

Effects of Computer Assisted Instructional Technique on Students' Achievement in Financial Accounting in Colleges of Education in Southeast Nigeria

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Abstract

The study was conducted to determine the effects of Computer Assisted Instructional (CAI) technique on students' achievement in financial accounting in Colleges of Education in Southeast Nigeria. Three research questions and three null hypotheses were developed to guide the study. The study adopted quasi-experimental design. The population for the study was 558 NCE III students of financial accounting in the nine colleges of education in Southeast Nigeria. The sample size for the study was 122 NCE III students of financial accounting from two randomly sampled Colleges of Education in Southeast Nigeria which include Federal College of Education, Eha-amufu, Enugu State, and Alvan Ikoku College of Education, Owerri, Imo State. The instrument for data collection was 40-multiple choice Financial Accounting Achievement Test (FAAT). The instrument was validated by three experts and the reliability was tested using Kuder Richardson 21 (K-R21) reliability method in which a coefficient of 0.81 was obtained. Data collected were analysed using mean and standard deviation for answering the research questions while Analysis of Covariance (ANCOVA) was used for testing the hypothesis at 0.05 level of significance. Based on data analyzed, the study found that students taught financial accounting with computer assisted instructional method had significantly higher mean achievement score than the control group that taught with conventional lecture method. The study also found that gender of the students had no significant ($p < 0.05$) interaction effects with the treatment given to them. Based on these findings, the study among others recommended that colleges of education lecturers should adopt the use of computer assisted instructional technique for effective teaching and learning of their students and that seminars and workshops should be organized to retrain the lecturers on the use of computer assisted instruction to enhance students' achievement.

Keywords: Computer Assisted Instruction, Conventional Teaching, Achievement, Financial Accounting, Gender

1. Introduction

At tertiary institution level, Business Education is one of the programmes that provide its recipients with knowledge, skills, understanding and attitude needed to compete favourably in the business world as a producer or consumer of goods and services. According to Okoye (2013), business education as an academic programme orientate beneficiaries in the art of business making, service delivery, secretarial and stenography skills, account clerking, office information system and management. In summary, Okoye adduced, business education prepares students in two interrelated areas, education for business and education about business. One of the major courses under a well planned business education programme is Financial Accounting, an area that exposes students to principles of financial management and account clerking.

Financial accounting, according to Ukpai, Kiabel & Obara (1998) is the art of recording, interpreting, verifying and reporting financial transactions of a business in accordance with the laid down accounting principles. In the opinion of Yusuf (2009), financial accounting is a generic term covering both the book-keeping and accounts aspects of any economic entity. It deals with the process of capturing, processing and communicating financial information (Osuala, 2000). Financial accounting is not an end in itself; rather it is an information system that measures, processes and communicates financial information of an identifiable economic entity for use by management and other interested parties.

The objectives of financial accounting, according to Osuala (2004) are: to give students additional vocational skills that will enhance their opportunities for future occupational success, to enable students become proficient in financial transactions and management, to equip students with better understanding of business practices and procedures, to provide vocational training to students in the practical knowledge of daily book-keeping activities, and to help students understand the cycles and steps involved in financial accounting so that the relations of each step to all other steps are properly understood. By these objectives, it is expected that students of financial accounting on graduation from tertiary institutions should be able to secure paid job or be self-employed. Equally, it is expected that these graduates would be able to successfully manage their own business outfit with the acquired financial accounting skills, thus contribute their quota to Nigerian economic growth and development. Unfortunately, one may be constrained to contend that the achievement of the above elaborated objectives is defeated as a result of the continuous poor achievement and declining interest of students in studying financial accounting. Supporting this claim, Azih and Nwosu (2011) reported that the performance of

students of financial accounting is generally poor in examinations. They argued that the major reason for this poor performance is the use of lecture method in teaching the course which is skill oriented.

The result of NCE students of financial accounting in southeast Nigeria as observed by the researcher is also not encouraging. The poor performance of students in financial accounting at both secondary and tertiary institution levels is worrisome. Take for instance, West African Examination Council (WAEC) analysis of percentage performance in 1998, 1999, and 2000 of students in financial accounting showed 52.48%, 58.38% and 51.21% for the respective years. The NCE II results of students in the 9 (nine) Southeast Colleges of Education, in approximation showed 44% and 52% failure in financial accounting, in 2013 and 2014 academic session respectively. The continuous poor performance of students has worsened their employability status, hence aggravating the current unemployment rate among Nigerian youths across the country including southeast Nigeria.

The continuous failure of students in accounting examination could lead to loss of interest in the course. It is widely documented in literature that most teachers use mere lecture and explanation methods to teach skill related courses (Unongo, 2015). According to Oranu (2003), the lecture and demonstration teaching methods are regarded as conventional teaching methods which are content driven and certainly not learner-centered. Conventional teaching methods are predominantly used for instructional delivery in Nigerian schools including colleges of education. Okon (2002) equally noted that conventional teaching methods are not challenging enough to the needs of the students. Conventional methods of instruction which are sometimes referred to as “one-way communication” methods of instruction are widely used in schools. When this method is used, the teacher does most of the talking, and the students more often assume a passive role which makes learning ineffective. Hence, Barnstein (2006) stated that effective teaching methods are meant to be as interactive as possible, emphasizing small group work using relevant and practical case studies. In affirmative, modern teaching methods require less talk on the part of the teacher and more activities and contributions from the students (Abdullahi, 1998). Therefore, it will be interesting to establish the effect the use of modern teaching method such as computer assisted instruction (CAI) could have on academic achievement of students in financial accounting, considering the current poor performance of students in the course.

Computer assisted instruction is an automated instructional method in which a computer (electronic machine) is used to present an instruction to the learner through an interactive process (Ajelabi 2000). Sharing a similar view, Gana (2013) described computer assisted instruction (CAI) as virtually any kind of computer use for teaching in educational settings which include drill and practice, tutorials, simulations and instructional management. Computer assisted instruction (CAI) is learner-centered and activity oriented. The advantages of computer assisted instructional method according to Orjika (2012) include, ensuring the application of proven teaching methods to students; offering equal educational opportunities for students by using the same programme; changing the role of the teacher from teaching capacity to that of a guide; also when properly handled, removing fright and embarrassment on students and bringing about meaningful learning and academic achievement.

Academic achievement is the learning outcome - the determination of the extent to which a student has achieved her educational goal, and which can be measured by any form of assessment technique. Akinbobola (2006) described achievement of students as learning outcomes which include the knowledge, the skill and experiences acquired in both classroom and laboratory practices. Boyle and Dunleavy (2003) stated that students' achievement in learning are determined by factors such as teachers ability, motivation, interest, meaningfulness of subject matter, methods of instruction, memory capacity of the learners and gender of the students. Gender has been identified as one of the factors influencing students' achievement (Anagbogu and Ezeliora, 2007). According to Uwameike and Osunde (2005), gender refers to all the characteristics of male and female which describes behaviours or attributes expected of individuals on the basis of being either a male or female in a given society. Ekeh (2003) stated that gender is a terminology that categorizes human beings into males and females. With reference to teaching and learning situation, Wasagu and Mohammad (2007) observed that different results and views of researchers in studies of different subjects showed that male and female students perform differently as a result of cultural and traditional reasons.

The present level of academic achievement of students of financial accounting irrespective of gender calls for immediate attention. One of the proven ways of preventing poor achievement of students and stimulate their interest in learning is the use of interactive teaching methods (Okoli and Nwosu, 2010; Azih and Nwosu, 2011; Orjika, 2012 and Gana, 2013). Hence, this study was designed to determine the effect of computer assisted instructional method on students' achievement in financial accounting in Colleges of education in southeast Nigeria.

1.1 Purpose of the Study

The main purpose of this study was to determine the effects of Computer Assisted Instructional technique on students' achievement in financial accounting in Colleges of Education in Southeast Nigeria. Specifically, the

study investigated:

1. the effects of Computer Assisted Instruction on students' mean achievement in Financial accounting;
2. the effects of gender on students' mean achievement in financial accounting; and
3. the interaction effect of treatments (CAI and lecture method) and gender on students' achievement with respect to their mean scores in Financial accounting achievement test.

1.2 Research Questions

Based on the specific purposes of the study, the following research questions were answered by the study:

1. What is the mean achievement score of students exposed to computer assisted instructional method and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?
2. What is the effect of gender on students' achievement in Financial Accounting Achievement Test (FAAT)?
3. What is the interaction effect of treatments (CAI and lecture method) and gender on students' achievement with respect to their mean scores in Financial Accounting Achievement Test (FAAT)?

1.3 Hypotheses

The following null hypotheses were tested at $p < 0.05$ levels of significance:

- H0₁:** There is no significant difference in the mean achievement score of students exposed to computer assisted instructional method (CAI) and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?
- H0₂:** There is no significant difference in the mean achievement scores of male and female students exposed to computer assisted instruction (CAI) and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?
- H0₃:** There is no significant interaction effect of treatments (CAI and lecture method) and gender on students' achievement with respect to their mean score in Financial Accounting Achievement Test (FAAT)?

2. METHODOLOGY

The study was conducted in southeast Nigeria. Three research questions and three null hypotheses were developed to guide the study. The study adopted quasi-experimental design. Quasi-experimental design as applied here encompasses pre-test, post-test, and non-equivalent control group design. According to Gall, Gall and Borg (2007), quasi experimental research design permits the use of intact classes. Nworgu (2006) described quasi-experimental design as the design adopted where random assignment of subjects to experimental and control groups are not possible. The population for the study was 558 NCE III students of financial accounting in the nine Colleges of education in Southeast Nigeria.

The sample size for the study was 122 NCE III students of financial accounting from two randomly sampled Colleges of education in Southeast Nigeria. These include Federal College of Education, Eha-amufu, Enugu State, with 58 NCE III financial accounting students (27 males and 31 females) and Alvan Ikoku College of Education, Owerri, Imo State, with 64 NCE III Financial accounting students (29 males and 35 females). Through balloting, Federal College of Education, Eha-amufu, Enugu State, was assigned to computer assisted instruction (experimental group) while Alvan Ikoku College of Education, Owerri, Imo State was assigned to conventional lecture method (control group). The assignment of the two colleges of education through balloting was to ensure that each of the two schools has equal probability of being selected to either experimental or control group. The instrument for data collection was 40-item multiple choice Financial Accounting Achievement Test (FAAT). The instrument was validated by three experts. Two of the experts are lecturers in Business education unit of the Department of Vocational Teachers Education, University of Nigeria, Nsukka while one was from the Department of Accountancy, University of Nigeria, Enugu Campus. For the purpose of ascertaining the internal consistency of the Financial Accounting Achievement Test (FAAT) instrument, Kuder Richardson 21 (K-R21) was used in which a coefficient of 0.81 was obtained.

Prior to the commencement of the treatment, all students both in experimental and control groups were subjected to a pre-test in order to obtain the pre-test achievement scores. The administration of the pre-test took place a week before the experiment began in the two Colleges of education. The achievement score obtained by students from the two groups served as the pre-test scores of the study. Immediately after the pre-test, the actual treatment began in which NCE III students of financial accounting in Federal College of Education, Eha-amufu, Enugu State, were taught financial accounting using computer assisted instructional method while NCE III students of financial accounting in Alvan Ikoku College of Education, Owerri, Imo State, were taught using conventional lecture method. The financial accounting topics that were covered in the treatment were: Consignment Accounts, Hire Purchase, Accounting for Purchase of Existing Business and Accounting Treatment for Share Issue and Allotment.

The treatment lasted for a period of six weeks. After the six weeks of the treatment, the post-test was

administered to the students in their respective groups to obtain the post-test achievement scores. The post-test was administered a day after the completion of the experiment. The scripts of the students were collated and marked by the researcher and the students were scored over 40. This is because; any correct answer out of the 40 questions is awarded 1 mark. The data collected in the two stages (pre-test and post-test) from the two groups (experimental and control) were compiled for analysis. The data collected from the pre-test and post-test were analyzed using mean and standard deviation to answer the research questions while the hypotheses were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance.

3. RESULT

3.1 Research Question One

What is the mean achievement score of students exposed to computer assisted instructional method and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?

The data for answering research question one are presented in Table 1 below.

Table 1: Pre-test and Post-test Mean Scores of Students Exposed to Computer Assisted Instructional Method and those exposed to Conventional Lecture Methods in Financial Accounting Achievement Test (FAAT).

Groups	Pre-test		Post-test		Pre/Post-test	
	N	\bar{X}	SD	\bar{X}	SD	Gain Scores
Computer Assisted Instruction (CAI)	58	15.60	2.78	32.64	5.71	17.04
Control (Lecture)	64	15.77	2.15	20.36	3.07	4.59

The result presented in Table 1 (see appendix) shows that NCE III students that were taught financial accounting with computer assisted instructional (CAI) technique had pre-test mean achievement score of 15.60, post-test mean score of 32.64 and mean achievement gain score of 17.04. On the other hand, the NCE III students that were taught financial accounting with conventional lecture method had pre-test mean achievement score of 15.77, post-test mean achievement score of 20.36 making the mean achievement gain score of the control group (lecture) to be 4.59. This result indicates that the teaching of financial accounting with computer assisted instructional method significantly increased academic achievement of the NCE III students than using conventional lecture method.

3.2 Research Question Two

What is the effect of gender on students' achievement in Financial Accounting Achievement Test (FAAT)?

The data for answering research question two are presented in Table 2 below.

Table 2: Pre-test and Post-test Mean Scores of Male and Female Students Exposed to Computer Assisted Instructional Method and Conventional Lecture Method to Determine Effect of Gender in Financial Accounting Achievement Test.

SN	Teaching Methods	Gender	N	Pre-test		Post-test		Gain Scores
				\bar{X}	SD	\bar{X}	SD	
1	Computer Assisted Instruction (CAI)	Males	27	15.62	2.36	32.66	5.61	17.04
		Females	31	15.58	2.66	32.63	5.87	17.05
2	Lecture (Control)	Males	29	15.54	2.35	20.35	3.76	4.81
		Females	35	16.00	2.54	20.37	3.40	4.37

The result presented in Table 2 above showed the effect of gender on the achievement scores of NCE III students taught financial accounting using CAI and those taught with conventional lecture method. The result showed that male students taught Financial accounting with CAI had pre-test mean achievement score of 15.62, post-test mean achievement score of 32.66 and mean achievement gain of 17.04. Female students taught financial accounting with CAI method had pre-test mean achievement score of 15.58, post-test mean achievement score of 32.63 and mean achievement gain of 17.05.

For the control group, male students taught financial accounting with conventional lecture method had mean achievement score of 15.54 in the pre-test and 20.35 in the post-test making their mean achievement gain to be 4.81. The female students taught with conventional lecture method had mean achievement score of 16.00 in the pre-test and 20.37 in the post-test making their mean achievement gain to be 4.37. This result indicated that teaching NCE III students of financial accounting with CAI method equally and significantly increased the achievement of both male and female students than those taught with conventional lecture method.

3.3 Research Question Three

What is the interaction effect of treatments (CAI and lecture method) and students' gender on the students' achievement in Financial Accounting Achievement Test (FAAT)?

The data for answering research question three are presented in Table 3 below.

Table 3: Mean Interaction Effect of Treatments (CAI and lecture method) and Gender of the Students on their achievement in Financial Accounting Achievement Test.

Gender	Group	Pre-test	Post-test	Gain Scores
Male	Mean	15.58	26.51	10.93
	Std. Deviation	2.49	4.92	
	N	56	56	
Female	Mean	15.79	26.50	10.71
	Std. Deviation	2.55	4.90	
	N	66	66	
Total	Mean	15.68	26.51	10.83
	Std. Deviation	2.53	5.02	
	N	122	122	

The result presented in Table 3 showed the interaction effect of gender and treatments (CAI and lecture methods) on students' academic achievement in financial accounting. The result revealed that, male students had mean achievement score of 15.58 in the pre-test and 26.51 in the post-test making their overall mean achievement gain in financial accounting to be 10.93. On the other hand, female students had mean achievement score of 15.79 in the pre-test and 26.50 in the post-test making the overall mean achievement gain of female students in Financial accounting to be 10.71. This result showed that, there is no difference in the mean achievement scores of male and female students in the financial accounting test as a result of the treatments given.

3.4 Hypotheses

3.4.1 Hypotheses 1, 2 and 3

H0₁: There is no significant difference in the mean achievement score of students exposed to computer assisted instructional method (CAI) and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?

H0₂: There is no significant difference in the mean achievement scores of male and female students exposed to computer assisted instruction (CAI) and those exposed to conventional (lecture) method in Financial Accounting Achievement Test (FAAT)?

H0₃: There is no significant interaction effect of treatments (CAI and lecture method) and gender on the mean achievement score of students in Financial Accounting Achievement Test (FAAT)?

The data for testing hypotheses 1, 2 and 3 are presented in table 4 below.

Table 4: Summary of Analysis of Covariance (ANCOVA) for test of Significance in the Mean Achievement Scores of Students and Interaction Effects of the Treatments (CAI and Lecture Method) and Gender of Students.

Source	Sum of Squares	DF	Mean Square	F-cal	Sig. (P-value)
Corrected Model	2774.125 ^a	2	693.531	58.655	0.000
Intercept	3929.246	1	3929.246	49.033	0.000
Pre-test	9.019	1	9.019	0.113	0.738
Group*	2320.198	2	2320.198	38.954	0.000
Gender	32.936	1	32.936	0.411	0.184
Group * Gender	36.978	2	36.978	0.461	0.499
Error	5208.746	102	80.135		
Total	243811.000	122			
Corrected Total	7982.871	121			

R Squared = .748 (Adjusted R Squared = .707)

Note: Level of Sig. = 0.05.

The result presented in Table 4 above showed that treatments (CAI and lecture methods) as main

factor had a significant effect on students' achievement in Financial accounting test. The F-calculated (F-cal) value of 38.954 and the p-value of 0.000 which is less than 0.05 level of significance indicating that there was significant difference in the mean achievement scores of students taught Financial accounting based on the treatments given. Therefore, the null hypothesis of no significant difference in the mean achievement scores of Financial accounting students exposed to CAI and those exposed to conventional (lecture) method was rejected.

For the effect of gender on academic achievement, the result in the table showed that, the F-calculated value of 0.411 and p-value of 0.184 which was greater than 0.05 level of significance indicated that there was no significant difference in the mean achievement scores of male and female students in the Financial accounting achievement test. Therefore, the null hypothesis of no significant difference in the mean performance scores of male and female students taught financial accounting test using computer assisted instruction was accepted.

For the interaction effect, that is Group*Gender, the F-calculated (F-cal) value was 0.461 while the p-value was 0.499 which is greater than 0.05 level of significance. This indicated that there was no significant interaction effect between the treatments (CAI and lecture method) given to students and their gender with respect to Financial accounting mean achievement scores.

3.5 Discussion of the Results

The findings of this study showed that NCE III students of financial accounting that were exposed to computer assisted instructional method had higher achievement and gain score in financial accounting achievement test than their counterparts that were exposed to conventional lecture method. In affirmation, Ochoyi and Ukwumunu (2008) reported that students' integration with computers produced positive effect on their learning. The findings of this study supported that of Kareem (2015) who investigated the effects of computer assisted instruction on students' academic achievement and attitude in Biology in Osun State and found that there is significant difference between the achievement of students taught Biology using computer assisted instruction and those taught with conventional method. In addition, the finding is in line with the result of the study of Gana (2013) who studied the effect of computer assisted instructional strategy on achievement and retention of colleges of education students in quantum physics in Minna, Niger State and found that computer assisted instructional strategy has positive effect on the achievement of NCE students in quantum physics.

The findings of this study on the effects of gender on students' achievement showed that the use of computer assisted instructional techniques significantly increased the mean achievement scores of both male and female NCE III of financial accounting. This showed that there is no significant difference in the mean achievement scores of male and female students in the financial accounting achievement test. The non-significant effect of gender on students' academic achievement in relation to the treatments implied that computer assisted instruction is not gender sensitive and can produce the same learning effect on both male and female students. The finding of this study agreed with that of Azih and Nwosu (2011) whose findings showed that modern teaching method such as instructional scaffolding was superior to conventional method in improving the achievement of both male and female students in financial accounting. Also, the findings of this study conformed to the earlier findings of Tabassum (2004) that the computer-assisted instruction was equally effective for both male and female students. The test of interaction in the study of Azih and Nwosu (2011) showed that gender had no significant interaction with teaching approach on students mean achievement which is also supported by the findings of this study. Although, the finding of this study disagrees with that of Abubule (1991) who observed that male students perform better than female students in financial accounting because the subject involves calculation of figures and female students are always afraid of mathematics.

4. Conclusion

The persistent low performance of students in vocational subjects in colleges of education is causing great deal of concern to the college administration and the society at large. Poor performance of students in financial accounting in particular has affected the production of skilled manpower for the Nigeria financial sector. The conventional lecture method employed by most lecturers for instructional delivery seem ineffective for equipping students for better academic achievement and interest in the study of financial accounting. The high level of incompetence displayed by most graduates of financial accounting makes their unemployable status by financial institutions and other organisation which they are meant to serve imperative. This ugly trend has further worsened unemployment rate among graduates across the country and south-eastern Nigeria in particular. To prevent the continuation of the present poor achievement of students in financial accounting, this study was carried out to investigate the effects of CAI technique on students' achievement in financial accounting in Colleges of Education in Southeast Nigeria.

Based on the data collected and analysed, the study found that CAI technique significantly increased students' academic achievement in financial accounting more than conventional (Lecture) teaching method. In addition, the study found that the use of CAI technique appreciably increased the performance of both male and female students in the financial accounting achievement test. This indicated that computer assisted instructional

technique is not gender sensitive as the technique can increase equally the performance of male and female students.

5. Recommendations

Based on the findings of this study, the following recommendations were made:

1. Since the use of CAI technique enhances academic achievement of students in financial accounting, teachers and lecturers at all levels of education should adopt the use of CAI technique for instructional delivery.
2. Seminars, workshops and conferences should be organized by States and Federal ministries of Education where teachers, lecturers and curriculum planners will be taught the application and usage of various modern teaching techniques such as CAI for effective teaching and learning of financial accounting and other vocational trades.
3. Instructional materials such as computers and its accessories should be provided by the government and school administrators to teachers and students alike, to facilitate quality teaching and learning.
4. Lecturers of financial accounting should be provided with in-service training for teaching skill update in the use of modern and student-centred instructional strategies such as CAI.

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