EFFECTS OF COMPUTER ASSISTED INSTRUCTION ON INDEPENDENT LEARNING SKILLS OF ECONOMICS STUDENTS IN SECONDARY SCHOOLS IN KADUNA STATE, NIGERIA

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Abstract:

The study investigated "*Effects of Computer Assisted Instruction on Independent Learning Skills of Economics Students in Secondary Schools in Kaduna State*". ICT are information handling tools used for producing, processing, distributing exchanging and storing of information. Computer Assisted Instruction (CAI) is an ICT-Driven Instructional technique in which computer system is used as an instructional material and the teacher monitors, the learning that takes place. The objective of the study among others was to determine the rate at which independent learning skills acquisition could be enhanced among Economics students taught with the use of Computer Assisted Instruction and those taught with the conventional method of teaching. Hypotheses were drawn from the objectives of the study. The research design was the two by two pre-test post-test quasi experimental control group design. The targeted population were the twenty-three thousand four hundred and sixty Public Senior Secondary two (SS2) students in twelve educational zones of Kaduna State. A stratified random sampling technique was adopted to draw two hundred SS2 Economics students from the rural and urban centres of two educational zones of the State. An Economics Achievement Test (EAT) was developed and validated as test instrument for data collection. The hypothesis was tested using covariance at 0.05 level of significance for acceptance or rejection. The results amongst others revealed that students taught with the use of CAI performed significantly better than those taught without CAI, and also the result shows that the use of CAI in teaching Economics is not significantly affected by school location. However, it was therefore recommended amongst others that, the "*Opon Imo*" meaning "*Tablet of Knowledge*" used in Osun State Senior Secondary Schools should be adopted by government for all Senior Secondary Schools in Nigeria.

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Introduction

The world of today is characterized by revolutionary advances powered by Information and Communication Technology (ICT). It has been reduced to a global village through the use of information and communication technology hence, promoting national development and better relationship with other nations of the world. ICT refers to the electronic and communication devices associated with human interactive materials that enable users' to employ them for a whole range of teaching and learning process in addition to personal use (Cox, 1999). These ICT facilities are all encompassing in areas like technology, social, political, economic, education, etc., for global transformation. Therefore, it becomes pertinent for teachers who serve as key implementers of the nations' education policy to be well-informed and adequately equipped with ICT facilities in order to function productively in this age of information explosion and technological advancement.

The Federal Ministry of Education (2010) identifies the role of ICT policy on education amongst others as:

> *"The policy provides the needed guidance on what is expected in the entire process of ICT integration in education to all stakeholders in education. Its' implementation therefore should lead to a speedy transformation of the teaching, learning and administration of education. This in turn will foster the production of graduates in the education system that can survive in the contemporary society, sustain national development and can compete globally (p.3).*

The realization of the above policy statement lie basically in the capability of the key implementers of the nation's educational policy i.e. teachers to integrate ICT-Driven instructional aids through Computer Assisted mode of Instruction (CAI) in their day to day classroom activities for effective pedagogy. According to Nwike and Chukwudum (2011), Computer Assisted Instruction (CAI) is one of the products of computer technology and has proven a very effective method of instruction delivery. CAI has a major advantage of individualizing instruction by presenting varied and flexible experiences to the individual learner and takes care of learners' indifference. It makes use of guided discovery and inquiry method thereby ensuring the application of proven effective teaching methods, to the learner. In applying the CAI mode of instruction, the computer is fed in sequential manner with what to teach, the steps to be followed, how to evaluate success, how and when other classroom activities are to be carried out

(Okafor, 2009). Hence, these will makes teaching tasks to become less cumbersome and productive thereby improving students' academic performance.

Economics as a social science subject was introduced into the Nigerian curriculum in the year 1967 and as at then, only ten (10) candidates registered and later sat for the senior secondary school final year examination (Odusanya, 2001, cited in Yusuf, 2012). Presently, because of the importance of Economics to all aspects of human endeavour, Nigeria has recorded a tremendous increase in the percentage of candidates who register and sit for Economics yearly at both West African Senior Secondary Certificate Examination (WASSCE) and National Examination Council (NECO) levels (Odusanya, 2001, cited in Yusuf, 2012).

Statement of the Problem

The pattern of teaching and learning process today is expected to shift from the conventional method to a more dynamic and flexible one, which is learner-centred (Ezekoka and Okoli, 2012). This learner-centred approach makes students to influence the content, activities, materials and pace of learning, which places them in the centre of the learning process and enhances independent learning (Collins and O'Brien, 2003). Beetheng and Sim (2008) asserted that, there is still a long way to go before secondary school teachers in developing countries like Nigeria will be able to take advantage of the opportunity provided by the 21st century technology and this was substantiated by Adomi (2010) who reported that 75 percent of teachers in Nigerian secondary schools have little or no experience regarding ICT in education. Also, observed from the examiners' report is the inability of the Economics teachers to cover every aspect of the Economics syllabus before presenting their students for WASSCE. This might be due to some observed limitations of the traditional "*chalk and talk*" system of teaching which is more of a teacher-centred approach than learners-centred as practised in some schools today, thereby affecting students' performance at various examinations. The information technological age offers ICT instructional strategies such as CAI designed to make teaching and learning faster, easier, immediate, effective, efficient, individualize and takes care of learners' individual differences regardless of their gender and location.

Objectives of the Study

The objectives of this study in specific terms are to**:**
1. Determine the rate at which independent learning skill acquisition will be enhanced amongst SS2 Economics students taught with the use of Computer Assisted Instruction and those taught without Computer Assisted Instruction.

2. Determine the effect of the use of Computer Assisted Instruction on gender mean performance scores of SS2 Economics students.

Research Hypotheses

The following hypotheses were formulated to guide the study:

HO1 There is no significant difference in the rate independent learning skill acquisition between SS2 Economics students taught Economics with the use of Computer Assisted Instruction and those taught without Computer Assisted Instruction.

HO2 There is no significant difference between gender and the mean performance scores of SS2 students taught Economics with the use of Computer Assisted Instruction.

Methodology

The research design for this study is the two by two pre-test, post-test quasi experimental control group. The pre-test-post-test equivalent group design involving four (4) cluster groups of intact classes having co-educational students was used. The population of the study comprises of all senior secondary school students in year two (2) in the twenty-three (23) Local Government Education Areas (LGEA's) of Kaduna State Therefore, the total population of Public Senior Secondary School two (2) students in Kaduna state is twenty-three thousand four hundred and sixty students (23,460). A sample size of two hundred (200) students) from four (4) schools was divided into four (4) groups A, B, C & D i.e.; two experimental groups (A and C); and two (2) control groups (B and D). Economics Achievement Test (EAT) was a teacher-made test on two selected units in Economics served as pre-test and post-test instrument. Economics Achievement Test which contains fifty questions in all consist of forty multiple choice items and ten items of fill in the blank short answers. The data collected for this study were analysed using descriptive and inferential statistics such as; two-sample t-test and covariance. All the hypotheses were tested at 0.05 level of significance for acceptance or rejection.

Table 1: Two sample t-test on the rate of independent learning skill mean scores of SS2 Economics students in experimental and control groups

Status	N	Mean	Std. Deviation	Std. Error	t-value	DF	P
Control	100	1.47	1.068	0.107	19.890	198	0.000
Experimental	100	4.23	0.886	0.089			

(critical value of t at DF(198) = 1.96)

The students who were taught with the Computer Assisted Instructions have higher mean score (4.23) of independent learning skills acquisition than students who were taught the subject with the conventional method whose score was 1.47. The observed t-value obtained in the test for the difference between the two scores is 19.890 and the level of significance obtained is 0.000. With these observations, there is enough evidence to reject the null hypothesis that there is no significant difference in the rate of independent learning skills acquisition between SS2 Economics students taught with Computer Assisted Instruction and those taught with the conventional method. The result revealed that Computer Assisted Instructions method would significantly improve students' performances through the independent learning skills acquired than through the use of the conventional method of teaching Economics.

Table 2: Two sample t-test on mean performance scores of male and female SS2 Economics students who were exposed to Computer Assisted Instructions

Sex	N	Mean	Std. Deviation	Std. Error	t-value	DF	P
Male	51	62.41	11.111	1.556	0.613	98	0.541
Female	49	61.14	9.493	1.356			

(critical value of t at DF(98) = 1.98)

The result revealed that the use of the Computer Assisted Instructions significantly improved the performances of both male and female after the experiment but with no variability between the two groups. This is indicated with observed t-value of 0.613 at 98 degree of which is lower than the critical value of 1.96 at the probability level of 0.05. The observed significant level in the test is 0.541 (P > 0.05). This means that there is enough evidence to accept the null hypothesis which states that there is no significant difference between performance of male and female SS2 Economics students taught with Computer Assisted Instruction. The implication is that the effect of Computer Assisted Instructions in enhancing performances of students in Economics is not gender biased.

Discussions and Conclusions

Hypothesis I tested for significant difference in the rate of independent learning skills acquisition between the students taught Economics with the Computer Assisted Instructions in the experiment and those in the control who were taught the subject using the conventional method. The result of the t-test used for the test revealed that students who were exposed to the use of the Computer Assisted Instruction method were significantly better through the independent learning skills acquired than those in the control group. The null hypothesis was therefore rejected. In a similar investigation, Brothen and Wambach, (2000), reported that Computer assisted instruction encourages

a student to take responsibility for his or her learning, acquire effective study habits, and persist until he or she has mastered the content. The finding here clearly showed that the use of CAI could significantly enhance independent learning skills acquisition among Senior Secondary School students. The finding agrees 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. The finding is also consistent with Yusuf, (2005) where it was reported that CAI contributes to radical changes in school; help to strengthen teaching, and provide opportunities for connection between the school and the world. ICT can make the school more efficient and productive. The findings of Becker (2000) show that ICT 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.

The effect of Computer Assisted mode of Instruction on gender academic performances of the students in Economics in the experimental group was tested in hypothesis II. The result of the test which was carried out with the two sample t-test did not reveal significant difference between the male and female students who participated in the Computer Assisted Instruction used in the teaching of the subject. The null hypothesis was therefore accepted. The observation here was that the CAI had equal impact on the performances of the male and female students involved in the study. The finding here contradicts Schumacher and Morahan Martin (2001) who reported that females are less experienced with ICT's and are more likely than males to have negative attitudes towards computers. The finding here agrees with Abdu-raheem (2012), Dantala (2006), Ash (2005) and Basturk (2005) investigations in the application of CAI in which it was revealed that there is no significant difference between the mean achievement scores of male and female students in both the experimental and control groups in mathematics, history and physics respectively. The result is a reflection of similar finding by Anyamene, Nwokolo, Anyachebelu and Anemelu (2012) from an investigation on the "*Effect of Computer-Assisted Packages on the Performance of Senior Secondary Students in Mathematics in Awka, Anambra State, Nigeria*". The results indicated no significant difference between the mean achievement scores of male and female students taught Mathematics (Algebra) with CAI package. This finding however contradicts the report of Yusuf, Kajuru and Musa (2013), from a study conducted on the "*Effect of a Computer Mediated Systems Teaching Approach on Mathematics Achievement of Engineering Students in Nigerian Polytechnics*" in Kaduna Polytechnic, Kaduna State. The result revealed that the male students taught mathematics using the CMSTA significantly outperformed their female counterparts.

Recommendations

The following recommendations are made on the basis of the outcome of this study:

- Secondary school teachers through the support of State and Local Education authorities should be trained on how to use ICT-driven Instructional facilities in the classroom to programme their lessons for students to access.
- Teachers should ensure that male and female students are equally encouraged in the use of ICT-driven instructional facilities for learning and there should not be any form discrimination especially for those who feels computer system seems to be difficult to manipulate.

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