



## **Distance to School and Students' Mathematics Achievement in Ethiopia East Local Government Area of Delta State.**

*<sup>1</sup>Isaac, D.T, and <sup>2</sup>Aghegho. I*

<sup>1</sup>Department of Mathematics, Delta State University Secondary School (DELSU), Abraka.

<sup>2</sup>Department of Guidance and Counseling (Measurement Evaluation Unit), Delta State University, Abraka, Nigeria.

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### **ABSTRACT**

This research investigated the impact of distance to school and students' mathematics achievement in Ethiopia East Local Government Area (L.G.A) of Delta State. The study formulated one research question and corresponding null hypotheses to guide its exploration. Employing a correlational research design, the sample comprised 300 secondary school students selected from ten public schools in Ethiopia East LGA of Delta State. Stratified random sampling and simple random sampling techniques were utilized to ensure a balanced representation, with 150 male and 150 female students included in the study. Data collection involved administering a questionnaire to gather pertinent information from the students, while the first-term examination scores in mathematics were obtained from school records. Descriptive statistics and regression analysis were employed to analyze the data. The findings indicated that the distance to school had a significant influence on secondary school students' mathematics performance in Ethiopia East Local Government Area of Delta State. Consequently, the study recommended that the government should prioritize investment in rural education infrastructure, particularly in areas where students have to travel long distances to access schools. This includes building new schools, improving road networks, and providing transportation subsidies for students.

**Keywords:** Distance to School, Academic achievement, Mathematics

### **Introduction**

Education encompasses a multifaceted process involving the acquisition of knowledge, skills, values, and attitudes through formal, informal, or non-formal channels. It serves as a lifelong pursuit empowering individuals to engage with their surroundings and contribute positively to society. Within the Nigerian context, formal education is structured across three main levels: Primary, Secondary, and Tertiary Education. Secondary education, the focus of this study, bridges the gap between primary schooling and further academic pursuits or vocational training. Divided into junior and senior stages, it typically caters to students aged 11 to 18, fostering a comprehensive learning environment.

Mathematics, a cornerstone of secondary education, constitutes the study of numbers, shapes, quantities, and patterns—a universal language facilitating comprehension of the world. Its evolution spans millennia, evidenced by its utilization in ancient civilizations and its crucial role in scientific inquiry and technological innovation. Despite its paramount significance, recent trends indicate a concerning decline in students' performance in mathematics, both internally and externally assessed. This declining performance underscores a critical issue within the educational landscape, prompting inquiries into its underlying causes.

Scholarly investigations into the factors contributing to poor academic achievement in mathematics have identified a myriad of influences, ranging from administrative challenges within educational institutions to broader socio-environmental factors impacting students' learning environments. Despite concerted efforts to address these challenges, the persisting issue of subpar academic outcomes necessitates further examination. This study is motivated by the recurring pattern of academic underperformance in mathematics, prompting an exploration into the potential role of distance to school as a contributing factor.

The concept of "distance to school" encapsulates the geographical proximity between students' residences and educational institutions—a factor often overlooked in discussions surrounding educational equity and access. Research underscores the significance of this factor, particularly for students residing in remote or rural areas, who contend with longer commutes and logistical barriers in accessing schooling. Moreover, the absence of adequate transportation infrastructure exacerbates these challenges, amplifying disparities in educational opportunities and outcomes. Despite its acknowledged importance, scant attention has been devoted to assessing the impact of distance to school on academic performance, particularly in core subjects like mathematics, within the Nigerian context.

While studies in developed countries have explored the nexus between distance and academic performance, limited literature exists on this phenomenon in developing nations such as Nigeria. Hence, this study seeks to fill this gap by investigating the influence of distance to school on students' academic

performance, with a specific focus on mathematics. By elucidating the relationship between geographical accessibility and educational outcomes, this research endeavors to inform policy interventions aimed at mitigating disparities in educational access and promoting equitable learning opportunities for all students in Nigeria.

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## Statement of the Problem

The Distance to School and Secondary School Students' Mathematics Performance in the Ethiopia East Local Government Area of Delta State poses a significant challenge. The long distances students have to travel to reach their schools have resulted in several negative consequences, including Students have to spend a considerable amount of time commuting to and from school, which can disrupt their concentration during mathematics lessons. The constant movement and lack of focus can hinder their ability to grasp complex mathematical concepts. Despite the pervasive nature of these challenges, limited research has been conducted to explore the specific effects of distance to school on students' academic performance in the Ethiopia East Local Government Area of Delta State. The primary goal of this research is to investigate the correlation between students' distance to school and their performance in mathematics.

## Research Question

The following research questions guided the study

1. To what extent does distance to school affect students' mathematics in Ethiopia Local Government Area?

## Hypotheses

The following null hypotheses were formulated to guard the study.

1. there is no significant relationship between distance to school and students' mathematics in Ethiopia Local Government Area

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## Literature Review

Over time, the distance students traverse from home to school has emerged as a pivotal concern for various stakeholders including governments, parents, students, and policymakers, as it directly impacts both education and health outcomes. Commuting to school typically occurs via two modes: active and passive. The passive mode encompasses motorized forms of transport such as cars, buses, taxis, tricycles, and motorcycles, while the active mode involves walking or bicycling. However, even in the passive mode, students may need to walk to and from stations or bus stops to catch transportation (Som & Dira, 2020).

Literature has consistently highlighted the profound influence of travel distance on students' academic performance and overall well-being. Extensive walking distances often result in psychological and physical strain, leading to fatigue, reduced concentration, and health hazards (Marique et al., 2013). Students enduring lengthy treks may experience tardiness, hunger, and sleep deprivation, ultimately impeding their ability to engage effectively in classroom activities (Mhiliwa, 2015). Moreover, the taxing nature of long commutes diminishes students' capacity to concentrate on academic tasks, fostering a cycle of underperformance and disengagement (Zuckerman, 2021). The arduous journey to school also detracts from students' extracurricular involvement and sleep patterns, further exacerbating academic challenges (Wheaton et al., 2016).

Studies have consistently underscored the pivotal role of parental preferences and choices in determining students' travel distance to school (He & Giuliano, 2018). Parents are advised to prioritize proximity when selecting schools for their children, as longer travel distances have been associated with diminished academic achievement (Akhtar, 2012). Empirical evidence from studies conducted in various contexts, such as Botswana and the Philippines, corroborates the adverse impact of distance to school on students' performance in mathematics (Baliyan & Khama, 2020; Peteros et al., 2022). Similarly, research conducted in Nigeria's Ovia North-East Local Government Area reveals a significant relationship between school distance and academic achievement, particularly among male primary school students (Ebinum et al., 2017).

Moreover, the deleterious effects of lengthy commutes extend beyond academic realms, with students from impoverished backgrounds facing heightened risks of distractions, theft, and even pregnancies en route to school (Mhilawa, 2015).

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## Research Method

The design for this study was a correlational research design. This design was considered appropriate as it allowed measurement of two or more variables and their relationship (Bahyan & Khama, 2020). The population of the study was the Basic 7 (JSS 1) students in Ethiopia East East LGA of Delta State. A sample of 300 students was selected from ten public secondary schools through a random sampling method. A questionnaire was used to obtain information about the students. The questionnaire contained two sections: section one provided information on the demographic variable of distance to school, and section two focused on the performance of the students in mathematics, which was considered to be measured by the examination marks in mathematics. The collection of data was carried out in two phases. In the first phase, the questionnaire was given to the selected students to provide the

necessary information on the questionnaire. In the second phase of data collection, the first-term examination marks of the selected students in mathematics were collected from the school records. Regression was used for analyzing the data at alpha level of 0.05.

## Results and Discussion

### Research Questions One

To what extent does distance to school affect students' mathematics achievement in Ethiopia East Local Government Area of Delta State.?

Table – 1: Means and Standard Deviation of analysis of influence of distance to school on students' mathematics achievement in Ethiopia East Local Government Area of Delta State

Level of distance	N	Mean ( $\bar{X}$ )	Standard deviation (SD)
Above 6km	54	42.42	15.06
3 – 5km	77	55.13	17.63
0 – 2km	169	84.78	23.22
Total	300	64.35	23.76

Table 1: Shows that between the three levels of distance to school, the longer distance to school of above 6km had the lowest mean performance ( $\bar{X} = 42.42$ ), followed by the medium distance ( $\bar{X} = 55.13$ ). The shorter distance to school had the highest mean performance ( $\bar{X} = 84.78$ ) in mathematics.

### Hypothesis one

There is no significant relationship between distance to school and students' mathematics achievement in Ethiopia East Local Government Area of Delta State

Table 2 regression Analysis of relationship between the distance to school and students' mathematics achievement in Ethiopia East Local Government Area of Delta State

#### ANOVA <sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3521.88	2	1761.24	3.533	.030 <sup>b</sup>
	Residual	109020.84	297	559.08		
	Total	112542.72	299			

a. Dependent Variable: students' performance

b. Predictors: (Constant), distance to school

Table 4.2 shows a regression output of the relationship between the distance to school and academic performance of students in mathematics. The computed F-value of 3.533 has a p-value of 0.030. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.030 was less than the alpha level of 0.05. Therefore, the null hypothesis was rejected. This means that there was a significant relationship between the distance to school and students' mathematics achievement in Ethiopia East Local Government Area of Delta State.

## Discussion of Result

The results of the analysis indicate that there is a significant relationship between the distance to school and students' mathematics achievement in Ethiopia East Local Government Area of Delta State. Longer distances could mean increased travel time and potentially more difficulties in accessing educational resources. This could lead to various factors impacting academic performance, such as fatigue, time constraints, or limited access to academic support. In the context of mathematics performance, a longer distance to school might affect a student's ability to consistently attend classes, participate in extracurricular activities, or access additional support such as tutoring. Conversely, students living closer to school might have more opportunities for academic engagement and support, potentially resulting in better performance in mathematics. Students who reported longer distances to schools tend to have lower academic performance in mathematics compared to their peers who reside closer to school. This finding corroborate with the findings of Gatechew (2018); Baliyan and Khama (2020); Thapa (2015); and Peteros, Ypil, Vera and Alcantara (2022) who determined that the distance to school has a significant effect on students' academic performance.

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## Conclusion

Based on the results, it was determined that students' mathematics achievement was impacted by their distance from the school. Students' mathematics achievement is significantly impacted by the distance they commute to school. This is because, owing to poor roads, the majority of kids live quite distant from the school and must walk there. The challenges that long-distance learners encounter on a daily basis might lead to fatigue, which in turn impairs students' mathematics achievement.

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## Recommendation

1. The government should prioritize investment in rural education infrastructure, particularly in areas where students have to travel long distances to access schools. This includes building new schools, improving road networks, and providing transportation subsidies for students.
2. School authorities should prioritize improving accessibility to schools by investing in transportation infrastructure such as bus services or providing bicycles for students who live far away. Additionally, establishing satellite campuses or learning centers in remote areas can help reduce the distance students need to travel to access education.
3. Teachers should implement flexible learning strategies that accommodate students who face challenges due to long distances. This could involve providing recorded lectures or online resources for students who miss class due to transportation issues. Teachers should also consider incorporating practical, real-life examples in mathematics lessons to enhance understanding and engagement, particularly for students who may struggle due to the distance factor.
4. Students should leverage technology to supplement their learning, especially if they face challenges related to distance. Access to educational apps, online tutorials, and virtual classrooms can help bridge the gap caused by long distances. Students should also take initiative in forming study groups with peers who live nearby to enhance collaborative learning and support each other academically.

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