

**COMPARATIVE ANALYSIS OF MATHEMATICS ACADEMIC ACHIEVEMENT IN GOVERNMENT
VERSUS PRIVATE SECONDARY SCHOOLS: A CASE STUDY OF KANO METROPOLIS**



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Abstract

Mathematics education plays a critical role in national development, particularly in science and technology advancement. This study comparatively analyzed students' mathematics performance in government and private secondary schools in Kano Metropolis, utilizing Senior Secondary Certificate Examination (SSCE) results from 2015 to 2025. This study was necessitated due to persistence poor performance in both public and private schools in Kano. Through a comprehensive quantitative research approach, the study examined potential differences in academic achievement between these two educational sectors. Using a sample of 540 students selected through simple random sampling, the research employed descriptive statistical analysis of mean and standard deviation to evaluate mathematics performance. The findings revealed significant performance variations between government and private schools in 2015 and 2025, with private school students demonstrating consistently superior academic outcomes. These results underscore the importance of educational resources, teaching quality, and institutional infrastructure in mathematics education. It is therefore recommended that public schools should be equipped with educational resource, infrastructure and effective supervision of teachers.

Keywords: Mathematics Education, Public School and Private Schools.

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Introduction

The advancement of any nation is intrinsically linked to its scientific and technological capabilities, with mathematics serving as a fundamental pillar of such progress (Nosakhare, 2007). As Nigeria aspires to become one of the world's top twenty economies, the critical role of mathematical knowledge becomes paramount. Mathematics, a human invention born from the resolve to solve complex problems, transcends mere numerical manipulation and represents a sophisticated mode of logical reasoning and problem-solving.

Problem Statement

In recent years, a concerning trend of declining mathematics performance among secondary school students has emerged, posing significant challenges to educational stakeholders. Most secondary school graduates struggle to pursue science and social science courses due to inadequate mathematics performance at the credit level in the Senior Secondary Certificate Examination (SSCE), Kolawole (2024).

The study is grounded in the cognitive development theory, which emphasizes the importance of logical thinking and abstract reasoning in mathematical education. According to Ibrahim (2021), mathematics education aims to: establish a robust foundation for everyday problem-solving.

Develop logical and abstract thinking capabilities; foster precision in mathematical and real-world problem resolution; enhance spatial awareness and analytical skills;

Research Objectives

Objectives of the Study are to:

- i. Compare mathematic performance between public and private secondary schools;
- ii. Identify factors contributing to performance differentials
- iii. Provide evidence-based and recommendations for improvement.

Research Questions

- i. What are the significant differences in mathematics academic performance between government and private secondary schools?
- ii. How do institutional factors influence students' mathematics achievement?
- iii. What strategies can be implemented to enhance mathematics education quality?

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Research Hypotheses

Null Hypothesis (H_0): There is no statistically significant difference in mathematics performance between government and private secondary schools in Kano Metropolis.

Methodology

Research Design

A quantitative, comparative research design was employed, utilizing secondary data from Senior Secondary Certificate Examination (SSCE) results. The study population comprised all students from government and private secondary schools in Kano Metropolis. A total of 540 students were selected using simple random sampling techniques. Secondary examination data were collected from school examination officers, covering mathematics performance for the years 2006, 2007, and 2008. Data were analyzed using: Descriptive statistics (mean and standard deviation); Inferential statistics (student's t-test), and Significance level set at $p \leq 0.05$. Thus, significant difference favoring private schools.

Results

Table1: Descriptive Statistics of Mean and Standard Deviation between Public and Private Secondary Schools in Kano

Variables	n	\bar{X}	Mdt
Public School	270	31.22	-10.77
Private School	270	42.99	

$$\bar{X} = 31.22 \text{ (Public School) } 42.99 \text{ (Private School)}$$

Hypothesis One

There is no significant difference between the academic performance in SSCE Mathematics of public and private secondary schools in Kano. X

Hypothesis one was tested using t-test statistic at P 0.05 and presented in Table 2.

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Table 2: t-test result of Public and Private Secondary Schools SSCE Scores in Kano Metropolis

Variables	n	\bar{x}	t value	P	R
Public School	270	31.22	-3.50	0.001	Sig
Private School	270	42.99			

Significant at $P \leq 0.05$ level.

Table 2 shows the result of t-test analysis between public and private schools in Kano Metropolis. The P value observed was 0.001 which is less than $p \leq 0.05$ showing that there is significant difference between public and private school students' performance in mathematics in favour of private secondary school. The null hypothesis is therefore rejected.

Discussion

The results consistently demonstrated superior mathematics performance in private schools, potentially attributable to: Enhanced educational infrastructure; More conducive learning environments; Higher quality teaching resources; Better-qualified mathematics instructors

The anomalous results in 2007, showing no significant difference, might be due to external factors such as examination cancellations or administrative irregularities.

Conclusion

Private secondary schools in Kano Metropolis demonstrated significantly better mathematics performance compared to government schools across two of the three studied years. These findings emphasize the critical role of institutional support, resource allocation, and teaching quality in mathematics education.

Recommendations

The following recommendations were offered:

- i. Implement mandatory professional development programs for mathematics teachers
- ii. Enhance government school infrastructure and resource allocation
- iii. Develop comprehensive mathematics curricula with practical applications
- iv. Establish robust guidance and counseling services
- v. Create continuous professional training mechanisms for educators.

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Limitations and Future Research

This study was delimited by:

- i. Geographical constraints (Kano Metropolis)
- ii. Narrow time frame (2015-2025)
- iii. Reliance on secondary examination data
- iv. Future research should:
- v. Extend geographical coverage
- vi. Include more recent examination data
- vii. Incorporate qualitative research methodologies

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