CEDTECH International Journal of Educational Research & Human Development
Volume 6, Number 1, March 2025
http://www.cedtechjournals.org
ISSN: 2756-4592

STUDENTS ATTITUDE TOWARDS SCHOOL SUBJECTS AND ATTITUDE TOWARDS SOLVING PROBLEMS IN MATHEMATICS AS PREDICTORS OF MATHEMATICS PERFORMANCE AMONG SECONDARY SCHOOL STUDENTS IN IKOM EDUCATION ZONE OF CROSS RIVER STATE-NIGERIA.

[1]Otu, Bernard Diwa *Ph.D*, [2]Obiji, Donatus *Ph. D,* [3]Otu and Stella Deborah Bokan, Kefas Vivian Azumi *Ph.D*
[1]Department of Educational Foundations, Taraba State University, Jalingo, Taraba State Nigeria
[3]Department of Library and Information Science, University of Calabar, Cross River State Nigeria
Department of Educational Foundations, Taraba State University, Jalingo, Taraba State,
Department of Guidance and Counselling, Taraba State University Jalingo, Taraba State Nigeria.
E-mail:otustelladeborahbokan@gmail.com,
otubernard76@gmail.com/Otu_bernard@yahoo.com/Bernardotu@unical.edu,ng, ORCID ID:
https:/orcid.org/0000-0001-6072-9619

ABSTRACT

This study investigated students attitude towards school subjects and attitude towards solving problems in mathematics as predictors of mathematics performance among secondary school students in Ikom Education Zone Cross River State. To achieve the purpose of the study, two hypotheses were formulated to guide the study. Correlational research design was adopted for the study. This design was considered appropriate as it attempts to find out the nature of the contribution of or relationship between a set of variables. A total of four hundred and eight (408) SSS III students was used for the study. The selection was done through the stratified random sampling technique. Students Attitude towards School Subjects and Attitude towards Solving Problems Questionnaire (SASSASPQ) and Mathematics Achievement Test were the instruments for data collection. The reliability estimates of the Secondary School Students Attitude Variables Questionnaire (SSSAVQ) instrument was established through the Cronbach Alpha reliability method. The reliability coefficient ranges from 0.71 to 0.91 which was high enough and the reliability estimate of the Mathematics Achievement Test was established through the kuder-Richardson (KR20). Simple Linear Regression analysis was employed to test the hypotheses. Each hypothesis was tested at .05 level of significance. Based on the results, it was concluded that students' attitudes towards school subject and problem-solving significantly predict their mathematics performance in Cross River State, Nigeria. It was recommended that teachers should relate mathematics to real-life situations and practical examples to show its relevance and applicability.

Using diverse teaching methods, including technology, games, and hands-on activities, can make learning more engaging and enjoyable.
Keywords: Students *Attitude, School Subjects, Solving Problems, Mathematics Performance*

INTRODUCTION

Mathematics is one of the core subjects in secondary school curricula worldwide, and its mastery is critical for students' success in higher education, scientific advancement, and technological development. Ideally, students are expected to not only pass mathematics but also develop strong problem-solving skills, analytical thinking, and the ability to apply mathematical concepts in real-life situations. Mathematics is central to many professions, and proficiency in this subject should open pathways for students in fields such as engineering, medicine, economics, and data science. In an ideal situation, students would excel in mathematics, and this would reflect in high pass rates in both internal and external examinations such as the West African Examinations Council (WAEC) and University and Tertiary matriculation Examination {UTME)

However, the real situation is far from this ideal. Although mathematics is a core subject, many students dread this subject and this negative emotional disposition they have towards mathematics interferes with their ability to solve numerical problems. This to a great extent could affect the performance of students in mathematics. Personal experience and observation have shown that blames have been apportioned to teachers for failing in their responsibility to use the right teaching techniques to teach the students properly to understand this subject. Also, that some mathematics teachers are not real qualified mathematics teachers that is why they cannot teach the students the fundamental mathematics concept to understand the subject. Some people also reasoned that students themselves are not dedicated to their studies because of the fear they have towards mathematics and peers influence. Although, government has made several interventions to salvage the problem of poor mathematics performance among secondary schools yet the students performance in mathematics have not been improved. This does not augur well for our educational system as mathematics is a core subject that feeds all facets of learning. The evidence as shown in Table 1 shows that a large number of students fail to achieve the required credits in mathematics in their WAEC and JAMB examinations which hinders their opportunities to pursue higher education in science and technology related courses. For instance,

WAEC results over the years have shown that a significant percentage of students either merely pass or outrightly fail mathematics, leading to low enrolment in mathematics-related courses at tertiary levels. This widespread poor performance raises concerns about the effectiveness of mathematics instruction in secondary schools and the learning environment as a whole. The consequences of this poor performance are far-reaching, both for students and the educational system. Students who fail mathematics are denied access to many science and technology-related disciplines, limiting their career prospects and future employability. The poor mathematics results also reflect negatively on the quality of education in the country, hindering national development efforts, as a robust foundation in mathematics is crucial for driving innovation and economic progress. This situation is unacceptable because education is supposed to be a transformative tool that empowers individuals and builds a knowledgeable workforce capable of contributing to national development. According to the National Policy on Education (2013), one of the key objectives of secondary education is to equip students with knowledge, skills, and attitudes necessary for self-reliance and effective participation in society. Mathematics, being a foundational subject, should play a central role in achieving this objective. The current trend of poor mathematics performance, therefore, undermines the broader goals of education and national development.

There is an urgent need to combat the challenges that contribute to this problem. Various efforts have been made by both the government and school authorities to address this issue, but these interventions have yielded limited or no results. Government initiatives, such as the introduction of teacher training programs, the distribution of learning materials, and the revision of the mathematics curriculum, have failed to substantially improve student outcomes. It is against this backdrop that the researcher embarked on the present study, aiming to identify the root causes of poor mathematics performance among secondary school students and to develop more effective solutions for improving mathematics education in Nigeria.

Purpose of the Study

The main purpose of this study was to investigate attitudinal variables as predictors of Mathematics performance among secondary school students in Ikom, Cross River State-Nigeria. Specifically, the study was aimed at investigating the extent to which:

1) Students attitude towards school subjects predicts mathematics performance among secondary school students
2) Students attitude towards solving problems in mathematics predicts mathematics performance among secondary school students

Research Questions

This study was carried out to find solutions to the following questions

(1) To what extent do students attitude towards school subject predict mathematics performance?
(2) To what extent do students attitudes towards problem solving in mathematics predict mathematics performance?

Statement of Hypotheses

The following null hypotheses were formulated for the study and were tested at

95% level of confidence

(1) Students attitude towards the school subject does not significantly predict their mathematics performance.
(2) Students attitude towards problem solving in mathematic does not significantly predicts their mathematics performance.

LITERATURE REVIEW

Concept of Students Attitude towards school subject

Students attitude toward mathematics most especially at junior level provide a foundation for the students in higher level. A child cannot achieve optimum performance in mathematics if there is no right attitude towards mathematics. Some studies have shown that negative students attitude and poor performance and/or engagement with mathematics are related, it is less clear about whether the attitudinal response causes or is a result of low attainment. Indeed, given the complexity of affectivity, cognition and performance in mathematics learning, it is likely that the relationship is symbiotic and complicated by other factors as well (Furinghetti & Morselli, 2009: Otu, Ojini, Uchegbue & Abang, 2023). Nevertheless, the exploration and unravelling of this relationship is important for the improvement of learning and teaching in mathematics (Gresalfi & Cobb, 2006; Grootenboer & Hemmings, 2007: Otu, Oyama, Ita, & Uchegbue, 2022).

Students attitude towards Mathematics is a positive or negative emotional disposition towards Mathematics. Zan & Martino (2007), defines attitude

towards Mathematics as an aggregated measure of a liking or disliking of Mathematics, a tendency to engage in or avoid Mathematical activities, a belief that one is good or bad at Mathematics, and a belief that Mathematics is useful or useless. Moreover, individuals attitude towards Mathematics can be defined as a more complex phenomenon characterized by the emotions that he associates with Mathematics, his beliefs about Mathematics and how he behaves towards Mathematics. Attitude towards Mathematics can also be seen in the tendency of the student to be afraid of and anxious about Mathematics. Attitude towards Mathematics is also comprise of cognitive, affective and behavioural components; and it can be formed through any of the three processes described earlier. A student can develop positive attitude towards Mathematics because he or she learns to associate positive experiences or events with it.

According to Wilkins, Zembylas and Travers (2002) positive students attitude toward mathematics can improve the confidence students have in solving mathematical problems and that there is a great relationship between attitudes towards mathematics learning and participation even though people understanding of how this association develop and maintain is limited.

Wimlot and Otchey (2012) opined students attitude toward mathematics could be influenced by motivation, anxiety, personality, interest, teaching methods, quality of instructions and home factors example parental influence, socio-economic status, school environments and students characteristics etc. hence students variables and attitudinal variables are the strongest variables.

Concept of students attitude towards problem solving problems

Students attitude toward mathematics can improve their ability to tackle any mathematics related course such as Physics, chemistry further mathematics, accountancy and so on. Any child with a negative attitude towards mathematics will definitely have difficulty in solving problems in any course and vice versa. Norhatta and Tengku (2011) In the study, the independent variable was student attitude while the dependent variable was the problem solving towards mathematics performance. According to him, performance can be influenced by attitude towards solving mathematics. He also added that attitude is the most important factors that relates to performance. Effandi and Normah (2009), added that students attitudes towards mathematics are very much correlated to their attitude

towards problem solving in general. they also emphasized that negative attitudes need to be overcome, so that later in life, students will not suffer from poor problem-solving skills.

Singh, Granville, and Dilka (2002) further claims that an individuals self-efficacy expectation of their ability to successfully perform a given task is a reliable predictor of whether or not they will attempt the task, the amount of effort they will expend and their level of perseverance in the face of unanticipated difficulties. Past studies had shown that self-efficacy has been used in the evaluation of performance in a variety of academic areas but a major focus has been related to mathematical skills . Odebunmi and Balogun (2015) asserted that a person would generally perform better in any task to which he is favorably disposed. Therefore, if a student is not favourably disposed to a subject like mathematics, his attitude will be negative. Infact, Ogunkola (2010) added that the attitude of a learner towards calculations would determine the measure of the learners attractiveness or repulsiveness to mathematics which involves calculation.

Students attitude towards the school subject and Mathematics performance
Kenya, Githaigal, And Mutahi, (2018) in their study however, focused on the mathematics heads of department, mathematics teachers and Form 3 students from all the public secondary schools in Kilifi Subcounty. Multistage sampling was used to come up with a sample of 156 respondents comprising 12 mathematics heads of department, 24 mathematics teachers and 120 students. Questionnaires were used to collect data. Descriptive statistics comprising frequencies, percentages, mean and standard deviation were used to organize findings. Chi-square tests and correlation analysis were used to establish relationships. SPSS was used to aid in data analysis. Majority (68%) of the teachers in the study disagreed that students generally like Mathematics and believe they will get good grades. Majority (68%) of the students in the study agreed that mathematics is too complex and it is difficult for them to pass. Majority (67%) of the heads of departments indicated that students have a negative attitude towards mathematics. There was also a statistically significant relationship (p=0.05) between students attitude towards mathematics and performance in public secondary schools in Kilifi sub-country. The study concludes that students attitude influences performance in mathematics among learners in secondary schools in Kilifi sub-country.

Leedy et al (2003) carried out research on students attitude towards mathematics performance with a population of one hundred students selected from three schools. A likert scale questionnaire of forty (40) items was used to collect the data involving self -confidence (15 items), enjoyments (10 items), value (10 items), and motivation (5 items). At the end of the analysis with correlation, he discovered that only enjoyment and motivation were moderately weak positive relationship with the students performance in mathematics while others have strong position relationship. The correlation value of 0.268 and 0.232 (enjoyment and motivation) as presented in this study thus implies that the relationship between students investigated and their performance in mathematics is small. The small relationship can be attributed to many factors examples of which may include learning environment, the contents of the mathematics curriculum, emotional disposition of what is being taught, teachers motivation towards learning mathematics, peer group study Lipnevich & Krumm 2011, Otu, Oyama, Ita, & Uchegbue, 2022)

Kenya, Githaigal, and Mutahi, (2018) in their study however, focused on the mathematics heads of department, mathematics teachers and Form 3 students from all the public secondary schools in Kilifi Subcounty. Multistage sampling was used to come up with a sample of 156 respondents comprising 12 mathematics heads of department, 24 mathematics teachers and 120 students. Questionnaires were used to collect data. Descriptive statistics comprising frequencies, percentages, mean and standard deviation were used to organize findings. Chi-square tests and correlation analysis were used to establish relationships. SPSS was used to aid in data analysis. Majority (68%) of the teachers in the study disagreed that students generally like Mathematics and believe they will get good grades. Majority (68%) of the students in the study agreed that mathematics is too complex and it is difficult for them to pass. Majority (67%) of the heads of departments indicated that students have a negative attitude towards mathematics. There was also a statistically significant relationship (p=0.05) between students attitude towards mathematics and performance in public secondary schools in Kilifi sub-country. The study concludes that students attitude influences performance in mathematics among learners in secondary schools in Kilifi sub-country.

Effiom, and Edoho, (2015) carried research on students attitude toward mathematics and science in which a survey design adopted. One research question and one hypothesis were formulated and tested at 0.05 level of

significance. One hundred and sixty-six (166) students formed the sample of this study, two (2) validated and reliable instruments namely Mathematics and Basic Science Performance Test (MBSAT) and Students Location Test (SLT) were used to collect data for this study. Analysis of the data results showed that; there was no significant difference in the mean performance scores between urban and rural school students with positive attitude towards mathematics and basic science using the independent t-test analysis. Based on these findings, some suggestions and recommendations were made on the need for students to develop positive attitude towards the study of mathematics and basic science despites a student location. This is because attitude is a good predictor of academic performance particularly in mathematics and basic science.

In addition, Mohamed and Waheed (2011) when reviewing literature aimed at understanding attitudes and the influences on their development in relation to differences between students, identified three groups of factors that play a vital role in influencing student attitudes: factors associated with the students themselves such as., mathematical performance, anxiety, self-efficacy and self-concept, motivation, and experiences at school; factors associated with the school, teacher, and teaching (such as teaching materials, classroom management, teacher knowledge, attitudes towards mathematics, guidance, beliefs); finally factors from the home environment and society such as educational background, and parental expectations). Attitudes can be seen as more or less positive. There have been many studies worldwide that have examined attitudes to mathematics at various levels (see, e.g. Grootenboer & Hemmings, 2007; Leder & Forgasz, 2006; Zan, Brown, Evans & Hannula, 2006: Otu, Ojini, Uchegbue & Abang, 2023).

However, while some studies have shown that negative mathematical attitudes and poor performance and/or engagement with mathematics are related, it is less clear about whether the attitudinal response causes or is a result of low attainment. Indeed, given the complexity of affectivity, cognition and performance in mathematics learning, it is likely that the relationship is symbiotic and complicated by other factors as well (Furinghetti et al 2009). Nevertheless, the exploration and unravelling of this relationship is important for the improvement of learning and teaching in mathematics (Gresalfi & Cobb, 2006; Grootenboer & Hemmings, 2007).

Wilkins, et al (2002) identified three groups of variables that related to student performance in mathematics and science: personal variables, including affective qualities; pedagogical variables, such as the quality of the teaching; and environmental variables, including social factors related to home and school. These six hundred and ninety-two Brian Hemmings et al. three groups of variables were used by Ercikan, McCreith & Lapointe (2005) in a mathematics study across three countries (viz., USA, Canada and Norway). They found that the strongest predictor of participation in advanced mathematics courses was students attitudes towards mathematics and in Canada and Norway, mathematical confidence was the strongest predictor of mathematical performance.

The findings from other studies point to a significant and positive relationship between attitude towards mathematics and mathematics performance. Cho & Hwang (2019) found that the strongest predictor of participation in advanced mathematics courses was students attitudes towards mathematics , and in Canada and Norway, mathematical confidence was the strongest predictor of mathematical performance. Furthermore, they found that there were gender differences that favoured the boys across all the three countries. They concluded that there is a great deal of evidence to confirm that the relationship between attitudes towards mathematics learning and participation, even though our understanding of how this association develops and maintained is limited.

Students attitude towards problem solving in Mathematics

Popoola, (2000), opined that multiple regression is used where we can predict one variable on the basis of several other variables. It is also a statistical approach to modeling the linear relationship between independent variables and dependent variables. Therefore, multiple regression is used in this study to test the hypothesis to see how many and which set of variables is influencing and affecting students performance in mathematics. In this study, 0.01 significant level was set as an indicator Based on the test result on the attitude, it shows that patience is a significant factor that contribute to the prediction model of the mathematics performance. ($F = 12.341$, significant= 0.01). Therefore, it can be concluded as rejection of hypothesis 2. In contrast, test result on confidence and willingness does not show the significant factor that contribute to prediction model of the mathematics performance. Also, test result shows that 7.6% variation in performance can be explained by patience, confidence and willingness. However, patience contributes

significantly to the prediction model of mathematics performance, and 92.4% are other factors that might contribute to their performance. (Clore &Schnall, 2005).

From the analysis of data, it was found that there is no significant difference between gender and attitude towards problem solving in mathematics. The finding of this study concurs with Mokhtar, (2000), Effandi and Normah (2009), and Hyde et al., (1990). This may be because equal attention is given to students, regardless of their gender Effandi et al (2009). Therefore, students attitude towards problem solving in mathematics was not influenced by gender.

The second finding of this study supports Faridah, (2004) who suggested that patience towards problem solving is essential to achieve good results in mathematics. Based on the finding, it could be assumed that the level of patience plays an important role in the effect of students mathematics performance. The finding also shows that there is significant contribution factor exist in attitude towards problem solving and mathematics performance.

Patience towards Problem Solving and Mathematics Performance: A study conducted by Faridah, (2004) found that students with high level of perseverance will not stop trying until they manage to get the answer and they will continue to work on a problem until they succeed in solving. Her study reported that most students immediately make an attempt to work out the problem without first planning any strategies to do so which resulted only moderate number of students are able to solve the mathematical questions. Her study indicates that the students have lack of patience to carefully read and understand the questions given. Therefore, her findings indicate that patience towards problem solving is essential to achieve good results in mathematics. Confidence Towards Problems Solving and Mathematics Performance: Therefore, willingness towards problem solving is believed to play a significant role in mathematics performance. A study conducted by Mahmud, (2001) found that excellent students have high level of willingness to solve mathematics problems compared to average and weak students (Mahmood & Ismail, 2001). His finding is also supported by Faridah (2004) that excellent students have high level of willingness towards problem solving Faridah, 2004). Andrew, Salamonson and Holcomb (2009:) emphatically affirmed that individuals self-efficacy expectation of their individual ability to successfully perform a given task is

a reliable predictor of whether or not they will attempt the task, the amount of effort they will expend and their level of perseverance in the face of unanticipated difficulties (Andrew, Salamnson & Halcomb 2009).

RESEARCH METHODOLOGY

The research design adopted for this study is the correlational design. Correlational research design is appropriate when the interest of the researchers is to explore the nature of the relationship between variables in order to make predictions of future trends of the variables through such approaches as naturalistic observation, survey and archival research. The area of the study which was Ikom Education Zone of Cross River State, Nigeria. The population of this study comprises of 4,578 SS3 students in Ikom Education Zone (The department of Planning Research of Statistics, Ministry of Education Calabar). The researcher adopted stratified random sampling technique. The researchers divided the population into strata by grouping the population based on the type of school (private and public schools), gender (boys and girls). In this study, the sample size was 408 SS 3 students from Ikom which comprise of 261 SS3 students from Calabar municipality and 147 SS3 students from Calabar south. The SS 3 students was chosen for the sample of this study because they have acquired enough experience and knowledge that help them to give appropriate information needed while responding to the research instrument that was used for data collection. Also, ten percent (6%) of the population size was selected to get the total number of schools sampled. There were two instrument that were used in collecting the data for this study. The first instrument was a questionnaire titled Students Attitude Variables Questionnaire (SAVQ) with a four-point Likert response scale as follows SA= strongly agreed, A= Agreed, D= disagree, SD= Strongly Disagree. This instrument had two sections. Section A comprises personal data (demographic data) which include gender, age, School Location, school type and school ownership. Section B consists of thirty-five items on Secondary School Students Attitude Variables (SSSAV) which can be referred to as phenomenal data consisting of students attitude towards the teacher, students attitude towards the fellow students, students attitude towards the school subject, students attitude towards the infrastructure, students attitude towards school subject and students attitudes toward problem solving in mathematics.

The researchers also developed the second instrument which is the Secondary School Mathematics Performance Test (SSMAT) consisting of twenty (50) multi-choice questions. These two instruments were designed

to elicit information from the sampled students. Two kinds of validity were established for the instrument of this study. These are the face and content validity. The face validity was established by using three experts in measurement and evaluation in the department of Educational Foundations Studies, Faculty of Education, University of Calabar. The content validity for the Mathematics Performance Test was established through the development of a Table of Specification (Test blue print). To establish the reliability of the instrument, the instrument was trial-tested on 50 SS III students selected from a school in the study area that was not be part of the sample but had similar characteristics and functions. After the administration and retrieval of the instrument from respondents, the instrument was coded and data subjected to statistical analysis using Cronbach Alpha reliability coefficient and in addition to Kuder-Richardson 20 to test the reliability for the Students academic performance. The reliability coefficient estimates ranged from .70 to .85 which showed that the instruments were consistent in measuring what they were purported to measure.

Presentation of results

In this section each hypothesis is re-stated, and the result of data analysis carried out to test it is presented. Each hypothesis of the study was tested at .05 level of significance.

Hypothesis one : Students attitude towards the school subject does not significantly predict their mathematics performance. The independent variable in this hypothesis is Students attitude towards the school subject; while the dependent variable is Mathematics performance. Simple regression analysis was employed to test this hypothesis. The result of the analysis is presented in Table 1.

TABLE 1
Simple regression analysis of the contribution of Students attitude towards the school subject and Mathematics performance

Model	R	R. square	Adjusted R square	Std error of the estimate	
1	.807(a)	.651	.651	1.83062	
Model	Sum of square	df	Mean square	F	p-value
Regression	2543.411	1	2543.411	758.960	.000(a)
Residual	1360.579	406	3.351		
Total	3903.990	407			
Variables	Unstandardized regression weight B	Standardized regression weight	Beta weight	t	p-value
(Constant)	10.754	.921		11.675	.000
Students attitude towards the school subject	1.434	.052	.807	27.549	.000

* Significant at .05 level.

The Simple regression analysis of the contribution of Students attitude towards the school subject and the Mathematics performance produced an adjusted R^2 of .651. This indicated that the Students attitude towards the school subject accounted for 65.1% of determinant Mathematics performance in the study area. This finding is a critical indication that Students attitude towards the school subject is relatively high in the area of the study. The F-value of the Analysis of Variance (ANOVA) obtained from the regression table was F = 758.960 and the significance value of .000 (or $p<.05$) at the degree of freedom (df) 1 and 406. The implication of this result is that students attitude towards the school subject is a significant predictor of Mathematics performance. The identified equation to understand this relationship was that Mathematics performance = 10.754 + 1.434 (students attitude towards the school subject). i.e Y= 10.754 + 1.434 x where Y is the mathematics performance, X is the students attitude toward to school subject and 7.398 is the regression constant

Hypothesis two

Students attitude towards problem solving in mathematic does not significantly predicts their mathematics performance. The independent variable in this hypothesis is Students attitude towards problem solving; while the dependent variable is Mathematics performance. Simple regression analysis was employed to test this hypothesis. The result of the analysis is presented in Table 2.

TABLE 2

Simple regression analysis of the contribution of Students attitude towards problem solving and Mathematics performance

Model	R	R. square	Adjusted R square	Std error of the estimate	
1	.847(a)	.718	.717	1.64661	
Model	Sum of square	df	Mean square	F	p-value
Regression	2803.194	1	2803.194	1033.885	.000(a)
Residual	1100.796	406	2.711		
Total	3903.990	407			
Variables	Unstandardized regression weight B	Standardized regression weight	Beta weight	t	p-value
(Constant)	7.403	.893		8.287	.000
Students attitude towards problem solving	1.618	.050	.847	32.154	.000

* Significant at .05 level.

The Simple regression analysis of the contribution of students attitude towards problem solving and Mathematics performance produced an adjusted R^2 of .717. This indicated that the Students attitude towards problem solving accounted for 71.7% of the determinant Mathematics performance in the study area. This finding is a critical indication that Gender attitude is relatively high in the area of the study. The F-value of the Analysis of Variance (ANOVA) obtained from the regression table was F = 1033.885 and the significance value of .000 (or p<.05) at the degree of freedom (df) 1 and 406. The implication of this result is that Students attitude towards problem solving are a significant predictor of Mathematics performance. The identified equation to understand this relationship was that Mathematics performance = 7.403 +1.618 (Students attitude towards problem solving).). i.e Y= 7.403 +1.618 x where Y is the mathematics performance, X is the students attitude toward problem solving and 8.517 is the regression constant

DISCUSSION OF FINDINGS

This section discussed findings from the results of the analysis. The discussion is presented in accordance with the variables of the study. Students attitude towards the school subject and Mathematics performance. The results of the first hypothesis indicated that, students attitude towards the school subject significantly predicts Mathematics performance. This means that students with positive attitude to school

subjects are likely to perform better in mathematics than those with negative attitude. The finding of this study agrees with that of Okoi (2015) who shows that students interpersonal relationship in the classroom has a significant correlation with academic performance; hence a student who is liked by his classmates performs better than the one who is not liked by his classmates. He buttresses it by saying that this awareness of self-esteem, belonging to the group and good mental health, therefore, makes him to approach his academic tasks with more confidence and vigour, which may lead to high academic performance especially in the course like mathematics.

Thomas, (2002) also discovered that in early adolescence, friends who cared about learning had learning educational outcomes. These people are less likely to drop out of school and are more likely to be enrolled in an academic programme, graduate from high school, and continue education after graduating. On the other hand, students who are interested in having sex, drinking, and using drugs experienced a higher rate of dropping out of school, a lower rate of graduating students from school will experience a lower rate of graduating from high school and pursuing post-secondary education.

Lord (2001) also reported that students working in groups perform better on exams especially questions that involve reasoning and critical thinking skills. Actually; peer teaching, a type of collaborative learning, often happens spontaneously with a group of students. In fact, educators have found through experience and their research that peer teaching is an effective strategy in helping learners achieve the educational goals. Watt et al., 2017) reveals that student engagement in terms of the behaviour, cognitive and affective contributes to improved mathematics performance. Student engagement in mathematics learning can increase mathematics performance. Students who have engaged actively during mathematics learning and who have completed mathematics tasks are found to show better mathematics performance. A longitudinal study International Journal of Academic Research in Business and Social Sciences shows that student engagement has a relationship with the increased quality of mathematics performance. Because students who are engaged learn more than students who are less engaged, active engagement in terms of behaviour, cognitive and affective ensures that mathematics knowledge and skills learned can be mastered to the maximum.

The result of the second hypothesis indicated that, Students attitude towards problem solving significantly relate with Mathematics performance. This means that students who engage in solving problems in mathematics tend to perform better than others in mathematics. The findings are in line with the view of Popoola, (2002) who opined that multiple regression is used where we can predict one variable on the basis of several other variables. It is also a statistical approach to modeling the linear relationship between independent variables and dependent variables. Therefore, multiple regression is used in this study to test the hypothesis to see how many and which set of variables is influencing and affecting students performance in mathematics. In this study, 0.01 significant level was set as an indicator Based on the test result on the attitude, it shows that patience is a significant factor that contribute to the prediction model of the mathematics performance. ($F = 12.341$, significant= 0.01). Therefore, it can be concluded as rejection of hypothesis 2. In contrast, test result on confidence and willingness does not show the significant factor that contribute to prediction model of the mathematics performance. Also, test result shows that 7.6% variation in performance can be explained by patience, confidence and willingness. However, patience contributes significantly to the prediction model of mathematics performance, and 92.4% are other factors that might contribute to their performance. From the analysis of data, it was found that there is no significant difference between gender and attitude towards problem solving in mathematics.

Faridah, (2004) also found that students with high level of perseverance will not stop trying until they manage to get the answer and they will continue to work on a problem until they succeed in solving. Her study reported that most students immediately make an attempt to work out the problem without first planning any strategies to do so which resulted only moderate number of students are able to solve the mathematical questions. Her study indicates that the students have lack of patience to carefully read and understand the questions given. Therefore, her findings indicate that patience towards problem solving is essential to achieve good results in mathematics. Confidence Towards Problems Solving and Mathematics Performance:

Students commitment in mathematics refers to students motivation to learn mathematics, their confidence in their ability to succeed in mathematics and their emotional feelings about mathematics. Students

commitment in mathematics plays a key role in the acquisition of mathematics skills and knowledge. Therefore, confidence towards problem solving is believed to play a significant role in mathematics performance and might be one of the factors that influence students in mathematics performance. An individuals self-efficacy expectation and their ability to successfully perform a given task is a reliable predictor of whether or not they will attempt the task, the amount of effort they will expend and their level of perseverance in the face of unanticipated difficulties skills. That confidence in learning mathematics and problems solving is essential to ensure excellent performance. Therefore, it can be assumed that confidence plays an important role in mathematics performance. Therefore, willingness towards problem solving is believed to play a significant role in mathematics performance.

CONCLUSION/RECOMMENDATIONS

Based on the findings of the study, it can be concluded that students' attitudes toward school subjects and problem-solving skills tend to predict their performance in mathematics in secondary schools in Cross River State, Nigeria. The study emphasizes that a positive attitude in these areas fosters better academic outcomes in mathematics, while negative attitudes hinder progress. On the basis of the findings of this study, it was recommended that teachers should relate mathematics to real-life situations and practical examples to show its relevance and applicability. Using diverse teaching methods, including technology, games, and hands-on activities, can make learning more engaging and enjoyable.

REFERENCES

Andrew, S., Salamnson, Y. & Halcomb, E. J. (2009). Nursing students confidence in medication calculations predicts math exam performance. Nurse education Today, 29: 217-223.

Cho, E. H, Hwang, S. H (2019) Exploring changes in multi ethnic students mathematics achievement motivation: longitudinal study using expectancy value theory in the mathematical education. 58(1),101-101.

Clore, G. L & Schnall ,S. (2005) the influence of effect on attitude (pp437 -489)

Effandi, Z., & Normah, Y., (2009). Attitudes and Problem-solving Skills in Algebra among Malaysian College Students. European Journal of Social Sciences, 8: 232-245.

Effiom, J. N. & Edoho, E.A.,(2017), influence of school location on students attitude towards mathematics and basic science. British Journal of Education by European Centre for Research Training and Development UK (www.eajournals.org) 76 ISSN 2054-6351 (print), ISSN 2054-636X (online) Vol.5, No.10, pp. 76-85

Ercikan, K., McCreith, T., & Lapointe, V. (2005). Factors associated with mathematics performance and participation in advanced mathematics courses: An examination of gender differences from an international perspective. School Science and Mathematics, 105(1), 5 14.

Faridah S, (2004). The ability to solve non-routine problems among high achievers. University Kebangsaan Malaysia, Bangi, Selangor,

Furinghetti, F., & Morselli, F. (2009). Every unsuccessful problem solver is unsuccessful in his or her own way: Affective and cognitive factors in proving. Educational Studies in Mathematics, 70, 71 90.

Gresalfi, M. S., & Cobb, P. (2006). Cultivating students discipline-specific dispositions as a critical goal for pedagogy and equity. Pedagogies: An International Journal, 1(1), 49 57.

Grootenboer, P., & Hemmings, B. (2007). Mathematics performance and the role played by affective and background factors. Mathematics Education Research Journal, 19(3), 3 20.

Kenya, E., Githaigal, W., Mutahi, D., (2018) Influence of Students Attitude in Mathematics Performance among Learners in Public Secondary Schools International Journal of Novel Research in Humanity and Social Sciences Vol. 5, Issue 5, pp: (228-237),

Kogce, D., Yildiz, C., Aydin, M., & Altindag, R. (2009). Examining elementary school students attitude towards Students Attitude Towards Mathematics / Dan'inna 20 Jocw. Discinternational. Org

Leder, G. C., & Forgasz, H. J. (2006). Effect of mathematics education: PME perspectives.

Leedy, M. G., LaLonde, D., & Runk, K. (2003). Gender equity in mathematics: Beliefs of students, parents, and teachers. School Science and Mathematics, 103(6), 285 292.

Lord, T. (2001). 101 reasons for using cooperative learning in biology teaching. The American Biology Teacher, 63(1), 30-38.

Mahmood, & Ismail (2011) factors that influenced student in mathematics achievement international journal of academic. Research vol 3(3) PP 49-54

Mohammed, L., & Waheel, H. (2011). Secondary students attitude towards mathematics in a selected school of Maldives. International journal of humanities and social science, 1(15), 277-281.

Norhatta, M & Tengku, F. (2011) The Effects of Attitude Towards Problem Solving in Mathematics Performance. Australian Journal of Basic and Applied Sciences, 5(12): 1857-1862.

Odebunmi, E. O. Balogun, T. A. (2015). The attitudes of some Nigerian students towards integrated Science .Journal of integrated curriculuk.3(1), 3-11.

Oden, O, N (2004), characteristics of good effective teacher: Gender differences in students descriptors. A paper presented at the annual meeting of the Mid-south Educational Research association. Nashville, November.

Ogunkola, B. J. (2010) instructor-expressiveness. Students locus of control and cognitive entry behaviour as measures of students performance and attitude towards Biology. An unpublished Ph. D Dissertion, University of Ibadan. Ibadan.

Okoi, O.E. (2015) student and prior mathematics performance as predictors of junior secondary school certificate, pg2.

Otu, B. D., Oyama, A. D., Ita, C, I., & Uchegbue, H. O. (2022). Teacher-student relationship and evaluation of students learning activities as correlates of Mathematics teachers teaching effectiveness in Ogoja Education Zone of Cross River State, Nigeria. *International Journal of Education, Learning and Development, 10 (2), 48-55*.Papanastasiou, C., (2000). Effects of attitude and beliefs on

mathematics performance. Studies in Educational Evaluation, 26: 27-42.

Otu, B. D., Ojini, R. A., Uchegbue, H. O. & Abang, K. B. (2023).Teachers gender and effective classroom management and teaching methods as a dimension for teaching effectiveness of mathematics teachers in Ikom Education Zone of Cross River State, Nigeria. *Global Journal of Educational Research* 22, 25-36.

Popoola, A.A., (2002). Effects of Hewistic problem solving and programmed instructional strategies in senior secondary school learning outcomes in mathmatics in Ekiti-state, Nigeria. Unpublished Ph.D Thesis, University of Ibadan

Singh, K., Granville, & Dika, S. (2002). Mathematics and science performance: Effects of motivation, interest, and academic engagement. The Journal of Educational Research, 95(6), 323 332.

Thomas, J. P. (2002). An examination of the relationship between learning variables and academic performance outcomes (Document No. TM 034 700). Grayslake: College of Lake County (ERIC Document Reproduction Service No. ED 471 988).

Tueller, S., & Lubke, G. (2010). Evaluation of structural equation mixture models: Parameter estimates and correct class assignment. Structural Equation Modeling, 17(2), 165-192.

Watt, H. M., Carmichael, C., & Callingham, R. (2017). Students engagement profiles in mathematics according to learning environment dimensions: Developing an evidence base for best practice in mathematics education. School Psychology International, 38(2), 166 183

Wilkins, J. L. M., Zembylas, M., & Travers, K. J. (2002). Investigating correlates in mathematics and science literacy in the final year of secondary school.

MJZan, R. and Martino, P. (2007). Attitudes towards Mathematics: Overcoming positive/negative dichotomy. The Montana Mathematics Enthusiasts Monograph, 3 157-168

Zan, R., Brown, L., Evans, J., & Hannula, M. (2006). Affect in mathematics education: An introduction. Educational Studies in Mathematics, 63(2), 113 121.