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Influence of Students' Perception of Mathematics on Junior Secondary School Students' Academic Performance in Yala Local Government Area of Cross River State, Nigeria

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Abstract

This study employs an ex-post facto research design to examine the influence of students' perception of mathematics on Junior Secondary School students' academic performance in Yala Local Government Area of Cross River State, Nigeria. Four research questions were asked to guide the study and two hypotheses was formulated and tested at 0.05 level of significance. The sample comprises 170 Junior Secondary School students. A validated instrument titled Students' Perception of Mathematics Questionnaire (SPOMQ) was used to collect students' opinions (data). Data collected were analyzed using percentage, mean,

standard deviation and the hypotheses were tested using t-test statistics technique. The findings revealed that the students in this study area have negative perception toward mathematics. The result also revealed that the students' negative perceptions toward mathematics grossly influence their performance in mathematics. The result indicated that gender and age do not contribute to the students' perception of mathematics but language background contributes greatly to the students' understanding of mathematics. Furthermore, there was a weak negative significant correlation between the students' perception of mathematics and their academic performance in mathematics. Lastly, there is no significant difference between the perceptions of male and female students toward mathematics. The study therefore recommends that School Management should put in enough effort in counseling the students toward developing positive attitudes and interest toward mathematics learning to enhance high performance in mathematics. Mathematics Teachers should reduce the use of ambiguous terminologies in teaching mathematics rather improve in explaining these terminologies in a language the students may understand. The Teachers should make use of appropriate audio-visual materials in teaching mathematics to enhance the interest of students thereby reduce the negative perceptions.

Keywords: Perception of Mathematics, Mathematics Education, Gender, Age, Language Background

Introduction

Mathematics is perceived by society as the foundation for scientific and technological knowledge that is cherished by societies worldwide. It is an instrument for political, socioeconomic, scientific and technological developments (Githua & Mwangi, 2003). Mathematics has importance over and above the application of basic numeracy skills. It is also the prime vehicle for developing student's logical thinking and higher-order cognitive skills. Mathematics also plays a major role in a number of other scientific fields, such as Physics, Engineering and Statistics. It is believed that more Mathematics lessons are likely to be taught in schools and colleges throughout the world than any other subject (Orton, Orton, & Frobisher, 2004). In fact, the benefit that the study of Mathematics offers in the society is so profound that it is often used by Universities to filter secondary school learners for entry into the prestigious science-based degree programs. According to Adeneye & Abisola (2020) 'mathematics not only enhances problem solving and analytical skills of students but promotes their logical, functional and aesthetic skills. In general human beings engage in daily usage of mathematics and this daily application of mathematics induces the human brain to articulate problems, theories and their solutions for the survival of human race. There is no gainsaying that mathematics at school prepares students to acquire functional and coping skills for adult life. Mathematical skills serve as catalyst for genuine invention, improved productivity, and expansion in social well-being of citizens. For any nation to be globally competitive, its citizens must display high mathematical and scientific literacy as a strong base for technological prowess. Many countries remain underdeveloped because they lack strong mathematical base cum scientific literacy.

In spite of the benefits that the study of Mathematics offer, it is commonly perceived that Mathematics is difficult, obscure, and of little interest to certain people. In this country students' achievement in mathematics is at low ebb when compared to high

achieving countries despite their adoption of mathematics as a filter of students into science, technology, engineering, and mathematics careers at the university level (Adeneye & Abisola, 2020). It cannot be denied that Mathematics plays an important role in life but the reality is that many students, specifically, in Yala Local Government of Cross River State, Nigeria, find mathematics very difficult, hampering the desire to acquire the different mathematical skills and processes that are useful in their everyday lives. Mathematics phobia developed by many students keeps them away from understanding the importance and roles of mathematics. Many Nigerian students seem not to develop and demonstrate a deep understanding of and capacity to do mathematics (Awofala, 2017). This lack of understanding developed by mathematics students is highly connected to students' perception of mathematics.

Perceptions of mathematics originate from past experiences; comprising both cognitive and affective dimensions (Aguilar, Rosas & Zavaleta, 2012). From a cognitive point of view perception relates to a person's knowledge, beliefs, and other cognitive representations while from an affective domain it refers to a person's attitudes, feelings and emotions about mathematics. The term is also understood broadly to include all visual, verbal representations, metaphorical images and associations, beliefs, attitudes and feelings related to mathematics and mathematics learning experiences. However, the complexity of factors that can influence Mathematics performance show that high achievement in Mathematics is a function of many interrelated variables related to students, families, and schools. Among student variables, Perceptions are regarded by several researchers, as an important factor to be taken into account when attempting to understand and explain variability in student performance in Mathematics (Kogce, Yildiz, Aydın, & Altındağ, 2009; Mohamed & Waheed, 2011; Mato and De la Torre, 2010). According to McLeod (1989) students' perception towards Mathematics teaching and learning play an important role in Mathematics education. The learning outcomes of students are strongly related to their perceptions towards Mathematics (Thompson, 1992). Some students view Mathematics as their waterloo; as result, students perform poorly in Mathematics. These perceptions toward Mathematics and Mathematics learning and their implications for Mathematics instructions have long received much attention from both Mathematics educators and mathematicians (Royster, Harris, & Schoeps, 1999). They further mention that in fact the poor performance of students globally in Mathematics is mostly linked to perception than any other variable. Students' poor achievement in Mathematics is not just a concern for particular countries, but has become a global concern over the years (PISA, 2009). Cell-assembly-phase-sequence theory suggests that perception is a product of learning. Thus, one's acquaintance with anything new in the world helps to form perception. The theory States that initial reactions to a visual presentation (exposition) give rise to exploratory motor components that play a significant role of sequentially building up activities of small groups of brain cells into a larger sequence of activity during the process of learning (Bartley, 1969). Therefore, the process of learning involves interpreting information about anything discovered. What this highlights for our attention is that the opinion one forms about another person depends on the amount of information available to him/her and the extent to which he/she is able to correctly interpret the information the person has acquired. In other words, you may be in possession of the same set of information that other people have on a particular

situation, person or group but still arrive at different conclusions due to individual differences in the capacity to interpret the information that you all have. However, this suggests that perception in this regard is ranks among the important cognitive factors of human behavior or psychological mechanism that enables people to understand their environment. In particular, the relationship between perception toward Mathematics and achievement in Mathematics had traditionally been a major concern in Mathematics education research (Ma & Kishor, 1997). For example, Neale (1969) describes the relationship between the two as a consequence of a reciprocal influence, that is, perceptions affect performance and performance in turn affects perception. On the other hand, there are studies reporting that the relationship is not statistically significant (Papanastasiou, 2002). Given this background, it is only reasonable and logic to assume that there is need to investigate whether students' performance in Mathematics is influence by their perception of the subject or not. It is this background that has motivated this study to find out the influence of student perception of mathematics on junior secondary school students' academic performance in Yala Local Government Area of Cross River State, Nigeria.

Statement of the Problem

Student negative perception of mathematics leading to failure in mathematics is a major concern for teachers, school management, and parents because it brings down the academic performance of students. These problems delay students' entry into tertiary institutions in Nigeria as students are well filtered with at least credit in mathematics before admission is given. Failure in mathematics at the junior secondary school level is majorly linked to student perception of mathematics considering the steps involved in mathematical operations and abstract nature of mathematics viewed by students. The negative perception of mathematics by student has a great setback on teaching and learning of mathematics specifically in Yala Local Government Area of Cross River State, Nigeria. Therefore, this study sought to investigate the influence of student perception of mathematics on junior secondary school students' academic performance in Yala Local Government Area of Cross River State, Nigeria.

Literature Review

Theoretical Frame Work

Theoretical framework provides guide and foundational knowledge to a specific study of interest. Abah (2020) defined theoretical framework to be a treatise on educational theories, psychological theories of learning, theoretical models, and traditional paradigms related to the topic under consideration. It observed by many researchers that a direct theoretical framework for perception is difficult to reach. In support of this Kabeera (2019) assert that it is not for the faints of hearts to come up with a well-developed theoretical framework when studying beliefs and attitudes and it has been equally a trek on the sea to develop any coherent framework in the area of people's believes and their attitudes to many researchers and none has to this day managed to claim any success. Hannula (2004) agreeing with this bothering fact stated that there has been numerous debates going on about the appropriate theoretical frameworks that can be used while

conceptualizing the effects of mathematics in education and presently there is no defined and collective lingo for describing the affective domain, within a theoretical framework that gives consents for its systematic study. However, this present study will consider the precept of Bem's Self-Perception Theory.

Self-Perception Theory (Bem, 1972)

The Self-Perception Theory holds that individuals come to "know" their own attitudes, emotions, and other internal States partially by inferring them from observations of their own overt behavior and/ or the circumstances in which this behavior occurs. Thus, to the extent that internal cues are weak, ambiguous, or not interpretable, the individual is functionally in the same position as an outside observer, an observer who must necessarily rely upon those same external cues to infer the individual's inner States.

External cues according to Bem theory of self-perception resided in the social and physical setting in which the individual was placed or in verbal instructions given to him by the experimenter and internal cues shows in the individual's attitude. Bem projected further that the important clues to know an individual's inner State are found in his behavior. When we want to know how someone feels, we look to see how he acts (Bem, 1972). To Bem, individual's own behavior will be used by him to the extent that the contingencies for the reinforcement for engaging in the behavior are made more subtle or less discriminable. The Cartoon Experiment in Bem's theory shows that: Self-attributions known as attitude Statements could be brought directly under the control of an individual's own verbal behaviour and the accompanying stimulus conditions in which that behavior occurs.

The tenets of Self-Perception Theory have shown that students perception of mathematics arouse from their internal State (which is shown in negative view of mathematics, low intrinsic motivation to learn mathematics & mathematical phobia) and also external cues such as peers opinion, teachers' incompetency, lack of instructional aids and many more other external factor that could present mathematics as a difficult subject to the students.

Conceptual Framework

Students' Perception of Mathematics and Mathematics Learning

Mathematical concepts as forms of teaching and learning have been in existing for many years, dated 5000 years ago (Kabeera, 2019). In line with this Awofala, Lawani & Adeyemi (2020) says that mathematics is as old as mankind in that God being the greatest mathematician ever framed the world with the idea of mathematics. It is believed that the notion of mathematics as a discipline was invented at the time when reading and writing was inaugurated by the Sumerians (Kabeera, 2019). Kabeera continues that from then to this day, mathematics has since become a dominant discipline among world academics with all education institutions throughout the world prioritizing it in their education curriculum. Throughout the world, mathematics is viewed as one of the fundamental intellectual tools that every educated individual should have (Kabeera, 2019). The world today looks at mathematics as an engine for the development of all scientific disciplines.(

Akuezuilo & Chinweoke, 2009) Stated that mathematics is the bedrock of all Science Subjects and is therefore, needed for scientific and technological advancement of any nation. Mathematics plays a key position when it comes to determining how individuals deal with the various spheres of private, social, and civil life (Anthony & Walshaw, 2009). This explains why most institutions in the world pressurize the students to study mathematics both at basic and secondary education (Anthony & Walshaw, 2009). On that accord therefore, Mathematics is considered as a central subject in all ordinary levels of education in Nigeria (National Policy on Education, 2004).

Students believe and attitudes (perception) towards mathematics present it as an abstract and difficult subject that can only be understood by gifted students. Kareera (2019), it is extensively said that student's unenthusiastic perceptions and myths towards mathematics are very broad. Sam as cited in Kareera (2019) added that many students are petrified of mathematics and feel powerless in the presence of mathematical ideas. Sam lament further those students consider Mathematics as unbearably a difficult, frosty and abstract subject. Many people especially student's believe that it is only academically gifted mates that can be powerful in the presence of mathematics or those who 'inherited mathematical ability, while others hold the view that the general challenges in mathematics performance is as a result of the permanent State over which they have no or little control (Kabeera, 2019). Tobias (2003) advances that many aged people have been deprived of many professional and personal opportunities because of their poor performance in mathematics and therefore to many, these negative experiences remain and keep haunting them throughout their lives. McLeod in Kabeera (2019) argues that, the role of parents towards the child's better mathematical performance should not be underestimated. Parents play a primary role towards building students beliefs and attitudes mathematics and thus better performance. Parents' take on mathematics greatly communicates sense of the subject to the child and greatly influences the way it is facilitated thus arousing the interest of the children to pursue it with a good attitudes and results into better performance in the long run (Sam in Kabeera , 2019).

Perceptions and beliefs about mathematics originate from past experiences; comprising both cognitive and affective dimensions (Mutodi, 2014). Rensaa (2006) agreeing with this fact says that Perceptions and beliefs about mathematics lays heredity in the people's lived and past experiences which comprises both cognitive and affective dimensions . Cognitively, it relates to a person's understanding or knowledge and credence's in addition to other cognitive demonstrations while affective domain refers to a person's to attitudes, feelings and emotions about mathematics (Kabeera, 2019). The perceptions towards mathematics (Kabeera , 2019) are vital towards the effective facilitation of learning and teaching the discipline. This concept influences the instruction of mathematics both positively and negatively, the school system, family background and student's attitudes towards the school altogether have an effect on the way students view mathematics (Kabeera, 2019). Kabeera projected further that student's positive discernment towards mathematics can steer many into mathematic success. Therefore an approach to get better of the students attitude towards mathematics at a young age would

present the opportunity for many students to perform well in mathematics while at a higher level of education (Kabeera, 2019).

It is important to note that an individual's perceptions affect his desires and love towards mathematics and hence deconcetration while learning it which in the end brings about horrendous results to both the students and the institutions (Kabeera, 2019). Hannula (2006) pointed out that mathematics phobia is within the student's structure of believes. Philipp in Kabeera (2019) expand that beliefs are vehicles of conveniences through which manages to construe the world.

Empirical Review

Kabeera (2019) examined the influence of student's perception on mathematics performance in three selected Rwandan secondary schools. The study took a qualitative case design and it explored the perceptions of high school students towards mathematics in three secondary schools in Rwanda. It further analyzed relationship between the teachers and the students and how this relationship can positively or negatively influence the student's perceptions towards the general mathematics performance. The study's sample size was 30 comprising of students from three selected schools and 6 mathematics teachers. The students were interviewed in their respective focused group each consisting of 8 students also secondary data from other researcher was used. The research revealed that Language is one of the factors that have influenced the students' perceptions towards mathematics. It was equally exposed that age greatly influences the way students view mathematics, it highlighted that students from the age of 14-18 usually view mathematics as a hard subject. The study found out that there was a significant discrepancy in perceptions between the ways girls perceive mathematics to boys. The research's results show that there is a grand relationship between teachers, learning materials, and school administrators' supports on the self-confidence of students of all ages, gender, beliefs, and attitudes, and thus influence positive attitudes towards mathematics. The study also revealed that gender related factors influence the student's perceptions towards mathematics, it noted that girls tend to develop a low self-esteem that they cannot out compete boys in mathematics. It therefore recommends that learners should not ground themselves in myths and baseless beliefs that if not well addressed can easily affect the student's performance in mathematics as well as making them insignificant in the society later in life. Though the study of Kabeera (2019) is assumed as a basis for this present study, still it differs from this present study in areas such population of interest. The present study adopts junior secondary school students in Yala Local Government Area of Cross River State, Nigeria.

Uwineza, Rubagiza, Hakizimana & Uwamahor (2018) carried out a study on gender attitudes and perceptions towards mathematics performance and enrolment in Rwandan secondary schools. The study used questionnaires, interviews and classroom observations to collect data from a sample of 150 participants including 60 females, 84 males' students, as well as 6 male mathematics teachers, who were purposefully selected. The main findings from this study show, in general that, boys and girls demonstrate shared perceptions towards the importance of mathematics subjects. However, boys manifested more negative perceptions towards girls' ability to perform well in mathematics. Besides,

some few females also manifested negative perceptions, which can explain their low confidence in mathematics. A particular trend which was highlighted in this study indicates the role of the teacher in shaping gender differences that are observed in mathematics learning. Hence a more longitudinal study, particularly focusing on teachers' classroom gender related practices, attitudes, beliefs with their impact on students' performance can provide more generalizable findings. The study recommends further research on teachers' gender related classroom practices, attitudes and assessments and their impact on students' performance with respect to gender. Such research may contribute to the improvement of quality mathematics education and performance, as well as to the subsequent increase of girls' enrolment in mathematics combinations. While considering the findings from this study as informative and not generalizable, the study suggests a more longitudinal study which can lead to generalization. The study of Uwineza, Rubagiza, Hakizimana & Uwamahor (2018) though addresses perception of students towards mathematics but in comparison with this present study, there is variance in variable of interest. The present study is not greatly attached to genter. Also in terms of population of interest. The present study is interested in junior secondary school students in Yala Local Government Area of Cross River State, Nigeria.

Afari, Aldridge, Fraser & Myint (2013) investigate students' perceptions of the learning environment and attitudes in game-based mathematics classrooms. A pre–post design involved the administration of English and Arabic versions of two surveys (one to assess students' perceptions of the learning environment and the other to assess their attitudes) after modification to ensure their relevance for college- level mathematics students in the UAE. For a sample of 33 classes (352 students), eight of which (90 students) were exposed to mathematics games, students involved in mathematics games perceived statistically significantly more teacher support, involvement, personal relevance, enjoyment of mathematics lessons and academic efficacy. The findings of the study provide that the use of mathematics games, can enhance students' attitudes towards mathematics. The study recommends that in many classrooms, the teacher's willingness to incorporate games or different pedagogies in their lessons could be a key to success in improving the classroom environment and students' attitudes towards mathematics. Afari, Aldridge, Fraser and Myint (2013) failed to critically address students belief towards mathematics outside the used of games and academic performance in mathematics. The present study also differs from the study of Afari, Aldridge, Fraser and Myint (2013) in terms of methodology and population of interest. The present study is interested in academic performance in mathematics of junior secondary school students in Yala Local Government Area of Cross River State, Nigeria.

Mutodi (2014) investigate The Influence of Students` Perceptions on Mathematics Performance. A Case of a Selected High School in South Africa. The influence of factors such as strength and weaknesses in mathematics, teacher support/learning material, family background and support, interest in mathematics, difficulties or challenges in doing mathematics, self- confidence and myths and beliefs about mathematics were identified as constructs of perceptions that influence students' performance. Five of the seven constructs were found to be influential on students' performance in mathematics. Quantitative methods were used to analyses the data collected from a questionnaire which

was administered to randomly selected secondary school students (n=124) in Polokwane, South Africa. From the regression analysis of the data, the following hierarchy of themes emerged as components of students' perceptions of mathematics. These were (i) weaknesses in mathematics (ii) family background and support, (iii) interests in mathematics, (iv) self-confidence in mathematics, (v) myths and beliefs about mathematics (vi) teacher /learning material support, (vii) difficulties in learning mathematics. Results from t- tests, Anova and suggest that there were significant differences in the perceptions and beliefs about mathematics between males and females, between mature and juvenile students and among students from different language backgrounds respectively. Correlation analysis results showed strong positive relationships between performance and perception constructs such as self-confidence, interests in mathematics, teacher and learning support material as well as myths and beliefs .The respondents tend to view lack of proficiency in mathematics as a challenge, and attribute success in mathematics to effort and perseverance. Students also perceive difficulty in mathematics as an obstacle, and attribute failure to their own lack of inherited mathematical ability. These findings suggest that differences in (i) myths and beliefs about mathematics success, ((ii) motivation given by mathematics teachers and parents, (iii) mathematics teachers' teaching styles and learning materials and (iv) self confidence in mathematics may lead to differences in perceptions about mathematics. These in turn may lead to differences in attitudes towards mathematics and learning mathematics which have a bearing on performance. The study of Mutodi (2014) suggests core premises for this present study, particularly in terms of population of interest.

Based on the diverse literature reviewed, consideration of facts which may serve as guide for the influence of perception towards mathematics on junior secondary students' academic performance in Yala Local Government Area of Cross River State, Nigeria has been toured. The empirical review shows that students' perception towards mathematics has great impact in their mathematics learning. Nevertheless, these studies do not delve into the perception of junior secondary students particularly in Yala Local Government Area of Cross River State, Nigeria. This present study intend to explore this gap in the existing body of knowledge.

Purpose of the Study

The main purpose of this study is to investigate the influence of student perception of mathematics on junior secondary school students' academic performance in Yala Local Government Area of Cross River State, Nigeria. In particular, this study is set to:

i. Find out the perception of students towards mathematics in Yala Local Government Area of Cross River State, Nigeria.
ii. Find out the influence of students' perception of mathematics on junior secondary school students' academic performance in Yala Local Government Area of Cross River State, Nigeria.
iii. To find out whether gender, age, and language background have an effect on the way students perceive mathematics in Yala Local Government Area of Cross River, Nigeria.

iv. Find out relationship between junior secondary school students' perception of mathematics and the academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria.

Research Questions

The following research questions guided the study:

i. What is the perception of junior secondary school students towards Mathematics in Yala Local Government Area of Cross River State, Nigeria?
ii. To what extent does students perception of mathematics influence junior secondary school students' academic performance in mathematics in Yala Local Government Area of Cross River, Nigeria?
iii. How does gender, age, and language background contribute to stuents' perception of mathematics in Yala Local Government Area of Cross River State, Nigeria?
iv. What is the relationship between junior secondary school students' perception of mathematics and the academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria?

Research Hypotheses

The following research hypotheses were formulated and tested at 0.05 level of significance.

i. There is no significant relationship between students' perception of mathematics and the academic performance in mathematics junior secondary school in Yala Local Government Area of Cross River State, Nigeria.
ii. There is no significant difference between the perceptions of male and female students toward mathematics in junior secondary schools in Yala Local Government Area of Cross River State, Nigeria.

Methodology

Design of the Study

The study adopted an ex-post facto research design. Ex-post facto research can be viewed as an experimental research in reverse (Marilyn & Geos, 2013). The study therefore used Ex- Post Facto research design to examine Influence of students' perception of mathematics on junior secondary school students' academic performance in Yala Local Government Area of Cross River State, Nigeria.

Area of the Study

The preferred area of the study is Yala Local Government Area of Cross River State, Nigeria which is one of the eighteen (18) Local Government that make up Cross River State. Yala is recorded (National Population Census, 2006) with population of two hundred and ten thousands, eight hundred and forty three persons. According to National Population Census (2006), Yala has a land mass of 1,739 km^2. In relation with the Equator, Yala lies $6^0 35^{'} 35^{"}$N 8^0 38'01"E. The Headquarter of Yala Local Government is Okpoma

and is bounded by two Local Government Areas which are Ogoja and Bekwarra local government areas. The dwellers of Yala Local Government engaged majorly in agriculture activities and few civil servants. Yala has eleven (11) council wards, which includes Okpoma, Yache, Yahe, Wanokom, Gabu, Echumofana, Wanihem, Okuku, Ijiraga, Ntrigom/Mfuma and Wanikade. The choice of this is on the basis that very little work on students' perception of mathematics has been done using the population dynamics of the area.

Population of the Study

The study considered Junior Secondary School three (JSS 3) students as the population which comprised two hundred and ninety five (295) students (Yala Local Government Education Authority, 2021).

Sample and Sampling Technique

The sample for this study comprises 170 Jss3 Students in Yala Local Government Area of Cross River State, Nigeria. This sample size is determined using Yamane's formula (Yamane, 1967). The respondents of the study were drawn from six (6) selected schools in Yala Local Government Area of Cross River State, Nigeria. Simple random sampling technique was used to select the schools.

Instruments for Data Collection

An instrument titled Students' Perception of Mathematics Questionnaire (SPOMQ) was used to collect data for the study. The SPOMQ has five (5) parts. Part A items seek respondents' personal information. Part B items were adopted from Students' Perception toward Mathematics and its Effects on Academic Performance by Hagan, Amoadiodai, Lawer, & Atteh (2020). Part C contains items that seek influence of perceptions. Part D contains items that solicit for age, gender and language background while part E provides a space for each student's score (entered by the researcher from mathematics assessment records). The parts B, C and D items used for the collection of data were built on a four (4) point Likert scale of "Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. While, part E recorded the respondents' previous scores in mathematics.

Validation of the Instrument

The instrument for this study was validated by one expert in Mathematics Education, one expert in Measurement and Evaluation and two in-service mathematics teachers. The expert in Mathematics Education, Measurement and Evaluation are from Joseph Sarwuan Tarka University Makurdi, Nigeria. The two in-service Mathematics teachers are from Angus College Makurdi, Nigeria. The experts were requested to evaluate the instrument base on the simplicity of language and appropriateness of the constructed items in respect of the objectives of the study. Based on the recommendations of the experts, necessary modifications were made to the instrument. The experts' comments, opinions, and suggestions used to design the SPOMQ in its final form.

Reliability of the Instrument

To secure reliability, the SPOMQ was trial-tested on 20 users of the students' perception of mathematics. The 20 respondents used in the trial-testing were subjected to reliability

analysis yielding a cronbach's alpha coefficient of 0.65 for the entire SPOMQ, indicating a good level of consistency of the instrument.

Method of Data Collection

Data were collected through the administering of the constructed questionnaire (SPOMQ) to the respondents individually and the researcher guided them to give data appropriately, after which the distributed SPOMQ were collected for further uses.

Method of Data Analysis

Techniques used in analyzing this study and its questions are percentage, means, standard deviation, Pearson product Moment Correlation Coefficient (PPMCC) and t-test. The percentage was used to obtain the proportion of respondents for each item. The mean was used to obtain the average opinion of the respondents on the items. The standard deviation was used to ascertain the level of different opinions that exist among the respondents. The Pearson product Moment Correlation co-efficient (PPMCC) was used to acquire the relationship that exist between student" perception of mathematics and their academic performance in mathematics, t-test of correlation was used to test the significant relationship between the students' perception of mathematics and their academic performance in mathematics also it was used to compare the perception of male and female students toward mathematics. The bench mark for decision on the research questions is a mean of 2.50. A mean of 2.50 and above implies acceptance of an item while, a mean below 2.50 indicates rejection.

Results

The results of this study are presented according to the research questions.

Research Question One

What is the perception of junior secondary school students towards Mathematics in Yala Local Government Area of Cross River State, Nigeria?

Table 1: Analysis of the Perception of Junior Secondary School Students toward Mathematics

S/No	Perception of Mathematics	Mean	Std	Remark
1	I enjoy studying mathematics.	2.46	1.04	Disagree
2	Mathematics has relevance in my life.	2.47	1.04	Disagree
3	I will like to pursue further studies in mathematics.	2.41	1.05	Disagree
4	Mathematics should continue to be a core subject.	2.33	1.06	Disagree
5	I learn mathematics quickly.	2.33	1.07	Disagree
6	I don't give up immediately if I don't find a solution to a mathematics problem.	2.29	1.07	Disagree
7	Everybody needs mathematical knowledge.	2.34	1.09	Disagree

8	I rate mathematics higher to all other core subjects.	2.22	1.00	Disagree
9	I can improve my mathematics skills	2.29	1.02	Disagree
10	The topics in mathematics are easy to learn.	2.34	0.92	Disagree
	Cluster Mean	**2.35**		Disagree

Table 1 shows the perception of Junior Secondary School Students (JSS3) toward Mathematics in Yala Local Government Area of Cross River State, Nigeria. As exhibited by the cluster mean of 2.35, the students in this study have poor opinion towards mathematics indicating that this set of students has negative perception towards mathematics which is lower than the benchmark of 2.50

Research Question Two

To what extent does students perception of mathematics influence junior secondary school students' academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria?

Table 2: Analysis of the extent in which students' perception of mathematics influence Junior Secondary School Students' academic performance in mathematics

S/No.	Influence of Perception	Mean	Std	Remark
1	My mathematics teachers have been successful with helping me to learn.	2.35	1.06	Disagree
2	I believe I can earn "A" in a mathematics test.	2.35	1.05	Disagree
3	The difficulties I perceive toward mathematics do not prevent me from trying again and again.	2.35	1.08	Disagree
4	I believe I can master mathematics principles because I need mathematics in my everyday life activities.	2.27	1.10	Disagree
5	It's important for me to do really well in mathematics because it is useful to me	2.28	1.09	Disagree
	Cluster Mean	**2.32**		**Disagree**

Table 2 gives the analysis of the extent in which students' perception of mathematics influence junior secondary school students' academic performance in mathematics. As shown by the general low mean of 2.32s, the negative perception towards mathematics showed by this unique set of students grossly influence their performance in mathematics.

Research Question Three

How does gender, age, and language background contribute to students' perception of mathematics in Yala Local Government Area of Cross River State, Nigeria?

Table 3: Analysis showing the contribution of gender, age, and language background to students' perception of mathematics

S/No.	Contribution of age, gender and language background to students' perception of mathematics	Mean	Std	Remark
1	I think mathematics understanding is for male students.	2.22	0.91	Disagree
2	As I grow older I understand mathematics better.	2.35	1.04	Disagree
3	I relate well with my mathematics teachers irrespective of their gender.	2.32	0.93	Disagree
4	I understand mathematics better when my teacher explains some concept in my dialect.	2.63	0.97	Agree
5	I understand the abstract and difficult Mathematics terminologies use by my teachers.	2.26	0.65	Disagree
6	I feel good learning mathematics from my younger ones.	2.29	0.92	Disagree
	Cluster Mean	**2.35**		**Disagree**

Comparing the cluster mean of 2.35 with the decision benchmark of 2.50, result in Table 3 revealed that the contribution of gender and age to students' perception of mathematics is not much. In other words gender and age do not contribute much to these students' performance in mathematics. But, in terms of language background, high numbers of the students were of the opinion that they understand mathematics better when their teacher explains some concept in their dialects

Research Question Four

What is the relationship between junior secondary school students' perception of mathematics and the academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria?

Table 4: Correlation between students' perception of mathematics and academic performance in mathematics

Variable	Mean	Std	r	Remark
Perception of mathematics	2.35	1.04	-0.043	Weak Negative Correlation
Academic performance in Mathematics	48.33	12.79		

The result of table 4 above shows a weak negative correlation between the students' perception of mathematics and their academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria. Statistically, this negative relationship

reveals that a continual increase in the negative perception of mathematics of these students will result in continual decrease in their academic performance in mathematics

Hypothesis Statement One

There is no significant relationship between students' perception of mathematics and their academic performance in mathematics in Junior Secondary School in Yala Local Government Area of Cross River State, Nigeria.

Table 5: t-test comparison of the relationship between students' perception of mathematics and their academic performance in mathematics

Variable	Mean	std	df	p-value	Decision
Perception of mathematics	2.35	1.04	169	0.00	H_0 is Rejected
Academic performance in mathematics	48.33	12.79			

Level of Significance $\alpha = 0.05$

Table 5 revealed that there is significant relationship between Students' perception of Mathematics and their academic performance in mathematics in Junior Secondary School in Yala Local Government Area of Cross River State, Nigeria. This is based on the fact that the p-value of 0.00 was less than the α - value of 0.05. Therefore, the null hypothesis was rejected.

Hypothesis Statement Two:

There is no significant difference between the perceptions of male and female students toward mathematics among junior secondary schools students in Yala Local Government Area of Cross River State, Nigeria.

Table 6: t-test comparison of the perceptions of male and female students toward mathematics

Variable	Mean	std	df	p-value	decision
Male	2.33	0.36	169	0.13	H_0 is Accepted
Female	2.32	0.36			

Level of Significance $\alpha = 0.05$

Table 6 shows that there is no significant difference between the perceptions of male and female students toward mathematics among Junior Secondary Schools Students in Yala Local Government Area of Cross River State, Nigeria. This is because the p-value of 0.13 is greater than the α - value of 0.05 and hence, the null hypothesis was accepted.

Discussion of Findings

The analysis of research question one shows that the students in this study area have poor opinion of mathematics which one can infer that these students have negative perception of mathematics. This poor perception could be as a result of the students' environmental, school or personal factors. This finding disagrees with the findings of Hagan, Amoaddai, Lawer and Atteh (2020), which portrayed that students have positive perception towards mathematics though they see it to be difficult. Sam in Kareera (2019) highlighted that many students are petrified of mathematics and feel powerless in the presence of mathematical ideas. Sam continued that those students consider Mathematics as unbearably a difficult, frosty and abstract subject. The school system, family background and student's attitudes toward the school altogether have an effect on the way students view mathematics (Kabeera, 2019). This implies that there exist levels of mathematics phobia in students which degenerate to the way they feel towards.

Research question two analysis points out that Yala Local Government students' negative perception towards mathematics grossly influence their performance in mathematics. This agrees with Kabeera (2019) assertion that student's positive discernment toward mathematics can steer many into mathematic success. Ironically, students' positive discernment towards mathematics can decline their performance in mathematics. Also this finding has a different outcome with Hagan, Amoaddai, Lawer and Atteh (2020) who concluded that students' perception towards mathematics has no influence or effect on their academic performance.

Table 3 results (research question three analysis) reveals that the contribution of gender and age to students' perception of mathematics is not much but language background contributed greatly to the students' understanding of mathematical concepts. It can be view from this finding that abstract presentation of mathematics using ambiguous mathematical terminologies by some teachers introduce poor or negative perception of mathematics among students. This finding is in line with Achor, Imoko and Uloko (2009) who found out that the students exposed to ethno-mathematics teaching approach (ETA) ere superior in achievement and retention than those exposed to conventional teaching method. Mutodi and Ngirande (2014) also found out that language-related effect significantly affects students' performance. The research of Kabeera (2019) revealed that Language is one of the factors that have influenced the students' perceptions towards mathematics.

Table 4 analysis shows the weak negative relationship between the students' perception of mathematics and their academic performances in mathematics. Statistically this negative relationship reveals that a continual increase in the negative perception of mathematics of these students will result in continual decrease in their academic performance in mathematics but if effort is put in place to decrease their negative perception of mathematics then their academic performance in mathematics will increase. This outcome is connected to that of Ahmad, Azizan, Rahim, Jaya, Shaipullah and Siaw (2017), which shows that the correlation between students' perception towards their Mathematics learning with their achievement in Mathematics was a weak negative correlation. Though these outcomes are similar, the finding of this current study disagrees

with the conclusion of Ahmad, Azizan, Rahim, Jaya, Shaipullah and Siaw (2017), which assert that there is no significant correlation between the average scores of students' perceptions of towards Mathematics learning with the average scores Mathematics achievement of the students. However the result in Table 5 revealed that there is significant negative relationship between the students' perception of mathematics and their academic performance in mathematics.

Table 6 results shows that there is no significant difference between the perceptions of male and female students toward mathematics among junior secondary schools students in Yala Local Government Area of Cross River State, Nigeria. This agrees with Ahmad, Azizan, Rahim, Jaya, Shaipullah and Siaw (2017), who found out that there are no significant differences between the average scores of male and female students' perceptions of Mathematics learning. Also Uwineza, Rubagiza, Hakizimana and Uwamahoro (2018) found out that in general, boys and girls demonstrate shared perceptions towards the importance of mathematics subjects. But the result in Table 6 disagrees the finding of Kabeera (2019) that there was a significant discrepancy in perceptions between the ways girls perceive mathematics to boys.

Conclusion

These conclusions are drawn based on the findings of this study:

i. The students' perceptions of mathematics have influences on their academic performance in mathematics in Yala Local Government Area of Cross River State, Nigeria.
ii. Students' language background has positive contribution on their understanding of mathematics.
iii. The both male and female students in this study have similar perception of mathematics.

Recommendations

The findings in this study leads to the following recommendations:

i. School Management should put in enough effort in counseling the students toward developing positive attitudes and interest toward mathematics learning and high performance in mathematics. This is possible because the result of this study indicate that the students' performance in mathematics will improved if their negative perception decreases.
ii. Mathematics Teachers should reduce the use of ambiguous terminologies to teach mathematics rather improve in explaining these terminologies in a language the students may understand.
iii. The Teachers should make use of appropriate audio-visual materials in teaching mathematics to enhance the interest of students thereby reduce the negative perceptions.
iv. Students should not be discouraged by past experiences in lower grades that convince them that they cannot do well sin mathematics.

v. Parents and teachers should play a significant role in shaping students' perceptions and attitudes towards mathematics through motivation.

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