



Students' Mathematics Achievement: Is Location A Factor?

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ABSTRACT

The primary focus of this study was to examine the influence of school location on the academic performance of secondary school students in mathematics. The study was guided by one research question and one null hypothesis, employing an ex-post facto research design. The population of interest consisted of 22,158 Senior Secondary Two (SS2) students from secondary schools in Delta Central Senatorial District of Delta State. From this population, a sample of 392 students was selected using a multi-stage sampling technique. To gather data, a 30-item objective test on mathematics was utilized as the research instrument. Data analysis was conducted using the product moment correlation coefficient and linear regression. The null hypothesis was tested at a significance level of 0.05. The findings revealed a significant impact of school location on students' mathematics achievement, with urban students outperforming their rural counterparts. Based on the results, it is recommended that the government should ensure the provision of adequate learning facilities in all schools, regardless of their location. This will help bridge the achievement gap between rural and urban students in mathematics. By investing in educational resources and infrastructure, policymakers can create an equitable learning environment for all students, irrespective of their geographical location.

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INTRODUCTION

Several research studies have explored the impact of location on students' achievement in secondary school mathematics. For instance, Osadebe and Diakelhe-Edjere (2018) conducted a study involving senior secondary school students to investigate the influence of gender, location, and socio-economic status on mathematics achievement. The study utilized four research questions, four hypotheses, and a sample of 759 students selected through simple random sampling. The findings revealed that gender and socio-economic status significantly influenced students' mathematics achievement, while location did not have a significant impact. However, when considering all three factors together, they collectively influenced students' mathematics achievement.

Interestingly, the study conducted by Osadebe and Diakelhe-Edjere (2018) aligns with the findings of Kolawole and Popoola (2011), who reported that secondary school

students' mathematics achievement did not significantly differ between urban and rural areas. This situation can be attributed to students' attitudes towards academic activities, as Ossai (2020) emphasized the influence of attitudes on academic achievement.

Other relevant studies on location and students' mathematics achievement were conducted by Alordiah et al. (2015) and Akissani et al. (2019). Alordiah et al. (2015) examined how gender, location, and socio-economic status affected students' mathematics achievement. The study employed four research questions, three hypotheses, and a sample of 1900 final-year secondary school students in Delta State. The results indicated that urban students performed better than their rural counterparts, consistent with the general expectation that urban schools excel in all academic subjects.

Similarly, Akissani et al. (2019) explored the effect of gender and location on mathematics achievement among senior secondary school

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students in Nigeria. The study posed two research questions, two hypotheses, and included 200 students randomly selected from a total population of 13,763 senior secondary two students. The findings revealed a significant difference in mathematics achievement based on gender, with students from urban schools outperforming their rural counterparts. Given the inconsistencies observed in gender studies in mathematics, similar variations can be seen regarding the impact of location on students' achievement in mathematics. Therefore, this present study aimed to determine the significance of location in students' achievement in secondary school mathematics within the context of Delta Central Senatorial District in Delta State. The research question and null hypothesis guiding this study were as follows:

Research Question: What is the relationship between school location and students' academic achievement in mathematics?

Null Hypothesis: 2. There is no significant relationship between location and students' academic achievement in mathematics.

METHODOLOGY

The study employed a correlational research design. The population consists of 22,158 senior secondary school two (SS2)

students in public schools in Delta Central Senatorial District out of this, a sample of 392 students was drawn using multi-stage sampling technique. A 30-item mathematics test was the instrument used in the study. Expert judgment and table of specification were used to establish content validity of the instrument. Kuder Richardson 21 was used to establish the reliability index of 0.83. Students' responses were personally collected by the researcher the same day. The product moment correlation coefficient and the coefficient of determination were used to answer the research question while linear regression was used to test the null hypothesis at .05 level of significance. An r-value of +0.1 to 0.49 was judged to be low positive correlation while an r-value of 0.5 to +1 was taken as high positive correlation. Low negative correlation and high negative correlation were taken as -0.1 to -0.49 and -0.5 to -1, respectively. The value of zero signified no correlation.

RESULT

Data collected were analysed as follows:

Research Question One: What is the relationship between school location and academic achievement of students in mathematics?

Table 1: Person Product Moment Correlation (r) and Coefficient of Determination (r²) of School Location and Academic Achievement of Students in Mathematics

Variables	N	R	r ²	r ² %	Decision
School Location	392	13	0.02	2.00	Low positive relationship
Academic Achievement					

Table 1 showed the R-value of 0.13 as the multiple correlation value of the relationship between school location and academic achievement of students in Mathematics. The coefficient of determination (r²) was 0.02 and the amount of contribution of location to academic achievement is 2.00%.

The result showed a low positive relationship between school location and academic achievement of students' Mathematics.

Hypothesis One: There is no significant relationship between location and students' academic achievement in mathematics.

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Table 2: Linear Regression Analysis of Location and Students' Academic Achievement in Mathematics Model Summary

Model	R	r-square	Adjusted-r-square	Std. Error of the Estimate
1	.13 ^a	.02	.01	

ANOVA					
Model	Sum of Squares	DF	Mean Square	F	Sig.
Regression	1093.68	1	1093.68	6.45	.01 ^b
Residual	66107.88	390	169.51		
Total	67201.56	391			

$\alpha=0.05$

Table 2 shows a linear regression output of the relationship between location and students' academic achievement in mathematics with computed F-value of 6.45 and a p-value of 0.01. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.01 was less than the alpha level of 0.05. Thus, the null hypothesis was rejected. This indicated that there was a significant relationship between location and students' academic achievement in Mathematics. The r^2 value of 0.02 showed that 2.00% of variance in academic achievement was accounted for by location.

FINDINGS

The following findings emerged from the study:

- I. There is a positive relationship between location and students' achievement in mathematics.
- II. There is a significant relationship between location and students' achievement in mathematics.

DISCUSSION OF FINDINGS

The research question and its hypothesis determined the relationship between school location and academic achievement of students in Mathematics. The finding indicated that there was a significant positive relationship between school location and academic achievement of students in Mathematics. The possible explanation for this finding could be that urban location is more provided with human resources and learning facilities for improved performance than the rural schools. This finding is in line with Akissani et al. (2019) who showed that gender and location impact on mathematics achievement of senior secondary school students in Nigeria. This finding is also in line

with Isa (2018) who showed that school location influences performance of mathematics students. The finding equally aligns with Chianson (2012) who reported that school location significantly influences students' achievement in Mathematics. However, the result disagrees with the works of Joseph, et al. (2017) and Alokun, et al. (2018) who separately reported that students' mathematics achievement did not differ significantly in terms of location. It is also possible for guessing to have impacted on scores in line with Ossai (2015). For a better performance, the use of essay questions in addition to objective questions is instructive (Ossai, 2019).

CONCLUSION AND RECOMMENDATION

Based on the findings from the study, it was concluded that location impacts on students' achievement in mathematics. Students from urban schools did better than their counterparts from rural schools. It was recommended that government should make provision of facilities for learning in all schools, regardless of the location.

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