EFFECTS OF INQUIRY TEACHING METHOD ON ECONOMICS STUDENTS' ACADEMIC ACHIEVEMENT IN SENIOR SECONDARY SCHOOLS IN ADAMAWA STATE, NIGERIA

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Abstract

The objective of the study is to investigate the effect of inquiry teaching method on the academic achievement of students in Economics in senior secondary schools in Adamawa State, Nigeria. Two research questions were raised to guide the study and three hypotheses were tested at 0.05 level of significance. The study adopted the pretest, posttest, non-equivalent quasi-experimental research design. The population of 13, 259 Economics students (SS II) were used for the study. Purposive and stratified sampling techniques were used to select sample size of 239 Economics students (SS II) from two education zones for this study. Economics Achievement Test (EAT) was the instruments used for data collection. Cronbach Alpha statistic was used to analyze the data from the trial test of the instrument, reliability coefficients of 0.83 was obtained for Economics Achievement Test. Mean and standard deviation was used in analyzing the research questions while t-Test and ANCOVA were used for testing the hypotheses. The findings of the study indicated that Students' level of academic achievement improves when taught economics using enquiry method. Based on these findings, it was recommended that educational institutions in Adamawa State should promote the widespread adoption of inquiry-based teaching methods in Economics. Also creating a student-centered learning environment is essential for optimizing the benefits of inquiry-based teaching methods. Schools should conduct regular assessments and monitor effectiveness to ensure the improvements in different teaching methods, establish a system for regular assessments and continuous monitoring of teaching practices.

Key words: *Inquiry Method, Teaching Practice, Economics, Assessment Methods, Academic Achievement*.

Introduction

Education is widely recognized as a critical instrument for personal and societal development. One of its primary objectives is the holistic development of learners, equipping them with the knowledge, skills, and attitudes necessary for effective participation in social, economic, and political life (Ibrahim, Hamza, Bello & Adamu, 2018). Within this broader educational context, academic achievement serves as a key indicator of students' learning outcomes, reflecting how well learners acquire knowledge, develop competencies, and apply skills in specific subjects. In senior secondary schools, academic achievement is not only a measure of individual student performance but also a benchmark for evaluating the effectiveness of instructional strategies and school quality.

Economics, as a social science subject, is central to the senior secondary school curriculum in Nigeria. It equips students with the knowledge to understand the production, distribution, and consumption of goods and services, as well as the analytical skills required to make informed economic decisions. Success in Economics is critical, as it determines eligibility for entry into many tertiary-level programmes in fields such as Economics, Accountancy, Business Administration, and Insurance. Despite its importance, students' academic achievement in Economics has remained suboptimal, with many learners struggling to master fundamental concepts and apply them in practical contexts (Ojo, 2016). A significant factor influencing this challenge is the teaching methodology employed by educators.

The teaching method adopted in the classroom plays a decisive role in shaping students' academic achievement. Traditional teacher-centered approaches, such as lecture or oral exposition methods, often limit active student engagement, reduce opportunities for critical thinking, and constrain students' ability to construct knowledge independently. In contrast, inquiry-based teaching methods emphasize student-centered learning, where learners actively engage with content through questioning, investigation, problem-solving, and critical reflection. By fostering higher-order thinking skills, promoting curiosity, and encouraging exploration, the inquiry method has the potential to enhance students' understanding of complex economic concepts and, consequently, improve their academic achievement (Sola & Ojo, 2007; Vanderpool & Robinson, 2017).Inquiry teaching encompasses structured, guided, and open approaches, each varying in the level of teacher guidance provided. Structured inquiry provides clear instructions and guidance for learning activities, while guided inquiry allows students to take partial responsibility for the learning process. Open inquiry, on the other hand, positions students as independent learners, requiring them to plan and execute investigations autonomously (Cheval & Hart, 2005). Regardless of the type, inquiry teaching encourages reflection, critical thinking, and active engagement—factors that are closely linked to improved academic performance.

Empirical evidences suggests that instructional methods significantly influence students' achievement. Students exposed to interactive, student-centered approaches, such as inquiry learning, often demonstrate superior performance compared to peers taught via traditional lecture methods. By providing learners with opportunities to construct knowledge actively, relate concepts to real-life scenarios, and engage collaboratively with peers, inquiry teaching strengthens comprehension and retention, thereby enhancing academic achievement (Ugwu, 2014; Narad & Abdullah, 2016).

In the context of senior secondary schools in Adamawa State, where poor academic performance in Economics has been reported, it becomes imperative to explore teaching strategies that can enhance learning outcomes. Linking the dependent variable academic achievement to the independent variable inquiry teaching method this study seeks to examine how student-centered, inquiry-based approaches influence learners' understanding, engagement, and performance in Economics. Understanding this relationship is critical for developing effective pedagogical strategies that can improve learning outcomes and foster higher academic achievement among senior secondary school students.

Statement of the Problem

Ideally, teaching Economics at the senior secondary school level should foster critical thinking, problem-solving, and analytical skills through learner-centered instructional strategies such as the inquiry teaching method. This approach encourages students to actively construct knowledge, apply economic concepts to real-life scenarios, and develop a deeper, long-lasting understanding of the subject. By engaging learners in questioning, investigation, and reflection, the inquiry method is expected to enhance students' comprehension, motivation, and overall academic achievement. However, the reality in many senior secondary schools in Adamawa State shows a heavy reliance on teacher-centered approaches, particularly the traditional lecture method. Such instructional practices often limit students' participation, discourage independent reasoning, and reduce opportunities for active engagement in the learning process. As a result, students struggle to understand fundamental economic concepts, fail to develop essential analytical and problem-solving skills, and frequently demonstrate low interest and motivation in Economics.

The consequences of this gap between the ideal and the actual instructional practices are evident in students' poor academic performance in Economics examinations. The continued dominance of teacher-centered methods has contributed to declining achievement levels, underdeveloped cognitive skills, and reduced preparedness for higher education and real-world economic decision-making. Therefore, the problem of this study is to examine the effects of the inquiry teaching method on the academic achievement of Economics students in senior secondary schools in Adamawa State, Nigeria. Understanding this relationship is crucial for identifying pedagogical strategies that can enhance learning outcomes and improve students' performance in Economics.

Purpose of the Study.

The purpose of this study is to investigate the effects of inquiry teaching method on achievement Economics students' academic achievement in Senior Secondary Schools in Adamawa State, Nigeria. Specially, the study sought to::

1. Determine the pre-test mean achievement score of Economics students before the treatment in Senior Secondary Schools in Adamawa State
2. Compare the pre-test and post-test mean achievement scores of students taught Economics using the inquiry and lecture methods in Senior Secondary Schools in Adamawa State
3. Examine the pre-test and post-test mean achievement scores of male and female students taught Economics using the inquiry and lecture methods in Senior Secondary Schools in Adamawa State
4. Determine the interaction effect between teaching methods (inquiry and lecture) and gender on students' academic achievement in Economics in Senior Secondary Schools in Adamawa State.

Hypotheses

The following hypotheses were formulated and were tested at a 0.05 level of significance:

$H0_1$: There is no significant difference between the pre-test mean score of economics student before the treatment in Senior Secondary Schools of Adamawa State

$H0_2$ There is no significant difference between the mean scores of students taught Economics using

inquiry method and those taught with lecture method in Senior Secondary School of Adamawa State.

$H0_3$: There is no significant difference between the mean scores of students taught Economics using Inquiry method and those taught with lecture method in Senior Secondary School of Adamawa State based on gender.

$H0_4$: There is no significant interaction effects between teaching methods (inquiry and lecture) and gender on students' academic achievement in Economicsin Senior Secondary School of Adamawa State.

Methodology

This methodology of this study comprises the population, the sampling, and the location of the study. Method of data analysis will guide us towards answering the objectives of the study.

The area of the study is Adamawa state which is located in the North-Eastern part of Nigeria. The state was selected for the purpose of this study for its highest gross net enrolment rate in secondary schools and the third in primary schools with the highest number of secondary school's teachers (19, 645) in North East Zone as at 2015 (Universal Basic Education, 2015). The population of the study was 13,259 Senior Secondary School students (SSII) in Adamawa State, (Adamawa State Education Resource Center 2021). The reason for selecting SSII was because the class is stable. The Students were also not freshly introduced to senior secondary school economics as those in SSI nor are they preparing for external examination as SSIII students, it was easy to get permission from school authorities to use these sets of students. The Instrument for Data Collection Economics Achievement Test (EAT) was used as instruments for collection of data. The instrument consists of 50 multiple choice test items with options A-D for each item. The test items were based on the following taught topics; meaning and basic concepts of economics, basic economic problem of the society, concept of production, money and its function. Test items were drawn from a pool of past WAEC objectives questions related to the topics selected. Data used was primary data.

Data was analyzed using the statistical package for social sciences (SPSS, version 25). The mean and standard deviation was used to answer the research questions. Analyses of covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. Decision rule, if P-valve $\leq$ 0.05 level of significance, the null hypotheses is rejected otherwise do not reject.

Results and Discussion

This chapter presents the results of the study. The data collected during the study was analyzed using descriptive statistics of mean and standard deviation, then. The hypotheses were tested at 0.05 level of significance.

Presentation of Results

Three research questions were formulated and answered using descriptive statistics of mean and standard deviation, while the hypotheses one to three were tested using independents sample t-test and hypothesis four was tested using two-way ANOVA at 0.05 level of significance.

Research Question 1: What is the pretest mean score of economics student before the treatment in senior secondary schools' student of Adamawa state.

Table 1. Mean and Standard Deviation of pretest mean score of economics student before the treatment

		PRETEST	
METHODS	N	Mean	SD
Inquiry method	114	10.95	2.68
Lecture method	125	10.83	3.54

The descriptive statistics in Table 1 revealed that, inquiry with 114 students has a pretest mean score of 10.95 and standard deviation of 2.68. The conventional lecture method has 125 students with a mean score of 10.83 and standard deviation of 3.54 at pretest level. In summary, the means shows no difference between pretest score of the two groups before the treatment.

Research Question 2: What are the pre-test and post-test mean achievement score of students taught using Economics using Inquiry and lecture methods in senior secondary school of Adamawa State?

Table 2. Mean and Standard Deviation of Pre-test and Post-test Mean Achievement Score of Students when Taught using Economics using Inquiry and Lecture Methods of Teaching

		PRETEST		**POSTEST**		**MD**
METHODS	N	Mean	SD	Mean	SD	
Inquiry method	114	10.95	2.68	39.54	8.02	28.59
Lecture method	125	10.83	3.53	33.72	9.21	22.89

The descriptive statistics in Table 2 revealed that, inquiry with 114 students has a pretest mean score of 10.95and standard deviation of 2.68. In the posttest, the inquiry has the highest mean score of 39.54 with a standard deviation of 8.02. The conventional lecture method has 125 students with a mean score of 10.83and standard deviation of 3.53 at pretest level and mean score of 33.72 with standard deviation of 9.21 at posttest level. In summary, the mean difference between pretest and posttest is high which means the instructional strategies under study (Inquiry and lecture) were equally important at improving students' achievement at different levels.

Research Question 3: What are the pre-test and post-test mean achievement score of students taught' Economics using Inquiry and lecture methods of teaching based on gender in senior secondary school of Adamawa State?

Table 3. Mean and Standard Deviation of Pre-test and Post-test Mean Achievement Score of Students when Taught using Economics using Inquiry and Lecture Methods of Teaching by gender

METHODS			PRETEST		POSTEST		MD
	GENDER	N	Mean	SD	Mean	SD	
Inquiry Method	Male	60	10.43	2.44	38.77	8.29	28.34
	Female	54	11.52	2.81	40.41	7.68	11.01
Lecture Method	Male	50	10.24	3.78	30.12	8.25	19.88
	Female	75	11.22	3.34	36.12	9.08	24.90

Hypotheses Testing

$H0_1$: there is no significance difference between the pretest mean score of economics student before the treatment in senior secondary schools of Adamawa State.

Table 4. t-test Significant difference between the pretest mean score of economics student before the treatment in senior secondary schools of Adamawa State.

Methods	n	Mean	SD	MD	df	t	p-value
Inquiry Method	114	10.95	2.677				
				0.115	237	0.282	0.778
Lecture Method	125	10.83	3.539				

The results of the analysis in Table 4 shows that, there is no significance difference between the pretest mean score of economics student before the treatment in senior secondary schools of Adamawa State with t = 0.282 (df 237), P = 0.778. Since the computed p-value (0.778) is greater than 0.05 level of significant, therefore, the null hypothesis of no significance difference between the pretest mean score of economics student before the treatment is retained.

$H0_2$ There is no significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in senior secondary school of Adamawa State.

Table 5. t-test significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in senior secondary school of Adamawa State.

Methods	n	Mean	SD	MD	df	t	p-value
Inquiry Method	114	39.54	8.016				
				5.824	237	5.191	0.000
Lecture Method	125	33.72	9.214				

The results of the analysis in Table 5 shows that, there is significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in Adamawa State with t = 5.191 (df 237), P = 0.000. Since the computed p-value (0.00) is less than 0.05 level of significant, therefore, the null hypothesis of no significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in Adamawa State is rejected.

$H0_3$: There is no significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in senior secondary schoolof Adamawa State based on gender.

Table 6. t-test significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in senior secondary school of Adamawa State based on gender.

GENDER	n	Mean	SD	MD	df	t	p-value
Male	110	34.84	9.302				
				-3.078	237	-2.632	0.009
Female	129	37.91	8.757				

The results of the analysis in Table 6 shows that, there is difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method based on gender in Adamawa State with t = -

2.632 (df 237), P = 0.009. Since the computed p-value (0.009) is less than 0.05 level of significant, therefore, the null hypothesis of no significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in Adamawa State is retained.

$H0_4$: There is no significant interaction effects between the mean scores of student's taught Economics using (Inquiry method and lecture method) and gender (male and female) in senior secondary school of Adamawa State.

Table 7. Two-Way Ancova of Significant Interaction Effects between the Mean Scores of Student's Taught Economics using (Inquiry Method and Lecture Method) and Gender (Male and Female) in Adamawa State

Source		Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	308606.394	1	308606.394	362.195	.033
	Error	852.046	1	852.046[a]		
METHODS	Hypothesis	2441.534	1	2441.534	8.803	.207
	Error	277.343	1	277.343[b]		
GENDER	Hypothesis	852.046	1	852.046	3.072	.330
	Error	277.343	1	277.343[b]		
METHODS * GENDER	Hypothesis	277.343	1	277.343	3.919	.049
	Error	16630.970	235	70.770[c]		

The results of the analysis in Table 7 shows that, there is significant interaction effects between the mean scores of student's taught Economics using (Inquiry method and those taught with lecture method) and gender (male and female) in Adamawa State F = 3.919 (df 1,235), P = 0.049. Since the computed p-value (0.049) is less than 0.05 level of significant, therefore, the null hypothesis of no significant interaction effects between the mean scores of student's taught Economics using (Inquiry method and lecture method) and gender (male and female) in Adamawa State is rejected.

Summary of Major Findings

The study revealed the following findings:

1. There is no significance difference between the pretest mean score of economics student before the treatment in senior secondary schools of Adamawa State.
2. There is significant difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method in Adamawa State
3. There is difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method based on gender in Adamawa State.
4. There is no difference between the mean scores of student's taught Economics using Inquiry method and those taught with lecture method based on gender in Adamawa State.
5.

Discussion of Findings

The finding of the study revealed that there is no significant difference between the pretest mean scores of economics students before the treatment in senior secondary schools of Adamawa State. This suggests that both the experimental and control groups were academically equivalent at the beginning of the study, and any subsequent difference in achievement can be attributed to the

instructional methods applied rather than pre-existing disparities. This finding is consistent with the results of Stephen et al. (2019), who found no statistically significant difference in the pretest scores between students taught biology using the inquiry method and those taught using the lecture method.

Similarly, Omokaadejo (2015) reported no significant pretest differences among chemistry students exposed to guided inquiry and traditional teaching methods, reinforcing the notion that both groups started from a comparable academic level. Ali (2014) also supported this trend in his study in Iran, where pre-intervention scores in science did not differ significantly between the control and experimental groups. The agreement of this finding with previous studies may be attributed to the consistent use of quasi-experimental designs and validated achievement tests, which ensure fair measurement and initial group equivalence. Additionally, the purposive and random sampling methods used across these studies, including the present one, likely contributed to balanced group formation. Therefore, this finding justifies that the absence of significant differences at pretest strengthens the internal validity of the study and provides a solid foundation for evaluating the true effect of instructional methods on students' academic achievement.

The finding of the study revealed that there is a significant difference between the mean scores of students taught Economics using the inquiry method and those taught with the lecture method in Adamawa State, with students exposed to the inquiry method outperforming their counterparts. This result aligns with several previous studies that support the effectiveness of the inquiry-based teaching method in enhancing students' academic achievement. For instance, Stephen et al. (2019) found that biology students taught using the inquiry method achieved significantly higher scores compared to those taught using the lecture method. Similarly, Ibrahim, Hamza, and Adamu (2018) reported that chemistry students in a teacher training college taught using the inquiry method outperformed those taught traditionally, and the method also promoted better retention. Lindsey (2018), in a study on eighth-grade social studies in South Carolina, also found improved academic achievement due to inquiry-based learning. Jamal (2017) demonstrated that students taught genetics using inquiry-based activities performed better in science process skills than those taught conventionally.

These findings agree with the current study as they all highlight the positive impact of student-centered, inquiry-driven approaches across various subjects and levels. The consistency of these outcomes can be attributed to the active engagement, critical thinking, and deeper understanding fostered by the inquiry method, which contrasts with the passive learning often associated with lecture methods. In the context of this study, the improved achievement in Economics may be due to the method's ability to stimulate learners' curiosity and involvement in problem-solving, making abstract economic concepts more relatable and easier to grasp. This justifies the agreement with past research and underscores the relevance of incorporating inquiry-based strategies in the teaching of Economics in senior secondary schools to boost learning outcomes.

The finding of the study revealed that there is a difference between the mean scores of students taught Economics using the inquiry method and those taught with the lecture method based on gender in Adamawa State. This suggests that gender played a role in how

effectively students benefitted from the teaching methods, with one gender performing better than the other under the inquiry approach. This finding is in agreement with the study by Sylvanus and Eke (2017), which reported that male students outperformed female students in chemistry when taught using inquiry-based strategies. Similarly, Adigun et al. (2015) found a significant gender difference in academic achievement in computer science, with male students showing better outcomes, particularly in private schools.

In contrast, studies such as Mkpa and Njideka (2019) and Olibie and Ezeoba (2013) reported no significant gender difference in students' achievement when taught using guided inquiry methods in history and social studies, respectively, suggesting that both male and female students can benefit equally from inquiry-based instruction. The disagreement between these studies and the present research may be attributed to subject specificity, contextual factors, or socio-cultural differences in learning environments. Economics, as a subject involving analytical thinking and abstract reasoning, may present unique challenges or advantages to different genders depending on their prior exposure, confidence levels, and learning support. Therefore, the gender-based difference observed in this study could be influenced by these contextual factors, highlighting the need for more inclusive teaching strategies that address diverse learning needs across genders. This finding also emphasizes the importance of teacher sensitivity to gender dynamics in the classroom to ensure equitable learning outcomes when using inquiry-based methods.

The finding of the study revealed that there is no significant difference between the mean scores of students taught Economics using the inquiry method and those taught with the lecture method based on gender in Adamawa State. This implies that both male and female students benefitted equally from the inquiry-based instructional method, and gender did not significantly influence academic achievement in this context. This finding is consistent with the results of several previous studies. For instance, Olibie and Ezeoba (2013) found no significant difference between male and female students' achievement in Social Studies when taught using the Guided Inquiry Method. Likewise, Mkpa and Njideka (2019) reported that gender had no significant effect on students' achievement in history when the guided inquiry instructional strategy was employed. These studies support the idea that the inquiry method, being student-centered and interactive, provides an equitable learning environment that allows all students, regardless of gender, to engage actively and perform at similar academic levels.

The current study further aligns with the findings of Ali (2014), who observed that inquiry-based learning significantly improved science achievement scores without any notable gender disparity. Conversely, studies such as those by Sylvanus and Eke (2017) and Adigun et al. (2015) reported gender-based differences in achievement, with male students performing better in inquiry-based settings. The discrepancy between these studies and the current findings may be due to differences in subject matter, socio-cultural dynamics, or educational contexts. Economics, being a subject that combines theoretical understanding with real-world application, may engage students in a way that neutralizes gender-based learning biases.

The absence of gender difference in this study suggests that when inquiry-based learning is implemented effectively, it

can provide an inclusive learning environment where all students are equally encouraged to participate, think critically, and construct knowledge. This reinforces the pedagogical value of inquiry methods in promoting gender equity in the classroom. It also highlights the potential of well-structured teaching strategies to bridge achievement gaps and ensure that students' academic outcomes are shaped more by the quality of instruction than by gender-related factors.

Conclusion

Based on the findings of the study, it can be concluded that the inquiry method of teaching significantly enhances students' academic achievement in Economics in Senior Secondary Schools in Adamawa State compared to the traditional lecture method. The study further revealed that while there is a significant improvement in students' academic achievement when taught using the inquiry approach, gender does not significantly influence the effectiveness of the method. This suggests that both male and female students benefit equally from inquiry-based instruction, making it a gender-inclusive teaching strategy. Additionally, the findings emphasize the importance of shifting from teacher-centered to student-centered pedagogies such as inquiry-based learning to foster active participation, critical thinking, and deeper understanding of economic concepts. Therefore, it is recommended that Economics teachers adopt the inquiry method as a core instructional strategy, and educational stakeholders should provide the necessary support and training to facilitate its effective implementation across schools.

Recommendations

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

1. Given the significant difference in academic achievement between students taught using the Inquiry method and those taught using the Lecture method, it is recommended that primary, secondary and tertiary educational institutions in Adamawa State promote the adoption of inquiry-based teaching methods in Economics education. This can be achieved by organizing workshops, seminars, and training programs to familiarize economics teachers with effective strategies for implementing inquiry-based instruction.
2. Primary, secondary and tertiary educational institutions in Adamawa State should prioritize student engagement, critical thinking, and problem-solving skills by providing resources, materials, and facilities that promote active learning.
3. To ensure the effectiveness of different teaching methods primary, secondary and tertiary educational institutions in Adamawa State should establish a system for regular assessments and continuous monitoring of teaching practices. This can involve collecting feedback from students, conducting classroom observations, and analyzing student achievement data.

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