ISSN 2384-7662
E-ISSN 2705-2508

EFFECTS OF MOTIVATION ON STUDENTS' ACADEMIC PERFOMANCE IN MATHEMATICS IN LAGOS METROPOLIS

BY

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Abstract

This study examined the effects of motivation on students' academic performance in Mathematics among selected secondary school students in Kosofe Local Government Area of Lagos State. The study sample comprised 100 Senior Secondary School two (SSS2) students drawn from four secondary schools in the study area, through stratified random sampling technique. The study was guided by three hypotheses while it adopted a descriptive survey design. A 21-item self-designed questionnaire titled: Effect of Motivation on Academic Performance Questionnaire (EMAPQ) and Students' Achievement Test (SAT) were used in the data collection. The instruments were validated and the reliability established through a pilot study with reliability coefficients of 0.76 and 0.74, respectively. The formulated hypotheses were tested using Pearson Product Moment Correlation Coefficient, and t- test statistical tools at 0.05 level of significance. Findings revealed motivation had a significant effect on students' academic performance, there was a gender difference leading to motivation among secondary school students. Age was found not to have a significant effect in the motivation of academic performance among secondary school students. Based on the findings, it was recommended, among others, that both intrinsic and extrinsic motivation should be encouraged and be a part of the pedagogical practices in schools to serve as model of positive ways to motivate students to boost their performance in Mathematics. Students should be encouraged and showed all the necessary measures to ensure they stay motivated, monitored and assisted by teachers and parents towards good academic achievements and performance. There is need to design appropriate teaching and learning materials that will educate adolescents and parents about the potential benefits and draw backs on the need to motivate students in their studies.

Keywords: *Motivation, Academic performance, Intrinsic, Extrinsic*

Introduction

The academic performance of students in mathematics has long been a subject of concern for educators, policymakers, and parents worldwide. (Adedeji & Owoeye, 2002). In Lagos State, Nigeria, this issue is particularly pronounced at the senior secondary school level, where mathematics serves as a critical gateway subject for higher education and numerous career paths. Despite the significant investments in educational infrastructure, teacher training, and curriculum development, many students continue to struggle with mathematics. (West African Examination Council, 2020). This persistent challenge has led to an exploration of various factors that can potentially enhance student achievement in this essential discipline. One such factor is motivation, a complex and multifaceted construct that encompasses students' intrinsic and extrinsic drives to engage in and succeed at academic tasks. According Deci and Ryan, 2000) Motivation is widely recognized as a critical determinant of educational outcomes, influencing not only the amount of effort students put into their studies but also their perseverance in the face of challenges. The significance of motivation in educational settings is underscored by numerous studies suggesting that motivated students are more likely to set challenging goals, employ effective learning strategies, and exhibit higher levels of academic performance.

The relevance of this study is heightened by the critical role that mathematics plays in the Nigerian education system and the broader societal context. Mathematics is not only a core subject in the senior secondary school

curriculum but also a prerequisite for many tertiary education programs and career opportunities in science, technology, engineering, and mathematics (STEM) fields. Consequently, improving students' performance in mathematics is essential for their academic success and future career prospects. Moreover, understanding how to effectively motivate students in mathematics can provide valuable insights for educators, policymakers, and parents striving to support student achievement.

This research will explore a variety of motivational strategies, including both intrinsic and extrinsic approaches. Intrinsic motivation strategies focus on fostering students' internal desire to learn, such as through goal setting, interest enhancement, autonomy support, and mastery orientation. Extrinsic motivation strategies, on the other hand, involve external incentives and rewards, such as tangible rewards, competition, parental involvement, and teacher feedback. Additionally, the study will consider the role of social and emotional support strategies, such as peer tutoring, mentorship programs, and counselling services, in enhancing student motivation and performance. To comprehensively investigate these aspects, a mixed-methods approach will be employed, utilizing a range of research instruments. These will include questionnaires, observations, and academic records. By triangulating data from multiple sources, the study aims to provide a robust analysis of both quantitative and qualitative dimensions of motivation and academic performance. (Adepoju, 2002)

The findings of this research are expected to contribute to the development of more effective educational strategies and interventions that can help improve mathematics performance among senior secondary school students in Lagos State. By clarifying the place of motivation in academic achievement, this study also seeks to offer practical recommendations for fostering a motivating learning environment that supports students in overcoming challenges in mathematics. Ultimately, this research aspires to enhance the educational experiences and outcomes of students equipping them with the skills and confidence needed to succeed in their academic and professional endeavours.
To investigate the place of motivation in promoting students' academic performance in mathematics in senior secondary schools in Lagos State, a variety of research instruments can be employed. These instruments will help collect data on students' motivation levels, academic performance, and the effectiveness of different motivational strategies. Here are some of the key research instruments that can be used:

Statement of the Problem
Mathematics education in Nigeria, particularly at the senior secondary level, has been a subject of concern due to persistently low academic performance and waning interest among students. Lagos metropolis, as one of the most populous and vibrant urban centres in the country, faces unique challenges in promoting students' academic achievement in mathematics. Factors such as overcrowded classrooms, limited resources, and socio-economic disparities contribute to the complexity of the educational landscape in Lagos. (Tella, 2007) Amidst these challenges, the role of motivation emerges as a crucial determinant of students' success in mathematics. Understanding the dynamics of motivation and its impact on academic performance is essential for devising effective strategies to enhance mathematics education in senior secondary schools within Lagos metropolis.

In the realm of education, mathematics stands as a pivotal subject, often revered for its role in shaping critical thinking and problem-solving skills. However, the journey of mastering mathematics can be arduous, particularly for students navigating the complexities of senior secondary education. In this context, the influence of motivation emerges as a crucial factor that significantly impacts students' academic performance in mathematics. Within the bustling educational landscape, understanding the dynamics of motivation becomes imperative for fostering a conducive learning environment and nurturing academic excellence among students

Motivation serves as the driving force behind students' engagement, persistence, and ultimately, their success in mathematics. Students face myriad challenges ranging from academic pressure to socio-economic disparities, the role of motivation becomes even more pronounced. A motivated student is more likely to exhibit perseverance in tackling mathematical problems, seek assistance when needed, and maintain a positive attitude towards learning despite encountering obstacles (Sandra, 2002)

This research aims to address this gap by investigating how different types of motivation intrinsic and extrinsic affect students' performance in mathematics. It seeks to understand the extent to which motivational strategies can enhance learning outcomes and identify the most effective methods for fostering a motivating environment in

mathematics classrooms. Additionally, this study will examine the influence of teacher practices, parental involvement, and school policies on students' motivation and their subsequent academic performance in mathematics.

Purpose of the Study.
The main purpose of the study is to examine the effects of motivation on students' academic performance in Mathematics in Selected Senior Secondary Schools in Lagos Metropolis. The study specifically sought to:

1. examine the relationship between motivation and students' academic performance in mathematics.
2. identify which types of motivation (intrinsic vs. extrinsic) are more strongly associated with better academic performance in mathematics.
3. ascertain the gender difference between motivation and students' academic performance in mathematics.

Research Questions
1. What is the relationship between motivation and students' academic performance in mathematics?
2. How does intrinsic and extrinsic motivations affect students' performance in mathematics?
3 What is the gender difference between motivation and students' academic performance in mathematics?

Research Hypotheses
1. There is no significant relationship between motivation and students' academic performance in mathematics.
2. There is no significant difference between Intrinsic and extrinsic motivation on students' academic performance in mathematics.
3. There is no significant gender difference between motivation and students' academic performance in mathematics

Methodology
The study sample comprised 100 SS 2 students drawn from four randomly selected secondary schools in Kosofe Local Government Area of Lagos State. The samples consisted of 100 students (48 males and 52 females) randomly selected from 4 senior secondary schools Stratified random sampling technique was used to select twenty-five participants from each of the sampled schools. To ensure gender equity in the study, twenty-five male and twenty-five female respondents were selected from each of the four schools to obtain a total of one hundred (100) participants used for the study.

A self-designed questionnaire titled: Effect of Motivation on Academic Performance Questionnaire (EMAPQ) was used for data collection from the respondents. This comprised of section A that elicited information on demographic data of the respondent and section B that contained items on the variables captured in the hypotheses. It adopted the four-point likert format of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The academic performance of the students was measured using Students' Achievement Test (SAT). The instruments were validated and their reliability established in a pilot study with reliability coefficients of 0.76 and 0.74 respectively. The instruments were administered on the respondents in their various locations and retrieved upon completion. The formulated hypotheses were tested using Pearson Product Moment Correlation Coefficient, and t- test statistical tools at 0.05 level of significance.

Descriptive Data Analysis
This aspect of the study presents the results of the descriptive analysis of the respondents' bio-data. The table below shows the distribution of respondents based on gender and age
.

Table 1
Distribution of respondents based on gender

Sex	Frequency	Percent	Cumulative Percent
Male	48	48.0	48
Female	52	52.0	52
Total	100	100.0	

One hundred students were drawn for this research, out of which forty-eight students were male and fifty-two students were female.

Table 2
Sample distribution by age

Age	Frequency
(12 – 14) years	17
(15 – 17) years	72
(18 – 21) years	11
Total	100

The above table shows that out of the 100 sample respondents, 17 students falls within the age range of (12 – 14) years, while 72 students fall within the age range of (15 – 17) years, while 11 students were between the ages of (18 – 21) years.

Data analysis and results

Hypotheses 1: There is no significant relationship between motivation and students' academic performance in Mathematics.

To test this hypothesis, Pearson Moment Correlation Coefficient was used and the result obtained is shown in the table below.

Table 3
Relationship between students' motivation on academic performance in Mathematics

Variable	N	X	SD	df	r-cal	r-critical	Decision
Motivation	100	54.63		98	1.33	0.02	Rejected
Students' Academic Performance	100	58.73					

Significant level at 0.05: df = 98, r-critical = 0.02, r-cal = 1.33

The evidence given in table 1 based on hypothesis 1 tested showed that the calculated r is greater than the critical r (i.e. 1.33 > 0.02) given at 98 degrees of freedom at 0.05 level of significance, therefore the null hypothesis is rejected. This implies that there is a significant effect on motivation on the academic performance of students in mathematics.

Hypotheses 2: There is no significant difference between intrinsic and extrinsic motivation on students' academic performance in mathematics.

The t-test statistical tool was used to test the hypothesis. The result of the hypothesis is presented in table 2 below.

Table4
Difference between intrinsic and extrinsic motivation on academic performance in Mathematics

Variables	n	X	sd	df	t-cal	t-critical	p	Decision
Intrinsic	50	59.04	7.00	98	0.07	1.65	0.05	accepted
Extrinsic	50	59.14	6.80					

Significant level at 0.05: df = 98, t-critical = 1.65, t-cal = 0.07

Since the calculated t is less than the t-critical (i.e. 0.07 < 1.65) given at 98 degrees of freedom at 0.05 level of significance, therefore the null hypothesis is accepted. This implies that there is no significant difference in the intrinsic and extrinsic motivation and students' academic performance of students in mathematics

Hypotheses 3: There is no significant gender difference between motivation and students' academic performance in mathematics.

The t-test statistical tool was used to test the hypothesis. The result of the hypothesis is presented in table 3 below.

Table 5
Gender difference on motivation and academic performance in Mathematics

Gender	n	X	sd	df	t-cal	t-critical	p	Decision
Male	48	59.21	6.40	98	2.06	1.65	0.05	rejected
Female	52	61.93	6.86					

Significant level at 0.05: df = 98, t-critical = 1.65, t-cal = 2.06

Since the calculated t is greater than the t-critical (i.e. 2.06 > 1.65) given at 98 degrees of freedom at 0.05 level of

significance, therefore the null hypothesis is rejected. This implies that there is a significant gender difference between motivation and the academic performance of students in mathematics

Discussion of the Findings

The finding from hypothesis one revealed that the calculated r-value is greater than the critical r-value (i.e. 1.33 > 0.02) given at 98 degree of freedom at 0.05 level of significance, therefore the null hypothesis is rejected. This implies that there is a significant effect on motivation on the academic performance of students in mathematics. This is in line with Meece et al. (2006) who opined that motivation influences academic performance through self-regulated learning strategies. Motivated steadings are more likely to set goals, manage their time effectively and perform better in mathematics

It was discovered in hypothesis two since the calculated t-value is less than the t-critical (i.e. 0.07 < 1.65) given at 98 degree of freedom at 0.05 level of significance, therefore the null hypothesis is accepted. This implies that there is a significant difference in the intrinsic and extrinsic motivation and students' academic performance of students in mathematics. The study suggests that no matter the type of motivation does not have any effects on the performance of students in their academics.

This finding is also in line with Pintrich and De Groot (1990) who suggests that the roles of both type of motivation are significant predictors to success. They opined a balanced approach incorporating both intrinsic and extrinsic motivation could be most beneficial.

It was observed that hypothesis three Since the calculated t is greater than the t-critical (i.e. 2.06 > 1.65) given at 98 degree of freedom at 0.05 level of significance, therefore the null hypothesis is rejected. This finding is in line with Eccles and Wigfield (2002) who opined that there is a significant gender difference between motivation and the academic performance of students in mathematics. The way motivation impacts academic performance in mathematics might differ between genders. Boys and girls show differing levels of motivation and or achieve different outcomes in their academic performance.

This finding was also in agreement with Hyde et.al, 1990: Else-Quest et.al, 2010 in their meta analyses showing that while there are small gender difference in mathematics performance favouring boys, these differences are generally small and have decreased over time.

Conclusion

By implementing these recommendations and understanding the roles of parents and teachers in student motivation, educators and families can work together to create a supportive and motivating environment that enhances students' academic performance in mathematics.

Recommendations

1. Counsellors can facilitate peer mentoring programs and group activities that promote collaborative learning and peer support. They can also train peer mentors to provide constructive feedback and encouragement.
2. Counsellors can offer practical advice on setting up a productive study environment at home and suggest routines that balance academic work with relaxation and extracurricular activities.
3. Providing Emotional Support: Parents should offer consistent emotional support, encouraging their children to persevere through challenges and celebrating their efforts and achievements. Emotional support helps reduce anxiety and fosters a positive attitude towards learning.
4. Modelling Positive Behaviours: Parents should model positive behaviours, such as persistence, curiosity, and a love for learning. Demonstrating these behaviours can inspire children to adopt similar attitudes towards their academic work.
5. Creating a Positive Learning Environment: Teachers should create a classroom environment that is supportive, inclusive, and encourages a growth mindset. This involves providing positive reinforcement, recognizing student achievements, and fostering a culture of mutual respect and collaboration.
6. Setting Clear Expectations: Teachers should set clear and achievable expectations for their students, providing guidelines and objectives for academic performance. Clear expectations help students understand what is required and how to achieve their goals.

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