

Enhancing Social Studies Achievement: A Comparison of Concept Mapping and Discussion Methods in Adamawa State, Nigeria

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ABSTRACT

Improving students' achievement in Social Studies remains a key concern in Nigerian junior secondary schools, largely due to overreliance on lecture-based instruction. This study explored the effectiveness of concept mapping and discussion methods—learner-centered approaches that foster participation, visualization, and critical thinking. Using a quasi-experimental pretest–posttest–retention design, 326 JSS II students from six schools in Adamawa State were assigned to concept mapping, discussion, or lecture groups. The Social Studies Achievement Test (SSAT), validated and reliable ($KR-20 = 0.89$), was used for data collection. Results showed that both concept mapping and discussion methods significantly improved achievement over the lecture method, with discussion yielding the highest gain ($M_{diff} = 16.16$). ANCOVA confirmed a significant effect of instructional method ($F(2,294) = 14.47, p < .05, \eta^2 = 0.09$). Gender and interaction effects were not significant, indicating equal benefits for male and female students. The study concludes that learner-centered strategies enhance understanding and retention in Social Studies and recommends their adoption in classrooms, along with teacher training to support interactive teaching.

Keywords: Concept Mapping, Discussion Method, Instructional Strategies, Retention Test, Constructivist Pedagogy, Educational Innovation, Social Studies Achievement, Adamawa State.

INTRODUCTION

The quality of Social Studies instruction plays a vital role in shaping civic knowledge, critical thinking, and social

responsibility among learners. Across the globe, educational reforms increasingly emphasize learner-

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centered pedagogies that promote active participation, conceptual understanding, and long-term knowledge retention (Wang, Chen, & Li, 2025; Izci, Cevik, & Turan, 2023).

Within this paradigm, concept mapping and discussion methods have emerged as effective instructional approaches that encourage students to construct meaning through engagement, dialogue, and visualization. These strategies align with the constructivist philosophy of learning, which views knowledge acquisition as an active process of meaning-making rather than passive reception (Novak, 2010).

In contrast, the lecture method, though widely practiced in many developing countries, has been criticized for promoting rote memorization and superficial learning. Studies from both advanced and developing educational systems have shown that overreliance on teacher-centered instruction limits learners' critical reasoning and problem-solving abilities (Usman & Yusuf, 2023; Attah & Ogbaji, 2025).

Globally, educators have transitioned toward collaborative and inquiry-based teaching techniques that enable students to integrate prior knowledge with new concepts, thereby improving retention and transfer of learning (Gowon & Yusuf, 2022; Cleopas & Igbojinwaekwu, 2024). Despite this trend, the lecture method remains dominant in Nigerian classrooms, especially in Social Studies instruction, due to factors such as large class sizes, examination pressure, and inadequate teacher training (Ifeoma, 2021; Junaid & Ayinde, 2018).

Social Studies, as a subject, aims to foster citizenship education, national consciousness, and problem-solving skills among young learners. However, evidence from several Nigerian states, including Adamawa, indicates persistent underachievement in Social Studies, attributed partly to the passive learning approaches commonly used (Ogheneakoke, Omo-Ojugo, & Benike, 2019). The need for improved teaching strategies has therefore become urgent. Concept mapping offers a visual representation of knowledge that enhances comprehension by connecting ideas hierarchically (Oyeyemi & Azeez, 2024). Discussion methods, on the other hand, emphasize dialogue, peer learning, and reflection, which align with Vygotsky's social constructivism, where learning is mediated through interaction and collaboration (Omovie & Okarume, 2023; Ugwu, Jatau, & Gwamna, 2020).

Comparative studies from both local and international contexts have demonstrated that these learner-centered approaches can significantly enhance academic achievement. For instance, Izci, Cevik, and Turan (2023) found that concept mapping improved students' performance across STEM and humanities subjects, while Wang, Chen, and Li (2025) confirmed its global efficacy in promoting meaningful learning. Similarly, Cleopas and Igbojinwaekwu (2024) reported that discussion-based teaching significantly improved retention and attitudes toward science learning. Yet, there remains a dearth of

empirical studies in Nigeria that directly compare these two strategies within the context of Social Studies, especially in the diverse sociocultural environment of Adamawa State.

This study, therefore, investigates the comparative effects of concept mapping and discussion methods on students' academic achievement in Social Studies at the junior secondary level in Adamawa State, Nigeria. It also examines the relative effectiveness of these strategies against the traditional lecture method and explores whether gender moderates their impact on learning outcomes.

Research Question

What are the differences in achievement among students taught Social Studies using concept mapping, discussion, and lecture methods?

Research Hypothesis

H₀₁: There is no significant difference in the mean achievement scores of students taught Social Studies using concept mapping, discussion, and lecture methods in junior secondary schools of Adamawa State, Nigeria.

Methodology

Research Design

This study employed a quasi-experimental, non-equivalent pretest–posttest–retention test control group design. The design was considered appropriate because random assignment of students was not possible within the natural classroom settings of the participating schools (Creswell, 2012).

The independent variable was the instructional method (concept mapping, discussion, and lecture), while the dependent variable was the students' achievement in Social Studies. This design enabled the comparison of the relative effectiveness of two learner-centered methods with the traditional lecture method while controlling for initial differences in students' academic ability.

Study Area and Population

The study was conducted in Adamawa State, located in the northeastern region of Nigeria. The state is divided into five educational zones—Ganye, Gombi, Numan, Mubi, and Yola—under the supervision of the Post Primary Schools Management Board. Adamawa is characterized by educational, cultural, and geographical diversity, making it suitable for comparative pedagogical research. The population comprised 43,205 Junior Secondary School II (JSS II) students enrolled in public secondary schools across the state during the 2023/2024 academic session (Post Primary Schools Management Board, 2024).

Sample and Sampling Techniques

A total of 326 students participated in the study, drawn from six public junior secondary schools across three educational zones—Ganye, Gombi, and Mubi. The choice of these zones was deliberate:

Ganye Zone represents the southern educational district, known for mixed rural–urban schooling contexts.

Gombi Zone represents the central belt, characterized by average school enrolment and access to instructional resources.

Mubi Zone represents the northern part of the state, hosting urbanized schools with higher student populations. This selection ensured geographical and socio-educational representation, thereby improving the external validity of the findings.

Sampling followed a stratified and simple random procedure. The state was first stratified into educational zones, after which three zones were randomly selected. Two schools were then randomly chosen from each selected zone, and one intact JSS II class was purposively used per school to maintain the integrity of existing class structures. Altogether, 109 students formed the concept mapping group (Experimental Group I), 102 students formed the discussion group (Experimental Group II), and 115 students constituted the lecture group (Control Group).

Instrumentation

Data were collected using the Social Studies Achievement Test (SSAT)—a 50-item multiple-choice test designed to measure students' understanding of Social Studies concepts. The instrument was adapted from past Basic Education Certificate Examination (BECE) questions set by the National Examinations Council (NECO) between 2019 and 2023 to ensure curriculum relevance. Each question had four options (A–D) with one correct answer, scored 1 for correct and 0 for incorrect responses.

Validity and Reliability

The instrument underwent face and content validation by three experts—two from the Department of Environmental and Life Sciences Education, Modibbo Adama University, Yola, and one experienced Social Studies teacher from the Post Primary Schools Management Board. The experts assessed each item for relevance, clarity, and alignment with curriculum objectives. Their feedback was used to revise ambiguous or redundant items before final administration.

To establish reliability, a pilot test was conducted using a sample of 40 JSS II students from a non-participating school. The Kuder–Richardson Formula 20 (KR–20) yielded a coefficient of 0.89, indicating high internal consistency suitable for educational measurement (Taber, 2018).

Experimental Procedure

To ensure instructional fidelity and minimize teacher bias, six trained Social Studies teachers—one from each selected school—served as research assistants. Prior to the experiment, they participated in a two-day orientation and lesson plan workshop organized by the researchers. During the training, they were familiarized with the concept mapping and discussion strategies, as well as standardized lesson plans developed for the study.

Each group received lessons covering the same Social Studies topics, drawn from the JSS II curriculum. While the content was identical across groups, the teaching approach differed:

Experimental Group I (Concept Mapping): Lessons emphasized hierarchical organization of ideas using visual maps created collaboratively by students.

Experimental Group II (Discussion): Lessons centered on guided peer discussions, question–answer sessions, and cooperative problem-solving activities.

Control Group (Lecture): Lessons followed the traditional teacher-centered approach with minimal student participation.

The teaching lasted three weeks, followed by a posttest immediately after instruction and a retention test two weeks later to measure knowledge retention. While the two-week interval provided preliminary retention data, future studies are encouraged to extend the retention test to 4–6 weeks to assess long-term memory and learning sustainability, as suggested by the editor.

Data Collection and Analysis

Data were collected in five sequential phases: teacher training, pretest administration, instructional intervention, posttest, and retention test. The collected data were coded and analyzed using SPSS version 24.

Descriptive statistics (mean and standard deviation) were used to summarize performance trends across the groups. Analysis of Covariance (ANCOVA) was employed to test the null hypothesis at a 0.05 level of significance, using pretest scores as covariates to adjust for initial group differences.

Effect size was computed using partial eta squared (η^2) to assess the magnitude of the instructional impact, classified according to Cohen's (1988) benchmarks.

RESULTS

This section presents findings according to the research question and hypothesis. Descriptive statistics were used to compare the performance of students taught with concept mapping, discussion, and lecture methods, while inferential statistics (ANCOVA) tested for significant differences in achievement after controlling for pretest scores.

Table 1: Descriptive Statistics of Pretest and Posttest Scores

Group	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Difference
Concept Mapping	109	10.33	4.23	24.96	8.71	14.63
Discussion	102	9.70	3.98	25.86	7.16	16.16
Lecture	115	8.06	3.61	20.19	5.85	12.13

Table 2: ANCOVA Results for Posttest Scores by Teaching Method

Source	SS	df	MS	F	Sig.	Partial η^2
Group (Teaching Method)	1544.09	2	772.04	14.47	<.001	0.09
Gender	200.21	1	200.21	3.75	.054	0.01
Group \times Gender	104.13	2	52.06	0.98	.378	0.00
Error	15690.84	294	53.37			
Total	17454.73	299				

Descriptive Statistics of Students' Pretest and Posttest Scores

Table 1 shows the descriptive statistics for students' performance before and after the instructional interventions across the three teaching methods. All groups showed improvement from pretest to posttest, indicating that learning occurred regardless of method. However, the discussion method produced the highest mean gain (16.16), followed by concept mapping (14.63), while the lecture group recorded the lowest improvement (12.13). These results suggest that both learner-centered approaches yielded better achievement outcomes than the conventional lecture method.

ANCOVA Results Testing the Hypothesis

The hypothesis that there is no significant difference in mean achievement scores among students taught with concept mapping, discussion, and lecture methods was tested using ANCOVA. Pretest scores served as covariates to adjust for baseline differences. The results in Table 2 show a significant main effect of instructional method on students' academic achievement in Social Studies ($F(2,294) = 14.47, p < .05$). The calculated partial eta squared ($\eta^2 = 0.09$) indicates a medium effect size (Cohen, 1988), confirming that instructional methods contributed meaningfully to differences in student achievement. Neither gender ($F(1,294) = 3.75, p > .05$) nor the interaction between method and gender ($F(2,294) = 0.98, p > .05$) was significant, suggesting that both male and female students benefited similarly from the learner-centered strategies.

Comparison with Previous Findings

The findings of this study are consistent with those of Izci, Cevik, and Turan (2023), who reported that concept mapping significantly enhances comprehension and achievement across various subjects. Similarly, Cleopas and Igbojinwaekwu (2024) found that discussion-based learning improved both performance and attitude toward

biology, affirming the collaborative advantage of peer interaction. The superiority of the discussion method observed in this study aligns with Ugwu, Jatau, and Gwamna (2020), who reported that interactive teaching enhanced retention among Nigerian students. However, the current result contrasts slightly with Achimugu and Mohammed (2021), who found concept mapping to be the most effective strategy in mathematics, suggesting that subject type and cognitive domain may influence instructional impact.

Summary of Findings

- i. Both concept mapping and discussion methods significantly improved students' academic achievement compared to the lecture method.
- ii. The discussion method recorded the highest achievement gain, demonstrating stronger effectiveness in facilitating understanding and engagement.
- iii. There was no significant effect of gender on performance, indicating that the benefits of these strategies are gender-neutral.
- iv. The medium effect size ($\eta^2 = 0.09$) suggests a practically meaningful contribution of instructional methods to student learning outcomes.

DISCUSSION

The results of this study demonstrate that both concept mapping and discussion methods significantly enhanced students' achievement in Social Studies when compared to the traditional lecture method. These findings highlight the value of learner-centered instructional strategies in promoting meaningful understanding, active engagement, and long-term retention among junior secondary school students in Nigeria.

The superior performance of the discussion group suggests that interactive and dialogic approaches better align with the learning culture and classroom dynamics of Nigerian schools. Social Studies, being an interpretive and participatory subject, thrives on shared dialogue, peer

exchange, and collaborative reasoning. The discussion method promotes these elements by allowing students to articulate their ideas, challenge assumptions, and refine understanding through social interaction. This outcome aligns with Vygotsky's (1978) social constructivist theory, which posits that learning occurs most effectively through guided interaction within a learner's "zone of proximal development." Through peer dialogue, learners co-construct knowledge, benefiting from the collective reasoning and experiences of others (Omovie & Okarume, 2023; Ugwu, Jatau, & Gwamna, 2020).

The results also support findings by Cleopas and Igbojinwaekwu (2024) and Saba and Adebayo (2023), who reported that cooperative and discussion-based learning environments significantly improve students' motivation, critical thinking, and achievement in science and Social Studies. The strong effect of discussion-based learning may also be attributed to contextual factors such as cultural preference for oral communication and group consensus typical of Nigerian classrooms, where verbal interaction is valued over solitary learning (Usman & Yusuf, 2023).

The effectiveness of concept mapping in this study corroborates earlier evidence that visualization of knowledge enhances comprehension and cognitive organization (Novak, 2010; Izci, Cevik, & Turan, 2023). Students exposed to concept mapping were able to see the logical connections between ideas, improving their ability to recall and apply learned concepts. However, its slightly lower performance compared to the discussion method could stem from limited familiarity with graphic organizers among students and teachers. As Achimugu and Mohammed (2021) noted, concept mapping requires adequate training to enable learners to independently construct and interpret conceptual hierarchies. Without such proficiency, students may focus more on drawing maps than on processing conceptual meaning, leading to modest gains.

The weak performance of the lecture method aligns with prior research that identified its limitations in promoting critical thinking and learner participation (Ifeoma, 2021; Junaid & Ayinde, 2018). Lecture-based instruction often fosters rote memorization, preventing students from engaging deeply with content or developing problem-solving abilities (Ogheneakoke, Omo-Ojugo, & Benike, 2019). The current study's results reinforce the argument that reliance on lectures perpetuates surface learning and hinders academic achievement in Social Studies.

Interestingly, gender did not significantly affect achievement, consistent with Ugwu et al. (2020) and Saba and Adebayo (2023), who found that teaching methods rather than gender differences primarily determine learning outcomes. This suggests that both male and female students can benefit equally from participatory instructional strategies when classroom interaction and teacher support are optimized.

The findings have practical implications for teacher education and curriculum design. They emphasize the

need to institutionalize interactive, visual, and inquiry-oriented pedagogies in Social Studies teaching to improve learning outcomes. Teacher training programs should focus on equipping educators with the skills to design structured discussions, construct concept maps, and balance both techniques to cater to different learning preferences.

However, the study acknowledges certain limitations that may have influenced the results. Variations in teacher enthusiasm, classroom resources, and student familiarity with the methods may have affected instructional fidelity. Additionally, the two-week retention test provides only a short-term assessment of learning; future studies should adopt longer intervals to measure sustained retention and transfer of knowledge.

In summary, the discussion method emerged as the most effective instructional strategy for enhancing Social Studies achievement, followed closely by concept mapping. Both methods outperformed the lecture approach, affirming the relevance of constructivist pedagogy in modern classroom practice.

Conclusion and Recommendations

Conclusion

This study investigated the comparative effects of concept mapping and discussion methods on students' academic achievement in Social Studies in Adamawa State, Nigeria. The findings revealed that both learner-centered methods significantly improved students' achievement when compared with the conventional lecture approach. Specifically, the discussion method yielded the highest mean gain, underscoring its strength in promoting interaction, critical thinking, and collaborative learning. The concept mapping method also enhanced comprehension and retention by helping students visualize and organize key concepts systematically. These results reinforce the principles of constructivist learning theory, particularly Vygotsky's social constructivism, which emphasizes the central role of interaction and collaboration in the construction of knowledge. The findings further confirm that effective pedagogy depends not merely on the content delivered, but on the instructional strategy that facilitates learner participation and reflection. The non-significant gender effect indicates that both male and female students can benefit equally when instruction emphasizes inclusivity and dialogue. In conclusion, the study provides empirical support for the adoption of active, student-centered pedagogies in Nigerian junior secondary schools. When properly implemented, these methods have the potential to enhance academic achievement, encourage problem-solving, and prepare learners for citizenship responsibilities that Social Studies seeks to promote.

Recommendations

Based on the findings and conclusions, the following

recommendations are made:

- i. **Adoption of Learner-Centered Pedagogies:** Teachers should integrate discussion and concept mapping strategies into their regular classroom instruction to promote deeper understanding, engagement, and retention among students.
- ii. **Teacher Training and Professional Development:** The Ministry of Education and Post Primary Schools Management Board should organize periodic in-service workshops and seminars to train teachers on the effective use of participatory instructional strategies. These workshops should also emphasize assessment techniques that align with interactive teaching.
- iii. **Integration of ICT Tools:** Teachers should be encouraged to utilize digital concept mapping software (such as Coggle, Mind Meister, and Lucid chart) and virtual discussion platforms to make Social Studies lessons more dynamic, collaborative, and technologically relevant.
- iv. **Curriculum Reform:** Curriculum planners at the Nigerian Educational Research and Development Council (NERDC) should review the Social Studies curriculum to explicitly promote constructivist and interactive pedagogical approaches.
- v. **Gender-Responsive Teaching Practices:** Even though gender differences were not significant, teachers should maintain inclusive practices—ensuring that both boys and girls actively participate and benefit equally from learner-centered instruction.
- vi. **Extended Retention Studies:** Future researchers should replicate this study using longer retention intervals (4–6 weeks) to assess long-term memory effects and determine whether instructional gains are sustained over time.
- vii. **Comparative and Multi-Subject Studies:** Further investigations should extend the comparative analysis of instructional methods to other subjects such as Civic Education, Geography, and Basic Science to generalize findings across disciplines.

Policy Implications

The results of this study have clear implications for educational policy and classroom practice. Policymakers should prioritize teacher capacity-building in participatory pedagogies, allocate resources for ICT-based instructional aids, and support continuous monitoring to ensure fidelity in classroom implementation. Institutionalizing innovative methods will contribute to the achievement of Sustainable Development Goal (SDG) 4, which advocates for inclusive and equitable quality education for all learners.

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