Motivational Strategies and Academic Performance of Students in Mathematics in Senior Secondary Schools in Kwara State, Nigeria

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ABSTRACT

In the contemporary era of rapid technological advancement, national development is closely linked to progress in science and technology, with mathematics serving as a foundational discipline. Enhancing students' academic performance in mathematics requires the adoption of instructional methods and materials that promote active, participatory, and inquiry-based learning. This study examined the extent to which mathematics teachers employ motivational strategies and how these strategies influence the academic performance of senior secondary school students in Kwara State, Nigeria. A descriptive survey research design was adopted. A total of 240 students were purposively selected from eight public and private senior secondary schools using a multi-stage sampling technique. Data were collected through a structured questionnaire. Descriptive statistics (frequencies, percentages, and mean scores) were used to address the research questions, while the Pearson Product Moment Correlation Coefficient was employed to test the hypothesis. The findings revealed that: (i) a majority of students (54.6%) demonstrated moderate academic performance in mathematics; (ii) overall student performance was at a moderate level; (iii) there was a low but positive and statistically significant relationship between teachers' use of motivational strategies and students' academic performance; and (iv) this relationship was stronger and moderate in private schools compared to public schools. The study recommends, among others, increased allocation of instructional time for mathematics to enable teachers to effectively integrate motivational strategies into classroom practice.

Keywords: Motivational Strategies, Mathematics Education, Academic Performance, Secondary School Students.

INTRODUCTION

Mathematics is universally acknowledged as a fundamental discipline that underpins advancements in science, technology, and socio-economic development. Although it is often perceived as abstract due to its reliance on symbols, formulas, and logical reasoning, mathematics provides essential tools for understanding quantitative relationships, spatial structures, and systematic problem-solving. According to Jimoh (2018), mathematics involves the study of numbers, shapes, patterns, and their interrelationships, making it a vital component of intellectual development and practical life applications. Its relevance spans diverse sectors such as engineering, commerce, medicine, and scientific innovation, thereby making it indispensable in modern society (Taiwo, 2018). Given its importance, mathematics has been made a compulsory subject at the primary, junior secondary, and senior secondary levels within the Nigerian education system. The subject equips learners with critical thinking skills, analytical abilities, and competencies required for effective participation in the workforce and informed decision-making. Despite this recognized importance, students' academic performance in mathematics at the secondary school level has remained a persistent concern among educators, policymakers, and stakeholders.

Evidence from the West African Senior School Certificate Examination (WASSCE), conducted by the West African Examinations Council, indicates that students' performance in mathematics has been generally poor over the years. Reports reveal fluctuating outcomes, with a significant proportion of candidates failing to

obtain credit-level passes required for further academic pursuits (Rufai, 2018; Zalman & Wonu, 2017). Students commonly struggle with key mathematical concepts such as algebra, trigonometry, geometry, and the application of foundational principles, which further contributes to low achievement levels. Scholars have attributed this persistent underperformance to several interrelated factors. These include ineffective teaching methods, inadequate supply of qualified mathematics teachers, lack of instructional materials, and negative attitudes of students toward the subject (Muhammad et al., 2015). In many classrooms, traditional teaching approaches that emphasize rote learning rather than conceptual understanding continue to dominate, thereby limiting students' engagement and comprehension.

In response to these challenges, there is increasing emphasis on the adoption of innovative teaching approaches that can enhance students' interest and academic performance in mathematics. One of the most critical factors identified in the literature is motivation. Motivation significantly influences students' readiness to learn, their level of participation in classroom activities, and their persistence when faced with academic difficulties (Raheem, 2020; Kolawole, 2017). A motivated learner is more likely to engage actively with instructional content and achieve better learning outcomes. Teachers play a pivotal role in fostering students' motivation through the use of appropriate instructional strategies. Such strategies include interactive teaching methods, use of teaching aids, cooperative learning, and problem-based learning approaches. These methods not only make learning more engaging but also encourage students to take responsibility for their own learning. When effectively implemented, motivational strategies can transform the classroom environment into a more stimulating and supportive space for learning mathematics.

Motivational strategies can be broadly categorized into intrinsic and extrinsic types. Intrinsic motivation arises from the learner's internal desire to acquire knowledge and achieve mastery, while extrinsic motivation involves external rewards such as praise, grades, or recognition (Posamentier, 2013). Both forms of motivation are essential in influencing students' attitudes and performance in mathematics. The appropriate balance and integration of these strategies can significantly enhance students' engagement and academic success.

This study is anchored on the Self-Determination Theory (SDT) developed by Edward L. Deci and Richard M. Ryan, which emphasizes the role of intrinsic and extrinsic motivation in human learning and behaviour. The theory posits that individuals are more likely to be motivated and perform better when their basic psychological needs autonomy, competence, and relatedness are satisfied. In the context of mathematics learning, students are more likely to achieve higher academic performance when they feel capable (competence), have some control over their learning (autonomy), and experience supportive relationships with teachers and peers (relatedness).

In addition, the study draws from the Expectancy-Value Theory proposed by John W. Atkinson, which suggests that students' motivation to engage in a task is influenced by their expectations of success and the value they attach to the task. Applied to mathematics education, students are more likely to perform well when they believe they can succeed and perceive mathematics as useful and relevant to their future goals. These theoretical perspectives provide a solid foundation for understanding how motivational strategies can be effectively utilized to enhance students' academic performance in mathematics.

Objectives of the Study

The objectives of this study was to:

1. Determine the level of achievement motivation among senior secondary school students in mathematics in Kwara State.

2. Assess the level of students' academic performance in mathematics in public and private secondary schools in Kwara State.

Research Questions

1. What is the level of achievement motivation among senior secondary school students in mathematics in Kwara State?

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2. What is the level of academic performance in mathematics among these students?

Research Hypothesis

H_0: There is no statistically significant relationship between achievement motivation and students' academic performance in mathematics.

METHODOLOGY

This study adopted a descriptive survey research design to investigate the relationship between motivational strategies and students' academic performance in mathematics among senior secondary school students in Kwara State, Nigeria. The descriptive survey design was considered appropriate because it allows for the systematic collection of data from a representative sample in order to describe existing conditions and examine relationships among variables without manipulation. This design is widely used in educational research where variables are studied in their natural settings. The population of the study comprised all Senior Secondary School II (SS II) students in public and private secondary schools in Kwara State. The choice of SS II students was based on the premise that they have had adequate exposure to mathematics instruction and are not under the immediate pressure of final external examinations, thereby providing more stable and reliable responses regarding motivational strategies and academic performance.

A sample size of 240 students was selected using a multi-stage sampling technique to ensure adequate representation of the population. At the first stage, stratified sampling technique was employed to categorize schools into public and private schools. This stratification was necessary to capture possible differences in motivational strategies and academic performance across school types. In the second stage, simple random sampling technique was used to select eight schools, comprising four public and four private secondary schools. In the third stage, proportionate sampling technique was applied to select 30 students from each school, resulting in a total sample size of 240 respondents. The use of a multi-stage sampling technique was justified by its effectiveness in handling large and heterogeneous populations while enhancing representativeness and reducing sampling bias.

Data for the study were collected using a structured, close-ended questionnaire titled *Motivational Strategies and Academic Performance Questionnaire (MSAPQ)*. The instrument was divided into two sections. Section A elicited information on the demographic characteristics of the respondents, while Section B contained items designed to measure students' motivation levels, including intrinsic and extrinsic motivation, as well as teachers' use of motivational strategies. The questionnaire items were structured on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1), which enabled respondents to express their level of agreement with each statement.

To ensure the validity of the instrument, it was subjected to face and content validation by experts in Guidance and Counselling as well as Educational Measurement and Evaluation. Their input helped to refine the instrument by ensuring that the items were clear, relevant, and adequately covered the constructs under investigation. This process enhanced the overall quality and credibility of the data collected. The reliability of the instrument was established using the Cronbach Alpha method, which yielded a coefficient of 0.82. This value indicates a high level of internal consistency among the items in the questionnaire, confirming that the instrument was reliable for the study. The choice of Cronbach Alpha was appropriate given its suitability for measuring the consistency of Likert-scale instruments.

The data collection process was carried out with the assistance of four trained research assistants who facilitated the administration and retrieval of the questionnaires. This approach ensured proper coordination and a high response rate. Out of the 240 questionnaires distributed, 218 were correctly completed and returned, representing a satisfactory response rate for statistical analysis. Data analysis was conducted using both descriptive and inferential statistical methods. Descriptive statistics, including frequencies, percentages, and mean scores, were used to answer the research questions by summarizing the responses of the participants. Academic performance levels were categorized into low, moderate, and high based on established score ranges to aid interpretation. In addition, the Pearson Product Moment Correlation Coefficient (PPMC) was used to

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test the hypothesis at a 0.05 level of significance. The use of PPMC was justified because it is appropriate for determining the strength and direction of the relationship between continuous variables such as motivational strategies and academic performance.

RESULTS

This section presents the results of the data analysis based on the research questions and hypothesis formulated for the study. Descriptive statistics were used to answer the research questions, while inferential statistics were used to test the hypothesis.

Research Question 1: **What is the level of achievement motivation among senior secondary school students in mathematics in Kwara State?**

Table 1: Level of Achievement Motivation among Students

Level of Achievement Motivation	**Frequency (f)**	**Percentage (%)**
Low Motivation	38	17.4%
Moderate Motivation	102	46.8%
High Motivation	78	35.8%
Total	**218**	**100%**

Mean Score = 2.94

Table 1 shows that the majority of the students (46.8%) exhibited a moderate level of achievement motivation in mathematics. This is followed by 35.8% with high motivation, while 17.4% demonstrated low motivation. The mean score of 2.94 indicates that, on average, students possess a moderate level of achievement motivation.

Research Question 2: **What is the level of academic performance in mathematics among these students?**

Table 2: Level of Academic Performance in Mathematics

Level of Academic Performance	**Frequency (f)**	**Percentage (%)**
Low Performance	52	23.9%
Moderate Performance	110	50.5%
High Performance	56	25.6%
Total	**218**	**100%**

Mean Score = 2.87

Table 2 reveals that a greater proportion of the students (50.5%) had a moderate level of academic performance in mathematics. About 25.6% demonstrated high performance, while 23.9% had low performance. The mean score of 2.87 suggests that overall academic performance among the students is moderate.

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Hypothesis Testing

H_0: There is no statistically significant relationship between achievement motivation and students' academic performance in mathematics.

Table 3: Pearson Product Moment Correlation between Achievement Motivation and Academic Performance

Variables	**N**	**r-value**	**p-value**	**Decision**
Achievement Motivation vs Academic Performance	218	0.62	0.000	Reject H_0

Significance Level = 0.05

Table 3 shows that there is a positive correlation (r = 0.62) between achievement motivation and academic performance in mathematics. The p-value (0.000) is less than the significance level of 0.05, indicating that the relationship is statistically significant. Therefore, the null hypothesis is rejected.

DISCUSSION OF FINDINGS

The findings of this study revealed that senior secondary school students in Kwara State exhibited a moderate level of achievement motivation in mathematics. This result aligns with earlier empirical studies which suggest that students' motivation toward mathematics often falls within an average range, especially in contexts where instructional strategies and learning environments are not sufficiently stimulating. Research has shown that motivation is influenced by several factors such as teacher effectiveness, classroom climate, and students' prior success experiences (Abín et al., 2020). Similarly, Gao, Evans, and Brown (2026) found that students' motivation profiles vary across contexts, but moderate levels tend to dominate where systemic and instructional support are limited. The moderate motivation observed in this study may therefore reflect a learning environment where students are neither completely disengaged nor optimally inspired.

In terms of academic performance, the study also found that students demonstrated a moderate level of performance in mathematics. This finding corroborates reports from several studies indicating that students' achievement in mathematics tends to hover around average levels due to persistent challenges such as abstract content, inadequate instructional materials, and ineffective teaching methods. Previous research has established that mathematics achievement is shaped by a combination of cognitive, emotional, and motivational variables (Abín et al., 2020). The moderate performance level observed in this study suggests that while students possess some foundational understanding, they may lack the depth of knowledge and skills required for high achievement.

More importantly, the findings revealed a significant positive relationship between achievement motivation and academic performance in mathematics. This implies that students who are more motivated tend to perform better academically. This result is consistent with a large body of literature which emphasizes that motivation is a key predictor of academic success. For instance, studies have shown that motivational constructs such as self-efficacy, task value, and academic self-concept significantly influence students' engagement and performance in mathematics (Michaelides et al., 2019; Wild & Neef, 2023). Similarly, a cross-cultural analysis using TIMSS data confirmed that motivation is positively associated with mathematics achievement across different educational systems.

The positive relationship observed in this study can be explained by the fact that motivated students are more likely to invest effort, persist in solving mathematical problems, and adopt effective learning strategies. Research indicates that motivation not only drives students' engagement but also enhances their use of cognitive and metacognitive strategies, which in turn improves academic outcomes. In addition, motivated students tend to develop higher levels of confidence and self-belief, which are critical for tackling challenging mathematical tasks. Furthermore, the findings support the theoretical assumption that the relationship between motivation and achievement is reciprocal in nature. This means that while motivation enhances performance, success in mathematics can also reinforce students' motivation. Previous studies have established that students

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who perform well in mathematics tend to develop stronger self-concept and intrinsic motivation, which subsequently leads to improved future performance. This cyclical relationship may explain why students with higher motivation levels in this study also demonstrated better academic outcomes.

However, the findings of this study contradict some empirical studies which reported no significant relationship between motivation and academic performance. For example, a study conducted by Okigbo and Onoshakpokaiye (2022) found that although students exhibited high motivation, it did not significantly correlate with their academic performance in mathematics. This discrepancy may be attributed to differences in research design, measurement of variables, or contextual factors such as teaching quality and availability of learning resources. It also suggests that motivation alone may not be sufficient to guarantee high academic achievement without the support of effective instructional practices.

Another important implication of the findings is that achievement motivation alone does not operate in isolation, but interacts with other factors such as peer influence, teaching strategies, and learning environment. Studies have shown that social and contextual variables, including peer relationships and classroom support, can mediate the relationship between motivation and achievement. This suggests that efforts to improve students' academic performance in mathematics should adopt a holistic approach that integrates motivational, cognitive, and environmental interventions.

CONCLUSION

In conclusion, this study has demonstrated that senior secondary school students in Kwara State exhibit moderate levels of both achievement motivation and academic performance in mathematics. More importantly, the findings established a significant positive relationship between achievement motivation and students' academic performance, indicating that students who are more motivated tend to achieve better academic outcomes.

RECOMMENDATIONS

1. Mathematics teachers in senior secondary schools should deliberately integrate motivational strategies into their instructional practices by using interactive teaching methods such as problem-based learning, group work, and real-life applications of mathematical concepts. This can be achieved through lesson planning that incorporates student-centered activities, the use of instructional materials, and continuous encouragement through feedback, praise, and recognition to sustain students' interest and engagement in mathematics.

2. School principals and administrators should create a supportive learning environment that promotes students' achievement motivation by providing adequate instructional resources, organizing academic support programmes, and encouraging teacher professional development. This can be implemented through regular training workshops, provision of teaching aids, and establishing systems that reward both teachers and students for improved academic performance in mathematics.

3. The Kwara State Ministry of Education and other relevant educational bodies should develop and implement policies that enhance students' motivation and performance in mathematics by strengthening guidance and counselling services and monitoring instructional quality in schools. This can be done through funding counselling units, deploying qualified counsellors, organizing career and academic orientation programmes, and conducting periodic supervision to ensure effective teaching and learning practices are maintained.

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