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EFFECT OF FLIPPED CLASSROOM TECHNIQUE ON SENIOR SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN FINANCIAL ACCOUNTING IN ANAMBRA STATE

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Abstract
This study determined the effect of flipped classroom technique on students' academic achievement in financial accounting in Anambra State. Two research questions were raised and three null hypotheses were tested at 0.05 level of significance. The study adopted quasi-experimental non-equivalent control group design. The population of this study comprise 1,876 SS II financial accounting students from six education zones in the 257 public secondary schools in Anambra State. The sample of the study comprised 59 (38 males and 21 females) SS II financial accounting students in four intact classes selected using multi-stage sampling procedure. Financial Accounting Achievement Test (FAAT) was validated and used as instrument for data collection. The reliability of FAAT was determined using Kudder-Richardson Formula 20 (KR-20) which yielded a reliability coefficient of 0.90. Mean and standard deviation were used to answer the research questions, while Analysis of Covariance (ANCOVA) was used to test the null hypotheses. Findings of the study revealed that flipped classroom technique has a higher effect on students' academic achievement scores in financial accounting than the lecture method and the difference was significant. The interaction effect between flipped classroom technique and lecture method and gender on students' academic achievement was not statistically significant. It was concluded that flipped classroom technique is not only gender-friendly but also an active instructional approach that positively enhance the academic achievement of students in financial accounting. It was recommended among others that financial accounting teachers should utilize flipped classroom technique in their instructional delivery more frequently than the lecture method.
Keywords: Flipped classroom technique, Academic Achievement and Financial Accounting

Introduction

Financial accounting is a social science subject offered in senior secondary schools in Nigeria. The purpose of financial accounting in senior secondary curriculum is to consolidate on the teaching of bookkeeping at the junior secondary schools (Obiwusi, 2014). Financial accounting provides background instruction which broadens the minds of students to their monetary and economic roles as intelligent consumers, business analyst and prudent citizens. Eze, Ezenwafor and Obidile (2016) stated that financial accounting is classification and recording of monetary transactions and presentation of financial results of the activities of business organizations for making informed financial decisions. Thus, financial accounting is the documentation of financial reports and information of the financial performance of business organizations. The teaching of financial accounting in secondary schools helps to lay proper foundation for further study of accounting and allied courses at higher levels and to enable the students understand basic accounting principles,

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practices and their applications to modern business activities (Idowu, 2015). One quick avenue of monitoring the quality of instructional delivery of financial accounting in senior secondary schools is through students' academic achievement

Academic achievement is the level of academic success obtained by students after undertaking an evaluation exercise in the classroom or laboratory. Academic achievement indicates the extent to which students have accomplished the specific instructional objectives of a subject matter in schools. It is the scholastic ranking of students' academic expertise on financial accounting. According to Ekhasemomhe in Nwaukwa (2021), academic achievement can be both indicative and predictive. It is indicative when it pin-points a students' level of success, that is, when a student who made grade A in financial accounting is adjudged to have had a higher achievement than another student who made grade C in the same subject. The author posited that it is predictive when it is a criterion for determining the ability of a student to undertake similar task such as the case of a student who is deemed fit to study accountancy in tertiary institutions because of his or her high score in financial accounting examination in senior secondary schools.

In Nigeria, the level of a student's academic achievement is determined by grades obtained from continuous assessment, internal and external examinations. Documenting the academic achievement of Nigerian students in financial accounting, the West African Examination Council (WAEC) Chief Examiner's (2021) revealed percentage of students' academic achievement on financial accounting stood at 48 percent, 43 percent, 36 percent and 49 percent respectively from 2016 - 2019 respectively. In 2020, 41.95 percent of students had grades A1 to C6 while 58.05 percent made weak pass or fail in financial accounting. In 2021, 42.98 percent of students had grades A1 to C6 while 57.02 percent made weak pass or fail in financial accounting. In 2022, 47.85 percent of students had grades A1 to C6 while 52.15 percent made weak pass or fail in financial accounting. The WAEC Chief Examiner's (2022) report attributed the poor academic achievement on financial accounting to students' poor acquisition of basic calculation skills to handle practical financial accounting questions correctly. This submission promoted educators to look for instructional avenues to improve the academic achievement of students on financial accounting in secondary schools.

Consequently, many innovative techniques have been advocated for effective teaching of financial accounting in the secondary schools. One of such innovative techniques is the flipped classroom technique. Flipped classroom technique is a specific type of blended learning design which uses technology to move lectures outside the classroom and integrate active learning activities inside the classroom. DeLozier and Rhodes (2017) posited that flipped classroom technique is an instructional arrangement through which teachers design lectures for students via Internet outside the classroom and later use class time for variety of learning activities. On the other hand, Talan and Gulsecen (2019) averred that flipped classroom technique is an instructional process where students learn the lesson content/learning materials at home or wherever that is convenient for them at their own time and pace through technology using computer or mobile phone before coming to class.

In this light, JoRanna (2014) averred that flipped classroom technique consists of two main components; the use of technologies outside classroom, and taking part in interactive discussions in real time in the classroom. In the context of this study, flipped classroom technique refers to a teaching-learning method in which students gain first exposure to new material outside of class, usually via lecture videos or reading of assigned materials online, and then the class time is used to do the harder work of assimilating that knowledge through problem-solving and discussions. It is called the flipped classroom technique because what used to be class work (the lecture) is done at home via media such as teacher-created videos, animated lessons and what used to be homework (assigned

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problems) is now done in class (Tan, Yue & Fu, 2017). However, the flipped classroom is much more than the videos because flip can be delivered via bulk SMS or any other digital media (Talbert, 2017). In this study, bulk Short Message Service (SMS) and Multimedia Messaging Service (MMS) are used as flips for instructional engagements. In situations where students do not have mobile phones with SMS and MMS, their parents' phones with such features are used for the study. Short Message Service (SMS) and Multimedia Messaging Service (MMS) are used because they are user friendly and can enable financial accounting students to express themselves without any fear or intimidations, thereby removing room for gender bias.

Gender is a biological characteristic differentiating between the feminine and masculine population. According to Owodunni and Ogundola (2013), there are many challenges posed by gender on academic achievement of students because certain subjects are recognized as masculine and others as feminine. Eze, Ezenwafor and Obidile (2014) revealed differential academic achievement among male and female students in financial accounting but Enwere and Enwere (2014) found no gender differences in achievement and retention at the secondary school level while Ethel-Echedo (2021) found that female students outperformed males in financial accounting examinations. Perceived gender roles and ambitions may have an underline influence on students' academic achievement in financial accounting. It is important therefore to test the effect of flipped classroom technique on academic achievement of students in financial accounting, as well as gender differences in their achievement in financial accounting at the secondary school level in Anambra State.

Statement of the Problem

Financial accounting is a skill-based subject that prepares students for account clerks and book-keepers. Despite the laudable attributes of the subject, students' academic achievement in the subject has been negatively skewed consecutively in Anambra State. This is evidenced by the WAEC Chief Examiner's Report from 2016 to 2022 which showed that students performed poorly in financial accounting in Anambra State. Hence, the WAEC Chief Examiner's report (2022) suggested that financial accounting teachers should adopt creative teaching methods where students are encouraged to acquire basic calculation skills either individually or as a group for them to be well grounded on the subject matter. This suggestion questions the usefulness of the lecture method where the teacher stands by the chalkboard and delivers lessons through verbal instruction without students' active participation.

Based on the foregoing, innovative teaching and learning methods need to be applied to see if they can reverse the current poor performance among students on financial accounting in secondary schools in Anambra State. The idea that delivering instructional content to students online may improve their study habit and increase their preparation for classroom activities is the rationale behind the use of flipped classroom technique by financial accounting teachers and students in Nigerian secondary schools. Flipped classroom technique has been employed in the teaching of some subjects like Physics, Mathematics and Chemistry and has improved students' achievement with positive results. Whether the same could be replicated in financial accounting is yet to be determined. It is with this understanding, the researcher is posed to ask, if the utilization of flipped classroom technique by teachers will improve students' academic achievement in financial accounting in Anambra State? This is the crux of the study.

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Purpose of the Study

The main purpose of this study was to determine the effect of flipped classroom technique on senior secondary school students' academic achievement in financial accounting in Anambra State. Specifically, the study determined the:

1. Difference between the academic achievement mean scores of students taught financial accounting with flipped classroom technique and those taught using lecture teaching method
2. Difference between the academic achievement mean scores of male and female students taught financial accounting with flipped classroom technique
3. The significant interaction effect of treatments and gender on students' academic achievement in financial accounting

Research Questions

The following research questions guided the study:

1. What is the difference between the academic achievement mean scores of students taught financial accounting with flipped classroom technique and those taught using lecture method?
2. What is the difference between the academic achievement mean scores of male and female students taught financial accounting with flipped classroom technique?

Hypotheses

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

1. There is no significant difference between the academic achievement mean scores of students taught financial accounting using flipped classroom technique and those taught using lecture method
2. There is no significant difference between the academic achievement mean scores of male and female students taught financial accounting using flipped classroom technique
3. There is no significant interaction effect of treatments and gender on students' academic achievement scores in financial accounting

Method

The study adopted a non-randomized non-equivalence post-test quasi-experimental design. Two groups (experimental and control groups) were involved in the study. The experimental groups were exposed to topics in financial accounting using flipped classroom technique and the control groups were taught the same topics using the lecture method. The population of this study comprised 1,876 SS II financial accounting students from six education zones in the 257 public secondary schools in Anambra State. The sample of the study comprised 59 (38 males and 21 females) SS II financial accounting students in four intact classes from four co-educational secondary schools in Awka and Onitsha education zones of Anambra State selected using multi-stage sampling procedure. Thus, 28 students (17 males and 11 females) were in the experimental groups while the 31 students (21 males and 10 females) formed the control groups.

Experimental Procedures

Before undertaking the experiment, one week was used for briefing and administration of the pre-test. Financial accounting teachers that handled the control groups had a discussion with the researchers individually on how to use the lecture method lesson plan prepared by the researchers. For the experimental groups, the researchers had an interactive session with financial teachers in order to

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get them acquainted with the flipped classroom instructional procedure. The briefing and interactive session lasted for one week (thrice a week) of one hour each.

The following were covered during the briefing and interactive session:

1. Introduction of the research assistants
2. The purpose of the research exercise
3. Flipped classroom technique and how it will be carried out in teaching financial accounting
4. Discussion on the role of mobile phones and internet in flipped classroom technique
5. Discussion on topics to be covered within the four weeks of the experiment
6. The researchers demonstrated how the flipped classroom instruction could be implemented. Here, the researchers taught the research assistants (regular financial accounting school teachers) the outside and inside class activities embedded in flipped classroom technique. The researchers gave the research assistants study guide/hints concerning the topics to be treated through Multimedia Messaging Service and SMS messages that were delivered to students' WhatsApp.

For the inside class activities which was the real teaching of the topics, the research assistants were briefed on how to implement instructional activities such as group discussions, class discussions, demonstration, experiments, guided discovery, collaborations, and other strategies that involves active participation of the students. The researchers taught the research assistants how to arrange the students in groups of five members and asked them to discuss the topic using the study guideline given/sent to them previously. The research assistants were briefed on how to moderate/direct the discussion and encourage students to ask questions concerning the topic, as well as state the challenges they encountered during the outside class activities (on the study guide).

The duration of the experiment;

Week One: The researchers visited the experimental and control group schools for familiarization and permission before briefing of financial accounting teachers and administration of the pre-test

Week Two: The teaching of introduction of manufacturing account to control and experimental groups

Week Three: The teaching of calculation of manufacturing account to control and experimental groups

Week Four: The teaching of introduction of account of non-profit making organizations to control and experimental groups

Week Five: The teaching of calculation of account of non-profit making organizations to control and experimental groups

Week Six: Administration of post-test to the experimental and control group schools.

Financial Accounting Achievement Test (FAAT) was used for data collection. The FAAT was developed by the researcher using WAEC standardized tests of 2011 to 2022. It contained 50 objective questions. Only one option was correct while the remaining three are distracters. Each correct answer in the FAAT was scored 2 marks, while questions not answered correctly and questions not attempted was scored zero (0). The maximum score for the 50 questions was 100%, while the minimum score was 0%. This instrument served dual purposes. First, it was administered to the experimental and control groups as pre-test before the commencement of the experiment and secondly, as a post-test after the experiment to determine whether the academic achievement of the two groups was significant or not.

The face and content validity of the instrument was established by three experts. Copies of FAAT were administered on 15 SS II financial accounting students from two co-education secondary school in Ogidi education zone, Anambra State who are not part of the study population. The

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reliability of FAAT was determined using Kudder-Richardson Formula 20 (KR-20) because the test items were dichotomously scored. The reliability coefficient of 0.90 was obtained. Four trained teachers were used for the experiment which lasted for six weeks.

Data related to research questions were analyzed using mean and standard deviation. ANCOVA were used to test the hypotheses at 0.05 level of significance. ANCOVA was considered appropriate because it controlled the initial differences across groups and increased the precision due to the extraneous variables. The decision on hypotheses was that where the p-value is less than or equal to the level of significance (0.05), the null hypothesis was rejected, otherwise the null hypothesis was accepted. The analysis was analyze using SPSS version 23.0.

Results

Research Question 1. What is the difference between the mean academic achievement scores of students taught financial accounting with flipped classroom technique and those taught using lecture method?

Table 1

Mean Academic achievement scores of students taught financial accounting using flipped classroom technique and those taught with the lecture method

Source of Variance	N	Pre-test Mean	Post-test Mean	Pre-test SD	Post-test SD	Mean Gain
Experimental Group	28	39.02	67.91	4.91	7.03	28.89
Control Group	31	31.16	48.72	3.56	5.28	17.56
Mean difference						11.33

Data in Table 1 show that the post-test mean academic achievement score for the experimental group was 67.91 while the pre-test mean academic achievement score was 39.02. The post-test mean academic achievement score for the control group was 48.72 while the pre-test mean academic achievement score is 31.16. The result indicates that flipped classroom technique has a higher effect on students' academic achievement scores in financial accounting than the lecture method. The standard deviation of the experimental group for both pre-test and post-test (4.91 and 7.03) was higher than that of the control group (3.56 and 5.28). This shows that the scores in the experimental and control groups are homogenous but the scores are more homogenous in the experimental group because their scores were spread out over the control group.

Research Question 2. What is the difference between the mean academic achievement scores of male and female students taught financial accounting with flipped classroom technique?

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Table 2.
Mean Academic achievement scores of students taught financial accounting using flipped classroom technique based on gender

Gender	N	Pre-test Mean	Post-test Mean	Pre-test SD	Post-test SD	Mean Gain
Male	17	22.31	37.61	2.77	3.85	15.3
Female	11	18.05	31.00	1.94	2.63	12.95
Mean Gain Difference						2.35

Data in Table 2 show that the post-test mean academic achievement score for male students taught financial accounting with flipped classroom technique is 37.61 while the pre-test mean academic achievement score was 22.31. The post-test mean score for female students taught financial accounting with flipped classroom technique is 31.00 while the pre-test mean score is 18.05. This result indicates that flipped classroom technique was more effective in enhancing the academic achievement of male students in financial accounting than female students. The standard deviation of the male financial accounting students for both pre-test and post-test (2.77 and 3.85) was higher than female financial accounting students (1.94 and 2.63). This shows that the scores of male financial accounting students are more homogenous than female financial accounting students.

Hypothesis 1. There is no significant difference between the mean academic achievement scores of students taught financial accounting using flipped classroom technique and those taught using lecture method.

Table 3.
ANCOVA result showing differences in students' academic achievement in financial accounting between the instructional approaches

Source	SS	Df	Mean Square	F	Sig.	Decision
Corrected Model	16831.588[a]	2	9214.764	64.516	.000	
Intercept	10315.340	1	10315.340	97.103	.000	
Pre-test	4032.811	1	4032.811	28.066	.001	
Method	6130.212	1	6130.212	41.902	.000	S
Error	10344.117	56	137.922			
Total	181777.000	59				
Corrected Total	25174.115	58				

a. R Squared = .681 (Adjusted R Squared = .678) S = Significant, NS = Not Significant

Data in Table 3 show that there was a significant effect of the treatment which accounted for 68 percent of the variance in the academic achievement scores of the students, F (1, 58) = 41.902, p (0.000) < 0.05. Since the p-value is less than the level of significance, the null hypothesis was therefore rejected. Thus, there is a significant difference between the academic achievement scores of students taught financial accounting using flipped classroom technique and those taught using lecture method

Hypothesis 2. There is no significant difference between the mean academic achievement scores of male and female students taught financial accounting using flipped classroom technique.

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Table 4.
ANCOVA result showing differences in mean academic achievement scores of students taught financial accounting using flipped classroom technique based on gender

Source	SS	df	Mean Square	F	Sig.	Decision
Corrected Model	1034.147[a]	2	917.033	10.226	.022	
Intercept	13122.083	1	13122.083	81.634	.000	
Achievement	618.225	1	618.225	50.287	.072	
Gender	301.009	1	301.009	1.605	.163	NS
Error	140.855	25	91.105			
Total	149801.503	28				
Corrected Total	1170.836	27				

a. R Squared = .218 (Adjusted R Squared = .102) S= Significant, NS = Not Significant

Data in Table 4 show that there was no significant effect due to gender on the academic achievement scores of the students, F (1, 27) = 1.605, p(0.163) > 0.05. Since the p-value is greater than the level of significance, the null hypothesis was therefore accepted. Thus, there is no significant difference between the academic achievement scores of male and female students taught financial accounting using flipped classroom technique

Hypothesis 3. There is no significant interaction effect of treatments and gender on students' academic achievement scores in financial accounting

Table 5.
ANCOVA result showing the interaction effect of treatments and gender on students' academic achievement scores in financial accounting

Source	SS	df	Mean Square	F	Sig.	Decision
Corrected Model	27634.597[a]	4	2204.080	91.401	.000	
Intercept	23135.396	1	23135.396	8.054	.000	
Pre-test	8405.214	1	8405.214	112.086	.001	S
Method	10500.110	1	10500.110	621.053	.000	S
Gender	921.196	1	921.196	1.018	.091	NS
Method*Gender	13.007	1	13.007	0.984	.261	NS
Error	29128.695	56	1084.121			
Total	319046.072	59				
Corrected Total	91702.411	58				

a. R Squared = .631 (Adjusted R Squared = .628) S = Significant, NS = Not Significant

Data in Table 5 show that the F-cal for Method* Gender is .984 with a p-value of .261 is greater than the level of significance (p-value > 0.05). Thus, the null hypothesis of no significant interaction effect between treatments and gender on students' academic achievement scores in financial accounting was accepted. Therefore, the interaction effect between flipped classroom

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technique and lecture method used and gender on students' academic achievement in financial accounting was not statistically significant.

Discussion of Findings

Findings of the study revealed that flipped classroom technique has a higher effect on students' academic achievement scores in financial accounting than the lecture method. This means that flipped classroom technique was effective in improving the academic achievement of students in financial accounting when compared to those taught with lecture method. These findings agree with Sağlam and Arslan (2018) and Talan and Gulsecen (2019) that flipped classroom technique was an effective enhancer of students' academic achievement than the lecture method. The researcher is of the opinion that flipped classroom technique was an effective enhancer of students' academic achievement in financial accounting than lecture method because they had control of their own learning, felt like they learned twice (via video and in class), and students were offered more help during the class time by their teachers. In support of the researcher's position, Badmus (2021) reported that flipped classroom technique improved the understanding and comprehension of students who found it difficult to learn with traditional lecture. The fact that students are given the chance to study ahead and familiarize themselves with the lesson materials and topics to be discussed in the class may be responsible for flipped classroom technique having a higher effect on students' academic achievement scores in financial accounting than the lecture method.

In addition, the study disclosed that there was a significant difference between the academic achievement scores of students taught financial accounting using flipped classroom technique and those taught using lecture method. This finding is in agreement with Al-Zebidi (2020) who reported that the academic achievement of students taught with flipped classroom technique differed significantly from those students taught using lecture method in favour of the treatment group. With flipped classroom technique, students come to class prepared thinking and planning what they would learn in financial accounting during the day with their teachers unlike the lecture method where they do know what to expect because they are passive learners. This could be why, there was a significant difference between the academic achievement scores of students taught financial accounting using flipped classroom technique and those taught using lecture method. This study supports, Onyema, Choudhury, Sharma, Atonye, Phylistony and Edeh (2021) which reported that students in flipped classroom technique had a higher mean score in the post-test which was statistically significant than their counterparts who were taught using the lecture method.

Outcome of the research showed that flipped classroom technique was more effective in enhancing the academic achievement, retention and interest of male students in financial accounting than female students. Although, male students' academic achievement, retention and interest scores in financial accounting were more than female students when taught with flipped classroom technique, the difference are not significant. These findings are in consonance with Ugwoke, Edeh and Ezemma (2018) that there was no gender difference among students in their achievement and interest in accounting when taught with flipped classroom technique. Also, Makinde and Yusuf (2019) reported that there was no significant difference between the retention performance of male and female students taught mathematics using flipped classroom technique. This means that flipped classroom technique is not gender sensitive in relations to students' academic achievement, retention and interest. The researcher is of the opinion that flipped classroom technique has the potential of minimizing gender differences in academic achievement, retention and among secondary school students because they highly appreciate the use of technology in learning financial accounting.

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The study discovered that the interaction effect between flipped classroom technique and lecture method used and gender on students' academic achievement, retention and interest in financial accounting was not statistically significant. This implies that both male and female students participated and achieved actively, hence there was no statistical interaction of flipped classroom technique and lecture method and gender on students' academic achievement, retention and interest scores in financial accounting. This finding was in support of the studies of Julie (2017) and Enwere, Ikeanyionwu and Goddy-Mkpa (2021) which reported non-significant interaction effect of treatments and gender on students' learning outcome in financial accounting. The non-significant interaction effect of treatment and gender means that the treatment conditions did not discriminate across gender in this study. This means that flipped classroom technique and lecture method and gender had no form of interaction and their combined effort meet the changing educational needs of students are technology savvy, hence students' academic achievement, retention and interest in financial accounting were not significant.

Conclusion

Based on the findings of the study, it was concluded that flipped classroom technique is not only gender-friendly but also an active instructional approach that positively enhance the academic achievement of students in financial accounting. With flipped classroom technique, students can construct their learning and become independent learners which in turn lead to improved academic achievement in financial accounting at the end of the school day.

Recommendations

In the light of the findings of the study, the following recommendations are made:

1. Financial accounting teachers should utilize flipped classroom technique in their instructional delivery more frequently than the lecture method in order to enable students actively participates in classroom teaching and learning process of financial accounting.
2. Financial accounting teachers should act as facilitators of knowledge in order to maintain the student-centred nature of flipped classroom technique so that students can work individually, and in pairs for improved learning academic achievement.
3. Financial accounting teachers should be encouraged their students to use internet enabled mobile phones and computers for educational purposes in order to appreciate the implementation of flipped classroom technique for teaching and learning financial accounting within and outside the school environment.
4. Management of secondary schools should organize workshop, seminar and symposium on flipped classroom technique in order to help financial accounting teachers learn the rudiments on how to use the technique for teaching financial accounting.

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