African Educational Research Journal
Vol. 14(2), pp. 329-334, April 2026
ISSN: 2354-2160
Full Length Research Paper

Evaluation of the effect of school location on the attitude of students towards mathematics in the era of digital technology

Udobia Elijah Etukudo[1] and Foluke Bosede Eze[2]*

[1]Department of Mathematics, Federal College of Education (Technical), Omoku, Rivers State, Nigeria.
[2]Federal University Otuoke, Bayelsa State, Nigeria.

Accepted 20 January, 2026

ABSTRACT

School location is an environmental factor that affects the attitude of students towards mathematics. In the era of digital technology, where information and learning tools reach every part of the world through smartphones and other digital learning tools, it is quintessential to carry out a study to establish its effect on the attitude of students towards mathematics. 3100 final year secondary school students in Bayelsa State, Nigeria, were used in this study. The participants were 1250 students from urban schools, 950 from sub urban and 900 students from schools in the rural communities. A 25-item attitude test was used for data collection, which was analysed using ANOVA at a 0.05 level of significance. The result shows that there exists a significant difference in attitude towards mathematics among the groups. Further analysis using Scheffe's test reveals that there exists no significant difference between the attitude towards mathematics of students in the urban and rural schools, but there exists a significant difference between the rural and suburban school students' attitude towards mathematics. It is also revealed that there exists a significant difference between the attitude toward mathematics of students in urban and suburban schools. The mean scores of the students in the attitude test were urban 68.7%, suburban 65% and rural 68.9%. The blending of attitude towards mathematics of students in urban and rural schools is due to the availability and application of digital technology. The difference that exists in the attitude of students in suburban schools is as a result of the complexity of semi-urban settlements. It is recommended that attention be drawn to students in the suburban settlement, and intervention in terms of the provision of learning tools be given to them.

Keywords: Evaluation, effect, school location, attitude, mathematics, digital technology.

*Corresponding author. Email: 08035470727@gmail.com. Tel: +2348035470727.

INTRODUCTION

There is a departure from the expected sequence of events and activities due to intervention via technology. School location is one of the environmental factors that has an immense impact on the attitude of students towards learning, ordinarily. In the era of digital technology, in which information and learning tools reach every part of the world through smartphones and other digital learning tools, this study is carried out to establish the effect of school location on the attitude of students towards mathematics. Ntibi and Edoho (2017) found from their study of 166 that there was no significant difference in the attitude of students from urban and rural areas towards mathematics and sciences, but pointed out that there exists a positive correlation between attitude and achievement scores; students with a positive attitude have higher achievement scores. Equally, it was discovered that in a study of 600 students comprising 300 male and 300 female secondary school students who were randomly selected from 12 secondary

schools in ten out of the 16 local government areas in Ekiti State, Nigeria, school location does not have a significant influence on students' attitude towards mathematics (Adebule, 2013).

In a similar study conducted by Edoho et al. (2018), the results reveal that there was a significant difference in the performance of students in rural and urban schools, using 190 SSC1 students from 6 schools in Calabar Local Government Area.

A study of 392 students in Delta State, Nigeria, revealed that there exists a significant impact of school location on achievement and attitude of students in favour of students from urban schools (Uloku and Euobor, 2023). It is evidence that school location should have an impact on attitude towards mathematics. The findings of the study conducted by Awodun and Ogeniyi (2018) confirm this assertion, pinpointing that there exists a significant difference in the achievement and attitude of junior school students in the urban and rural schools in Ekiti State.

The greatest catalyst in phenomena in recent times is technology, digital technology. A study of 399 mathematics students revealed that there is a very high positive correlation between digital awareness, achievement and attitude towards mathematics (Khanal et al., 2021). The application of digital technology has a significant positive impact on achievement and attitude towards mathematics. Studying the effect of using smartphones and websites in learning mathematics by 110 secondary school students, King-Ogboto (2023) advocated constant practice to be able to gain from the utilisation of digital technology in mathematics education. Research using 256,411 participants in the Programme for International Students Assessment (PISA) shows that the use of digital technology within and outside the school in learning mathematics is predictive of good achievement (Joshi et al., 2025). The use of digital technology proved very efficient in inducing higher achievement and incentives to 52 participants in a study of primary school pupils (Fabian et al., 2018). In an experimental study conducted with 80 pupils divided into two groups with equal numbers, it was discovered that there exists a significant difference in attitude towards mathematics of the experimental group that used digital games in learning and the control group that learned with the conventional strategy, with the experimental group scoring higher (Dursun and Ulum, 2024). Application of digital technology in learning resulted in higher achievement and a positive attitude towards mathematics in 155 students used in a study (Rahmadhani et al., 2023). It was further revealed that 20 undergraduate mathematics students who learned with digital technology developed a positive attitude towards mathematics and had higher achievement (Gqoli, 2024). Similarly, Khan et al. (2023) confirmed from a study of 68 pupils that the use of digital technology has a significant positive impact on achievement

Some studies prove that the intervention of digital technology has successfully changed the narratives of orthodoxies and stimulated reforms in customs and previous cultural norms and beliefs. The issue of the effects of environmental factors, such as school location, on education cannot be an exception. The traditional philosophy of high-profile schools in cosmopolitan locations capable of superbly transforming wards superficially, attitudinally and qualitatively, may not be applicable today. Technology, precisely digital technology, which makes every information and learning tool available in rural communities, semi-urban settlements and cities equally and at par, has brought the change. The study investigates the effect of school location on attitude towards mathematics in the era of digital technology.

Statement of the problem

The traditional belief is that students in schools located in the cities are better in attitude and achievement than students in semi-urban (suburban) and rural communities. This was due to the presence of better facilities in urban environments. The remoteness of rural communities and the distance of villages from towns where the amenities for better education in terms of teaching and learning are available have constituted impediments to learning in the rural and suburban schools. This is not likely to be the case in contemporary times. Digital technology present in smartphones is expected to bridge the gap. The difference in the effect of school location on the attitude of students toward mathematics is influenced by the application of digital technology in teaching and learning. There is blending induced by the availability and application of digital technology by all and sundry, and in all locations.

Purpose of the study

The study was carried out to determine the effect of school location on the attitude of students towards mathematics. The main purpose is to evaluate the effect of the school environment on the attitude of students towards mathematics in today's world, where digital technology has made learning facilities available even in the most remote areas. The attitude towards mathematics of students learning in schools that are located in the urban, semi-urban and rural communities is evaluated to determine whether there exists any significant difference in their attitude towards mathematics.

Hypothesis

HO_1: There is no significant effect of school location on students' attitude towards mathematics.

Significance of the study

The evaluation of the effect of school location on the attitude of students towards mathematics is very important for the purpose of gathering information on where intervention is required. It enables the government and the stakeholders to decide where intervention is required and initiate activities that will help the students level up with their contemporaries in the other locations. Considering that a higher attitude towards mathematics is fundamental for good achievement.

METHODOLOGY

Design

The study is causal comparative research. It was carried out by administering an attitude test to students in three locations of urban, suburban and rural environments to collect information about their attitude towards mathematics in the face of widespread usage of digital technology in teaching and learning.

Participant

The participants were 1250 students from schools in the urban environments, 950 students from suburban schools and 900 students from schools located in rural communities, giving a total of 3100 participants. All the participants were final year students in senior secondary class three (SSC3) in Bayalsa State, Nigeria.

Instrument for data collection

The instrument for data collection was a 25-item five-point Likert scale test to ascertain the effect of the environment and school location on the attitude of students towards mathematics. It has a test-retest reliability coefficient of 91% and was face validated by three specialists in test and measurement and two mathematics teachers. Spearman's product-moment correlation was used to determine the coefficient of stability after an interval of two weeks. It was administered directly to the participants through their teachers within 30 minutes.

Data collection and analysis

The scores of the participants were collected by the researchers through their teachers and the research assistants and analysed using analysis of variance (ANOVA), with Scheffe's test to determine the source of differences. The test question papers were administered simultaneously in all the schools by the class teachers and sent directly to the researchers the same day for collation of the data and analysis. The hypothesis was tested at the 0.05 level of significance. Two research assistants were used in each school to help in the administration of the test and sorting of the scores.

RESULTS

Hypothesis

There is no significant effect of school location on students' attitudes towards mathematics. Table 1 gives a summary of the data analysis for the test of the hypothesis.

Table 1. Summary of data analysis (ANOVA).

School location	Number of students	Mean scores	Mean sum of squares between	Mean sum of squares within	Degree of freedom between	Degree of freedom within	F	Decision
Urban	1250	68.7						
Suburban	950	65	164.72	37.64	2	2097	4.4	Reject
Rural	900	68.9						

Considering the result at P = 0.05, the critical value is F = 2.99. Since the calculated value F^2_{2097} = 4.4 > 2.99, the hypothesis is not accepted. There exists a significant difference in the attitude of students from different school environments towards mathematics. Further evaluation is given in Tables 2, 3 and 4.

Table 2. Scheffe's test for urban and suburban students' attitude towards mathematics scores.

School location	Number of students	Mean scores	Mean sum of squares between	Mean sum of squares within	Degree of freedom between	Degree of freedom within	F	Decision
Urban	1250	68.7	164.72	37.64	2	2097	111.6	Reject
Suburban	950	65						

From Table 2, there exists a significant difference in the attitude of students towards mathematics between students from urban and suburban schools. This is shown by Scheffe's test of F = 111.6, which is greater than the critical value of F = 2.99.

Table 3. Scheffe's test for urban and rural students' attitude towards mathematics scores.

School location	Number of students	Mean scores	Mean sum of squares between	Mean sum of squares within	Degree of freedom between	Degree of freedom within	F	Decision
Urban	1250	68.7	164.72	37.64	2	2097	0.4	Accept
Suburban	950	65						

From Table 3, there is no significant difference in the attitude of students towards mathematics between students from urban and rural schools. This is shown by Scheffe's test of F = 0.4, which is less than the critical value of F = 2.99.

Table 4. Scheffe's test for suburban and rural students' attitude towards mathematics scores.

School location	Number of students	Mean scores	Mean sum of squares between	Mean sum of squares within	Degree of freedom between	Degree of freedom within	F	Decision
Urban	1250	68.7	164.72	37.64	2	2097	101.7	Reject
Suburban	950	65						

From Table 4, there exists a significant difference in the attitude of students towards mathematics between students from suburban and rural schools. This is shown by Scheffe's test of F = 101.7, which is greater than the critical value of F = 2.99.

DISCUSSION

Despite the availability of learning resources through the use of digital technology, there exists a significant difference in the students' attitude towards mathematics between urban and suburban school children. Similarly, there is also a significant difference in students' attitudes towards mathematics between schools in the suburban and rural settlements. Surprisingly, there is no significant difference in the students' attitude towards mathematics in the urban and rural settlements. This finding tends to support Ntibi and Edoho (2017), though they did not include suburban settlement in their study; as a result of this, their definition of rural and urban communities might have been different. They would have integrated the suburban with urban or suburban with rural communities. However, Figure 1 shows that students from rural schools score higher than their counterparts from urban and suburban schools.

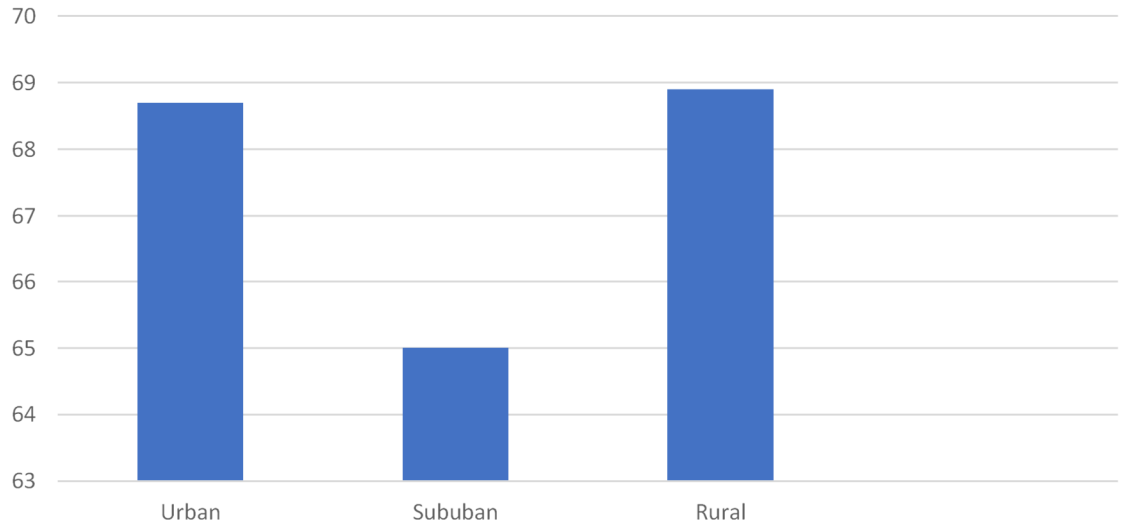

Figure 1. Mean scores of students from urban, suburban and rural schools on attitude towards mathematics.

Conclusion

The implication of the results of this study is that the school children in the suburban communities need help. It should be understood that suburban communities are occupied by peoples of which, most of whom, could not stay in the cities and resorted to living in the suburbs and are facing difficulties. Consequently, the children from these communities need attention in order to catch up with their contemporaries in the urban and rural environments. Children from rural environments are more confident, self-assertive, and focused, because they see education as a means to take them to another level and mathematics as a very important weapon to make them useful in life. The cost of living in the rural communities is low, and education is cheap. Unlike suburban environments that are competing with the city dwellers. The rural dwellers, by implication of the result of this study, make better use of the digital technology in their smartphones than students in the suburban environments.

The research finding is that there exists no significant difference between the students in urban and rural environments in their attitude towards mathematics. The students from suburban communities are the people who have problems, hence they need help in order to level up with their peers.

RECOMMENDATIONS

Based on the findings of this study, it is recommended that the government, stakeholders, international organisations, and non-governmental agencies should direct their attention towards helping children in suburban communities so that they can level up with counterparts in rural and urban communities.

REFERENCES

Adebule, S. O. (2013). Influence of study interest and school location on the attitude of secondary school students towards mathematics in Ekiti State of Nigeria. *Green Journal of Educational Research*, *3*(6) 229 – 232.

Awodun, A. O., & Ogeniyi, O. (2018). Influence of school location on junior secondary school students' academic achievement in Basic Science in Ekiti State. *European Journal of Educational and Development Psychology*, *6*(4), 18–27.

Dursun, Ö. Ö., & Ulum, Ö. G. (2024). The effect of digital game-based learning on students' mathematics achievement and attitude. *International Journal of Education and Technology*, *14*(1), 35–42.

Edoho, E. A., Inah, J. O., & Okorie H. E. (2020). Effect of school location on students' academic performance in mathematics in Calabar Municipal Local Government Area of Cross River State, Nigeria. *Inter-Disciplinary Journal of Education*. 2(1)133 – 138.

Fabian, K., Topping, K. J., & Barron, I. G. (2018). Mobile technology and mathematics: Effects on students' attitudes, engagement, and achievement. *Journal of Computers in Education*, *5*(2), 121–143. https://doi.org/10.1007/s40692-018-0100-6

Gqoli, N. (2024). Investigating the impact of digital learning technologies on students' attitudes and achievements in undergraduate mathematics. *South African Journal of Education Technology*, *21*(1), 54–66.

Joshi, D. R., Chapai, K. P. S., Upadhayaya, P. R., & Adhikari, K. P. (2025). Effect of using digital resources on mathematics achievement: Result PISA 2022. *Cogent Education*, *12*(1).

Khanal, B., Belbase, S. & Joshi, O. R. (2021). Effect of digital awareness on mathematics achievement from school to university. *Mathematics Teaching Research Journal*, *12*(4), 47–68.

Khan, S. A., Ralinm, M. & Naz, F. L. (2023). Effect of digital technology on achievement of primary school students: Evidence from Khyber Pakhtinakhiwa, Pakistan. *Journal of Excellence in Education and Research, 2*(3).

King-Ogboto, F. O. (2023). The impact of digital technology on students' academic performance in mathematics: A comparative study of

smartphones and website assessment. *Journal of Teacher Perspective*, *18*(1), 1–9.

Ntibi, J. E & Edoho, E. A. (2017). Influence of school location on students' attitude towards mathematics and basic sciences. *British Journal of Education*, *5*(10), 76-85.

Rahmadhani, F., Joha, R. & Hidayat, M. (2023). The effect of digital learning on students' mathematics achievement at Junior High School. *Journal of Honai Mathematics*, *6*(1), 46-58.

Uloku, O. P. A. & Emuobor, E. P. O. (2023). Students' mathematics achievement is location a factor? *Journal of Science, Technology and Education, 11*(2), 143-146.

Citation: Etukudo, U. E., and Eze, F. B. (2026). Evaluation of the effect of school location on the attitude of students towards mathematics in the era of digital technology. *African Educational Research Journal, 14*(2), 329-334.