

**EFFECTS OF CONCEPT MAPPING AND SCAFFOLDING TEACHING STRATEGIES
ON SENIOR SECONDARY SCHOOL STUDENTS' INTEREST, ACADEMIC ACHIEVEMENT,
AND RETENTION IN ECONOMICS IN KANO STATE, NIGERIA**

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Abstract

The study investigated the effect of Concept Mapping and Scaffolding Teaching Strategies on students' interest, academic achievement, and retention in Economics among Senior Secondary School II (SS II) students in Kano State, Nigeria. The study adopted a quasi-experimental research design using the pretest posttest nonequivalent control group design. The population of the study comprised 73,422 SS II students offering Economics in Kano State, from which a sample of 172 students was selected using purposive and simple random sampling techniques. Data were collected using the Economic Achievement Test (EAT) and the Economics Interest Inventory (EII). The instruments were validated by experts and subjected to reliability testing. The objective section of the EAT yielded a Kuder Richardson Formula 20 (KR-20) reliability coefficient of 0.824, the essay section recorded an Intraclass Correlation Coefficient (ICC) of 0.818, while the EII produced a Cronbach's alpha coefficient of 0.867. Data collected were analyzed using mean, standard deviation, Analysis of Variance (ANOVA), and Analysis of Covariance (ANCOVA) at a 0.05 level of significance. The findings revealed that students taught using concept mapping and scaffolding strategies recorded higher interest ratings, academic achievement scores, and retention scores in Economics than those taught using the conventional teaching method. The study further established significant differences in students' mean interest ratings, academic achievement scores, and retention scores among those taught using concept mapping strategy, scaffolding strategy, and traditional teaching method. Specifically, the analysis showed significant differences in interest ratings, $F(2, 171) = 7.481, p < 0.05$; academic achievement scores, $F(2, 171) = 28.251, p < 0.05$; and retention scores, $F(2, 171) = 27.655, p < 0.05$. The study concludes that concept mapping and scaffolding teaching strategies are effective instructional approaches for improving students' interest, achievement, and retention in Economics. It is recommended among others that Economics teachers should adopt concept mapping and scaffolding strategies during classroom instruction to stimulate students' interest and positive attitude towards the subject.

INTRODUCTION

Background of the study

Education is a vital tool for the development of an individuals and societies. It enables individuals to acquire knowledge, skills and values necessary for personal growth and participation in the global economy. However, the traditional method of teaching has been criticized for being ineffective in promoting students' engagement, academic achievement and retention. In Nigeria the education system has faced numerous challenges including poor academic performance low retention rates after a given period, and limited opportunities for student to develop critical thinking and problem-solving skills. These challenges have been attributed to various factors including inadequate teaching methods, lack of resources, large class size and poor teachers' training. The

channels in which knowledge is imparted is through teaching, which presently dominated by traditional teaching method in Nigeria, such as lecture method and rote memorization. In Kano state the challenges are further compounded by systematic issues such as overcrowded classroom, inadequate teaching materials and insufficient teacher training. This constraint hindered the effective delivery and limit the student opportunities, which resulted to lack of interest, poor academic achievement and low retention. These pave the ways of introducing and exploring innovative teaching methods like cooperative learning strategy, inquiry-based learning, project-based learning, field trip, concept mapping and scaffolding to improve students' comprehension and long-term retention in senior secondary schools. According to Slavin (2017), teaching methods serve as the framework through which teachers organize and deliver instructional content to enhance understanding, engagement, and retention. Concept mapping and scaffolding have gained attention for their potential to enhance learning outcomes.

Concept mapping as innovative teaching strategy, is a visual learning strategy that helps student organize the content ideas, making abstract economic concept more understandable. By representing concept in a structured format, students can see relationship between key economic principles such as demand and supply, inflation and fiscal policy. Concept mapping is a method of arranging conceptual nodes and link to show relationship among multiple concepts in domain. This method encourage active learning, enhances problem solving skills, improve retention, fosters critical thinking and self-regulation, and encourage interest. As noted by Kola and Ibrahim (2019). Interest serves as a driving force for student engagement, motivation and perseverance (Deci & Ryan, 2019). Students' who are genuinely interested in economics are more likely to invest time and effort in understanding the subject. Also, while transforming passive learner into active participants. Proper application of this strategy will make economic subject in senior secondary school more interested, understandable and everlasting. Therefore, concept mapping has positive influence on economic students' interest because of its features of making learning structured and interactive.

Scaffolding is another innovative strategy where teacher provides temporary support to help students learn new concept or skills, as students gain confidence and competence, the support is gradually removed, promoting independent learning that led to effective academic achievement. Omiko (2015) saw scaffolding as the assistance (parameters rules or suggestions) a teacher gives to promote a vast level of learning. In the context of economics subject, scaffolding has been shown to enhance students' academic achievement and retention by providing tailored support that meet their individual needs for example, Okoye and Adebayo (2021) observed that scaffolding techniques such as guided questioning, modelling and feedback helped students develop a deeper understanding of economic principles and improve their problem-solving abilities. Scaffolding enhances economic students' achievements in senior secondary schools as it builds confidence and motivation, improve critical thinking and problem-solving, enhances students' autonomy and promote long term retention.

The integration of concept mapping and scaffolding in economics classes is expected to offer a powerful approach in addressing challenges of limited retention, low interest and poor academic achievement, while concept mapping will provide a framework for organizing and understanding information. Scaffolding will offer necessary support to ensure that students can effectively utilize the framework.

To support the efficacy of combining these strategies a study by Yusuf and Agboola (2020) revealed that students taught economics using combination of concept mapping and scaffolding strategies outperformed their peers taught through traditional methods. The study also found that these strategies enhanced students' long-term retention of knowledge, as t

Statement of the Problem

Economics is an essential subject in the senior secondary school curriculum in Nigeria, aimed at equipping students with economic knowledge, decision-making skills, and problem-solving abilities necessary for national development. However, in recent years, there has been growing concern about the consistently low levels of student interest, poor academic achievement, and inadequate retention of economic concepts among senior secondary school students in Nigeria, particularly in Kano State. Reports from examination bodies such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO) have consistently shown poor performance in Economics across many states, including Kano, indicating a serious gap in learning outcomes (WAEC Chief Examiners' Report, [2021](#)). Several factors have been identified as contributing to this persistent underachievement, including the predominant use of traditional, teacher-centred instructional methods that limit student engagement and active participation in the learning process. These methods often fail to stimulate students' interest or provide adequate support to help them understand and retain abstract economic concepts. In response to these challenges, contemporary educational researchers have advocated for the adoption of more innovative, student-centred instructional strategies such as concept mapping and instructional scaffolding.

Purpose of the Study

The main purpose of this study was to investigate the effects of concept mapping and scaffolding on interest, academic achievement and retention of senior secondary school students offering economics in Kano state.

Specifically, the study sought to;

1. Determine the effects of concept mapping and scaffolding strategies on senior secondary school students' interest in Economics in Kano State.
2. Investigate the effects of concept mapping and scaffolding strategies on senior secondary school students' academic achievement in Economics in Kano state.
3. Determine the effects of concept mapping and scaffolding strategies on senior secondary school students' retention in Economic in Kano state.

Research Questions

The research questions guiding this research are:

1. What is the effect of concept mapping and scaffolding strategies on senior secondary school students' interest in Economic in Kano state?
2. What is the effect of concept mapping and scaffolding strategies on senior secondary school students' academic achievement in Economics in Kano state?
3. What is the effect of concept mapping on senior secondary school students' retention in Economic in Kano state?

Research Hypotheses

In line with the research questions the following null hypotheses were formulated and would be tested at 0.05 level of significance.

H₀₁: There is no significant difference in the mean interest ratings of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

H₀₂: There is no significant difference in the mean academic achievement scores of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

H₀₃: There is no significant difference in the mean retention scores of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

METHODOLOGY

The study adopted quasi-experimental research design, specifically the pretest-posttest non-equivalent group design. The area of this study was Kano State Nigeria. The target population of the study comprises 73,422 senior secondary schools SSII students offering economics in Kano state. The study employed purposive sampling as the method of data collection to allow for the selection of schools that offered Economics in the state. A total of 172 SSS II students offering Economics in the three intact classes from the selected senior secondary schools constituted the sample for the study. The instruments used for data collection were Economics Achievement Test (EAT) and Economics Interest Inventory (EII). Three lecturers from the Department of Vocational Education, Modibbo Adama University, Yola, examined the instruments for content relevance, clarity, appropriateness of the items, and alignment with the study objectives and Economics curriculum. The reliability of the instruments was established through a pilot test conducted among 40 SSS II Economics students in a secondary school with characteristics similar to those of the study participants but outside the study area. The internal consistency reliability of the objective section of the Economics Achievement Test (EAT), which consisted of multiple choice and True/False items, was determined using the Kuder Richardson Formula 20 (KR-20). The analysis produced a reliability coefficient of 0.824, indicating a high level of internal consistency among the test items. The reliability of the essay section of the EAT was determined using the Intraclass Correlation Coefficient (ICC) based on the scores assigned by two independent raters, which yielded an index of 0.818, indicating a high level of agreement between the raters. Data collection was conducted by the use of Pre-test Phase: All students (control and experimental groups) Assignment of Groups were Experimental Group 1: GSSS Rano was taught using the Concept Mapping teaching strategy, Experimental Group 2: GGSSS Dawaki was taught using the Scaffolding teaching strategy and Control Group: GSSS Bichi was taught using the conventional teaching method, Instruction Period was six weeks. Experimental Group 1: Concept Mapping (GSSS Rano) Experimental Group 2: Scaffolding (GGSSS Dawaki) and Control Group: Conventional Method (GSSS Bichi) Data was analyzed using both descriptive and inferential statistics. Descriptive statistics (mean and standard deviation) were used to answer the research questions. The mean scores of the experimental groups were compared with the control group to obtain mean differences. Inferential statistics, specifically t-tests, were used to test the hypotheses at a 0.05 level of significance.

RESULTS AND DISCUSSION

Research Question One

What is the effect of concept mapping and scaffolding strategies on senior secondary school students' interest in Economic in Kano state?

Table 4.1: Mean and Standard Deviation of Students' Interest in Economics in Kano State

Teaching Methods	N	Interest	
		Mean	S. D
Concept Mapping (Experimental Group I)	62	3.69	.38
Scaffolding (Experimental Group II)	53	3.524	.53
Conventional method (Control Group)	57	3.40	.31

The mean and standard deviation of students' interest in Economics based on the teaching methods are presented in Table 4.1. The result shows that students taught using the concept mapping

strategy recorded the highest mean interest score ($M = 3.69$, $SD = 0.38$), followed by students taught using the scaffolding strategy ($M = 3.52$, $SD = 0.53$). Students taught using the conventional teaching method recorded the lowest mean interest score ($M = 3.40$, $SD = 0.31$).

The result indicates that students exposed to concept mapping and scaffolding strategies demonstrated higher levels of interest in Economics compared with those taught using the conventional teaching method. Specifically, the concept mapping strategy produced the highest improvement in students' interest, suggesting that it may be more effective in stimulating students' engagement and positive disposition towards Economics than the other instructional approaches.

Research Question Two

What is the effect of concept mapping and scaffolding strategies on senior secondary school students' academic achievement in Economics in Kano state?

Table 4.2: Mean and Standard Deviation of Pretest and Post-test Achievement Scores of Students in Economics in Kano State

Teaching Methods	n	Pre-Test		Post-Test		Mean Gain
		Mean	S. D	Mean	S. D	
Concept Mapping (Experimental Group I)	62	66.66	5.31	87.60	4.75	20.94
Scaffolding (Experimental Group II)	53	67.66	5.60	87.19	6.25	19.53
Conventional method (Control Group)	57	66.96	5.08	80.95	4.89	13.99

Table 4.2 presents the mean and standard deviation of pre-test and post-test achievement scores of students taught Economics using concept mapping strategy, scaffolding strategy, and conventional teaching method. The result shows that students in the concept mapping group had a pre-test mean score of 66.66 with a standard deviation of 5.31, which increased to a post-test mean score of 87.60 with a standard deviation of 4.75 after exposure to the treatment. The group recorded a mean gain score of 20.94, indicating a substantial improvement in students' academic achievement following the use of concept mapping strategy. This suggests that concept mapping enhanced students' understanding and achievement in Economics.

Students taught using the scaffolding strategy recorded a pre-test mean score of 67.66 with a standard deviation of 5.60 and a post-test mean score of 87.19 with a standard deviation of 6.25. The group obtained a mean gain score of 19.53, showing that students' academic achievement improved considerably after being taught using the scaffolding approach. The improvement suggests that scaffolding provided learners with structured support that assisted them in developing better understanding of Economics concepts.

The students in the conventional teaching method group recorded a pre-test mean score of 66.96 with a standard deviation of 5.08, while their post-test mean score was 80.95 with a standard deviation of 4.89. The group achieved a mean gain score of 13.99, indicating improvement in academic achievement after conventional instruction. However, the magnitude of improvement was lower compared with the concept mapping and scaffolding groups.

Comparatively, the concept mapping group recorded the highest mean gain score (20.94), followed by the scaffolding group (19.53), while the conventional teaching group recorded the lowest mean gain score (13.99). This indicates that students exposed to concept mapping and scaffolding strategies achieved greater improvement in Economics achievement than those taught using the conventional method. The result suggests that the use of learner-centred instructional strategies such as concept mapping and scaffolding may be more effective in improving students' academic achievement in Economics. However, statistical analysis such as one-way ANCOVA is required to determine whether the observed differences among the groups are statistically significant.

Research Question Three

What is the effect of concept mapping and scaffolding strategies on senior secondary school students' retention in Economic in Kano state?

Table 4.3: Mean and Standard Deviation of Retention Scores of Students in Economics in Kano State

Teaching Methods	n	Retention		Post-Test		Mean Gain
		Mean	S. D	Mean	S. D	
Concept Mapping (Experimental Group I)	62	85.10	4.77	87.60	4.75	2.5
Scaffolding (Experimental Group II)	53	84.72	6.54	87.19	6.25	2.47
Conventional method (Control Group)	57	78.42	4.80	80.95	4.89	2.53

Table 4.3 presents the mean and standard deviation of students' retention scores in Economics after exposure to concept mapping, scaffolding, and conventional teaching methods. The result shows that students taught using concept mapping strategy recorded a post-test mean score of 87.60 with a standard deviation of 4.75, compared with a retention mean score of 85.10 and standard deviation of 4.77. The group recorded a mean gain score of 2.50, indicating that students retained a substantial proportion of the knowledge acquired after instruction using the concept mapping strategy.

Students exposed to the scaffolding strategy recorded a post-test mean score of 87.19 with a standard deviation of 6.25, while their retention mean score was 84.72 with a standard deviation of 6.54. The group obtained a mean gain score of 2.47, suggesting that scaffolding strategy also contributed positively to students' retention of Economics concepts. This indicates that the instructional support provided through scaffolding helped students maintain understanding of learned concepts beyond the immediate teaching period.

For students taught using the conventional method, the post-test mean score was 80.95 with a standard deviation of 4.89, while the retention mean score was 78.42 with a standard deviation of 4.80. The group recorded a mean gain score of 2.53, showing a slight improvement in retention scores. Although the conventional group also demonstrated retention, its overall mean scores remained lower compared with the concept mapping and scaffolding groups. The findings indicate that students taught using concept mapping and scaffolding strategies demonstrated higher retention scores compared with those taught using the conventional teaching method. Concept mapping produced the highest retention mean score (85.10), followed closely by scaffolding (84.72), while the conventional group recorded the lowest retention mean score (78.42).

H₀₁: There is no significant difference in the mean interest ratings of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

Table 4.4: Summary of ANOVA of Difference in the Mean Interest Ratings of Senior Secondary School Students in Economics taught using Concept Mapping Strategy, Scaffolding Strategy, and Traditional Teaching Method in Kano State

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.564	2	1.282	7.481	.001
Within Groups	28.956	169	.171		
Total	31.519	171			

Table 4.4 presents the summary of one-way Analysis of Variance (ANOVA) conducted to determine whether there is a significant difference in the mean interest ratings of students taught Economics using concept mapping strategy, scaffolding strategy, and traditional teaching method. The result indicates that the between-group sum of squares was 2.564, with 2 degrees of freedom, while the

within-group sum of squares was 28.956 with 169 degrees of freedom. The obtained F-value was 7.481 with a significance value of 0.001.

Since the significance value ($p = 0.001$) is less than the 0.05 level of significance, the null hypothesis, which states that there is no significant difference in the mean interest ratings of students taught using the three teaching methods, is rejected. This implies that there is a statistically significant difference in students' interest ratings in Economics among those taught using concept mapping strategy, scaffolding strategy, and traditional teaching method.

Table 4.5: Scheffe Multiple Comparisons Analysis (Post Hoc)

(I) teaching methods	(J) teaching methods	Mean Difference (I-J)	Std. Error	Sig.	
Concept Mapping (Experimental Group I)	Scaffolding (Experimental Group II)	.16918	.07744	.095	
	Conventional lecture method (Control Group)	.29200*	.07596	.001	
Scaffolding (Experimental Group II)	Concept Mapping (Experimental Group I)	-.16918	.07744	.095	
	Conventional lecture method (Control Group)	.12282	.07899	.301	
Conventional lecture method (Control Group)	Concept Mapping (Experimental Group I)	-.29200*	.07596	.001	
	Scaffolding (Experimental Group II)	-.12282	.07899	.301	

*. The mean difference is significant at the 0.05 level.

To determine the specific groups responsible for the observed difference, Scheffé post hoc analysis was conducted as presented in Table 4.5. The result shows that the difference between students taught using concept mapping strategy and those taught using the conventional lecture method was statistically significant (Mean Difference = 0.292, $p = 0.001$). However, the difference between concept mapping and scaffolding strategies was not statistically significant (Mean Difference = 0.169, $p = 0.095$). Similarly, the difference between scaffolding strategy and the conventional lecture method was not statistically significant (Mean Difference = 0.123, $p = 0.301$).

This indicates that although concept mapping produced significantly higher interest ratings compared with the conventional teaching method, the differences between concept mapping and scaffolding strategies, as well as between scaffolding and conventional teaching method, were not statistically significant. Therefore, the significant overall difference observed in students' interest ratings was mainly attributed to the higher interest level among students exposed to concept mapping strategy compared with those taught using the conventional method.

H₀₂: There is no significant difference in the mean academic achievement scores of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

Table 4.6: Summary of ANCOVA of Difference in the Mean Academic Achievement Scores of Senior Secondary School Students in Economics taught using Concept Mapping Strategy, Scaffolding Strategy, and Traditional Teaching Method in Kano State

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1596.067 ^a	3	532.022	18.834	.000	.252
Intercept	7779.679	1	7779.679	275.408	.000	.621
Pretest	.244	1	.244	.009	.926	.000
Teaching methods	1596.056	2	798.028	28.251	.000	.252
Error	4745.631	168	28.248			
Total	1256874.000	172				
Corrected Total	6341.698	171				

a. R Squared = .252 (Adjusted R Squared = .238)

Table 4.6 presents the summary of Analysis of Covariance (ANCOVA) conducted to determine whether significant differences exist in the academic achievement scores of students taught Economics using concept mapping strategy, scaffolding strategy, and traditional teaching method while controlling for pre-test achievement scores. The result shows that the effect of teaching methods on students' academic achievement was statistically significant, $F(2,168) = 28.251$, $p = 0.000$, with a partial eta squared value of 0.252. This indicates that the teaching methods accounted for approximately 25.2% of the variance in students' academic achievement scores after controlling for pre-test scores. The pre-test scores were not statistically significant predictors of post-test achievement ($F = 0.009$, $p = 0.926$), indicating that initial differences in students' achievement did not significantly influence the post-test results.

Since the significance value for teaching methods ($p = 0.000$) is less than the 0.05 level of significance, the null hypothesis is rejected. This means that there is a significant difference in the mean academic achievement scores of students taught using concept mapping strategy, scaffolding strategy, and traditional teaching method.

Table 4.7: Bonferroni Multiple Comparisons Analysis (Post Hoc)

(I) teaching methods	(J) teaching methods	Mean Difference (I-J)	Std. Error	Sig. ^b	
Concept Mapping (Experimental Group I)	Scaffolding (Experimental Group II)	.401	.997	1.000	
	Conventional lecture method (Control Group)	6.647*	.976	.000	
Scaffolding (Experimental Group II)	Concept Mapping (Experimental Group I)	-.401	.997	1.000	
	Conventional lecture method (Control Group)	6.246*	1.016	.000	
Conventional lecture method (Control Group)	Concept Mapping (Experimental Group I)	-6.647*	.976	.000	
	Scaffolding (Experimental Group II)	-6.246*	1.016	.000	

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

The Bonferroni multiple comparison analysis presented in Table 4.7 shows that students taught using concept mapping strategy had significantly higher achievement scores than students taught using the conventional lecture method (Mean Difference = 6.647, $p = 0.000$). Similarly, students taught using scaffolding strategy performed significantly better than those taught using the conventional lecture method (Mean Difference = 6.246, $p = 0.000$). However, there was no significant difference between concept mapping and scaffolding strategies (Mean Difference = 0.401, $p = 1.000$).

The result indicates that both concept mapping and scaffolding strategies were more effective than the conventional teaching method in improving students' academic achievement in Economics. However, neither strategy demonstrated superiority over the other, suggesting that both learner-centred approaches produced comparable achievement outcomes.

H₀₃: There is no significant difference in the mean retention scores of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State.

Table 4.8: Summary of ANCOVA of Difference in the Mean Retention Scores of Senior Secondary School Students in Economics taught using Concept Mapping Strategy, Scaffolding Strategy, and Traditional Teaching Method in Kano State

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1614.643 ^a	3	538.214	18.438	.000	.248
Intercept	7268.787	1	7268.787	249.009	.000	.597
Pretest	.014	1	.014	.000	.982	.000
Teaching methods	1614.562	2	807.281	27.655	.000	.248
Error	4904.055	168	29.191			
Total	1184796.000	172				
Corrected Total	6518.698	171				

a. R Squared = .248 (Adjusted R Squared = .234)

Table 4.8 presents the ANCOVA results on the difference in mean retention scores of students taught Economics using concept mapping strategy, scaffolding strategy, and traditional teaching method. The analysis was conducted while controlling for pre-test scores.

The result indicates that teaching methods had a significant effect on students' retention scores, $F(2,168) = 27.655$, $p = 0.000$, with a partial eta squared value of 0.248. This shows that the teaching methods explained approximately 24.8% of the variation in students' retention scores after controlling for pre-test scores. The influence of pre-test scores on retention was not significant ($F = 0.000$, $p = 0.982$). Since the significance value for teaching methods ($p = 0.000$) is less than 0.05, the null hypothesis is rejected. Therefore, there is a significant difference in the retention scores of students taught using concept mapping strategy, scaffolding strategy, and traditional teaching method.

Table 4.9: Bonferroni Multiple Comparisons Analysis (Post Hoc)

(I) teaching methods	(J) teaching methods	Mean Difference (I-J)	Std. Error	Sig. ^b	
Concept Mapping (Experimental Group I)	Scaffolding (Experimental Group II)	.378	1.014	1.000	
	Conventional lecture method (Control Group)	6.675*	.992	.000	
Scaffolding (Experimental Group II)	Concept Mapping (Experimental Group I)	-.378	1.014	1.000	
	Conventional lecture method (Control Group)	6.297*	1.032	.000	
Conventional lecture method (Control Group)	Concept Mapping (Experimental Group I)	-6.675*	.992	.000	
	Scaffolding (Experimental Group II)	-6.297*	1.032	.000	

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

The Bonferroni post hoc analysis in Table 4.9 reveals that students taught using concept mapping strategy had significantly higher retention scores than students taught using the conventional lecture method (Mean Difference = 6.675, $p = 0.000$). Likewise, students taught using scaffolding strategy recorded significantly higher retention scores than those taught using the conventional lecture method (Mean Difference = 6.297, $p = 0.000$). However, the difference between concept mapping and scaffolding strategies was not statistically significant (Mean Difference = 0.378, $p = 1.000$).

The finding implies that concept mapping and scaffolding strategies significantly improved students' retention of Economics concepts compared with the conventional teaching method. However, both instructional strategies were equally effective, as no significant difference was found between them.

Discussion of Findings

The finding of the study revealed that Students taught using concept mapping and scaffolding strategies recorded higher interest ratings in Economics than those taught using the conventional teaching method. Furthermore, the study reveals that there was a significant difference in the mean interest ratings of senior secondary school students in Economics taught using concept mapping strategy, scaffolding strategy, and traditional teaching method in Kano State. This finding suggests that concept mapping and scaffolding strategies were more effective in developing students' positive attitudes, enthusiasm, and willingness to participate in Economics learning than the conventional teaching method.

The finding of this corroborates the work of Okechukwu et al. (2018), who found that students taught Economics using concept mapping had significantly higher interest levels than those taught using lecture instructional strategies. The agreement is particularly important because Okechukwu et al. focused on Economics, suggesting that the positive influence of concept mapping on students' interest is not limited to science-related subjects but can also improve learning experiences in Economics classrooms.

The finding is also in tandem with the principles reported by Yusuf and Agboola (2020), who found that the combined use of concept mapping and scaffolding strategies improved students' learning outcomes, including retention, compared with traditional teaching methods. The similarity may be attributed to the fact that both instructional approaches involve students actively constructing

knowledge rather than passively receiving information. Concept mapping enables learners to visually connect economic concepts, while scaffolding provides gradual support that helps learners understand difficult ideas.

Similarly, the finding corroborated the result of Adebisi (2024), who found that students taught using scaffolding strategy performed significantly better than those taught using the conventional method.

The finding also agrees with Idris (2024), who found that students taught using concept mapping strategy achieved significantly higher academic performance than those taught using lecture method. It also agrees with Obiekwe and Ekwueme (2023), who reported that scaffolding improved students' academic performance and learning autonomy by providing structured support that gradually developed learner independence. The finding agrees with the findings of Ogunniyi and Akinbobola (2022), who reported that concept mapping improved students' retention and conceptual understanding compared with traditional lecture methods. The agreement suggests that concept mapping supports retention because it enables learners to create connections between ideas, making information easier to retrieve when needed. The finding is also consistent with Yusuf and Agboola (2020), who reported that the combined use of concept mapping and scaffolding strategies improved students' long-term retention of knowledge. This similarity strongly supports the effectiveness of combining both instructional approaches. Scaffolding may improve retention by ensuring that learners receive adequate support during the initial stages of learning, while concept mapping may reinforce memory by helping students develop meaningful links between concepts.

The present finding also agrees with Adebisi (2017), who found that students taught using concept mapping strategy achieved significantly higher retention scores than those taught using conventional methods. This indicates that the influence of concept mapping on retention has been observed across different subject areas, including Physics and Economics. Overall, the findings demonstrate that concept mapping and scaffolding strategies are effective instructional approaches for improving students' interest, academic achievement, and retention in Economics. The consistency of the findings with previous empirical studies strengthens the argument that learner-centred instructional strategies provide better learning outcomes than conventional teaching methods, particularly in subjects involving abstract concepts and complex relationships such as Economics.

RECOMMENDATIONS

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

1. Since students taught using concept mapping and scaffolding strategies recorded higher interest ratings in Economics than those taught using the conventional teaching method, Economics teachers should adopt concept mapping and scaffolding strategies during classroom instruction to stimulate students' interest and positive attitude towards the subject.
2. Since students taught using concept mapping and scaffolding strategies achieved higher academic achievement scores than those taught using the conventional teaching method, Economics teachers should integrate these strategies into their teaching practices to improve students' academic performance in Economics.
3. Since students taught using concept mapping and scaffolding strategies demonstrated higher retention scores than those taught using the conventional teaching method, teachers of Economics should apply these strategies when teaching difficult concepts to enhance students' ability to retain learned knowledge.

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