeria is rejected. It happened due to the p-value is 0.000 ($P < 0.05$) therefore, using CAI in teaching English language has positive effect on students' academic performance in Junior Secondary Schools Adamawa State, Nigeria.

Discussion of Findings

Tables 1 revealed the result of pre-test and post-test for experimental group of , therefore, the pre-test mean scores is 36.10, while the post-test has the mean scores of 70.88. The outcome revealed the mean differences between pre-test and post-test is 34.78. This indicated the differences between mean scores of pre-tests and post-test. So, a post-test result is far better than the pre-test mean scores.

Table 2 revealed the outcome of post-test for experimental group and control group. The experimental class was taught with English language using CAI obtained the highest mean of 70.88 while students taught with conventional scored mean of 41.75. Therefore, differences exist in the mean scored by the two groups up to 29.13, based on the results CAI has significant impact on students' performance compared to those taught with conventional method.

Table 3 revealed the stated hypothesis, there is no significant differences in the pre-test and post-test performances of students taught English using CAI in Junior Secondary Schools Adamawa State, Nigeria is rejected. Because the p-value obtained is 0.000 ($P < 0.05$), therefore, significant differences do exist in the performances of students in post-test compared to pre-test because the $P < 0.05$ is less than the alpha value of .05 level of significance.

Table 4 revealed differences between pre-test and post-test, therefore the stated hypothesis, there is no significant differences in the pre-test and post-test performances of students taught English using CAI in Junior Secondary Schools Adamawa State, Nigeria is rejected. Since the p-value obtained is 0.000 ($P < 0.05$), therefore, significant differences do exist in the performances of students in JSS II in English language.

The finding agrees with Anyamene, Nwokolo, Anyachebelu, Anemelu (2012) and Baytraum and Kesan (2012), who discovered that use of computer assisted instruction has positive effect on students' academic achievements. It was also conformed with that of Basturk (2005) on the effectiveness of computer assisted instruction in teaching introductory statistics, also, Waziri, Bello and Mohammed, (2010) conducted a study on students' performance in mathematics and find out gender has no significant impact on students' performance this study is in line with Wheeler, (2001) where it was pointed out that the use of ICT will not only enhance learning environments but also prepare the next generation for their future lives and careers. Yusuf (2005) reported that CAI contributes to radical changes in school; help to strengthen teaching, and provide opportunities for connection between the school and the world. The findings show that CAI increases students' engagement, which leads to increased amount of time spent by students working on computer system outside the classroom which might account for better performance than those students who were taught with the use of conventional method.

Recommendations

The researchers in line with the findings recommended the following:

1. English Teachers should implore the use of Computer Assisted Instruction in teaching more especially, language since it was found suitable for JSS II students.
2. Curriculum planners should recommend the use of Computer Assisted Instruction in primary and secondary schools and should provide the means of using it.
3. The States should provide adequate funds for purchasing computers, educational software and means for power supply for daily usage in schools.

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