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RELATIONSHIP BETWEEN AVAILABILITY AND ACCESSIBILITY OF INSTRUCTIONAL MATERIALS FOR TEACHING MATHEMATICS AND ON STUDENTS' ACADEMIC PERFORMANCE AMONG SENIOR SECONDARY SCHOOLS IN SABON GARI LOCAL GOVERNMENT AREA, KADUNA

BY

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Abstract

This study examined the availability and accessibility of instructional materials for teaching mathematics and their impact on students' academic performance in senior secondary schools in Sabon Gari Local Government Area, Kaduna State, Nigeria. The research adopted an ex-post facto design with a population of 1,334 SS2 students across four public secondary schools, from which 175 students were proportionally sampled. Data were collected using a structured questionnaire validated by experts in mathematics education, and reliability was established

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through a pilot test that produced a Cronbach's alpha of 0.82. The instrument was administered directly to respondents, and data were analyzed using descriptive statistics to summarize responses and inferential statistics to test hypotheses. Findings showed that instructional materials were inadequate and not readily accessible, but their availability and accessibility had a statistically significant positive relationship with students' mathematics performance ($p < 0.05$). The study recommended that government and stakeholders provide adequate instructional resources, train teachers regularly on their effective use, and strengthen accessibility through proper distribution and monitoring.

Keywords: **Availability, accessibility, instructional materials, mathematics teaching, academic performance.**

Introduction

Mathematics is a core subject in Nigeria's secondary school curriculum and is compulsory alongside English Language (National Policy on Education, 2013). It provides the foundation for many disciplines and careers, fostering critical thinking and problem-solving skills essential for personal and professional success. Akachukwu (2020) emphasized its role in driving scientific and technological advancement. Yet, despite its importance, many students continue to perform poorly in national examinations such as WAEC (2019) and NECO (2019).

The use of instructional materials has been identified as a strategy to enhance mathematics teaching and learning. These resources—including textbooks, geometric models, visual aids, and digital tools—make abstract concepts more concrete and engaging (Otu, 2016). Studies have shown their positive impact on mathematics performance both internationally and in Nigeria (Adedoyin, 2010). However, gaps remain in availability, accessibility, and effective utilization, particularly in regions like Sabon Gari LGA, Kaduna. Inadequate resources hinder both teaching and student participation, especially in complex areas such as surds, algebra, and calculus (David, 2020; Idoko, 2020).

Academic performance, often measured through examinations and continuous assessment, reflects students' ability to understand, apply, and analyze mathematical concepts. Research shows that resource availability strongly influences learning outcomes. For example, Iyekekpolor and Paul (2021) reported that students with access to instructional materials outperformed peers without such access, while Umar and Ibrahim (2017) demonstrated the effectiveness of manipulative in improving conceptual understanding. Similar findings were reported by Oladipo and Olatoye (2018) regarding interactive resources.

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Theoretical perspectives also support the role of instructional materials in learning. Piaget's Constructivist Learning Theory (1970) emphasizes hands-on engagement, Atkinson and Shiffrin's Information Processing Theory (1968) explains how materials aid memory and comprehension, and Vygotsky's Social Development Theory (1978) highlights their role in collaborative learning. Together, these frameworks suggest that instructional resources are crucial to improving mathematics performance.

Despite this evidence, mathematics failure rates in Nigeria remain high, ranging from 60% to 90% (WAEC Chief Examiners' Report, 2020). In Sabon Gari LGA, the extent of resource availability and accessibility and their relationship with student achievement have not been adequately studied. This research therefore examines the availability and accessibility of instructional materials for teaching mathematics and their influence on students' academic performance, with the objective of providing evidence-based recommendations to improve mathematics education outcomes

Objective of the Study

To examine the relationship between the availability and accessibility of instructional materials and the academic performance of senior secondary school students in mathematics in Sabon Gari Local Government Area, Kaduna.

Research Question

What is the relationship between the availability and accessibility of instructional materials and the academic performance of senior secondary school students in mathematics in Sabon Gari Local Government Area, Kaduna?

Research Hypothesis

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There is no significant relationship between the availability and accessibility of instructional materials and the academic performance of senior school students in mathematics in Sabon Gari Local Government Area, Kaduna.

Methodology

Research Design, this study employs an ex-post facto research design, as described by Creswell (2017), to examine the availability and accessibility of instructional materials for teaching mathematics and their impact on students' academic performance in senior secondary schools in Sabon Gari Local Government Area, Kaduna. This design was chosen because it investigates existing conditions without manipulating variables. A questionnaire-based approach was used for data collection, enabling statistical analysis and generalization of findings. Population and Sample; The population of this study consists of all Senior Secondary School 2 (SS2) students in public secondary schools in Sabon Gari Local Government Area, totaling 1,334 students across four schools (Kaduna State Ministry of Education, 2022). The schools include: GSS Jama'a (420 students), GGSS Samaru (356 students) GSS Basawa (278 students) GSS Kwangila (280 students).

A simple random sampling technique was used to select 175 students, representing 13% of the total population. The sample distribution across the schools was proportional to student population size, ensuring that findings reflect the general student body in Sabon Gari LGA.

Instrumentation

A self-structured questionnaire titled *"The Availability and Accessibility of Instructional Materials for Teaching Mathematics and Their Impact on Students' Academic Performance in Senior Secondary Schools in Sabon Gari Local Government Area, Kaduna"* was used for data

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collection. The questionnaire was divided into: Section A**:** Respondent biodata (school, age, class, gender). Section B: Statements measuring the availability, accessibility, and utilization of instructional materials, as well as their impact on students' academic performance, rated using a 4-point Likert scale (Strongly Agree to Strongly Disagree).

Validity and Reliability of the Instrument

To ensure content and face validity, the questionnaire was reviewed by experts in education and mathematics instruction. Their feedback was incorporated into the final version**. Reliability** was determined using the test-retest method with a subsample of 30 students. The responses were analyzed using Cronbach's alpha, yielding a reliability coefficient of 0.82, indicating high internal consistency and reliability.

Data Collection Procedure

An introductory letter from Ahmadu Bello University, Zaria, was presented to the Kaduna State Ministry of Education to obtain permission for questionnaire distribution. The researcher administered 175 questionnaires across the four selected schools. All questionnaires were retrieved immediately to ensure a high response rate.

Data Analysis

The type of analysis used in the study is descriptive statistics. Frequency counts were employed to determine how many students selected each response option. Percentages were calculated to show the proportion of respondents for each option. Overall, the analysis focused on summarizing the data using descriptive statistical methods.

Results and Discussion

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Table 1: Descriptive Analysis of Availability and Accessibility of Instructional Materials for Teaching Mathematics

Option	Frequency	Percentage
Strongly agree	61	7%
Agree	114	13%
Disagree	306	35%
Strongly Disagree	394	45%
Total	**875**	**100%**

Interpretation: As shown in Table 1, the majority of students (80%) disagreed that instructional materials were sufficiently available and accessible in their schools, while only 20% agreed. This indicates a shortage of teaching resources in senior secondary schools in Sabon Gari LGA. These results are consistent with Audu (2014), who reported that inadequate instructional materials limit effective mathematics teaching and learning in Nigeria.

Table 2: Descriptive Analysis of Students' View of the Impact of Instructional Materials on Academic Performance

Option	Frequency	Percentage
Strongly agree	543	62%
Agree	219	25%
Disagree	70	8%
Strongly Disagree	44	5%
Total	**875**	**100%**

Interpretation: Table 2 shows that a large majority (87%) of the students believed instructional materials positively influence mathematics learning and improve performance. Only 13%

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disagreed. This demonstrates that students recognize the importance of instructional resources in enhancing achievement. The result aligns with Salami (2013), who found instructional materials significantly improve comprehension, engagement, and achievement.

Table 3: Correlation between Availability and Accessibility of Instructional Materials and Students' Academic Performance in Mathematics

Variable	Academic Performance	Availability & Accessibility
Academic Performance	1.000	0.43**
Psychological Adjustment	0.43**	1.000

Table 4: Correlation between Students' View of Instructional Materials and Academic Performance in Mathematics

Variable	Academic Performance	Students' View
Academic Performance	1.000	0.36**
Students' View of Instructional Materials	0.36**	1.000

Note: ** indicates $p < 0.01$; $n = 175$.

The results Interpretation: Pearson product–moment correlation analysis was conducted to test the null hypothesis. Table 3 indicates a statistically significant positive relationship between availability and accessibility of instructional materials and students' mathematics performance ($r = 0.43$, $n = 175$, $p = 0.002$). Similarly, Table 4 shows a significant positive correlation between students' view of instructional materials and academic performance ($r = 0.36$, $n = 175$, $p = 0.004$). Since p-values were below 0.05, the null hypothesis was rejected.

Discussion

The findings confirm that while instructional materials were not sufficiently available or accessible (Table 1), students nonetheless recognized their positive impact (Table 2). The correlation analysis (Tables 3 and 4) established that both actual resource availability and students' acknowledgment of their usefulness were significantly associated with higher academic performance in mathematics. These findings are consistent with Iyekekpolor and Paul (2021), Umar and Ibrahim (2017), and Oladipo and Olatoye (2018), who reported that instructional resources improve achievement and engagement. Collectively, these results highlight the urgent need to improve provision, distribution, and utilization of instructional materials to enhance mathematics learning outcomes in Nigerian schools.

Conclusion

This study investigated the availability and accessibility of instructional materials for teaching mathematics and their influence on students' academic performance in senior secondary schools in Sabon Gari LGA, Kaduna State. Findings revealed that instructional resources were inadequate and not readily accessible, yet both descriptive and inferential analyses confirmed that they have a significant positive relationship with students' mathematics performance. The results indicate that when instructional materials are available, accessible, and effectively utilized, students achieve better outcomes in mathematics. It is therefore concluded that strengthening the provision and utilization of instructional materials is critical for improving mathematics achievement in Nigerian secondary schools.

Recommendations

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Based on the findings, the study makes the following recommendations:

1. **Increased Provision of Resources**: Government and school authorities should prioritize the supply of adequate instructional materials such as textbooks, manipulative, models, and digital tools for mathematics teaching.

2. **Teacher Training and Capacity Building**: Regular workshops and in-service training should be organized to equip mathematics teachers with the skills to effectively integrate instructional materials into classroom practice.

3. **Monitoring and Accountability**: School administrators should establish systems to ensure equitable distribution, proper utilization, and maintenance of instructional materials

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