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Relationship Between Academic Motivation and Academic Performance of Secondary School Students in Mathematics

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Abstract. The study looked at the relationship between academic motivation and secondary school students' academic performance in mathematics. A correlation survey was used in the study. The study was guided by two research questions and two hypotheses tested at 0.05 alpha level. A sample of 1,650 students was selected using a multistage sampling procedure from among 42,299 senior secondary two (SS2) students studying mathematics in Delta State, Nigeria, in the academic year 2021-2022. The Academic Motivation Questionnaire (AMQ), validated by three experts was used as the instrument for gathering data and had a reliability value of 0.68 using Cronbach Alpha. The student's performance in the subject is reflected in their examination scores in mathematics for the SS1 class of 2021-2022. The gathered data were analyzed using Pearson product-moment correlation. The results of the study showed a negative connection, and the majority of the students reported strong levels of motivation. Academic motivation and students' performance in mathematics did not significantly correlate. Students' academic performance in mathematics also differed significantly between those with strong and low motivation. In light of the findings, it was suggested, among other things, that mathematics teachers and guidance counselors in schools should make a concerted effort to increase the motivation of their students through proper teaching and conditioning as well as modeling the behaviour of the students for better performance in mathematics.

Keywords:
Motivation;
Mathematics performance;
Correlation;
Secondary school;

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INTRODUCTION

Since education gives one the skills and information needed for success and also develops the personalities of young people in every country, it is crucial for someone to succeed in life. It has been observed in Nigeria that certain students experience various learning difficulties relating to their academic fields, which has a detrimental effect on their performance, notably in mathematics. Researchers in mathematics in particular, as well as educationalists in general, are thus particularly interested in figuring out the source of this low performance and finding a remedy.

Learning mathematics is essential for students as they get ready for their current and future occupations since it serves as the basis for many other subjects, especially the sciences. Mathematics is regarded as a branch of science that deals with numbers and related operations, such as calculation and problem-solving, according to Roohi (2012). Additionally, Roohi claims that mathematics deals with the study of quantity, space, and structure. It also reveals hidden patterns that enable us to understand the environment. According to Odumosu and Olusesan (2016), mathematics is crucial for thought, logical reasoning, and progress since it teaches more than simply the science of numbers, which is taught in all schools and is either adored or dreaded by many students. Amarjeet and Malik (2016) claim that nearly every aspect of everyday living now relies heavily on mathematics, including planning, keeping track of travel schedules, buying and selling food, and more.

The performance of students in internal and external examinations in the subject was not encouraging, despite the subject's significance and the fact that it is included in the Nigerian school curriculum. In public examinations, students' academic performance has declined, with mathematics in particular. This may be found in the National Bureau of Statistics report on the Delta state WAEC results (2016-2021). It is necessary to raise the performance of students in this crucial subject (mathematics). Poor mathematics performance in secondary school has been linked to a variety of factors, including strategies and techniques for teaching, insufficient elementary school preparation, the complexity of mathematics, subject phobia, as well as the mindset of both students and teachers toward the subject. These factors have all been identified in the literature.

The Latin word "movers," which meaning to move, is the source of motivation. Thus, motivation may refer to the act of stimulating a person's interest to move them towards to a particular goal. Motivation, according to Awan et al. (2011), is an innate state that activates, guides, and sustains students' behaviour. Younes et al(2014) define academic motivation as the behaviour that is associated to learning and academic development in their relationship between motivation and academic performance. According to Akpokiniovo (2017), academic motivation is the desire to complete a challenging task, overcome challenges, meet a high level, and outperform oneself. According to this notion, academic motivation may have an impact on students' academic performance in areas like mathematics. In a school context, academic motivation is typically seen as the students' commitment to the pursuit of success or academic excellence in the activities they engage in.

Students who have a strong desire to learn about a subject are eager to participate in the activities they think will help them learn, pay close attention to the teacher's instructions, and frequently ask for assistance when they don't understand what is being taught. However, unmotivated students are less passionate in their attempts to study (Sikhwari, 2014). Students' motivation in school can impact how they study or learn, as well as how they behave in relation to subject matter. In order to help students attain their academic objectives, motivation may also be thought of as a process. According to Kian, Yusoff and Rajah (2014) and Turan (2015), motivation is a crucial element that influences behaviour and performance in persons.

In order to determine the motivating elements that improve students' academic performance at St. Michael's Tulwopngetuny Secondary School in Wareng Sub County, Uasin Gishu County, Birgen (2017) did a research. A descriptive survey research approach was used for the study. 180 respondents, including 6 instructors, 139 students, and 35 parents, from St. Michael's Tulwopngetuny Secondary School in Wareng

Sub County, Uasin Gishu County, made up the study's population. The results showed that incentives encourage students to exert more effort and energy in activities that are relevant to their goals and needs. The results showed that highly motivated students perform better in class and have a tendency to reach higher levels of success, which suggests that rewards play a significant role in raising students' academic performance.

In a study, Dramanu and Mohammed (2017) investigated the academic motivation, performance, and differences between male and female students, as well as students from urban and rural schools in Ghana. They also looked at the academic motivation of students in JHS. The research was guided by three hypotheses. All of Ghana's public junior high school students in the second year served as the study's population. From 24 Junior High Schools, a stratified random selection process was used to choose a sample of 1470 JHS 2 students (756 male and 714 female). The results showed a relationship between JHS students' academic achievement and academic motivation.

In a research done at Tehran University in Iran, Amrai, Motlagh, Zalani and Parhon(2011) looked at the relationship between academic motivation and achievement. The study's research design was correlation. Two hypotheses were stated to guide the study. Through the use of a multi-cluster sampling approach, a sample of 252 students from Tehran University, including 115 male and 137 female, was chosen. The results showed that academic motivation and achievement had a positive and significant connection.

Balogun, Balogun, and Onyencho(2017) carried out a research at Adekunle Ajasin University in Ondo State, Nigeria, to examine the moderating effect of achievement motivation in the relationship between test anxiety and academic performance. Ex-post facto research was used in this study. Through the use of a purposive sampling approach, 393 undergraduate students from Adekunle Ajasin University in Ondo state, Nigeria, were selected as a sample (192 male and 201 female). The results showed a significant positive association between achievement motivation and academic performance, indicating that students who are highly motivated to achieve will probably do well in school or perform better.

In a study carried out by Affum-Osei, Eric, Barnie and Forkuoh(2014) explored the connections between high school students' academic achievement, achievement motivation, and academic self-concept in the Western Region of Ghana. This research involved a descriptive survey. 120 students were selected as a sample for the study using a stratified random sampling procedure from four high schools. The results showed that there was no connection between students' achievement motivation and performance.

The aim of the study was to investigate:

I. the association between academic motivation and academic performance of secondary school students in Mathematics

2. whether there is difference between the academic performances of students with high and low motivation levels in mathematics

Statement of the Problem

Student performance in secondary schools is persistently poor, despite the government's attempts to improve mathematics education and learning. Numerous factors, such as a lack of instructional resources, a shortage of trained math teachers, student learning capabilities, and more, have been suggested as contributing to the unacceptably low level of students' performance in mathematics. A significant majority of secondary school students continue to do badly in mathematics, according to observations and studies, despite the fact that there has been and is still a lot of research being done to identify how performance could be improved. The National Bureau of Statistics (2016–2021) report on the WAEC results for Delta State shows that students' performance in mathematics has not been encouraging. Students' dislike, hatred or fear of mathematics may be the cause of this. Many secondary school students opt not to study math or attend math classes. While collaborating with WAEC officials, some of them commit examination fraud, and some parents even help their children pass mathematics exams by using unethical methods. Due to these causes, students fail to prepare for the math test, which eventually leads to poor mathematics performance. The following hypotheses were tested at 0.05 level

of significance: (1) There is no significant relationship between academic motivation and academic performance of secondary school students in Mathematics; (2) There is no significant difference between the academic performances of secondary school students with high and low motivation levels in mathematics.

METHOD

This study employed a correlation survey design. The population of the research consisted of all 42,299 senior secondary two (SS 2) students (20,730 males and 21,569 females) enrolled in mathematics at the 466 public secondary schools dispersed over the 11 educational zones in Delta state. The study's sample consisted of 1650 Senior Secondary School students (771 male and 879 female) from 22 Senior Secondary Schools two (SS2) in Delta State's 11 educational zones for the 2021-2022 school year. The selection was done using a multi-stage sampling process. Data were gathered using an instrument called the Academic Motivation Questionnaire (AMQ). The academic performance of the students was assessed using their math scores from the three terms of the academic year 2021-2022. Three experts validated the instrument. The internal consistency of the (AMQ) items was evaluated using Cronbach's alpha statistics, and the alpha coefficient value was 0.68. Pearson moment correlation coefficient was used to answer the research questions. The t-test of correlation analysis was used to test the null hypotheses at 0.05 alpha levels and evaluate the significance of the relationship between the two significant variables.

RESULTS AND DISCUSSION

The relationship between academic motivation and academic performance of secondary school students in Mathematics.

Table 1. Pearson Product Moment Correlation Statistics showing relationship between academic motivation and students' academic performance

Variable	N	R	r^2	r^2%	Sig(2-tail)
Motivation – performance	1650	-0.031	0.00096	0.096	0.726

According to Table 1, there is a moderately negative correlation between students' motivation and their academic performance in mathematics. As a result, the correlation coefficient between the two variables is -0.031, indicating a moderately negative association between motivation and students performance in mathematics. Additionally, the table 1 shows that motivation has a 0.096% impact on academic performance.

The difference between the academic performances of secondary school students with high and low academic motivation levels in mathematics, in the table 2.

Table 2. Independent t-test analysis of students' academic motivation, percentages and their academic performance in mathematics (N = 1650)

Levels	**N**	**Percentage**	**t-value**	**P-value**
High Motivation	1521	92.2		
			3.52	0.000
Low Motivation	129	7.8		
Total	1650	100		

Table 2 above shows that 1521 students, or 92.2% of the class, reported having a high level of academic motivation in mathematics, whereas 129 students, or 7.8%, reported having a low level of academic motivation in that subject. It may be inferred from this that the majority of students were very motivated to study mathematics.

Hypothesis one: There is no significant relationship between academic

motivation and academic performance of secondary school students in Mathematics

` Using Pearson product-moment correlation statistics to determine whether there is a significant relationship, hypothesis one was examined, and the results is displayed in table 1. The significant value (Sig.2-tailed) of 0.726 is larger than 0.05, indicating that there is no correlation between academic motivation and students' academic performance in mathematics. Thus, the null hypothesis is accepted. This suggests that there is no connection between academic motivation and secondary students' performance in mathematics.

Hypothesis two: There is no significant difference between the academic performances of secondary school students with high and low academic motivation levels in mathematics.

According to the result in Table 2, students with high levels of academic motivation outperformed those with low levels of academic motivation by 92.2 percent to 7.8 percent in the subject of mathematics. The fact that the p-value (0.000) is less than the significant value of 0.05 revealed that there is a significant difference. The null hypothesis, which states that there is no significant difference between the academic performances of secondary school students with high and low academic motivation levels in mathematics, is rejected because there is a significant difference between the academic performances of secondary school students with high and low academic motivation levels in mathematics.

Discussion

Relationship between Secondary school students' academic motivation and their Mathematics Academic Performance

Table 1 showed that there was no significant correlation between mathematics students' academic motivation and performance, indicating that the null hypothesis which states that there is no significant correlation between secondary school students' academic motivation and their mathematics performance is accepted. Given that the null hypothesis is accepted, it shows that there was no significant correlation between secondary school students' academic motivation and their mathematics academic performance. Table 1 show that there was no significant correlation between secondary school students' motivation and their academic performance in mathematics. This is because the significant value (Sig.2-tailed) of 0.726 was higher than 0.05, which led to the acceptance of the null hypothesis, which states that there was no significant correlation between secondary school students' motivation and their academic performance in mathematics.

The current study's conclusions conflict with that of Birgen (2017), whose research indicated that motivating factors improve students' academic performance. Since there was no correlation between secondary school students' motivation and their academic performance in mathematics, this suggests that other factors, such as interest in the subject and high self-efficacy in math, may be more important than incentives in influencing how much effort and energy students will put into math activities and thus their academic performance.

The findings of Amrai, Motlagh, Zalani and Parhon (2011) and Dramanu and Mohammed (2017) are in contrast to this study; they showed a strong and positive relationship between students' academic motivation and performance. Since there was no correlation between secondary school students' motivation and their academic performance, it is possible that other factors, such as a personal interest in and love for mathematics, will help them and facilitate their academic performance in this subject.

In contrast to the current study, which found no correlation between secondary school students' motivation and academic performance in mathematics, Gachigi (2018) found a significant relationship between academic motivation and mathematics achievement. The study examined academic self-concept, motivation, and resilience as predictors of mathematics achievement among secondary school students. Since there was no correlation between academic motivation and academic performance in mathematics, it follows that the level of motivation of the students has no bearing on how well they perform in mathematics.

Difference between students with high and low academic motivation levels and their academic performance in mathematics

Table 2 demonstrated that there was a significant difference between students with high and low academic motivation levels and their academic performance in mathematics, refuting the null hypothesis which states that there is no significant difference between the academic performances of secondary school students in mathematics who have high and low academic motivation levels. It implies that students in secondary schools who were highly and poorly motivated to learn in the subject of mathematics showed a significant difference in their academic performance. This study is in agreement with Birgen (2017) findings, which claimed that students who were highly motivated did better than those with lower motivation levels, the results revealed that students with low academic motivation may not do better in mathematics than those with high academic motivation.

The findings of a study conducted by Balogun, Balogun and Onyencho (2017) to examine the moderating role of achievement motivation in the relationship between test anxiety and academic performance of students at Adekunle Ajasin University in Ondo state, Nigeria, showed that those students who possess high levels of achievement motivation outperform those who have low levels in mathematics. Their findings supported the findings of the current study, showing that students with high levels of academic motivation performed better on mathematics examinations.

CONCLUSION AND SUGGESTION

The researcher came to the conclusion that academic performance and academic motivation among students in secondary schools were related as a result of the study's findings. Furthermore, it was demonstrated that students with strong academic motivation and low motivation levels showed a significant difference in their academic performance in mathematics.

In light of the study's findings and conclusions, the following recommendations are made: Math teachers should make sure to encourage their students through their teaching and evaluation strategies to raise their motivation levels. Since there was no correlation between academic motivation and performance, the mathematics teacher should look into other potential reasons for the students' poor mathematics performance. The resources they require through training should be provided to math teachers so they can increase their students' motivation, which should improve their academic performance.

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