



## Effect of Concept Mapping on Students' Academic Achievement in Financial Accounting in Secondary Schools in Abia State, Nigeria

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### Abstract

*The study investigated the effect of concept mapping on students' academic achievement in financial accounting in secondary schools in Abia State, Nigeria. Three research questions guided the study. Three null hypotheses were formulated and tested at 0.05 level of significance. The study adopted a quasi-experimental design of pre-test, post-test, non-equivalent control group design. Intact classes were used and there was no randomization of the research subjects into control and experimental groups. The target population for the study comprises 4,123 Senior Secondary two (SS2) students in the public secondary schools in Abia State. Simple random sampling technique was used to obtain a sample size of 364 students. Four co-educational schools were purposively sampled out of two hundred and ninety-two (292) secondary schools. Two intact classes were randomly sampled in each school and one of them was used for Experimental and the other for Control. The instrument for data collection was validated by three research experts. A reliability coefficient of 0.71 was obtained using Kuder-Richardson formula 20 (K-R-20). The research questions were answered using mean with standard deviation. The hypothesis for the study were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The pre-test scores and post-test scores were subjected to data analysis using statistical package for social sciences (SPSS) version 20.0. Results from the findings showed that concept mapping method appreciably increased academic achievement gains of SS II students in financial account than conventional lecture method. The study revealed that in teaching of financial accounting using concept mapping, male students significantly performed better than their female counterparts. It was recommended among others that since the use of concept mapping learning strategy enhances academic achievement in financial accounting in secondary schools, the teachers should adopt the use of concept mapping for instructional delivery.*

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## Introduction

Secondary education is meant for pupils after the completion of primary education. Adak (2017) described secondary education as an education immediately after primary school. Secondary school begins generally at about the age of eleven years and continues for about the next six years. Thus, the Federal Republic of Nigeria (FRN) (2013) stated that secondary school education in Nigeria is a six-year duration in two stages which include: junior secondary and senior secondary of three years duration each. The senior secondary school is comprehensive with a core-curriculum designed to broaden students' out-look and knowledge in different school subjects including vocational subjects. Among the vocational subjects taught at the secondary school level is financial accounting.

Financial accounting is the art of recording, interpreting, verifying and reporting financial transactions of a business in accordance to the laid down accounting principles. Chukwunta (2021) described financial accounting as a generic term covering the book-keeping and accounting aspects of any economic entity. Financial accounting deals with the process of capturing, processing and communicating financial information (Oyeyemi, & Oyeyemi, 2021). Financial accounting is not an end in itself, rather an information system that measures, processes, and communicates financial information of an economic entity. It constitutes a process by which data relating to economic activities are recorded and communicated to interested parties for analysis and interpretation (Umekwe, 2023). Financial accounting is a systematic process of identifying, measuring, recording, and communicating financial transactions of an organization over a period of time.

Financial accounting at the senior secondary school level is designed to equip students with necessary accounting skills and knowledge. The objectives of financial accounting at secondary school level, according to National Policy on Education (2013), include: to give students additional vocational skills that will enhance their opportunities for future occupational success: to enable students become proficient in recording the financial transactions of the average business office; to equip students with better understanding of business practices and procedures; to provide vocational training to every student in the practical knowledge of daily book-keeping activities; to help students understand the cycles and steps involved in financial accounting so that the relationship of each step to all

other steps are properly understood. The achievement of the above stated objectives of financial accounting can be attained through effective teaching of the school subject to students. Effective teaching in relation to this study involves the application of useful strategies in the teaching of financial accounting in secondary schools.

Various teaching strategies have been developed to accelerate learning process of students in financial accounting. The strategies adopted by teachers for the teaching of financial accounting include demonstration, inquiring/discovery method, field trip, laboratory method, lecture method, question and answer method. Some of these methods are complementary to one another because no single method is the best (Godpower-Echie & Owo, 2019).

Despite the efforts of the teachers in employing the various methods in teaching financial accounting, a significant proportion of Nigerian financial accounting students have low achievement in financial accounting in WAEC (West African Examination Council, 2023). For instance, in 2022, West African Examinations Council reported that about 5214 and 6118 students enrolled for financial accounting in SSCE in Abia State in 2022 and 2023 respectively and the results show that about 53.4 percent of the students failed financial accounting. One of the topics that students fail most is trading, profit and loss account. The poor achievement of students in financial accounting has been blamed to many factors by many researchers. Yakubu (2020) laid the blame to lack of well qualified financial accounting teachers. Oyeyemi and Oyeyemi (2021) further laid the blame to the poor achievement on the method of presentation of financial accounting content to the students. The poor achievement could also be blamed on the inability of students to retain previous learning and link new knowledge with prior knowledge. According to Umekwe (2023), the blames are pointing to the current status of financial accounting instruction in Nigeria, which is basically the teacher centred-method of teaching.

Students who pass through conventional method of teaching are not able in majority of cases to use what they learnt in one domain to solve problem in another domain (Kenley, 2017). These conventional methods of teaching according to Oyeyemi and Oyeyemi (2021), include questions and answer, demonstration and expository method. Expository teaching is a group of teaching strategy that involves the transmission of information in a single direction from source to the students (one way communication). Çelik (2018) defined expository teaching method as a mode or planned scheme devised and employed by the teacher for presenting a

segment or unit of the desired content material of a subject to a group of learners through lecturing (verbal communication of ideas). Oyeyemi and Oyeyemi (2021) stated that expository teaching method is mostly used in our secondary schools these days in Nigeria in teaching accounting.

The students' prior knowledge, culture, experiences, background and embedded world view are not known by the teacher. Thus, enhancing the students' achievement in financial accounting is difficult. For example, in the teaching and learning of "cash book" if the teacher does not know what the learners already have in their worldviews as cash book and their learning styles, he will not be able to facilitate the learners to link the prior knowledge to this accounting concept. In order to enhance students' achievement in financial accounting, researchers sought ways to promote meaningful learning through the use of learning styles teaching/learning methods (Oyeyemi, & Oyeyemi, 2021).

Learning styles are sets of cognitive, emotional and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with and responds to the learning situations (Adaramola, 2018). Adaramola further stated that most teachers tend not to recognize the learning styles or tend to cater mainly for a particular learning style. Reacting to the inability of teachers to cater for the learners' learning styles, Golji and Dangpe (2019) posited that Ausubel's theory of meaningful learning called concept mapping has the potentials to make students assimilate, taking into consideration their individual backgrounds, worldview and the diversity in their learning styles.

Concept mapping is a technique of visually representing the structure of information, concepts and their relationship (Adaramola, 2018). Research studies in the field of education reveal that concept mapping can be used as a successful teaching-learning strategy from primary school to university level. Concept maps are used as a tool for meaningful learning, assessment, in structural planning and finding out the alternative concepts or misconceptions held by the learners (Bernido, 2020). Learning through concept mapping has long lasting effect on memory demonstrated in the form of better results in delayed post-test as compared with other teaching learning strategies (Aydin, 2020). Concept mapping had been used in many countries in many subjects as a tool to help students organize their cognitive framework into more powerful integrated pattern and improve their academic achievement (Damoeroem, 2021). But there is no evidence available to the best of researcher's knowledge of concept mapping being or having been used in senior

secondary schools in Abia State in teaching and learning of financial accounting. Therefore, there is need to explore its effectiveness in enhancing students' achievement in financial accounting in secondary schools in Abia State.

Notwithstanding the different teaching/learning methods employed by teachers to help students' gain meaningful learning in financial accounting, many researchers report that differences exist between gender in financial accounting achievement. Adak (2017) asserted that better performance of female students is revealed by short term researches on use of concept mapping as study tool in financial accounting grade showing that female students scored significantly higher than boys. While in the studies of longer durations of using concept mapping by Godpower-Echie and Owo (2019) showed no gender difference in performance in financial accounting. Chukwunta (2021) found out that males have higher achievement than females in financial accounting when concept mapping is used but, Nwoha (2022) observed that females achieve higher than males when concept mapping is used in teaching financial accounting. It means that it is not certain how gender affects achievement as a result of using concept mapping in teaching financial accounting to senior school students. Therefore, the need arises to research into the effect of concept mapping on students' academic achievement in financial accounting in senior secondary school in Abia State.

### **Statement of the problem**

Financial accounting is the systematic recording of financial transactions to showcase the overall performance of the business. Financial accounting as a subject equips students with the right skills that enable them to engage in a life of work in the office as well as for self-employment. Generally, financial accounting aims at providing specialized instruction to prepare students for career in business and to help students to assume their economic roles as consumers, workers and citizens. Therefore, students ought to be well grounded in financial accounting at senior secondary schools' level for them to be prepared for career in business and also to assume their economic roles as consumers, workers and citizens.

Regrettably, the rate at which students fail financial accounting in internal and external examinations is alarming and has been a bone of contention in the Nigerian Educational System (Umekwe, 2023). There is evidence to show that there is consistent poor academic achievement of students in financial accounting. For instance, in

2022, West African Examinations Council reported that about 5214 and 6118 students enrolled for financial accounting in SSCE in Abia State in 2022 and 2023 respectively and the results show that about 53.4 percent of the students failed financial accounting. One of the topics that students fail most is trading, profit and loss account. The blame majorly goes to the method of teaching financial accounting which has been dominated by the conventional method of teaching. It has been observed that conventional methods do not give the students chance for active participation.

Financial accounting, with its numerous factual knowledge needs to be taught using teaching method that allows students active participation. Against this backdrop, it becomes expedient to undertake empirical research in order to determine the effect of concept mapping on students' achievement in senior secondary school financial accounting, using gender as the mediating variable.

### Purpose of the study

The study aimed at determining the effect of concept mapping on students' academic achievement in financial accounting as well as the effect of concept mapping on male and female students' academic achievement in financial accounting. Thus, the following research questions guided the study:

1. What are the mean financial accounting achievement scores of students taught financial accounting concepts using concept mapping and those taught with expository method?
2. What are the mean achievement scores of male and female students taught financial accounting using concept mapping method?

### Hypotheses

In addition, the following null hypotheses were tested at 0.05 level of significance.

H<sub>01</sub>: There is no significant effect of on concept mapping and expository method on students' academic achievement in financial accounting.

H<sub>02</sub>: There is no significant effect of concept mapping and expository methods on

academic achievement of male and female students in financial accounting.

### Method

The study adopted a quasi-experimental design of non-equivalent control group design. Intact classes were used and there will be no randomization of the research subjects into control and experimental groups. The study will be conducted in senior schools in Abia State. The target population for the study comprised 4,123 Senior Secondary Two (SS II) students in the public secondary schools in Abia State. The sample size for the study was 364 SS financial accounting students in Abia State and this sample size was obtained using simple random sampling technique. Four co-educational schools were purposively sampled out of two hundred and ninety-two (292) secondary schools in the state to enable the researcher carry out the research work successfully because gender is a variable in the study. Two intact classes were randomly sampled in each school and one of them will be used for experimental and the other control. The sample size was determined statistically using Taro Yamane's formular. The instrument for data collection were validated by three research experts, two from Business Education Department and one from Measurement and Evaluation Department, all from University of Nigeria, Nsukka. A reliability coefficient of 0.71 was obtained using Kuder-Richardson formula 20 (K-R-20). The research questions were answered using mean with standard deviation. The hypotheses for the study were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. A null hypothesis of no significant difference will be upheld when the p-value reaches a significance level that is greater than or equal to 0.05. On the other hand, the null hypothesis of no significant difference will not be upheld when the p-value is less than 0.05. The scores will be subjected to data analysis using statistical package for social sciences SPSS version 20 package.

### Analysis of research questions

**Research question 1:** What is the accounting academic achievement mean scores of students taught financial accounting concepts using concept mapping and those taught with expository method?

**Table 1: Mean academic achievement scores and standard deviation of financial accounting students exposed to concept mapping method and those exposed to expository method**

Groups	Method	Mean	SD
Experimental	Concept Mapping	66.53	12.35

Table 1 shows the mean with standard deviation of the financial accounting achievement test scores of students taught some financial accounting concepts using concept mapping and those taught with expository method. The result revealed that concept mapping method yielded an adjusted mean achievement score of 66.53 with a standard deviation of 12.35 while the expository

method yielded a mean achievement score of 47.07. This indicated that concept mapping method is superior to the expository method in enhancing students' academic achievement in financial accounting.

**Hypothesis 1:** There is no significant effect of concept mapping and expository method on students' achievement in financial accounting.

**Table 2: Summary of Analysis of Covariance (ANCOVA) between the mean academic achievement scores of students taught financial accounting students with concept mapping and those taught with expository method**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	11122.298 <sup>a</sup>	2	5040.762	63.881	.000	.278	
Intercept	17832.453	1	19934.724	212.766	.000	.432	
Pretest	122.723	1	135.723	1.639	.201	.005	
Method	6547.654	1	9957.776	113.181	.000	.275	
Error	13425.342	157	82.797				
Total	398712.000	160					
Corrected Total	2763.100	159					

a. R Squared = .278 (Adjusted R Squared = .273)

Data presented in Table 2 revealed the significant difference in the mean achievement score of students exposed to concept mapping and those taught with expository method. The obtained value of  $F(1,355) = 113.181$  is significant 0.000 for method main effect ( $P < 0.05$ ). The results showed that the mean achievement scores of the students taught financial accounting with concept mapping were significantly higher among those taught with expository method. Thus, the null hypothesis is rejected and the

researcher concludes that there is significant difference in the mean achievement score of students taught financial accounting using concept mapping and those taught with expository method.

**Research question 2:** What are the mean achievement scores of male and female students taught financial accounting using concept mapping method?

**Table 3: Mean achievement scores of Male and Female Students taught Financial Accounting using Concept Mapping Method**

Gender Categories	Mean	SD
Males	69.00	11.39
Females	64.79	12.81

Data on Table 3 show the mean achievement scores of male and female students taught financial accounting using concept mapping method. The data analyzed revealed that the adjusted mean achievement scores of male students taught financial accounting with concept mapping is 69.00 with a standard deviation of 11.39 while their female counterpart had a mean achievement score of 64.79 with a standard deviation of 12.81. This gives a difference in mean academic achievement scores of 4.21 in favour of the male students.

**Hypothesis 2:** There is no significant effect of concept mapping and expository methods on achievement of male and female students in financial accounting

**Table 4: Summary of Analysis of Covariance (ANCOVA) Difference between the Mean Academic Achievement Scores of Male and Female Financial Accounting Students Exposed to Concept Mapping**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	21123.111 <sup>a</sup>	4	1243.232	31.146	.000	.283	
Intercept	23554.231	1	12112.124	243.430	.000	.436	
Pretest	151.894	1	151.894	1.838	.176	.006	
Method	86754.621	1	9914.621	119.970	.000	.276	
Sex	177.047	1	194.047	2.348	.126	.007	
Method * Sex	22.277	1	20.277	.245	.241	.001	
Error	26032.379	355	82.642				
Total	645321.000	364					
Corrected Total	36328.200	363					

a. R Squared = .283 (Adjusted R Squared = .274)

The results presented in Table 4 show that the p-value ( $p \leq 0.241$ ) is greater than 0.05 alpha level. Thus, the hypothesis is not rejected at 0.05 alpha level of significance and, 1 and 355 degrees of freedom ( $F(1, 355)=0.000, p(0.05)$ ). This indicates that there is a significant difference between the academic achievement mean scores of male and female students taught financial accounting using concept mapping.

### Discussion of findings

The findings of this study presented in Table 1 revealed the effect of concept mapping on academic achievement of financial accounting students in secondary schools in Abia State. The study found that students exposed to concept mapping method had high academic achievement than students exposed to expository method. The result of the ANCOVA analysis in Table 2 showed that there is significant difference in the mean achievement scores of students taught financial accounting using concept mapping and those taught with expository method. This finding is in agreement with that of Adak (2017) who observed that concept mapping method is more efficacious than the lecture method in enhancing students' achievement in sciences. The finding is also in consonance with that of (Nwoha, 2022) where the concept mapping proved better than the expository method. Nwoha reported that concept mapping stimulates students thereby enhancing learning since students tend to learn better when more of the senses are involved. The finding is also in line with that of Chukwunta (2021) who stated that concept mapping helps teachers discover the theme they want to emphasize based on how students may see or organize knowledge differently from their own information. This helps teachers select appropriate instructional materials, incorporate teaching

strategies as well as time and task allocated for various part of the course that are meaningful, relevant pedagogically sound and interesting to the students. The results implied that concepts mapping teaching method enhance higher students' achievement in financial accounting than the expository method. This could be attributed to the fact that the concept mapping method is learner-centred and activity-based as against the teacher-centred nature of the expository method.

The findings of this study presented in Table 3 revealed the influence of gender on academic achievement of financial accounting students in secondary schools in Abia State when taught with concept mapping method. The study found that in teaching of financial accounting using concept mapping method, male students achieved more than their female counterparts. The corresponding hypothesis revealed that there is a significant difference in the gain in mean academic achievement scores of male and female students taught financial accounting using concept mapping strategy. The findings of the study supported the findings of Adaramola (2018) who reported that male students performed better than females when taught mathematics using concept mapping method. Umekwe (2023) also found that male secondary school students scored higher in mean achievement scores more than the female students in financial accounting when taught with concept mapping method. This implies that concept mapping had no relative effect on achievement of male and female students and as such is an authentic teaching method.

### Conclusions

The findings of the study revealed that concept mapping method had significantly and positively affect students' academic achievement in financial accounting than the expository method. In addition, the result of the study revealed that male students achieved higher. Though, the size of the effect is minimal. This implies that concept mapping strategy is not sensitive to gender in improving students' academic achievement in financial accounting, the method should be used to teach mixed classes, especially in coeducational school. Therefore, the efforts of school authorities, the teachers and other stakeholders should be geared towards the use of concept mapping and other innovative methods in teaching financial accounting.

### Recommendations

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

1. Since the use of concept mapping strategy enhance academic of students in financial accounting in secondary schools, the teachers in secondary schools in Abia State should adopt the use of this strategy for instructional delivery. This should come as the new policy of government to be integrated in the curriculum.
2. Secondary school teachers of financial accounting should undergo in-service training for skill update in the use of modern and student-centred learning strategy such as concept mapping. The in-service training should be sponsored by the teachers or sponsored by the school in collaboration with ministry of education.
3. Seminars, workshops and conferences should be organized by States and Federal ministries of Education where teachers and curriculum planners will be taught the application and use of various modern teaching techniques such as concept mapping strategy for effective teaching and learning of financial accounting.

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