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**LEARNERS' ATTITUDE AND SENIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS IN BAYELSA STATE, NIGERIA**

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**ABSTRACT:** *The study was carried out to examine learners' attitude and Senior Secondary School Students' Achievement in Mathematics in Bayelsa State, Nigeria. Two research questions were posed and two corresponding hypotheses were equally formulated. The study adopted an ex-post-facto research design. The population of the study consisted of all the 10,818 S.S.2 students in the eight local government areas in Bayelsa State whereas the sample size of the study was 480 obtained through cluster random sampling techniques. Two instruments were used to obtain data for the study which include Mathematics Attitude Inventory (MAI) and Mathematics Achievement Test (MAT). The Mathematics Achievement Test was validated by two senior secondary school teachers while the reliability of the instrument was 0.77 obtained using alternate form reliability method. Other instrument was standardized instrument whose validation and reliability have been established over time. Mean, standard deviation and t-test statistics were used to answer the research questions and test the hypotheses respectively. Findings of the study revealed that there is a significant difference in the academic performance of students with positive and negative attitudes in mathematics in Bayelsa State secondary schools. The study recommended amongst others that Mathematics teachers should develop a very friendly attitudes to students during lesson, this could motivate students who possess low or no interest to mathematics.*

**KEYWORDS:** attitude, learners, achievement, mathematics, students

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## **INTRODUCTION**

Mathematics in general is linked with the development of any nation in the world. Mathematics as a discipline opens and shuts more doors for men and women than any other content area. Whether it is in science, engineering or technology, it is tremendously important that a person be well-armed with mathematics if they are going to have options in their lives (Charles-Owaba, 2018). Mathematics represents the superb and sublime product of reason as well as the upper limits of what one hopes to attain in all rational domain. Adenegan (2012) described mathematics as a model of thinking, for developing scientific structure, for drawing conclusions and for problem-solving. The supremacy of mathematics over other subjects is extolled by the National Policy on Education (FRN, 2014), when it stated that mathematics should be made a core subject in the primary and secondary education levels. The policy strongly emphasizes an effective teaching and learning of subject through the use of variety of strategies and this has consistently generated interest amongst scholars over the years.

Furthermore, mathematical ability is important for the economic success of the society (Lipnevich, MacCann, Krunm, Rufus & Robert, 2011). It is important in the scientific and technological development of countries (Enu, Agyman, & Nkun 2015). This is because mathematics skills are essential in understanding other disciplines including engineering, sciences, social sciences and even the arts (Patena & Dinglasan, 2013; Phonapichat, Wongwanich & Sujiva, 2014). Abe and Gbenro (2014) pointed out that mathematics plays a multi-dimensional role in science and technology of which its application outspread to all areas of science and technology as well as business enterprises.

Modern businesses all over the world as well as scientists, transportation, medicine, sports, military science, information and communication facilities are based on science. These are based to a large extent on mathematics. Wilder in Abramoviah, Grinspham and Milligan (2019) pointed out that such applications which represent the practical aspect of mathematics in the fulfilling of vital needs of society are the usefulness of mathematics. Mathematics is the science of quantity and space. It is much more than Arithmetic – the science of numbers and computation. It is not enough with Algebra – the language of symbols and relation. It is far more than Geometry–the study of shape, size and space. It is more than Numerical Trigonometry–which measures distance to stars and analyses oscillation. It involves more than Statistics, - the science of interpreting data and graphs, more than Calculus–the study of change, infinity and unit.

Mathematics prepares pupils for a useful living, such as counting, notation, addition, subtraction, multiplication, division, weighing, measuring, selling, and buying which are simple fundamental processes of life. Every person on finishing secondary education should have clear ideas of numbers and comprehensive notion of both large and units. They should understand the way numbers are applied to measure length, volume, weight, area, density, temperature, speed, acceleration and pressure etc. Estimation and approximation will help check economics in everyday life. Azuka, (2012) stated that mathematics is mostly consider as a gizmo that contains the skills for solving real life situations, organizing, simplifying, interpreting duties and performing calculations that are necessary in fields such as science, business and industry for national development. Ngussa and Mbuti (2017) stated that the subject of mathematics became key in school curriculum. In Nigeria, mathematics is being taught at all levels and compulsory in both primary and secondary (Federal Republic of Nigreia, 2014). Furthermore, Mensah, Okyere & Kuranchie (2013) pointed out that student with high school experiences and feelings towards the learning of mathematics are usually constant and make a long time to change. Ingram stated that students form meaning in their minds about curricular subjects like mathematics even before they learn anything or realise the importance of the subject. Suleman, Asiam and Hassain (2014) and Kpolovie, Joe and Okoto (2014) all concluded that secondary education is the foundation stone for further studies and also for the development of a nation. This conclusion is very true of Nigeria where academic achievement in secondary school Certificate Examination determines who proceeds to higher institutions. Unfortunately, performance of students in mathematics at the end of secondary education has not improved in the past decade.

Students' attitudes towards mathematics could be explained to be a learned tendency of a person to respond positively or negatively towards an object, situation and concept or another person (Sannah & Puri 2014). Syydeda (2016) opined that attitude can change and develop with time. Once a positive attitude is formed towards a subject, it can improve students learning (Akinsola and Oluwajaiyi, 2008; Muthai, 2011). On the other hand, a negative attitude hinders effective learning and consequently affects the learning outcome, hence performance (Joseph, 2013). In the view of Adelson and McCoach (2011), Chaman and Callingham, (2013) learners' attitude towards mathematics includes self-confidence, anxiety in mathematics, mathematics enjoyment, perceived usefulness and intrinsic motivation. According to Obodo (2002) noted that, if a learner has a positive attitude towards mathematics, he will definitely be interested in its teaching and learning. Students' attitude to mathematics has been attributed as a primary function of students' lack of interest in the subject (Goolsby, 2013). Whatever one learns interest plays a dominant role in making a student learn something (Sarmah & Hazarika, 2012). According to Idigo (2012), factors associated with mathematics interest include, students' factor, teachers factor, mathematics anxiety, government, lack of infrastructural facilities, lack of instructional materials and problem of large class size. According to Gardener and Tamir in Sarmah and Hazarika (2012) the term 'interest' refers to engage in some types of activities rather than others. 'Interest' may be regarded as a highly specific type of attitude. When we are interested in a particular phenomenon or activity, we are favorably inclined to it and give time to it. The term 'interest' is used also to indicate a permanent mental disposition. Have proposed that 'interest' influences academic achievement and learning in school (Sarmah & Hazarika, 2012).

### **Purpose of the study.**

The main purpose of this study was to investigate the learners' attitude and senior secondary school students' achievement in Mathematics in Bayelsa State, Nigeria. In specific terms, the study sought

1. To determine the difference in the academic achievement of students with positive and negative attitudes towards learning mathematics in Bayelsa State.
2. To determine the difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State.

### **Research Questions**

The following research questions were formulated to guide the study.

1. What is the difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State?
2. What is the difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State?

### **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State.

2. There is no significant difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State.

## LITERATURE REVIEW

### Conceptual Review

The concept of students' attitude towards mathematics can be described as a state of readiness, a tendency to act or react in a certain way. Generally, it refers to a learned disposition or tendency on the part of individuals to respond positively or negatively to a situation or another person. Attitude refers to a learned tendency of a person to respond positively or negatively towards an object, situation, concept or another person (Sarmah & Puri, 2014). Attitudes can change and develop with time (Syyeda, 2016), and once a positive attitude is formed, it can improve students' learning (Akinsola & Olowojaiye, 2008; Mutai, 2011). On the other hand, a negative attitude hinders effective learning and consequently affects the learning outcome henceforth performance (Joseph, 2013). The effect of attitude on students' performance in mathematics might be positive or negative depending on the individual student (Mazana, Montero, & Casmir 2018).

### Students' interest and the academic achievement in Mathematics

Interest could be defined as the focusing of the sense organs on or giving attention to some person, activity, situation or object (Essien, Akpan & Obot, 2015). It is an outcome of experience rather than gift. It could either result or cause motivation. It could also be regarded as a pre-determinant of one's perceptions that is, what aspect of the world one is mostly likely to see always (McClnermey, Dowson, Young & Nelson, 2005).

Interest according to Schiefele in Essien et al. (2015) is a feeling of identification with a person and some conditions, things or other persons. It has been variously defined as a kind of consciousness accompanying and stimulating attention, a feeling, pleasant or painful directing attention, the pleasurable or painful aspect of a process of attention, and as identical with attention of itself. Thus it may be said, "I attend to what interests me". The term is also used to indicate a permanent mental disposition. However, interest is defined and whether it will be described as a cause of attention, an aspect of attention or as identical with attention, it's special significance lies in its intimate connection with the mental activity or attention. Interest is the focusing of the sense organs on or giving attention to some person, activity, situation or object. It is an outcome of experience rather than a gift. It could either result or cause motivation. It could also be regarded as a pre-determinant of one's perceptions that is, what aspect of the world one is mostly likely to see always, McMillian (2014). It could be a temporary or permanent feeling of preference. It could also be viewed as a condition in which an individual associates the essence of certain things or situation with his needs or wants, McMillian (2014) posits that genuine interest is the accomplishment of the identification, through action of the self with some object or idea. This is necessary because of the necessity of that object or idea, for maintenance of a self-initiated activity. Interest is a course of action, an occupation or pursuit that absorbs the power of an individual in a thorough going way. Going by this definition, interest thus seems particularly useful as the relationship between identification,

absorption and the maintenance of a self-initiated activity which offers a straight forward way to analyze classroom activities. According to Shiefele in Essien, et al (2015) interest is a content-specific motivation of characteristics composed of intrinsic feeling-related and value-related initiatives with an organized force. Relationships between interest and academic achievement has been studied empirically but according to Silvia (2006) in Kpolovie et el (2014) & psychologist have characteristically disregarded close examination of interest as overwhelming construct in the determination of human learning, motivaton and emotion. Kpolovie et el (2014) reported that situational interest which could be generated by classroom environment is a potent medium that can be harnessed by tachers to motivate students interest in learning mathematics. Adeyeme and Adeyeme (2014) interest has to do with a learner's preciscosion to react positively in certain ways towards certain aspects of the environment and is usually developed in relation to and remains allied to basic motivities. Adeyeme and Adeyeme (2014) noted that when students lose interest in their studies, failure rate will be higher.

### **Theoretical Review**

The study is pinned to attribution theory.

Attribution Theory of Academic Achievement is the best chance for success. The study of attribution was initially associated with Fritz Heider (1896-1988, 1958), later Bernard Weiner (1935) of the University of California at Los Angeles developed a more comprehensive, extensive model of human attribution. Weiner's model is particularly on information in research on students learning in school setting. In his model, Weiner outlined the processes through which learners learn from casual beliefs (Weiner 1985-2005), A base assumption of Wieners model attribution is that, learners are affected by both environment factors (e.g, characteristics of the learners home or school) and by personal factors (e.g prior experiences and prior knowledge. These background variables affect the types of attribution that individuals are likely to make. In his first dimension of attribution, response is locus of control. Locus of control describes the cause of an outcome as either internal or external. An internal cause would be something like the skill of the learner, or his mood/attitude. An external cause would be a parent or a teacher. Many have observed that learners attitude to success are internal causes and failure to external causes. The second dimension is stability. This refers to the idea that many causes for success are stable. Most see things like ability and knowledge as being fairly stable. Other causes such as effort and circumstances are considered unstable. The key thought with this dimension is that if a learner's success is linked to a stable cause, he is much more likely to have repeated success if it is a result of an unstable cause.

### **Empirical Review**

Andamon and Tan (2018) carried out a study on Conceptual understanding, attitude and performance in mathematics of Grade 7 Students. The study investigated the conceptual understanding, attitude and performance in mathematics of grade 7 students. This study sought to; describe the students' demographic profile, in terms of gender, family income and parent's educational attainment; determine their level of performance in mathematics; ascertain the level of students' conceptual understanding in mathematics; describe students' attitude towards mathematics; correlate the students' performance in mathematics to students' demographic profile,

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conceptual understanding, and attitude; and identify which of the variables singly or in combination best predict performance in mathematics. There were 225 grade 7 students in six participant – catholic schools in Valencia City. These schools were all member of Bukidnon Association on Catholic Schools (BUACS). The instruments used were teacher-researcher made test on conceptual understanding in mathematics with two sub-topics, the skills transferring knowledge, and the complete understanding in the language of mathematics; Fennema and Sherman Likert attitude scale; standardized mathematics test for grade 7 adopted from department of education k to 12 curriculum; and a demographic profile sheet. Results revealed that: students’ demographic profile by gender showed that there were more females than males, almost three parts of the total population had finished the college category and half of the total population belongs to the poverty line. Students’ performance in mathematics belongs to the range of approaching to proficiency which implies moderate or in the average level of learning. For the overall students’ level of conceptual understanding in mathematics, the result described as approaching to proficiency meaning moderate. The students’ attitude towards mathematics overall mean rated as uncertain implies further that students were neutral with regards to their attitude towards mathematics, they are fair. Students’ performance in mathematics did not relate significantly to respondents demographic profile, and conceptual understanding in mathematics. Students’ attitude towards mathematics and conceptual understanding in mathematics were found the best predictors of students’ performance in mathematics.

While Nzomwe, Calkin and Respickius (2019) investigated students’ attitude towards learning mathematics. The participants in the study constituted 896 students (409 males and 460 females) from public primary schools, secondary schools which include O’ Level lower, upper secondary school and colleges. These schools were selected from urban and semi-urban areas in five administrative region, namely: Dares Salaam, Arusha, Dodoma and Iringa in mainland Tanzania. Among the selected schools, sixteen were co-educational and one was a single sex school but all classes with mixed learning ability students. The sample used were region sampled base on multi-stage sampling technique. Region were grouped into five zones, from each zone one region was selected, one district was randomly selected from each region and from which schools and colleges were selected. Kothari (2004, 66) a multi-stage technique is appropriate when the study involves a large area. The likert scale survey was adopted from Fennema and Sherman (19760, Tahar et al (2010), Sundre, Barry, Gynild and Ostagand (2012) in order to ensure content validity. Five aspects of attitude were considered such as self-confidence in mathematics, perceived usefulness and enjoyment of mathematics, mathematic anxiety and intrinsic motivation. The general result revealed that students had self-confidence and did enjoy mathematics classes, they were motivated and find it useful. Significant differences were found between primary and secondary students in terms of self-confidence, usefulness, enjoyment, motivation and anxiety albeit the small effect size. However insignificant difference were established between secondary and college in terms of usefulness, anxiety and motivation. Kumari (2018) found anxiety and academic achievement as negative correlate to each other. The result also indicates that majority (94.2% of students like mathematics in higher primary schools which dropped at the secondary school level. In Turkey post-test shows that attitude became positive as students advanced from primary (mean = 4.36) to secondary (mean

= 3.74). This means that there is a significant relationship between students' attitude and academic achievement that affects mathematics. Nzomwe et al (2019) categorized students' attitude to mathematics to positive and negative and discovered a relationship between students' attitude and academic achievement in mathematics. However, the study did not dig deep to other related variables such as interest which could also influence students' attitudes, the present study have bridge the gap by also putting students' interest into observation using interest standardized questionnaire.

Chagwiza, Mutambara, Tatira and Nyaumwe (2013) studied the analysis of attitude and mathematics achievement of O-Level pupils: insight from some Bindura Urban Secondary School. This sought to analysis pupils' attitude and how they influence academic achievement in mathematics. The study adopted a survey design using percentages to quantify levels of attitudes on a likert scale during data analysis. A sample of 72 O-Level pupils were randomly selected from Bindura Urban High Schools who provided the data that answered the research questions. The modified Fennema-Shermann Mathematics Scale and two open questions to enable pupils to state their own opinion on what they think can be done to make mathematics learning meaningful to them. The result revealed that the pupils had positive attitude towards mathematics and many believed that the subject is worthwhile to study and necessary for their future but performed badly in the subject due their lack of understanding the basic concepts. The correlation coefficient shows a negative relationship between the two variables. Chagwiza et. Al., (2013) centred their study on students' attitude and adopted a survey research design, however, the present study adopted an ex-post-facto research design, being expository on five variables that could influence students' achievement in mathematics.

## **METHODOLOGY**

The ex-post –facto research design was adopted in this study because it seeks to investigate an existing phenomenon regarding students' achievement in mathematics. This design was adopted because the researcher didn't manipulate any variables. Neil (2010) stated that ex-post facto study or after-the-fact research is a category of research design in which the investigation starts after the fact has occurred without interference from the researcher. The population of the study consisted of all the 10,818 SS 2 students in the 190 secondary schools of the 8 local government areas in Bayelsa State (Ministry of Education, 2021). The sample size used for the study was 480 senior secondary school 2 students. Cluster random sampling was used to select three secondary school from each of the eight local government in Bayelsa state (24 schools). In each of the 24 selected schools, 20 SS2 students were systematically sampled in such that students whose name appeared at the 20<sup>th</sup> count in the register were chosen for the study. Hence, the total sample size for the study was 480 students. There are two research instruments used for this study. Mathematics Achievement Test (MAT) was used to measure the mathematics achievement of the students. MAT was sectioned into two segments, section A was designed to obtain demographic information of the respondents. Information such as age range and gender were obtained. Section two contains 50 multiple choice questions. The scope of the test items comprised all second term SS2 mathematics topics. Each of

the test items carries two marks that is, the totality of the test was 100 marks. The researcher subjected the instrument, MAT to face and content validity. The test instrument was presented to the researcher's supervisor and two other experts who critically examined the instrument for content validity. Other areas like clarity of statements, competence of instruction and its suitability to elicit response were scrutinized by the researcher's supervisor. Alternate form reliability method was used to determine reliability coefficient of the MAT instrument. MAT was administered to fifty (50) students in Bayelsa State. After two weeks the instrument was reshuffled and distractors were changed, then administered to the same group of students. The scores obtained on the two different occasion were correlated using Kuder-Richardson reliability formula (KR21). The reliability index obtained was 0.77. This shows that the instrument was reliable. According to Hickcox, (1995) the psychometric ratings generally for MAI were strong for reliability and good for validity. The administration of the research instrument was carried out by the researcher with the help of two research assistants and the classroom teachers, who retrieved the questionnaires from the sampled students. Most of the principals granted permission to administer the questionnaire starting from the break period till the end of the day. In each of the selected school questionnaire administration process only took a day. Four hundred and Eighty (480) copies of questionnaire (MAT, MAI) administered, and 100 percent were fully completed and utilized for the study

For data analysis, the research questions were answered using descriptive and inferential statistics. In the descriptive statistics, means ( $\bar{X}$ ), and standard deviation were used. Deductions made from mean scores formed the answers to the research questions. Specifically, Mathematics Achievement Test scores were analyzed using mean and standard deviation. However, the MAT scores were categorized based on the learner related variables that were considered in the study. Since students with field dependent and field independent were identified using MAI, mean and standard deviation scores with those students were computed and presented.

## ANALYSIS AND RESULTS

**Research Question 1:** What is the difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State?

**Table 1: Difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State**

	N	Percent	Mean	Std. Dev.	Mean Diff.	Skewness
	(ATMI)		(MAT)			
<b>Positive Attitude</b>	168	35.00	66.56	11.48	38.39	-0.467
<b>Negative Attitude</b>	312	65.00	28.17	12.64		0.311
<b>Total</b>	<b>480</b>	<b>100</b>				

Field Survey, 2021.



Table 1 shows the difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State secondary schools. Mathematics Attitudes Inventory (MAI) shows that 35.00 percent of the respondents have positive attitude towards mathematics whereas 65.00 percent of the respondents have field dependence cognitive style. In Mathematics Achievement Test (MAT) students with positive attitudes towards mathematics obtained mean score of 66.56 and standard deviation of 11.48. The mean difference obtained (38.69) showed that students with positive attitudes towards mathematics performed better than students with negative attitudes towards.

**Research Question 2:** What is the difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State?

**Table 2: Difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State?**

	N	Percent	Mean	Std. Dev.	Mean Diff.	Skewness
	(MIM)		(MAT)			
<b>High Interest</b>	192	40.00	62.04	15.94	32.91	-0.47
<b>Low Interest</b>	288	60.00	29.13	13.16		0.52
<b>Total</b>	<b>480</b>	<b>100</b>				

**Field Survey, 2021**

Table 2 shows the difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State secondary schools. Mathematics Interest Measure (MIM) shows that 40.00 percent of the respondents have high interest towards mathematics whereas 60.00 percent of the respondents have low interest to mathematics. In Mathematics Achievement Test (MAT) students with high interest towards mathematics obtained mean score of 62.04 and standard deviation of 15.94.

### Hypotheses

H<sub>01</sub>: There is no significant difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State secondary schools

**Table 3: z-test Analysis on the Mean Scores of students with positive and negative attitudes in mathematics in Bayelsa State senior secondary schools**

Groups	N	Mean	S.D	D.f	Lev. of z-cal Sig.	z-crit	p-value	Decision
<b>Positive</b>	168	66.56	11.48	478	0.05	32.76	1.96	0.000
<b>Negative</b>	312	28.17	12.64					

*Research Data Output, 2021*

Table 3 presents the Z-test analysis on the mean scores of students who has positive and negative attitudes towards mathematics in Bayelsa State senior secondary schools. The table revealed that z-cal is 32.76 while the Z-crit is 1.98 at 0.05 level of significance. Since z-calculated is greater than the z-table (i.e.,  $32.76 > 1.96$ ), the hypothesis is therefore rejected. The p-value of 0.000 which is less than the level of significance of 0.05 showed that the null hypothesis failed to reject. This implies that there is a significant difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State secondary schools

$H_{02}$ : There is no significant difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State.

**Table 4: z-test Analysis on the Mean Scores of students with high and low interest in mathematics in Bayelsa State senior secondary schools**

Groups	N	Mean	S.D	D.f	Lev. of z-cal Sig.	Z-crit	p-value	Decision	
High	192	62.04	15.94	478	0.05	24.64	1.96	0.000	Reject
Low	288	29.13	13.16						

*Research Data Output, 2020*

Table 4 presents the z-test analysis on the mean scores of students with high and low interest in mathematics in Bayelsa State senior secondary Schools. The table revealed that z-cal is 24.64 while the z-crit is 1.98 at 0.05 level of significance. Since z-calculated is greater than the z-table (i.e.,  $24.64 > 1.96$ ), the hypothesis is rejected. Also, the p-value obtained (0.000) is less than the level of significance (0.05). This again confirmed the rejection of the null hypothesis. This implies that there is significant difference in the mean scores of students with high and low interest in mathematics in Bayelsa State.

## DISCUSSIONS OF FINDINGS

Table 1 and 2 shows the difference in the academic achievement of students with positive and negative attitudes in mathematics in Bayelsa State secondary schools. Mathematics Attitude Inventory shows that 35.00 percent of the respondents have positive attitude towards mathematics whereas 65.00 percent of the respondents have field dependence cognitive style. In Mathematics Achievement Test (MAT) students with positive attitudes towards mathematics obtained a higher mean score of (66.56) than students with negative attitudes to mathematics (28.17). The mean difference (38.69) showed that students with positive attitudes towards mathematics performed better than students with negative attitudes towards. This is inconsistent with the works of Nzomwe, Kalkin and Respickius (2019) in their study to investigating students' attitude towards learning of mathematics. The finding shows that students had confidence, did enjoy mathematics classes, they were motivated and find it useful. The result is not in line with the finding of Munni (2017) who found that academic achievement and anxiety of senior secondary school students are negatively correlated with each other. The result of this study is not in supported of El-Anzi, Freih, Owayed

(2005) and Sumetha, (2006) also shows a negative relation between student attitude toward mathematics and their achievement in mathematics. The result is line with Oli, (2014) who found one of the factor that affect student's academic achievement in science was attitude of students towards science, including mathematics.

Table 3 and 4 shows the difference in the academic achievement of students with high and low interest in mathematics in Bayelsa State secondary schools. Mathematics Interest Measure shows that 40.00 percent of the respondents have high interest towards mathematics whereas 60.00 percent of the respondents have low interest to mathematics. In Mathematics Achievement Test (MAT) students with high interest towards mathematics obtained mean score of 62.04 while students with low interest towards mathematics obtained mean score of 29.13. The mean difference obtained (38.69) showed that students with high interest towards mathematics performed better than students with low interest towards mathematics. This findings is in agreement with that of Illiyas (2017) who observed that objective test conduct the level of interest in mathematics of high school students in respect of their gender. That 21.1% of the male students have low level, 71.8% of them average level and 7.1% of them have high level of interest in mathematics and 22.3% of the female students have low level, 66.9% of them average level and 10.8% of them have high level of interest in mathematics The level of interest in mathematics of high school students in respect of their type of management It is inferred that 23.5% of the government school students have low level, 61.2% of them average level and 15.3% of them have high level of interest in mathematics and 17.8% of the government aided school students have low level, 63.6% of them average level and 18.6% of them have high level of interest in mathematics and 14.4% of the matriculation school students have low level, 61.9% of them average level and 23.7% of them have high level of interest in mathematics. The level of interest in mathematics of high school students in respect of their locality of school. It is inferred from that 17.6% of the rural area school students have low level, 59.2% of them average level and 23.2% of them have high level of interest in mathematics and 17.1% of the urban area school students have low level, 61.1% of them average level and 21.8% of them have high level of interest in mathematics. Furthermore, the researcher stated that Objective test conducted the level of academic achievement in mathematics of high school students in respect of their gender.

It is inferred from that 9.4% of the male students have low level, 74.7% of them average level and 15.9% of them have high level of academic achievement in mathematics and 7.7% of the female students have low level, 77.7% of them average level and 14.6% of them have high level of academic achievement in mathematics. The level of academic achievement in mathematics of high school students in respect of their type of management. It is inferred from that 17.6% of the government school students have low level, 64.7% of them average level and 17.6% of them have high level of academic achievement in mathematics and 10.2% of the government aided school students have low level, 67.8% of them average level and 22% of them have high level of academic achievement in mathematics and 8.2% of the matriculation school students have low level, 66% of them average level and 25.8% of them have high level of academic achievement in mathematics.

The level of academic achievement in mathematics of high school students in respect of their locality of school. It is inferred that 17.6% of the rural area school students have low level, 59.2% of them average level and 23.2% of them have high level of academic achievement in mathematics and 17.1% of the urban area school students have low level, 61.1% of them average level and 21.8% of them have high level of academic achievement in mathematics.

## CONCLUSION

The study has established that attitudes of the students is a strong determinant of students' performance in mathematics. This is evident as students with positive attitudes perform better than others in the mathematics achievement test. It is also worthy of conclusion that students interest in mathematics is an essential factor that contributes to students' academic performance. It was evidently revealed in the study that students with high interest in mathematics perform better than those with low interest in the subject.

## Recommendations

Based on the findings of this study, recommendations were made as follows:

1. Mathematics teachers should develop a very friendly attitudes to students during lesson, this could motivate students who possess low or no interest to mathematics.
2. Students should develop positive attitude towards mathematics to increase their self-confidence and motivation for greater achievement in the subject.

## References

- Abe, T. O., & Gbenro, O. S. (2014). Comparison of students' attitudinal variable towards mathematics between private and public senior secondary schools. *Journal of Educational Policy and Entrepreneurial Research 1 (1)*, 32-39.
- Adenegan K.E (2012). Setting Mathematics Laboratory in Schools, *Journal of Education and Technology 12(2)*, 5-6.
- Ajai, J.T. & Imoko, I.I. (2015). Gender differences in mathematics achievement and retention scores: A case of problem-based learning method. *International Journal of Research in Education and Science (IJRES)*, 1(1), 45- 50.
- Akinsola, M.K. & Olowojaye, F. B. (2008) Teachers' instructional methods and students' attitude towards mathematics. *International Electronic Journal of Mathematics Education 3 (1)* 60-73.
- Azuka, B.F. (2012). Improving the Memory of Students in Mathematics Classroom Towards better Performance. *Journal of Mathematics Association of Nigeria. (MAN)*, 37, (1), 65-72.
- Bassey, S.W., Umoren, G. & Udida, I.A. (2009). Cognitive styles, secondary school students attitudes and academic performance in Chemistry in Akwa Ibom State Nigeria,
- Chagwiza, C. J., Mutamambara, L. H. N, Ttira, B., & Nyaumwe, L. J. (2013).An Analysis of Attitude and Mathematics Achievement of O' Level Pupils: Insight from some Bindura

- Urban Secondary Schools. *International Journal of Academic Research in progressive Education and Development*, 2 (2) 26-34.
- Charles-Owaba, T. (2018). Effects of Traditional Games on Students' Achievement in Mathematics. *Journal of Contemporary Research*, 9(3), 150-164.
- Enu, J. Agyman, O. K, & Nkum, D. (2015). Factors influencing students' mathematics performance in some selected Colleges of Education in Ghana. *International Journal of Education Learning and Development* 3(3) 68-74.
- Enu, J. Agyman, O. K, & Nkum, D. (2015). Factors influencing students' mathematics performance in some selected Colleges of Education in Ghana. *International Journal of Education Learning and Development* 3(3) 68-74.
- Joseph, G., (2013) A Study on School Factors Influencing Students' Attitude Towards Learning Mathematics in the Community Secondary School in Tanzania. The Case of Bulcaha municipal Council in Kajira Region. *Master Dissertation Kenya University*.
- Kpolovie, P. J. Joe, A.I. & Okoto, T. (2014). Academic Achievement Prediction: Role of Interest in learning and attitude towards school. *International Journal of Humanities, Social Science and Education* 1(11), 73-100
- Lipnevich, A. A., MacCain, C. Krumm, S. Rufus, A. & Robert R.D. (2011) Mathematics attitude and mathematics outcome of USA and Belrusian Middle students. *Journal of Educational Psychology* 103(1)105.
- Lipnevich, A. A., MacCain, C. Krumm, S. Rufus, A. & Robert R.D. (2011) Mathematics attitude and mathematics outcome of USA and Belrusian Middle students. *Journal of Educational Psychology* 103(1)105.
- Mensah, J. K., Okyere, M., & Kuranchie, A. (2013) Students' attitude towards mathematics and performance. 'Does the teacher attitude matter?'. *Journal of Education and Practice* 4(3), 132-139.
- Mutai, K. J. (2011). Attitudes towards learning and performance in mathematics among students in selected secondary schools in Bureti district, Kenya (*Masters Dissertation*). Retrieved from <http://irlibrary.ku.ac.ke/bitstream/handle/123456789/609/JACKSON%20KIPRONOH.pdf>
- Ngussa, R.M., & Mbuti, E. E., (2017). The influence of humour learns' attitude and mathematics achievement: A case of secondary school in Arusha City, Tanzania. *Journal of Education Research* 2 (3) 170-181.
- Odili, G. A., (2006). *Mathematics in Nigeria Secondary Schools: A teaching perspective*. California: Published by Rex Charles & Patrick Limited.
- Patena, A. D., & Dinglasan, B. L. (2013). Students' Performance in Letter Mathematics Developmental Examination: Bsis for Maths Intervention Program. *Asian Academic Research Journal of Social Science and Humanities* 1(14) 255-268.
- Phonapichat, P., Wongwanich, S. & Sujiva, S. (2014). An analysis of elementary school difficulties in mathematics problem solving. *Procedio-social and Behavioural Sciences*. 116-3169-3174.
- Pitcher, R.T. (2002). Cognitive learning styles: A review of field dependent-independent approach. *Journal of Vocational Education and Training*, 13 (4) 267-268

- Suleman, O. Asiam, H. D. & Hassan, I. (2014) Effects of classroom physical environment on academic achievement scores of secondary school students in Kohat Division Pakistan. *International Journal of Learning Developed*, 4 (1), 71-82.
- Syyeda, F. (2016). Understanding Attitude towards Mathematics (ATM). Using a multi-model. An Exploratory Case Study with Secondary School Children in England. *Cambridge Open-Review Educational Research Journal* 3, 52-63.