



Effect of Gender on Students' Academic Performance and Retention in Financial Accounting in Technical Colleges

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Controversial reports on gender and academic performance of students necessitated the study to determine the effect of gender on students' academic performance and retention in financial accounting in technical colleges. Technical colleges in Anambra State were chosen for the study. Four research questions guided the study and two null hypotheses were tested at 0.05 level of significance. Quasi-experimental design of pretest, posttest non-randomized control group was adopted for the study. Population was all the 168 National Business Certificate (NBC) year II students from all the 11 state owned technical colleges in the area. A sample of 138 was purposively selected to compose the experimental and control groups based on schools that offer accounting and have both male and female students. Experimental groups were exposed to Problem-based teaching method (PBTM) while the control groups were exposed to lecture teaching method. Instrument for data collection was Accounting Achievement Test (AAT) validated by three experts with a reliability coefficient of 0.83. Arithmetic mean was used to analyze data relating to research questions while analysis of covariance (ANCOVA) was used to test the null hypotheses.

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Findings revealed that male and female students taught financial accounting using PBTM performed better with higher post test scores than those taught with lecture teaching method. Also the findings revealed that there was no significant difference in the post test mean scores and also in the mean retention scores of male and female students taught financial accounting using PBTM. Based on the findings, it was concluded that adoption of PBTM in the teaching of financial accounting would enhance the performance and retention of both male and female students in the subject. Consequently, it was recommended among others that accounting teachers at post basic education level should use PBTM which is more practical and stimulating involving all students to enhance students' academic performance and retention in the subject.

Keywords: Problem-based teaching method; gender effect; academic performance; retention; financial accounting.

1. INTRODUCTION

Education is often conceived as a systematic action of imparting relevant knowledge, skills and habits to the learners in their preparation for meaningful life and contribution to better society [1]. Educational opportunities for both sexes are supposed to be equally distributed. According to the requirements of the Millennium Development Goals [MDGs], countries are supposed to ensure that by 2015, gender disparity in education should be eliminated especially at the primary and secondary levels. Unfortunately, in some developing countries like Nigeria, this objective is yet to be achieved even as at 2016.

Statistics show that the literacy rate is 73 percent for men and 48 percent for women showing that gender gap in literacy rates at post basic level of education stood at 79 percent for boys and 61 percent for girls [2]. Similarly [3,4] identified gender as one of the factors that affect students' academic performance. However, [5] reported that no significant difference exists in academic performance of students as a result of gender.

The foregoing shows that gender effect on academic performance has been a controversial issue that requires further investigation in specific subject areas. This is why the issue has been attracting attention from researchers and psychologists in recent times. It is advocated that both male and female students should be given equal opportunities in education and allowed to participate actively in teaching and learning situations. This process is believed to help students take charge of their learning in order to enhance their performance irrespective of gender. There are some subjects that students could do well in but if the teaching method adopted by the teacher leads to their non-involvement in the teaching and learning

processes, they would be found wanting. Financial Accounting is considered to be one of such subjects.

Financial Accounting is defined as the process of recording, classifying, selecting, measuring, interpreting, summarizing and reporting financial data of an organization to the users for objective assessment and decision making [6]. According to [7], financial accounting cannot be learnt by mere memorization of the basic rules rather, students' active participation in the teaching and learning processes is necessary for better understanding. Knowledge of accounting is necessary to both males and females in their individual endeavors. As stated by [8] every individual, irrespective of class or gender, requires the knowledge of accounting to meet the day-to-day activities.

According to [9], retention is the ability to keep or retain what is learnt and be able to recall it when it is required. Retention in the context of this study is the ability to recall or remember what has been taught after a given time as a measure of students' progress [10]. Some studies have reported the effects of different forms of pedagogy on retention of learning. Some studies found out that retention of learning were more with one method of teaching than the other [11,12,13]. Some studies found out that there was no significant difference in students' knowledge retention using different methods of teaching except after a long time [14]. Retention helps in knowledge development and knowledge development can be guaranteed when effective teaching method[s] is/are used in the teaching and learning process and thus, students are able to internalize what has been taught. In order to correctly and effectively apply the concept[s] learnt, retention is very vital. Knowledge retention of accounting concepts could lead to high academic performance in the subject.

According to [15] academic performance is used to measure students' success in educational institutions or how well students meet standards set out by examining bodies or the institution. Academic performance in this study is the outcome of students' effort in examinations [10]. The definition of academic performance depends on the indicators used to measure it. Among the many criteria that indicate academic performance, there are curricular-based criteria such as grades or performance on an educational achievement test. Students' academic performance in financial accounting has been observed from literature to be hindered by many factors such as teachers' insensitivity to the nature of financial accounting when planning instructional activities in the classroom [16], inadequate instructional materials and ineffective/poor teaching method [17,18], teachers' predominant usage of conventional method of instruction [19].

In spite of the advocacy that accounting teachers should employ student-centred method[s] in the teaching of accounting [20], yet most accounting teachers at the post basic level still use conventional method[lecture] in the teaching of accounting and this has been a contributory cause of students' failure in the subject [19].

Problem-based method is a student-centred instructional method that empowers learners to integrate theory and practice and apply knowledge and skills to develop viable solution to problems [21]. According to [22] problem-based method is a teaching method that is based on practical approach, where problem solving is incorporated in a learning environment. According to [23], Problem-based method [PBTM] is an instructional method which is aimed at preparing students for real-world settings by requiring them to solve problems as the main format of instruction. However problem-based teaching method in this study can be viewed as a learner-centered instructional approach where a problem is presented and the learner searches for knowledge to solve the problem in the classroom to enhance cognitive development. PBTM could be used in variety of educational settings from middle and secondary education to higher education [24].

The goals of PBTM are to help students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic motivation [24]. In PBTM, the problem presented is a vehicle for the

development of problem solving skills which stimulates the cognitive process and allows new knowledge to be obtained through self-directed learning. The use of problem-based method has been motivated by the notion of the failures of traditional instruction [25].

Several studies have examined the effect of PBTM and found that it could be used to enhance content knowledge, collaboration, foster communication skill, problem-solving skill, critical thinking skill and self directed learning skill in other subject areas like engineering [26], medicine [27]. PBTM is characterized by student-centered approach where teachers are facilitators rather than disseminators of knowledge [28].

In PBTM, the instructor should ensure that all students are involved in the problem-solving process and are familiarized with the resources needed to solve the problems [29,30]. In the same vein, [31] asserted that the two major responsibilities of tutors in PBTM are facilitating students' thinking or reasoning skills that could promote problem solving and critical thinking, as well as helping students to become independent and self-directed learners.

1.1 Features of PBTM

PBTM assumes that teaching and learning constitute a constructive process influenced by social and contextual factors [27]. It is student-centred where students are involved in class/group discussion for the assessment of their work [32]. There is/are ill-structured problem[s] in PBTM. The ill-structured problems are questions that could generate interest and cause learners to think beyond recall and thus ask questions [33]. The content in PBTM should be authentic to the discipline. The instructor should ensure that all students are involved in the problem-solving processes and should familiarize with the resources needed to solve the problem[s] either before introducing the problem[s] [33,29] or after introducing the problem[s] [34].

1.2 Structuring a PBTM Course

In structuring a PBTM course as adopted from [35] the following should be observed: Define the purpose and assign students to groups arbitrarily [this may mean leaving empty rows between groups]. Introduce the problem [ill-structured] before/after familiarizing the students with the resources. If the problem is printed [rather than

viewed], provide copies for each person in each group or for each group then assess progress at regular intervals and allow time for class discussion of the problem. Also, there should be peer assessment [33]. Finally, the instructor should provide detailed comments about each student's strengths and weaknesses [36].

In PBTM all these should be observed in the teaching and learning environment before it could be called a problem-based teaching approach. It is worrisome to note that some teachers do not employ student-centred method[s] for want of time; most times they resort to the use of lecture teaching method.

Lecture method is a teacher-centred method which makes the learner a passive recipient of information. Although most studies criticize the use of lecture teaching method [37] but some studies found it effective [38]. From the literature, lecture teaching method seems to be the most widely used in the teaching of financial accounting at post basic level [39]. Hence the need to use the method as a control.

1.3 Problem Statement

Many studies have been conducted to ascertain the effect of gender on academic performance and retention of students in many subject areas using different teaching methods. However, not much has been done in the area of financial accounting in technical colleges, especially using the Problem-Based Teaching Method [PBTM]. It therefore becomes imperative to ascertain the effect of gender on students' academic performance and retention in financial accounting in technical colleges using PBTM.

1.4 Research Questions

The following research questions guided the study.

1. What are the differences in the pre-test and post-test mean achievement scores of male and female students taught financial accounting using problem based teaching method?
2. What are the differences in the pre-test and post-test mean achievement scores of male and female students taught financial accounting using lecture teaching method?
3. What are the differences in the mean retention scores of male and female students taught financial accounting using problem based teaching method?

4. What are the differences in the mean retention scores of male and female students taught financial accounting using lecture teaching method?

1.5 Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference between the post-test mean achievement scores of male students and the post-test mean achievement scores of female students taught financial accounting using problem based teaching method.
2. There is no significant difference between the mean retention scores of male students and the mean retention scores of female students taught financial accounting using problem based teaching method.

2. METHODS

The design of the study was quasi-experimental design involving pretest, posttest non-randomized control groups. The study was carried out in technical colleges in Anambra State in South East Nigeria. The population of the study was 168 [102 males and 66 females] National Business Certificate [NBC] II students from all the state owned technical colleges in the state. The sample of the study was 138 students from the four schools purposively selected based on the schools that offer accounting and those that have male and female students and willingness of their teachers to participate in the study.

From the four schools selected, one intact class each was used, giving a total of four intact classes. Simple random sampling was used to assign two intact classes to experimental groups and the other two intact classes to control groups. The groups for the study were coded group A and group B comprising one experimental class and one control class each. Experimental class of group A consisted of 43 students [16 males and 27 females] while experimental class of group B consisted of 27 students [15 males and 12 females]. Control class of group A consisted of 36 students [26 males and 10 females] while control class of group B consisted of 32 students [25 males and 7 females].

The instrument for data collection was Accounting Achievement Test [AAT] adapted by the researcher from the NABTEB past questions between 2003 and 2013. It contained 30 multiple choice test items with four options [A-D]. The instrument was validated [face] by three experts because standardized instrument [past examination questions] was used. Reliability of the instrument was determined by administering it to 32 NBC II accounting students from Delta State technical college who were not part of the population. Kuder-Richardson Formula 21 was used to analyze the data and a reliability coefficient of 0.83 was obtained. Data collected were analyzed using mean scores to answer the research questions and Analysis of Covariance [ANCOVA] to test the null hypotheses at 0.05 level of significance. Results of the pre-test, post-test and delayed post-test were used for data analyses.

2.1 Experimental Procedure

The researchers sought and obtained permission from the authorities concerned for the involvement of their colleges and teachers in the study. The study lasted for eight weeks [1st week for the pre-test, 2nd -5th week for the study, 6th week for the post-test and 8th week for the delayed post-test]. The researchers briefed the research assistants [regular classroom teachers] on the techniques to be used before commencement of the experiment. In the first week, the researchers visited the four schools and administered the pretest with the help of research assistants [the class teachers] to determine the initial abilities of the students prior to the experiment. In the second week, the teaching commenced and ended on the fifth week. In the sixth week, post-test was administered by the class teachers so as to reduce the Hawthorn effect which would be introduced if the researchers administer the test. In the eighth week, the delayed post-test was administered by their class teachers too, to ascertain their retention level. The teaching was conducted during the normal school period using the school time table. Lessons were taught to students once a week for four weeks using 80 minutes per week. The experimental groups were taught using problem-based teaching method and the control groups were taught using lecture teaching method.

2.2 Treatment Administration

In the experimental groups, students were arbitrarily grouped into three [X, Y and Z

respectively] according to their sitting rows. At the end of each lesson and discussion, typed questions on the topic would be distributed to every member of the class. The students would be allowed to discuss and ask questions as they seek for solutions to the problems. Answers would be turned in and exchanged among groups for peer assessment. Thereafter, their teachers would collect all the peer-assessed scripts and identify each student's strengths and weaknesses which would be discussed at the beginning of the next class.

In the control groups, students were taught using the conventional [lecture] method where the teacher's activities dominate. Students were taught and allowed room for discussion but there was no room for students' practice during the instruction. Teacher's questions were written on the chalkboard at the end of every lesson and students would copy the questions and would be expected to turn in their answers by the next class for their teachers to award marks.

3. RESULTS

Table 1 shows the pre-test mean scores of male and female students as 32.32 and 28.15 and their post-test mean scores as 55.23 and 54.67 with mean gain scores of 22.91 and 26.52 for male and female students respectively. This shows that achievement scores of male and female students taught financial accounting using PBTM were close in value even though the mean gain of 26.52 for the female students is higher than 22.91 for their male counterparts. Both male and female students taught financial accounting using PBTM performed higher in their post test scores.

Table 1. Mean achievement scores of male and female students taught financial accounting using PBTM

Gender	N	Pre-test	Post-test	Mean gain/loss
		X_1	X_2	$X_{G/L}$
Males	31	32.32	55.23	22.91
Females	39	28.15	54.67	26.52

Table 2 shows the pre-test mean scores of male and female students as 31.65 and 29.53 respectively and their post-test mean scores as 32.35 and 31.71 respectively with mean gain scores of 0.70 and 2.18 for male and female students respectively. This shows that achievement scores of male and female students taught financial accounting using lecture teaching

method were close in value. Also, that both male and female students taught financial accounting using lecture teaching method had low post test scores.

Table 2. Mean achievement scores of male and female students taught financial accounting using lecture teaching method

Gender	N	Pre-test	Post-test	Mean gain/loss
		X ₁	X ₂	X _{G/L}
Males	51	31.65	32.35	0.70
Females	17	29.53	31.71	2.18

Table 3 shows the post-test mean scores of male and female students as 55.23 and 54.67 and their mean retention scores as 63.42 and 63.15 with mean gain scores of 8.19 and 8.48 respectively. This shows that retention scores of male and female students taught financial accounting using PBTM were close in value. Also, that both male and female students taught financial accounting using PBTM achieved high retention scores.

Table 4 shows the post-test mean scores of male and female students as 32.35 and 31.71 and their mean retention scores as 30.55 and 28.71

with mean loss scores of 1.8 and 3.0 respectively. This shows that retention scores of male and female students taught financial accounting using lecture teaching method were close in value. However, both male and female students taught financial accounting using lecture teaching method had mean loss in their retention scores.

Table 3. Mean retention scores of male and female students taught financial accounting using PBTM

Gender	N	Post-test	Delayed post-test	Mean gain/loss
		X ₂	X ₃	X _{G/L}
Males	31	55.23	63.42	8.19
Females	39	54.67	63.15	8.48

Table 4. Mean retention scores of male and female students taught financial accounting using lecture teaching method

Gender	N	Post-test	Delayed post-test	Mean gain/loss
		X ₂	X ₃	X _{G/L}
Males	51	32.35	30.55	1.8
Females	17	31.71	28.71	3.0

Table 5. ANCOVA summary of male and female students' achievement scores in financial accounting using PBTM

Source	Type III sum of squares	Df	Mean square	F	P-value	Decision
Corrected model	7927.849 ^a	2	3963.924	47.821	.000	
Intercept	2701.843	1	2701.843	32.595	.000	
Posttest	7922.449	1	7922.449	95.578	.000	
Gender	282.384	1	282.384	3.407	.069	Not rejected
Error	5553.637	67	82.890			
Total	224572.000	70				
Corrected total	13481.486	69				

Table 6. ANCOVA summary of male and female students' retention scores in financial accounting using PBTM

Source	Type III sum of squares	Df	Mean square	F	P-value	Decision
Corrected model	10461.945 ^a	2	5230.972	208.878	.000	
Intercept	927.881	1	927.881	37.051	.000	
DelPosttest	10460.727	1	10460.727	417.706	.000	
Gender	.891	1	.891	.036	.851	Not rejected
Error	1677.898	67	25.043			
Total	292369.000	70				
Corrected total	12139.843	69				

Data in Table 5 show that the obtained value of $F[1,67] = 3.407$ is not significant at .069 for the gender main effect [$P > 0.05$]. This shows that there was no significant difference in the post test mean achievement scores of male and female students taught financial accounting using problem-based teaching method. The null hypothesis was therefore, not rejected.

Data in Table 6 show that the obtained value of $F[1,67] = .036$ is not significant at .851 for the gender main effect [$P > 0.05$]. This shows that there was no significant difference in the mean retention scores of male and female students taught financial accounting using problem-based teaching method. The null hypothesis was therefore not rejected.

4. DISCUSSION

The study revealed that male and female students taught financial accounting using PBTM performed higher in their post-test scores than their counterparts taught with lecture teaching method. This result is in line with the finding of [40] which stated that male and female students taught using problem-based learning performed higher than their counterparts taught using conventional method. This might be as a result of practical exercises which they obtained during the instruction. Also the study revealed that there was no significant difference in the post-test scores of male and female students taught financial accounting using PBTM. Although male and female students taught with PBTM had higher post-test scores, their post-test scores did not differ significantly [see Table 1]. This indicates that PBTM was effective to both male and female students. This result is in line with the finding of [5] which stated that gender was not significant in the academic performance of students using PBTM. However, this result is contrary to the findings of [3] which revealed that there was significant difference in the mean achievement scores of male and female students using PBTM.

The study also found that male and female students taught financial accounting using PBTM had higher retention scores than those taught using lecture teaching method. The study also revealed that although male and female students taught financial accounting using PBTM had higher retention scores, their retention scores did not differ significantly. This indicates that both male and female students taught financial accounting using PBTM retained more

knowledge of accounting concepts than their counterparts who were taught using lecture teaching method. This is in line with the finding of [14] which revealed that gender was insignificant in the knowledge retention of students using PBTM.

5. CONCLUSION

Based on the findings of this study, it was concluded that PBTM has the potential to improve students' academic performance and retention in financial accounting irrespective of gender.

6. RECOMMENDATIONS

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

1. Accounting teachers at post basic education level should adopt PBTM which is more practical and stimulating involving all students to enhance academic performance and retention in the subject.
2. Government, through the Ministry of Education should ensure the provision of adequate instructional materials at post basic education level to facilitate the use of PBTM in the teaching of financial accounting.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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