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School Location, Gender and Senior Secondary School Students' Academic Performance in Mathematics in Obubra Local Government Area of Cross River State, Nigeria

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Abstract
The study was carried out to probe the influence of school location and gender on students' performance in Mathematics in Obubra Local Government Area of Cross River State, Nigeria. The ex-post facto design was used. 114 boys and 111 girls, both from rural and urban areas, were selected randomly as the sample of this study. Four public secondary schools were selected randomly using Disproportionate Random Sampling Method from rural and urban areas in Obubra Local Government Area. Three (3) hypotheses were tested to determine the influence of school location on students' performance in mathematics, particularly between urban and rural students and between urban and rural girls, as well as between urban and rural boys. A significant difference was found in favour of urban students, irrespective of sex. Also, there was no significant difference in the performances of urban and rural girls. However, a significant difference exists in terms of students' performance between urban boys and their counterparts in rural schools. It was recommended that rural schools should be provided with basic human and physical facilities for better results.
Keywords: academic, performance, gender, mathematics, location

Introduction
The comprehension of the world is facilitated by mathematics, and in turn, understanding of the world is utilized to comprehend mathematics. Thus, mathematics is recognized as a potent instrument for fostering global understanding and communication (Rosa & Pinheiro, 2020; Foster et al., 2022). It is widely acknowledged that various environmental factors, including the influence of teachers, instructional methodologies, test administration strategies, birth variables, and parental engagement, play pivotal roles in fostering students' mathematical performance, as noted by scholarly observations (Brezavšček et al., 2020; Owan et al., 2019).

It is evident that educators, parents, and society are deeply interested in students' academic performance across all subjects. Moreover, when educators are tasked with preparing students for training programmes, they must understand the likelihood of success or failure for each candidate (Kutsyuruba et al., 2019; Schonert-Reichl, 2019). Students' academic performance holds immense importance at various levels, including individual, household, organisational (such as schools), and national perspectives.

According to Zakirah (2023), performance is the knowledge acquired and evaluated by a teacher through grades; or educational objectives established by both students and instructors to be met within a specific timeframe.

Some significant factors contributing to poor performance in mathematics include students' fear for the subject, a lack of properly trained teachers, negative students' attitudes toward mathematics, and insufficient teaching resources (Githaiga, 2019; Suleiman & Hammed, 2019). According to Githaiga (2019), insufficient use of teaching materials in mathematics classroom affects the performance of students. Thus Banerjee (2016) observed that geographical setting of a school appears to significantly influence learning outcomes, while Farooq et al. (2011) stated that the socio-economic background of students can also impact their academic performance. Livumbaze and Achoka (2016) added that parental socioeconomic status significantly affects student's academic performance. Moreso, Aznar-Díaz et al. (2020) noted that the availability of ICT resources in schools is positively associated with students' academic success.

The literature on school location vividly points out some fundamental differences between urban and rural schools regarding their academic performances. Nepal (2016) found a significant difference between rural and urban students on their level of Mathematics performance. In their studies, Liu et al. (2015) and Tang et al. (2023) observed a notable contrast in the mathematics performance of secondary school students from rural schools and their urban school counterparts. However, some studies presented contradictory views, asserting that students in rural schools are not significantly different from their urban counterparts (Huang, 2016; Kresch, 2020). According to Banerjee (2016), a considerable distinction exists in the mathematics performance of secondary school boys from rural schools compared to their urban school counterparts. Specifically, Morgan et al. (2023) observed a significant gap in mathematics performance between males from rural and urban schools. The superior academic performance of urban students can be attributed to the higher quality of education they receive and their access to a wide range of information from various sources such as mass media and electronic media (Garcia et al., 2021). Moreover, Mege (2014) indicated that many teachers in rural areas lack dedication to their work, mainly due to inadequate supervision system in rural schools.

Furthermore, Li et al. (2018), Ahmed et al. (2020), and Smith and Farkas (2023) noted in their research that there exists a significant disparity in mathematics performance between males from rural school and counterparts from urban schools. Similarly, Kumar et al. (2019) noted that urban girls outperformed their rural counterparts. Contrary to these findings, Semab and Naureen (2022) found no significant difference in academic performance. Other studies found no notable contrast in the mathematics performance of secondary school girls from rural schools compared to their urban school counterparts (Marshall et al., 2022; Nkoma, 2022). Equally, Sember et al. (2018)

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and Nepal (2016) observed no significant difference between the academic performance of rural females and urban females.

The primary goal of this study was to fill the gaps present in the existing literature, giving the apparent scarcity of research specifically targeting students' academic performance. Prior studies have typically explored academic performance in a broader sense without a specific emphasis. Moreover, the existing literature suggested that the majority of studies in related areas predominantly originated from foreign sources. In the Nigerian context, there is a dearth of research evidence specifically addressing students' academic performance in mathematics as it relates to the location of the school.

Purpose of the study

The purpose of the study is to probe the influence of school location on students' performance in mathematics in Obubra Local Government Area of Cross River State, Nigeria. Specifically, the study seeks to:

1. To contrast the academic performance of students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State.
2. To contrast the academic performance of female students in Mathematics in urban schools and female students in rural senior Secondary Schools in Obubra Local Government Area of Cross River State, Nigeria.
3. To contrast the academic performance of male students in Mathematics in urban schools and male students in rural senior Secondary Schools in Obubra Local Government Area of Cross River State, Nigeria.

Hypotheses

The following hypotheses are stated and tested at 0.05 level of significance:

Ho1: There is no significant difference in the academic performance of students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State.

Ho2: There is no significant difference in the academic performance of female students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State.

Ho3: There is no significant difference in the academic performance of male students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State.

Methodology

Ex post facto design is used in this study. It examines how an independent variable, present before the study, affects the dependent variable. The population consisted of 2,342 senior secondary school students, who sat for 2021 West African Senior School Certificate Examination (WASSCE) in Obubra Local Government Area public schools. The sample size is made up of 225 senior secondary school students randomly

selected from the population. Four senior secondary schools were randomly selected from within Obubra Local Government Area. This included two (2) senior secondary schools in urban settlements and two (2) from rural settlements.

Table 1: The number of male and female participants

Name of School	Location	Male	Female	Total
Community secondary school, Adun Obubra	Rural	41	20	61
Government Secondary School, Apiapum	Rural	21	29	50
Governmental Technical College, Ogada II	Urban	42	33	75
Mbembe Comprehensive secondary School, Ogada II	Urban	20	21	41
		124	**103**	**227**

The data used for this study came solely from 2021 results of senior secondary school certificate mathematics results obtained from the principals of the four (4) schools used. The students' scores in the WASSCE examination for 2021 mathematics as obtained from the West African Examination Council (WAEC) was used. A t-test for independent sample was used to analyze the data obtained.

Presentation of results

Ho1: There is no significant difference in the academic performance of students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State, Nigeria.

Table 2: t-test analysis of the academic performance of students in urban and rural senior secondary schools in Mathematics

Group	N	Mean	SD	Df	t-cal	t-crit	Decision
Urban	114	3.16	0.56				
				223	3.33	1.96	Significant
Rural	111	2.85	0.80				

Table 2 shows the t-cal as 3.33 while the critical value is 1.96 at 223 degree of freedom (df) and a significant level of 0.05. Since the value of t-cal is greater than the critical value, the null hypothesis is rejected. This implies that there is a significant difference in the academic performance of students in urban and rural schools in favour of the urban schools in Mathematics

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Ho2: There is no significant difference in the academic performance of female students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State, Nigeria.

Table 3: t-test analysis of the academic performance of female students in urban and rural senior secondary schools in Mathematics

Group	**N**	Mean	**SD**	**Df**	**t-cal**	**t-crit.**	**Decision**
Urban (Girls)	52	3.29	0.54				
				99	1.39	1.96	Not Significant
Rural (Girls)	59	3.1	0-79				

Table 3 shows the t-cal as 1.39 while the critical value is 1.96 at 99 degree of freedom (df) and at a significant level of 0.05. Since the value of t-cal is less than the critical value, the null hypothesis is accepted. This implies that there is no significant difference in the academic performance of female students in urban and rural schools.

Ho3: There is no significant difference in the academic performance of male students in Mathematics in urban and rural senior secondary schools in Obubra Local Government Area of Cross River State, Nigeria.

Table 4: t-test analysis of the academic performance of male students in urban and rural senior secondary schools in Mathematics

Group	**N**	**Mean**	**STD**	**Df**	**t-cal**	**t-crit.**	**Decision**
Urban (Boys)	62	3.05	0.61				
				111	2.93	1.96	Significant
Rural (Boys)	52	2.73	0.67				

Table 4 shows the t-cal as 2.93 while the critical value is 1.96 at 111 degree of freedom (df) and at a significant level of 0.05. Since the value of t-cal is greater than the critical value, the null hypothesis is rejected. This implies that there is a significant difference in the academic performance of male students in urban schools and rural schools in favour of the male students in urban schools.

Discussion of the findings

The first finding of this study showed that there is a significant difference in the academic performance of students in urban and rural schools in favour of the urban schools in Mathematics in Obubra Local Government Area of Cross River state. This finding may have appeared this way since the educational facilities like instructional materials, well trained teachers, access to online study, provision of needed text books

and standard school library are mostly available to students in urban schools and are mostly not available to students in rural schools. This finding agrees with the results of Nepal (2016) who found out that there is a significant difference between rural and urban students on the level of Mathematics performance.

The finding of the study clearly revealed that students who attend urban schools performed better than their counterparts in rural areas as it can be seen on table 2. This finding support Banerjee (2016), who reported that the performance of students in academic will differ considerably based on school location. This however favours urban schools. Mege (2014) points out that most teachers in rural areas are not committed to their work largely as a result of poor supervision machinery in rural schools. The study linked the underperformance of rural students to several factors including the absence of school facilities, inadequate funding, disparities in teacher quality, limited access to reading materials, insufficient teaching resources, low parental socio-economic status, as well as deficient infrastructures and inadequate instructional materials (Githaiga, 2019). The superior academic performance of urban students can be attributed to the higher quality of education they receive, as well as their access to abundant information from diverse sources such as mass media and electronic media (Garcia et al., 2021).

Also the study revealed that female students in urban do not perform better than their counterparts in rural school as shown in Table 3. This finding supports that of Semab and Naureen (2022) who reported no significant difference found in their academic performance. The finding of the study is not in agreement with that of Kumar et al. (2019) who observed that urban girls performed better than their counterparts in rural areas. Similarly, Kumar et al. (2019) in the findings of their study, stated that urban girls performed better than the rural ones.

In Table 4, the outcome shows that the male students in urban schools perform better than the male students in rural schools in mathematics. The finding agrees with that of Ahmed et al. (2020) who reported that the performances of male students in academic differs significantly based on location and in favour of male students in urban schools. Banerjee (2016), Li et al. (2018), Ahmed et al. (2020), and Morgan et al. (2023) also noted in their research that there exists a significant disparity in mathematics performance between males from rural school and counterparts from urban school. By suggesting indirectly, it indicates that certain fundamental necessities crucial for comprehending mathematics might be lacking or are insufficiently provided in rural schools, thus impacting the academic performance of male students in those settings.

Conclusion

This research examines the difference in academic performance in Mathematics in both urban and rural senior secondary schools within the Obubra Local Government Area of Cross River State. The aim is to provide solutions to the apparent disparity in academic

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achievement observed among students in Mathematics between urban and rural schools. The findings of this study showed that students in urban senior secondary schools performed better than their counterparts in rural senior secondary schools. The study concluded that there is no significant difference between rural school girls and urban school girls of secondary level in respect to their mathematics performance, and that the male students belonging to rural school differed significantly from their urban school counterparts in secondary level in respect to their mathematics performance.

Recommendations

Based on the findings of this study, the following recommendations have been made:

1. Only instructors who possess proper training, qualifications, and a commitment to education should be recruited, particularly in rural schools. The government should motivate educators to continually enhance their expertise through consistent participation in seminars, workshops, and conferences.
2. The government should ensure that adequate learning facilities and quality infrastructure are provided in both urban and rural schools to improve the teaching and learning of mathematics.
3. Educational authorities should conduct regular supervision of teachers in rural areas to ensure compliance with educational standards and assess their dedication to the teaching profession.

References

Ahmed, E. A., Banerjee, M., Sen, S., & Chatterjee, P. (2020). Academic achievement in mathematics among rural and urban students: A study on secondary and higher secondary level students. *International Journal of Multidisciplinary Research and Development*, *7*(8), 178-182.

Aznar-Díaz, I., Hinojo-Lucena, F. J., Cáceres-Reche, M. P., & Romero-Rodríguez, J. M. (2020). Analysis of the determining factors of good teaching practices of mobile learning at the Spanish University. An explanatory model. *Computers & Education*, *159*, Article No. 104007.

Banerjee, P. A. (2016). A systematic review of factors linked to poor academic performance of disadvantaged students in science and maths in schools. *Cogent Education*, *3*(1), 1178441.

Brezavšček, A., Jerebic, J., Rus, G., & Žnidaršič, A. (2020). Factors influencing mathematics achievement of university students of social sciences. *Mathematics*, *8*(12), 21-34.

Farooq, M. S., Chaudhry, A. H., Shafiq, M., & Berhanu, G. (2011). Factors affecting students' quality of academic performance: A case of secondary school level. *Journal of Quality and Technology management*, *7*(2), 1-14.

Foster, C., Burkhardt, H., & Schoenfeld, A. (2022). Crisis-ready educational design: The case of mathematics. *The Curriculum Journal*, *33*(4), 519-535.

Garcia, A. G., McGrew, S., Mirra, N., Tynes, B., & Kahne, J. (2021). Rethinking digital citizenship: Learning about media, literacy, and race in turbulent times. *Educating for Civic Reasoning and Discourse*, 319-352.

Githaiga, E. W. (2019). Factors influencing Mathematics performance in KCSE among learners in public secondary schools in Kilifi sub-county [Unpublished Doctoral dissertation]. Kenya Methodist University.

Huang, S. H. (2016). Communicative Language Teaching: Practical Difficulties in the Rural EFL Classrooms in Taiwan. *Journal of Education and Practice*, *7*(24), 186-202.

Kresch, R. (2020). *Explaining Rural Resentment: A Comparative Case Study* [Unpublished Doctoral Dissertation]. Haverford College

Kumar, P., Saxena, S., Gupta, S. B., Agarwal, N., & Imtiaz, D. (2019). A comparative study of knowledge regarding reproductive health among rural and urban adolescent girls in district Bareilly. *National Journal of Community Medicine*, *10*(04), 212-217.

Kutsyuruba, B., Godden, L., & Bosica, J. (2019). The impact of mentoring on the Canadian early career teachers' well-being. *International Journal of Mentoring and Coaching in Education*, *8*(4), 285-309.

Li, M., Zhang, Y., Liu, H., & Hao, Y. (2018). Gender differences in mathematics achievement in Beijing: A meta-analysis. *British Journal of Educational Psychology*, *88*(4), 566-583.

Liu, T., Holmes, K., & Albright, J. (2015). Predictors of mathematics achievement of migrant children in Chinese urban schools: A comparative study. *International Journal of Educational Development*, *42*, 35-42.

Livumbaze, A. G., & Achoka, J. S. K. (2016). Effect of parents' socio-economic status on secondary school students' academic achievement in Hamisi Sub-County, Kenya. *European Journal of Education Studies,* 2(12), 65-81.

Marshall, D. T., Neugebauer, N. M., Huang, L., & White, J. (2022). Describing Rural Charter Schools in the United States. *Journal of School Choice, 16*(4), 562-587.

Mege, C. A. (2014). Influence of school environmental factors on teaching-learning process in public primary schools in lower Nyokal Division, Homa-Bay District, Kenya [Unpublished Doctoral Dissertation]. University of Nairobi.

Morgan, P. L., Hu, E. H., Farkas, G., Hillemeier, M. M., Oh, Y., & Gloski, C. A. (2023). Racial and Ethnic Disparities in Advanced Science and Mathematics Achievement During Elementary School. *Gifted Child Quarterly*, *67*(2), 151-172.

Nepal, B. (2016). Impact of gender and location on mathematical thinking and mathematics achievement. *Journal of Advanced Academic Research*, *3*(3), 11-21.

Nkoma, E. (2022). A Comparative Study on the Academic Achievement of Non-Disabled Learners in Inclusive and Non-Inclusive Classrooms at a Rural Primary School in Zimbabwe. *Research and Advances in Education*, *1*(3), 1-10.

ISSN: 2645-324X (Print)
ISSN: 2645-3223 (Online)

Owan, V. J., Duruamaku-Dim, J. U., & Eneje, S. (2019). Mode of test administration, birth variables, and students' academic achievement in Mathematics in Obubra Local Government Area of Cross River State, Nigeria. *Prestige Journal of Counselling Psychology, 2*(2), 60–77. https://bit.ly/2Xfux0D

Rosa, M., & Pinheiro, R. P. (2020). Cybereducation with Mathematics Teachers: Working with Virtual Reality in Mathematics Activities. *Constitution and Production of Mathematics in the Cyberspace: A Phenomenological Approach*, 123-140.

Schonert-Reichl, K. A. (2019). Advancements in the landscape of social and emotional learning and emerging topics on the horizon. *Educational Psychologist*, *54*(3), 222-232.

Semab, T., & Naureen, S. (2022). Effects of flipped classroom mode on academic achievement of students at elementary level. *Pakistan Journal of Social Research*, *4*(1), 393-401.

Sember, V., Morrison, S. A., Jurak, G., Kovac, M., & Starc, G. (2018). Differences in physical activity and academic performance between urban and rural school children in Slovenia. *Montenegrin Journal of Sports Science and Medicine*, *7*(1), 67-72.

Smith, E., & Farkas, G. (2023). Gender and mathematics achievement: the role of gender stereotypical beliefs of classroom peers. *European Sociological Review*, *39*(2), 161-176.

Suleiman, Y., & Hammed, A. (2019). Perceived causes of students' failure in mathematics in Kwara State Junior Secondary Schools: Implication for educational managers. *International Journal of Educational Studies in Mathematics*, *6*(1), 19-33.

Tang, S., Wang, Z., & Sutton-Jones, K. L. (2023). A multi-level analysis of upper elementary students' performance on the STAAR reading exam: Comparing growth trajectories of rural and non-rural school districts. *Educational Studies*, *49*(5), 799-822.

Zakirah, U. (2023). The Impact of Teacher's Professional Competence on Student's Performances [Unpublished Doctoral dissertation]. Ar-Raniry State Islamic University.