

*Full Length Research*

# Effect of Jigsaw Cooperative Learning Strategy and Gender on Students' Academic Achievement in Cost Accounting in Colleges of Education in Ogun State, Nigeria

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This study examined the effect of jigsaw cooperative learning strategy and gender on academic achievement of students' in cost accounting in colleges of education in Ogun State. The study adopted a 2X2 factorial design comprising of two groups (control and experimental) in their intact classes. Two research questions and three hypotheses, tested at 0.05 level of significance, were formulated to guide the study. The study population comprised 405 final year cost accounting students drawn from two colleges of education in Ogun State. Cost accounting achievement test (CAAT) is the instrument used for data collection. The CAAT and the lesson plans for both control and experimental groups were all validated by three experts. The reliability coefficient of the instrument was computed using cronbach alpha and was found to be 0.97. Mean was used to answer the research questions while Analysis of Covariance (ANCOVA) was employed to test the hypotheses. The results showed that cooperative learning method is more effective than the traditional lecture in the teaching of cost accounting. The study also revealed that gender did not contribute significantly to varying students' achievement scores. The study recommends the adoption of jigsaw cooperative learning strategy in teaching cost accounting among other courses in colleges of education.

**Keywords:** Academic Achievement, Cost Accounting, Gender, Jigsaw Cooperative Learning Strategy, Traditional Lecture Method.

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## INTRODUCTION

Cost accounting is one of the major accounting courses offered in business education and accounting department of tertiary institutions in Nigeria. Chartered Institute of Management Accountant (2008) defined cost accounting as a systematic set of procedure for recording and reporting the cost of manufacturing goods and services performed in the aggregate and in details. Horngren, Datar and Rajan (2012) corroborated that cost accounting measures, analyses and reports financial and non-financial information relating to cost of acquiring and using resources in an organization. It includes the methods of recognizing, classifying, allocating, aggregating and reporting such cost and comparing them with standard cost (Akinde, 2006). The goal of cost accounting as summarized by Jimoh (2014) is to ascertain cost of producing or rendering services in order to provide information for planning, control and decision making for effective operation of business outfit. Accounting courses offer in higher institutions including colleges of education are the hub of management information system which assists managers for better planning, control and decision making in an organization (Ekhasemomhe, 2010). Whoever aspires to become a manager or teacher in the field of accounting must possess cost accounting knowledge and skills needed to perform job roles of cost accounting. Meanwhile, these knowledge and skills can be acquired in tertiary institutions which include colleges of education.

Colleges of Education are tertiary institutions in Nigeria specially established to provide training for those who aspire to become teachers at primary and secondary level. Colleges of Education are designed such that training are provided in various fields including Business Education to enable students acquire academic, vocational and pedagogical knowledge and skills that will enable them perform well in the field of education. Graduates of colleges of education in Nigeria are qualified to teach in primary and secondary level or pursue a degree program in any university of their choice. Business education department of colleges of education offers accounting courses such as financial Accounting, Cost Accounting, Managerial Accounting, Auditing, Taxation and other business subjects. Successes in these courses will lead to the award of Nigeria Certificate in Education (N.C.E) after three years of study and academic achievement.

Academic achievement is the degree of success attained by students after being exposed to one form of learning or the other. Jimoh (2014) corroborates that academic achievement is the level of success attained by student in school subjects. In the world of it is the degree of success reached in some general or specific area of study. Academic achievement is the success achieved by students in some general or specific area of study or field

work (Enyi, 2004 and Ezenwosu & Nworrugu, 2013). It is commonly measured using classroom exercise, assignment and continuous assessment as well as internal and external examination (Ezenwosu & Nworrugu, 2013 and Jimoh, 2014). Academic achievement can be used to indicate students' level of success in a particular task previously exposed to and it can also be used as indices for determining students' ability to effectively undertake another task (Jimoh, 2014). To assist business education students attain academic success in cost accounting, lecturers need to adopt certain method and strategies in instructional delivery. Unfortunately, researchers experience and preliminary investigation showed that most business education students perform poorly in cost accounting with over 55 percent scoring below expectation. Many of them claim that they lack in-depth understanding due to the nature of the subject and teaching strategy use by the lecturers.

Meanwhile, poor performance of students in cost accounting may be attributed to, among other factors, the traditional lecture method popularly used by lecturers in instructional delivery. Ezenwosu and Nworgu (2013) noted that most teachers adopted traditional lecture method which is an oral presentation of ideas, concepts and principles to the students. In teaching with lecture method, the teacher stands in front of the classroom and dictates information relevant to course contents (Ezenwosu & Nworgu, 2013). Ezeani, (2004) expatiated that students only listen and take down the notes and are not encourage to ask question. Nworgu (2009) stressed that lecture method is a one way flow of communication from the teacher to the students. Lecture method is a teacher – centered method because most of the talking is carried out by the teacher (Ezenwosu & Nworgu, 2013). It has the following characteristics: teacher-centered, teacher-active, learner-passive, content emphasis, large class size, wide content coverage and lesser use of chalkboard and low level of interaction (Cantrell, 2004; Adunfe, 2005). Considering the above scenario, lecture method may be inappropriate for teaching practical and calculation subject like cost accounting. This is because it is a strategy that is concerned with how much ground is covered by the teacher before examination and this make it attractive to most teachers (Ezenwosu & Nworgu, 2013).

To enhance students' academic achievement in cost accounting, teaching methods that emphasize student's active involvement and give opportunities to communicate, interact, reason and develop self-confidence to solve accounting problem are required (Jimoh, 2014). This situation leads to intensive search for more effective strategies of teaching and learning in the field of accounting education. A lot of researches have confirmed the effectiveness of more innovative,

interactive and student-centered instructional strategies against the traditional lecture method (Ekhasemomhe, 2010; Zakaria, Chin and Daud, 2010; Ajaja and Eravwoke, 2010; Ezenwosu and Nworgu, 2013; Mbacho, 2013; Amedu, 2015). To ensure effective teaching and learning in school, strategy that emphasize students' involvement and opportunity to communicate, reason and develop self-confidence to solve academic problems are required and should be effectively utilized (Zakaria, Chin and Daud, 2010). One of the methods through which effective teaching and high academic achievement can be achieved is cooperative learning method.

Cooperative learning is an instructional method that allows students to learn in group under the guidance of a teacher. Johnson and Johnson cited by Gupta (2004) defined cooperative learning as an instructional process in which students learn by working in small groups and helping one another to learn for a common goal. Mogan (2003) stressed that cooperative learning helps in cognitive development, behavioural learning and social interdependence of student which enables them to discover and comprehend contents of learning through a collaborative effort of group members. It is an active method of instruction that enhances students learning in several ways to build attitudes and values (Borich, 2004). Jig-Saw is one of the cooperative learning strategies which allow students to take responsibility for teaching each other to achieve certain objectives. Aronson (2002) posits that jigsaw cooperative learning strategy enables students of a "home" group to specialize in one aspect of learning unit. Jimoh (2014) proposed that in using jigsaw, the teacher divides the students into four to five jigsaw groups, divide the lesson into expert areas and assigns brilliant students to each expert area'. Experts from different groups meet together at a round table to discuss their content giving each expert opportunity to learn the whole content and then experts return to their jigsaw groups to teach members the whole unit of work. Jigsaw cooperative learning strategy can be used to teach or learn in secondary and higher institutions (Mbacho, 2013). Indeed, the use of cooperative learning strategies at all levels of education has been recommended for teaching at all level of education (Federal Government of Nigeria in National Policy on Education, 2004). It is argued that the goal of schooling should be to teach students to become aware of their own learning, to think critically and to derive their own patterns of thought and meaning from contents presented through interaction as a result of cooperative learning. However, most accounting teachers are not yet sensitized on the advantages and the use of some of its strategies.

Gender is one of the factors that may determine students' achievement when cooperative learning is adopted for classroom instruction. Gender is the grouping of people into feminine and masculine through interaction

with caretaker and socialization in childhood (Ezenwosu & Nworgu, 2013). Lee (2002) corroborated by explaining that gender is the ascribed attributes that differentiate feminine from masculine. From the above, gender is the socially defined capabilities and attributes assigned to persons on the basis of their alleged sexual characteristics (Abul, 2004). There is a general belief in Nigeria that males are superior to females in terms of physical fitness, cognition, logical reasoning and even academic achievement (Anigbogu, 2002). According Ezenwosu and Nworgu, (2013), male students perform better in practical oriented subjects like physics, mathematics, statistics and accounting. Attesting to this, Kurumeh (2004) observed that boys perform better than girls in practical science subjects while girls excel in languages. On the contrary, Ozofo (2001) found that females achieve better than males in mathematics. So, no study has examined effect of gender difference in students' performance in cost accounting. Consequently, the above research evidences concerning gender difference on academic achievement can not be ignored by the researcher when considering the use of jigsaw cooperative learning strategy for teaching cost accounting. It is on this premise that this study explored the effect of jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting in colleges of education in Nigeria

## PURPOSE OF THE STUDY

The general purpose of this study was to empirically investigate the effect of cooperative learning (using jigsaw strategy) on students' academic achievement in cost accounting in colleges of education in Ogun state. Specifically, the study sought to:

1. Determine the difference in academic achievement of students taught cost accounting using jigsaw cooperative learning strategy and those taught with lecture method.
2. Find out whether gender affects students' academic achievement when jigsaw cooperative learning strategy is used.

## RESEARCH QUESTIONS

The following research questions were answered in the study:

1. Is there a significant difference between academic achievements of students taught cost accounting using jigsaw cooperative learning strategy and traditional lecture method?
2. What is the effect of gender on students' academic

achievement in cost accounting when jigsaw cooperative learning strategy is used?

## RESEARCH HYPOTHESES

The following null hypotheses, tested at 0.05 level of significance were formulated to guide the study:

- H<sub>01</sub> There is no significant difference between the mean achievement scores of students taught using jigsaw cooperative learning strategy and those taught using lecture method.
- H<sub>02</sub> There is no significant difference between the mean achievement scores of male and female students taught using jigsaw cooperative learning method.
- H<sub>03</sub> There is no significant interaction effect between jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting

## THEORETICAL FRAMEWORK

In this study, jigsaw cooperative learning strategy is based on social cognitive theory. Social cognitive theory was formally called social learning theory and it was propounded by Canadian psychology Albert Bandura in 1962. It is a learning theory that is based on the idea that people learn by watching others do. The theory states that learning occurs through observation and that environment, behaviour and cognition are all chief factors that influence development. The major assumptions of social cognitive theory include that: People can learn by watching others i.e. Learning occurs when people watch others doing the task; Learning is an internal process that may or may not change or affect behavior; Reinforcement and punishment have direct as well as indirect effect on learning.

Social cognitive theory relates to cooperative learning in that it posits that the most effective means of learning is through observation i.e. (by watching others). Jigsaw cooperative learning strategy also results in observational learning as a result of collaborative effort of jigsaw group members to discover facts and explain it to others. For instance, in a jigsaw technique where expert meet to discuss view about a concept while other members of the group observe. It is obvious that those watching will gain and learn from the exercise being illustrated during interactive section. Therefore the use of cooperative learning method leads to improved learning and retention from social cognitive theoretical perspective.

## MATERIALS AND METHODS

This study employed a 2 X 2 factorial design which consisted two groups of students (control and experimental) in their intact classes and gender (male and female) to determine the effect of jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting in colleges of education in Ogun State. Two instructional methods (cooperative learning method and lecture method) were investigated to know the most effective one. To achieve the objective of the study, three specific purposes, three research questions and three null hypotheses were formulated and tested at 0.05 level of significance. The population is 415 final year students of business education department in colleges of education in Ogun State. The population is made up of 201 students of Tai Solarin College of Education and 215 students of Federal College of Education Abeokuta. No sample selected because the population is not too large for the study. Cost accounting achievement test was the instrument developed, validated and administered for data collection. The jigsaw cooperative learning strategy and lecture method lesson plans were also validated by experts. The reliability of the instrument was determined using cronbach alpha techniques and the coefficient was found to be 0.97

Prior to the commencement of treatment, a pre-experimental briefing section was organized to highlight to the research assistants; the procedures for the experiment after which a pretest was administered. After the pretest, a three-week intensive teaching was given to the groups, using the jigsaw cooperative learning strategy and traditional lecture method. The post-test was administered to the two groups after the completion of the lesson and the data collected were analyzed using means to answer the research questions and ANCOVA to test the null hypotheses formulated for the study.

## RESULTS

### Effect of jigsaw cooperative learning strategy on students' academic achievement in cost accounting

The first research question sought to determine if there existed a significant difference between academic achievement of students taught cost accounting using jigsaw cooperative learning strategy and traditional lecture method? The results are presented in Table 1.

The data presented in Table 1 shows that the control group had a pretest mean of 15.27 and posttest mean of 24.09 with a mean gain of 8.82. The experimental group had a pretest mean 14.87 and posttest mean of 34.34 with a mean gain of 19.47. Since the mean gain of 19.47 in the experimental group is higher than the mean gain of

**Table 1:** Mean achievement scores of students taught cost accounting with jigsaw cooperative learning method and lecture method

TEST	GROUP			
	Control		Experimental	
	N	Mean (X)	N	Mean (X)
Pretest	194	15.27	211	14.87
Posttest	194	24.09	211	34.34
Mean gain score		8.82		19.47

**Table 2:** ANCOVA of students' achievement scores in cost accounting in relation to groups

Source	Type III sum of squares	Df	Mean square	F	Sig.
Corrected model	11257.65a	7	1608.24	111.67	.00
Intercept	3332596.60	7	3332596.60	2.31E4	.00
<b>Group</b>	<b>10225.31</b>	<b>1</b>	<b>10225.31</b>	<b>709.97</b>	<b>.00</b>
Group*gender	2.76	1	2.76	0.19	.66
Error	5717.79	397	14.40		
Total	366571.00	405			
Corrected total	16975.44	404			

\*Significant at Sig of F (p) < 0.05.

**Table 3:** The Mean Achievement Test Scores of Male and Female Cost Accounting Students in Experimental and Control groups.

Group	Gender	N	Pretest mean(x)	Posttest mean(x)	Mean gain score	Difference
Control	Male	86	15.82	24.15	8.33	0.98
	Female	108	14.73	24.04	9.31	
Experimental	Male	96	14.40	34.56	20.16	1.36
	Female	115	15.32	34.12	18.80	

8.82 in the control group, it therefore means that, jigsaw cooperative learning strategy is more effective in teaching cost accounting than lecture method.

Table 2 shows the results of testing hypothesis 1 which sought to determine if significant difference existed between the mean achievement test scores of students taught cost accounting using jigsaw cooperative learning strategy and those taught using lecture method

The analysis shows that F-value for the groups is 709.97 with a significant of F at 0.00, which is less than 0.05 alpha value. Therefore, the null hypothesis was rejected. This means that there is a significant difference in the mean achievement scores of students taught cost accounting using jigsaw cooperative learning strategy and those taught using lecture method. It means the mean achievement of students taught using jigsaw strategy is significantly higher than that of those taught using lecture method.

#### Effect of students' gender on academic achievement in cost accounting

The mean achievement test scores of students categorized by gender is shown in Table 3.

Table 3 shows that the mean gain score of 8.33 for male students in the control group is lower than the mean gain score of 9.31 for female students in the same group with a difference of 0.98 in favour of female students. In addition, the mean gain score of male students in the experimental group was 20.16 and 18.80 mean gain score for female students in the same group with a difference of 1.36 in favour of male students. This result shows that there is a slight difference in the mean achievement of male and female in both groups.

The results of testing hypothesis 2 are as shown in Table 4:

Table 4 indicates that the F-value for the effect of gender

**Table 4:** ANCOVA of Students' Achievement Scores in Cost Accounting in Relation to Gender

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	11257.65a	7	1608.24	111.67	.00
Intercept	3332596.60	7	3332596.60	2.31E4	.00
Group	10225.31	1	10225.31	709.97	.00
<b>Gender</b>	<b>7.38</b>	<b>1</b>	<b>7.38</b>	<b>0.51</b>	<b>.48</b>
Error	5717.79	397	14.40		
Total	366571.00	405			
Corrected total	16975.44	404			

\*Significant at Sig of F (p) < 0.05

**Table 5:** ANCOVA of Students' Achievement Scores in Cost Accounting in Relation to combination of Group and Gender

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	11257.65a	7	1608.24	111.67	.00
Intercept	3332596.60	7	3332596.60	2.31E4	.00
Group	10225.31	1	10225.31	709.97	.00
Gender	7.38	1	7.38	0.51	.48
<b>Group*gender</b>	<b>2.76</b>	<b>1</b>	<b>2.76</b>	<b>0.19</b>	<b>.66</b>
Error	5717.79	397	14.40		
Total	366571.00	405			
Corrected total	16975.44	404			

\*Significant at Sig of F (p) < 0.05

in the application of treatment is 0.51 with a significance of F at 0.48 which is higher than 0.05. The null hypothesis was therefore accepted. This means that there is no significant difference in the mean achievement scores of male and female students taught cost accounting using jigsaw cooperative learning strategy. It means that gender does not statistically affect the achievement of students in cost accounting when jigsaw cooperative learning strategy is used.

#### **Interaction effect between jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting**

The results of testing hypothesis 3 are as shown in table 5:

Table 5 shows that the F-value for combination of groups and gender is 0.19 with a significance value of 0.66. The significance value of 0.66 is greater than the alpha significance of 0.05. Therefore, the null hypothesis was accepted. It therefore means that there is no significant interaction effect of jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting.

## **DISCUSSION**

The result of research question one showed that students taught cost accounting using jigsaw cooperative learning strategy performed significantly better than those taught using lecture method. Similarly, the findings of the hypothesis one revealed a significant difference between the achievement test score of students taught cost accounting using jigsaw cooperative learning strategy and those taught using lecture method. This finding is consistent with that of Ajaja and Eravwoke (2010), and Zakaria, Chin and David (2010) which found that cooperative learning method improves students' achievement than the traditional lecture methods. This is because the strategy promotes students interaction and collaboration, gives them equal opportunities to reflect and think critically to solve accounting problems. Jimoh (2014) corroborated that cooperative learning emphasizes students' active involvement in learning process and gives them opportunity to communicate, reason and develop self-confidence to solve academic problems.

Findings for the research question two revealed that jigsaw cooperative learning strategy had higher achievement scores in cost accounting for male students than female students. However, hypothesis two found that there is no significant difference between the mean achievement scores of male and female students in cost

accounting. This finding resonates with the finding of Ajaja and Eravwoke (2010) that no significant difference exists in the achievement test scores between male and female students in a cooperative learning group. Also, Azih and Nwosu (2011) stated that instructional approach with scaffolding does not have much differential effect on male and female students' achievement.

Hypothesis three found no significant interaction effect of jigsaw cooperative learning strategy and gender on students' academic achievement in cost accounting. The finding contradicts the findings of Adesoji (1995) that a combination of method and gender has significant effect on students' achievement in schools, consistent with Azih and Nwosu (2011) finding that no significant interaction effect exists between instructional approach and gender.

## CONCLUSION AND RECOMMENDATIONS

It is evident from the findings of this study that, irrespective of students' gender, jigsaw cooperative learning strategy has a comparative advantage over the traditional lecture method in enhancing students' academic achievement in cost accounting. Thus, the study concludes that jigsaw cooperative strategy is more effective in teaching cost accounting than the traditional lecture method. Therefore, business education lecturers in colleges of education should employ jigsaw cooperative learning strategy in teaching cost accounting. Nonetheless, studies should be conducted to further affirm the appropriateness of jigsaw and other cooperative learning strategies for teaching financial accounting in secondary schools.

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