



Influence of Parental Educational Status on Attitude and Performance in Mathematics among Senior Secondary School Students in Katsina State, Nigeria

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Abstract

This study examined the influence of parental educational status on senior secondary school students' attitude and performance in Mathematics in Katsina State, Nigeria. The study adopted an ex-post facto survey research design. The population comprised 215,370 senior secondary school students in public secondary schools in Katsina State, from which a sample of 382 students was selected using multistage sampling. Data were collected using the Attitude towards Mathematics Questionnaire (ATMQ) and a Students' End-of-Term Result Sheet to collect students' performance. The ATMQ had a Cronbach's Alpha reliability coefficient of 0.88. Data collected were analysed using simple linear regression at the 0.05 level of significance. The findings revealed that parental educational status significantly influenced students' attitude towards Mathematics, $F(1, 380) = 66.842, p < .05$, with an R^2 of .127, indicating that parental educational status explained 12.7% of the variance in students' attitude. Similarly, parental educational status significantly influenced students' performance in Mathematics, $F(1, 380) = 64.171, p < .05$, with an R^2 of .138, indicating that parental educational status accounted for 13.8% of the variance in students' performance. The study concluded that parental educational status is a significant factor associated with students' attitude and performance in Mathematics. It was recommended that educational stakeholders strengthen parental involvement, school-home collaboration, and academic support programmes to assist parents in supporting their children's learning of Mathematics, irrespective of their educational background.

Keywords: Parental Educational Status, Students' Attitude and Mathematics Performance.

Introduction

Mathematics is an important subject in the Nigerian educational system because it contributes to the development of logical reasoning, problem-solving abilities, quantitative skills, and scientific thinking. It is also relevant to students' progression into science, technology, engineering, economics, education, and other fields of study. Despite the importance of Mathematics, students' achievement in the subject remains a concern in Nigeria, making it necessary to examine the factors that may influence students' learning outcomes. Recent Nigerian research has continued to identify factors associated with students' achievement in Mathematics, including parental and home-related variables (Adeleke et al., 2024). Students' performance in Mathematics is influenced by a combination of school, individual, and family factors. These include teachers' instructional practices, availability of learning resources, students' motivation, learning environment, parental involvement, and socioeconomic and educational background. Among these factors, parental educational status is particularly important because the educational experiences of parents may shape the nature and extent of support they provide for their children's schooling. Adeleke et al. (2024), for example, found a significant relationship between parental qualification and children's Mathematics achievement among students in Oyo State, Nigeria. Parental educational status refers to the highest level of formal education attained by a student's parent or parents. It may range from no formal education to primary, secondary, and tertiary education. Differences in parents' educational attainment may influence their knowledge of school requirements, educational expectations, ability to assist with schoolwork, and capacity to provide learning materials and other forms of academic support. Parents



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with higher educational qualifications may have greater familiarity with the educational system and may therefore be more capable of supporting their children's academic activities. However, parental educational status alone does not determine students' educational performance, as other family, school, and individual factors also contribute to learning.

Students' attitude toward Mathematics is another important consideration in understanding their performance in the subject. Attitude encompasses students' feelings, beliefs, interest, confidence, and disposition toward Mathematics. Students who develop positive attitudes may demonstrate greater interest in Mathematics, participate actively in classroom activities, and persist when faced with challenging mathematical tasks. Conversely, negative attitudes may be associated with reduced interest, avoidance of mathematical activities, and reluctance to engage with difficult problems. Therefore, understanding factors that may contribute to students' attitudes toward Mathematics is important for improving both engagement and achievement. Parental educational status may influence students' attitudes toward Mathematics through parental expectations, encouragement, academic guidance, and involvement in learning. Parents with higher educational attainment may be more likely to recognize the importance of Mathematics and encourage their children to develop positive attitudes toward the subject. They may also monitor schoolwork, communicate with teachers, provide learning resources, and establish expectations concerning academic achievement. However, the influence of parental education may also depend on the extent to which parents actively participate in their children's education. Adeleke et al. (2024) reported that parent-teacher partnership attitude partially mediated the relationship between parental qualification and children's Mathematics achievement, suggesting that parental educational qualification may operate partly through parents' engagement with the school.

The relationship between parental educational status and students' Mathematics performance has also received attention in Nigerian educational research. Evidence from studies conducted in Nigeria indicates that parental educational attainment can be associated with students' Mathematics outcomes. For instance, Salaudeen and Azeez (2022) reported that parental educational attainment significantly affected pupils' performance in Mathematics in selected primary schools in Zaria Local Government Area of Kaduna State. Similarly, Adeleke et al. (2024) found that parental qualification had a significant direct relationship with children's Mathematics achievement in Oyo State. These findings suggest that parents' educational background may be an important family-related factor in students' Mathematics achievement. Parental educational status is an important family-related factor associated with students' Mathematics achievement (Adeleke et al., 2024; Salaudeen & Azeez, 2022). The influence of parental educational status is particularly relevant in the Nigerian context because students come from families with diverse educational backgrounds. Some parents have no formal education, while others have attained primary, secondary, or tertiary education. These differences may affect the educational resources, academic guidance, expectations, and learning support available to students (Claudine, 2023). Nevertheless, students from families with lower parental educational attainment can also achieve highly when they receive appropriate support from teachers, schools, parents, and other educational stakeholders. Therefore, parental educational status should be examined as one of several factors that may contribute to students' educational outcomes rather than as the sole determinant of achievement (Adeleke et al., 2024).

In Katsina State, understanding the influence of parental educational status is important because students attend schools within diverse family and socioeconomic environments. Differences in



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parents' educational backgrounds may be reflected in the level of academic support and guidance students receive outside the classroom. Such differences may potentially influence students' attitudes toward Mathematics and their performance in the subject (Adeleke et al., 2024; Claudine, 2023). However, findings from other Nigerian states may not necessarily reflect the situation among senior secondary school students in Katsina State because educational and family contexts vary across locations. This makes context-specific research necessary to establish the extent to which parental educational status is associated with students' Mathematics outcomes in Katsina State. Although previous Nigerian studies have examined parental qualification, parental involvement, and other family-related variables in relation to Mathematics achievement (Adeleke et al., 2024; Salaudeen & Azeez, 2022), there is a need for further empirical evidence focusing specifically on the influence of parental educational status on students' attitude toward and performance in Mathematics among senior secondary school students in Katsina State. Examining both attitude and performance is important because students' disposition toward Mathematics may influence their engagement with the subject, while academic performance reflects their measurable learning outcomes. Therefore, this study investigates the influence of parental educational status on senior secondary school students' attitude toward and performance in Mathematics in Katsina State, Nigeria.

Statement of the Problem

Mathematics is a core subject in Nigerian secondary schools and is essential for developing students' logical reasoning, problem-solving abilities, and quantitative skills. Despite its importance, students' attitude towards and performance in Mathematics continue to be a concern to educational stakeholders. Negative attitudes, including low interest, lack of confidence, and reluctance to engage in mathematical activities, may affect students' participation and academic outcomes (Adeleke et al., 2024). This situation calls for greater attention to the factors that may influence students' attitude and performance in Mathematics. One factor that may be associated with students' Mathematics outcomes is parental educational status. Parents differ in their levels of educational attainment, and such differences may affect their capacity to provide academic guidance, monitor schoolwork, assist with learning activities, provide educational resources, and encourage their children to learn Mathematics. Evidence from previous studies indicates that parental educational qualification is significantly associated with students' Mathematics achievement (Adeleke et al., 2024; Salaudeen & Azeez, 2022). However, parental educational status should not be regarded as the sole determinant of students' outcomes, since students' attitude and performance may also be influenced by school, teacher, peer, and individual factors. Although previous studies have examined the relationship between parental educational background and students' academic achievement, limited empirical evidence is available on the influence of parental educational status on both students' attitude towards and performance in Mathematics among senior secondary school students in Katsina State. Furthermore, findings obtained from other geographical locations may not adequately reflect the educational and family circumstances of students in Katsina State. This creates a need for context-specific evidence on the extent to which parental educational status is associated with students' Mathematics outcomes in the State. Therefore, the problem addressed by this study is the insufficient empirical evidence on the influence of parental educational status on senior secondary school students' attitude towards and performance in Mathematics in Katsina State, Nigeria. The study consequently examined the influence of parental educational status on students' attitude towards and performance in Mathematics in the State.

Research Objectives



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The objective of this study were to:

1. determine the influence of parental educational status on senior secondary school students' attitude toward Mathematics in Katsina State, Nigeria.
2. examine the influence of parental educational status on senior secondary school students' performance in Mathematics in Katsina State, Nigeria.

Null Hypotheses

The following null hypotheses were tested at .05 level of significance.

1. There is no significant influence of parental educational status on senior secondary school student attitude toward mathematics in Katsina State, Nigeria
2. There is no significant influence of parental educational status on senior secondary school student performance in mathematics in Katsina State, Nigeria

Significance

The findings of this study are expected to be useful to students, parents, teachers, school administrators, educational planners, and researchers. The study may help teachers understand how parental educational status relates to students' attitude and performance in Mathematics, thereby supporting the adoption of appropriate strategies for students from different family backgrounds. Parents may also gain greater awareness of the importance of providing academic support and encouragement to their children irrespective of their educational attainment. School administrators and educational planners may use the findings to develop programmes that strengthen parental involvement and improve students' learning outcomes in Mathematics. The study may also provide empirical evidence for educational policymakers in planning interventions aimed at improving Mathematics education. Finally, the findings may serve as a reference for researchers interested in parental educational status, students' attitude, and academic performance in Mathematics.

Research Methodology

Research Design

The study adopted an ex-post facto survey research design. The design was considered appropriate because the variables under investigation already existed and could not be manipulated by the researcher. The design enabled the researcher to examine the influence of parental educational status on students' attitude toward and performance in Mathematics.

Population and Sample

The population comprised 215,370 senior secondary school students in 261 public senior secondary schools across the 34 Local Government Areas of Katsina State. A sample of 382 students, comprising 224 males and 158 females, was selected using the Krejcie and Morgan (1970) sample size determination table. A multistage sampling technique involving stratified, purposive, and simple random sampling was used to select the participants from 30 public senior secondary schools across the three senatorial zones of the State.

Instrumentation

Data were collected using the Attitude towards Mathematics Questionnaire (ATMQ) and a Proforma (Students' End-of-Term Result Sheet). The ATMQ consisted of Section A, which collected students' background information and parental educational status (no formal education, primary, secondary, and tertiary education), and Section B, which comprised 20 items measuring students' attitude toward Mathematics on a four-point Likert scale. The Proforma was used to obtain students' Mathematics scores from official school records.

Validity and Reliability



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Experts in Mathematics Education, Measurement and Evaluation, and Educational Psychology subjected the instruments to face and content validation. A pilot study involving 30 SS II students from a school outside the sampled schools was conducted. The ATMQ yielded a Cronbach's Alpha reliability coefficient of 0.88, indicating satisfactory internal consistency.

Data Collection and Analysis

Data were collected by the researcher with the assistance of trained research assistants after obtaining the necessary permission from the relevant authorities and school principals. The completed questionnaires were retrieved immediately after administration, while students' Mathematics scores were obtained from official school records. Data were coded and analysed using SPSS Version 23. Percentages were used for descriptive analysis, while regression analysis was used to test the hypotheses at the 0.05 level of significance.

Data Analysis

The data collected were coded and analysed using the Statistical Package for the Social Sciences (SPSS) Version 23. Simple linear regression analysis was employed to test the two null hypotheses at the 0.05 level of significance.

Presentation of Results

Research Hypotheses

The hypotheses formulated for the study were tested using simple linear regression analysis. The null hypothesis was rejected whenever the p-value was less than the alpha level of 0.05; otherwise, it was retained.

Hypothesis One: There is no significant influence of parental educational status on senior secondary school students' attitude toward mathematics in Katsina State, Nigeria

Table 1: *linear Regression Analysis Summary Table Showing the Relative influence of parental educational status on senior secondary school students' attitude toward mathematics*

R = .356

R Square = .127

Adjusted R Square = .125

Std. Error of the Estimate = 12.41857

Model	Sum of Squares	Df	Mean Square	F-value	Sig.
Regression	10312.445	1	10312.445		
Residual	71123.754	380	187.168	66.842	.000
Total	81436.199	381			

Table 1 reveals that the independent variable significantly influenced the dependent variable among the respondents ($F_{1, 381} = 66.842$; $p < 0.05$). Therefore, the null hypothesis is rejected. This means that there is a significant influence of the independent variable on the dependent variable among the respondents. The findings further imply that the independent variable is a significant predictor of the dependent variable among the respondents, contributing 12.7% to the total variance in the dependent variable ($R^2 = .127$).

Hypothesis Two: There is no significant influence of parental educational status on senior secondary school students' performance in mathematics in Katsina State, Nigeria.

Table 2: *Linear Regression Analysis Summary Table Showing the Relative influence of parental educational status on senior secondary school students' performance in mathematics*

R = **.372**

R Square = **.138**

Adjusted R Square = **-.136**

Std. Error of the Estimate = **13.12741**

Model	Sum of Squares	Df	Mean Square	F-value	Sig.
Regression	11056.742	1	11056.742		
Residual	68960.644	380	181.954	64.171	.000
Total	80017.386	381			

Table 2 reveals that the independent variable significantly influenced the dependent variable among the respondents ($F_{1,380} = 64.171$; $p < 0.05$). Therefore, the null hypothesis is rejected. This means that there is a significant influence of the independent variable on the dependent variable among the respondents. The findings further imply that the independent variable is a significant predictor of the dependent variable among the respondents, contributing 13.8% to the total variance in the dependent variable ($R^2 = .138$).

Summary of the Findings

The summary of the major findings of the study are:

1. There is significant influence of parental educational status on senior secondary school student attitude toward mathematics in Katsina State, Nigeria
2. There is significant influence of parental educational status on senior secondary school student performance toward mathematics in Katsina State, Nigeria

Discussion of Findings

The finding in hypothesis two showed that there is significant influence of parental educational status on senior secondary school students' attitude toward Mathematics in Katsina State, Nigeria. The result indicated that parental educational status significantly influenced students' attitude toward Mathematics. This finding supports Claudine (2023) and Caixin and Yumeng (2023), who established that parents with higher educational qualifications tend to provide stronger academic support and expectations that positively influence students' attitudes toward learning. The finding implies that educated parents are more likely to guide, motivate, and create a conducive learning environment for their children, thereby improving students' attitude toward Mathematics. However, the result contradicts Adigun (2023), who reported that parents' education has no significant influence on students' academic attitude and performance. The finding in hypothesis four showed that there is significant influence of parental educational status on senior secondary school students' performance in Mathematics in Katsina State, Nigeria. The result indicated that parental educational status significantly influenced students' performance in Mathematics. This finding agrees with Atolagbe, Oparinde and Umaru (2019), Claudine (2023), and Uwaonye and Ben (2021), who found that parents' educational attainment positively influences students' academic performance by creating enabling learning conditions and academic support. The finding suggests that educated parents are more likely to assist with academic activities, monitor learning progress, and encourage effective study habits that improve students' performance in Mathematics. However, the result disagrees with Adigun (2023), who argued that parental education has no significant effect on students' academic achievement.

Conclusion

Based on the findings in this study, the following conclusions were made:



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From the findings of this study, the study concluded that there are significant influences of parental educational status on senior secondary school students' attitude and performance in Mathematics in Katsina State, Nigeria.

This implies that when students receive adequate parental support arising from favourable educational status, their interest, attitude, and performance in Mathematics are likely to improve.

Recommendations

Based on the findings and conclusion drawn, the researcher recommends the following:

1. The Katsina State Ministry of Education and other educational stakeholders should intensify sensitization, adult literacy, and continuing education programmes to improve parents' educational awareness and capacity to provide adequate academic guidance, encouragement, and support for their children's learning of Mathematics.
2. Schools should establish effective school-home collaboration and parent-support programmes involving teachers, counsellors, and parents to help parents with different educational backgrounds understand how to guide, monitor, and support their children, thereby promoting positive attitudes towards Mathematics.
3. Schools and relevant educational stakeholders should provide adequate academic support, including remedial Mathematics lessons, mentoring, instructional materials, guidance, and counselling, particularly for students whose parents may have limited educational capacity to support their learning, in order to improve their attitude and performance in Mathematics.

Contribution to Knowledge

The study has made the following contributions to knowledge:

1. The study provides empirical evidence that parental educational status significantly influences both senior secondary school students' attitude towards Mathematics and their performance in Mathematics in Katsina State, Nigeria. This contributes to existing knowledge by demonstrating that parents' level of educational attainment is an important factor associated with students' Mathematics learning outcomes.
2. The study contributes context-specific evidence on the relationship between parental educational status and Mathematics outcomes among senior secondary school students in Katsina State. The findings provide useful information for educational planners, policymakers, school administrators, counsellors, parents, and researchers in understanding the importance of parental educational background in supporting students' positive attitudes and improved performance in Mathematics.
3. The study provides a foundation for further research by highlighting the need to examine other factors that may influence students' attitude and performance in Mathematics, including parental involvement, parenting style, family size, socio-economic status, teacher effectiveness, school facilities, classroom environment, peer influence, and students' motivation. It also provides a basis for comparative studies across different locations, subjects, and parental groups.

Suggestions for Further Studies

The following suggestions were made:

1. Future studies should be conducted in other States and geo-political zones of Nigeria and across other school subjects, such as English Language, Biology, Chemistry, and Physics, to determine whether similar findings would be obtained regarding the influence of parental educational status on students' attitude and academic performance.



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2. Further studies should employ longitudinal designs and examine other family-related variables, such as parental involvement, parenting style, family size, socio-economic status, and household income, to provide a broader understanding of factors influencing students' attitude and performance in Mathematics.
3. Future researchers should separately examine the educational status of fathers and mothers and also investigate school- and learner-related factors, such as teacher effectiveness, school facilities, classroom environment, peer influence, and students' motivation, to provide deeper and broader evidence on factors influencing students' attitude and performance in Mathematics.

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