Test Anxiety and Location as Determinants of Students' Academic Achievement in Senior Secondary School Mathematics in Rivers State, Nigeria.

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ABSTRACT:
The study was designed to investigate the Relationship among Test Anxiety and Location as determinants of students' Academic Achievement in senior secondary school mathematics in Rivers State. Purpose of this research was to establish the relationship between test anxiety and academic achievement of students in the urban areas; and test anxiety and academic achievement of students in the rural areas in mathematics. Sample for the study consists of 360 Senior Secondary SSII mathematics students (180 males and 180 Females) randomly selected from twelve public Senior Secondary Schools that are co-educational. Two major research instruments were used to collect data for this study. The reliability coefficients of the instruments were established using test-retest technique. Two research questions in line with the purpose of the study were posed to be answered in the study, while two null hypotheses were formulated based on the research questions and to be tested at 0.05 alpha levels. To analyze the data, mean and standard deviation, Pearson (r) and t-test were used. Based on the analysis, the results indicated that there was a high positive relationship between the urban students' test anxiety and their academic achievements in mathematics, the relationship is statistically significant. There was a high positive relationship between the rural students' test anxiety and their academic achievement in mathematics. The relationship was statistically significant. The implications of these findings were discussed. Recommendations and suggestions for further research work were made on the basis of the results of the investigations. This include that Government should ensure that a conducive environment is created for their students.

INTRODUCTION

From the stone ages, farmers and shepherds used matching device to check their counting e.g pebbles, shells, stones, sticks, clods of earth scratches on the ground, knot on rope, etc. In this modern age of technological advancement of counting, calculation and computation, the teaching of mathematics and response to the process of teaching becomes a crucial aspect of the technological age.

One of the broader aims of secondary education is to equip students live effectively in this modern age of science and technology. The bedrock subject in science and technology is mathematics. It is as a result of the importance accorded to mathematics, that most States grant special educational favour to students who have aptitude for mathematics. However, there are indication that even with the best of science students, majority have difficulty in basic mathematics tasks essential for studying and understanding science (Seldon, 1998).

One now begins to appreciate the precarious state in which the nation's scientific and technological changes in the development is as result of deficiencies in mathematics especially when one takes into cognizance, the finding of Abone (1986), Agwagah (1993) and Harbor- Peters (2000) that there is a significant general decrease in the level of performance of secondary school students in mathematics with increasing class levels. Although recognition is accorded to mathematics at all levels, it is unfortunate that most

students exhibit nonchalant attitude towards the subject (Amoo, 2002). A study conducted by Nigeria Educational Research and Development Council (NERDC, 1997) on the performance of students in public examination over some years has confirmed students' poor performance in physical sciences (Mathematics, Physics and Chemistry) which form the foundation of future work in much of technology needed in Nigeria (Amoo, 2002). The implication of this is that only few citizens of the nation will eventually be left with the task of advancing the nation technologically when a majority of the secondary school students dread mathematics.

There have been criticisms in dailies and periodicals as to why Nigeria is falling behind in technology. In the publication under education in Aburime (2003) and Maduabum & Odili (2006), the continued poor performance in senior secondary school examinations may stunt Nigeria's technological growth. At the national level, out of the 50,000 candidates for Joint Matriculation Examination (JME) in the 1985/ 1986 Academic session only 1000 (2%) passed the subject (Ogbonnaya, 1986). This implies that the academic Performance of students in WAEC and JME in mathematics is low.

Several conferences have been held by such professional bodies like the Mathematics Association of Nigeria (MAN) and the Science Teachers Association of Nigeria (STAN), on how to improve the teaching and learning of mathematics in Nigeria. One of such conferences was held by STAN during her 45th Annual Conference between 15th to 21st August, 2004 at St. Patrick's collage; Asaba, Delta State. It was termed "Refocusing Research in Science, Technology and Mathematics (STAM) Education (Akale, 2004). In like manner, the Mathematical Association of Nigeria (MAN) launched in Kwara State what is called challenge of Mathematics Education for future Mathematics Education during her 33rd Annual Conference held at Ilorin between 2nd to 6th September, 1996 (Agwagah, 1996).

Despite the attention given to mathematics education in Nigeria by the government and some professional bodies, studies and other evidences have continued to reveal low level of mathematics achievement by Nigeria secondary school students (Amoo, 2001; Harbor-Peters, 2000; Nwobu,1998 and Obodo, 2002). Harbor-Peters (2000); Kurumeh (2004) and Obodo (2002) found that students have serious problems when symbolic and geometric representation and models are used to express nature. Among the factors suspected to be contributing to the low academic achievement in mathematics in secondary schools are method of teaching, sex, interest etc (Ale, 2002; Agwagah, 1993 and Obodo, 1991). According to Ezike & Obodo (1991), Kurumeh (2004) and Ogbonnaya (1986), these factors include the over growing complexity of mathematics, it abstractness, scarcity of properly trained mathematics teachers, poor or non- existent facilities in schools for the teaching of mathematics, poor foundation at the primary schools level and population explosion in the schools which make individual classroom supervision and teaching difficult. Aguele (1999) and Nwobu (1998) all identified these factors, among other factors as the root cause of poor achievement by Nigeria students. Another important factor, which was identified to have been influencing students' poor performance in secondary school mathematics, is anxiety. According to Abone cited by Nwankwo (1996), he pointed out that test anxiety is among other factors why secondary school student play truancy. He pointed out that test anxiety is known to constitute a big nuisance to some students. A study by Denga cited by Nwankwo (1990) showed that 90 percent of the secondary school students from Kano and Kaduna States ranked test anxiety second among the numerous problems confronting them. With these assertions, it seems that, test anxiety can have adverse effect on the academic achievement of some students in mathematics. One therefore assumes that students who get pre-occupied with worries and task irrelevant thoughts about test especially during the examination period may or may not perform creditably to the best of their abilities. This is so

because, their attention has become polarized between worries and looking out for answers to the questions.

The term anxiety is a psychological construct employed in the description of a state of fear, which borders on uncertainty in the individual. In the learning situation, a little dosage of anxiety is beneficial while an excess of it is detrimental. According to Nwachukwu (1999); a certain amount of anxiety can be useful stimulus, and part of the background of education is to learn to use it as such. To him anxiety may increase subjectively the difficulty of understanding with regard to mathematics. He also pointed out that high anxiety levels might result in responses that would impede performance in learning situations. If the state of anxiety for mathematics is allowed to thrive and grow among secondary school students, the attainment of the much desired scientific and technological advancement may fall.

Anxiety, according to Gerow (1992), is general feeling of apprehension or dread accompanied by predictable physiological changes. Anxiety is an aspect of emotions in which there is fear and uncertainty about the future. It is a nervous feeling caused by fear that something bad is going to happen. Gerow (1992), defined anxiety as unpleasant sensation that is usually experienced as feeling of apprehension and general irritability accompanied by restlessness, fatigue and various somatic symptoms such as headaches and stomachache. He continued by saying, that within the classroom setting, there are numerous sources of anxiety for students: Teachers examination, peers, social relations, achievement setting, what boys think of girls, like and dislike of subjects (interest), and distance from home for younger students. Whatever the cause; whatever the level of anxiety; you can be sure of one thing; anxiety can affect students' classroom performance, especially their test taking (Edebor, 2002).

Test is the question structured to elicit behaviour (Ogbonnaya, 1986). Test means a standard set of questions to been answered. It could be regarded as an instrument for evaluating learning in schools (Nworgu, 2015). He went further to say that test is administered to the testee for determining the extent he had attained previously identified objectives. According to Harbor-Peters (1999), tests are instruments/devices for measurement. They are used to find the quality, value or composition of a process or product. She also said that tests are employed to determine the extent a trait or construct is possessed by a person or group of persons.

Test anxiety is the anxiety aroused in evaluative situations, especially by the variety of tests administered in most educational institutions (Ogbonnaya, 1986). Mathematics test anxiety is the feelings of fear, anxiety and nervousness associated with bodily symptoms that interfere with solving mathematical problems in classes, courses, tests, examination and also in daily activities that may involve mathematical calculation e.g. domestic and business budgeting (Ogbonnaya, 1986).

The construct test anxiety has been used for some time past to describe the behaviour and emotions of students who find preparing for and taking tests stressful. Hence Elliot, Kratochwill, Cook & Travers (2002) stated that test anxiety is anxiety generated by planning for and taking tests. An anxious child therefore is the one who is unduly concerned about his progress in class, who worries about not understanding what his/her teacher is saying or what his/her teacher expects of him/her, who normally experiences tension when called upon to answer questions and who suffers acute distress before and during school examination (Nwankwo, 2001). However, not all anxieties are natural, rational and useful in motivating learning. Stones (1981) referred to this as anxiety generated by the unfulfilled school task. He stated that when a teacher presented his class with a problem, he upsets their state of psychological equilibrium. To restore the equilibrium, the children have to solve the problem because as long as the problem remains unsolved the state of disequilibrium exists and this

accompanied by anxiety. Solution to the problem ends this state and it is satisfying to the children. He went on to say that emotional difficulties caused by anxieties would be more serious for the backward than for the normal child. Anxiety caused by fear of the teacher, of being in a strong room for an examination will tend to act as an inhibitor of a child's activity. Furthermore, school failures causing heightened emotionality could lead some adolescent commit suicide, leave home and sometimes give up education (Edebor, 2002). On the effect of students' emotion in Mathematics, Kuhlen in Chauhan (1985) reported a research study on the effect of emotional tension. In his report, he stated Kuhlen found out that individual cannot reason, think and concentrate on a problem because of emotional tension, which negatively affect the academic achievement of students in mathematics.

Achievement, according to The New International Webster's Comprehensive Dictionary of the English Language (2003:12), 'is the act of accomplishment or attainment of educational goal. It is performance through a standardized test for measuring an individual's progress in the mastery of a subject to be learned'. Performance itself is the act of execution, completion and exhibition of feat.

In Nigeria, the Mathematical Association of Nigeria (MAN) has been facing the challenge of improving Mathematics achievement in Nigeria Secondary Schools. At MAN Silver Jubilee conference, Ale (1989) identified teaching problems, negative attitude and examination difficulties as some of the root causes of poor performance in Mathematics. He analyzed the causes of failure in mathematics as follows: Teaching problem- 67%, negative attitude- 42% and examination difficulties as 21%.

The above information shows the degree of blame by students on three main areas for their poor performance in mathematics. Indeed it is believed that secondary schools are important determinants of the quality of students who go into tertiary level of education. It is therefore necessary that the factors that affect the learning of science generally and mathematics in particular be improved upon from year to year to ensure adequate supply of suitable candidates for training in the scientific and technology professions in various institutions of higher learning.

Fakuode and Abata (1988) stated that for the children to enjoy mathematics, the teacher needs to plan a lot of activities for the children to perform as this is the only way by which one can capture their attention and make them interested in learning activity. According to Agwagah (2001) and Ali (1994) there are several ways mathematics learners can enjoy mathematics. He gave three of such way as: the use of teaching aids to drive home certain points and concepts, and the drawing of students' attention to the usefulness of mathematics to other subjects and to its everyday practical applications. All these ways involve activities.

A major determinant of children's academic interest is of course, their academic performances. Children who do well in school are likely to develop high opinions of their competence, as poor performances are likely to develop low opinions (Harbor-Peters, 2001 and Ubulom, 1997). They also put more light by saying that when children are unsuccessful at a task they may attribute their failure to lack of effort, a lack of ability or both, which attribution they make can be very significant. They finalized by saying that academic achievement influences children's academic interest. Whereas Elliot, etal (2002), has identified anxiety, interest, gender and location of school environment as the factors that affect learning. Adigwe (2000) considered gender, age of students, school type and school location as the factors that affect learning.

According to Ezeudu (2003), by school location therefore, it means urban – rural schools setting while school type refers to single sex and co-educational school. The urban-rural influence is also expected in mathematics just like some other subjects because of the psycho-social influence it may have on the teachers and students resulting mainly from government

based on location. This may even dictate their academic achievement in science (Mathematics inclusive) in which this study will investigate empirically. Innomesia cited in Ezeudu (2003) supported this view when he indicated that students in the urban environment performed better than those in the rural areas. This is because the urban setting has organized streets, different types of occupations, and many amenities that tend to more required interactions.

Ezeudu (2003) reported that students in urban and rural locations performed in a similar manner. However, Obioma in Ezeudu (2003) findings indicated that most mathematically deficient learners were found in major urban centres rather than other locations. It is against this backdrop that the researcher finds it pertinent to investigate whether or not any relationship exists between test anxiety and academic achievement of mathematics students in different school locations.

Statement of the problem:

The influence of some variables in the propagation of students' phobia and anxiety for mathematics seem not to be clear to mathematics teachers and educators with the result that such variables continues to contribute to the development of test anxiety as the students are given test on the subject. It has been reported that slight anxiety in relation to the solving of a problem may keep learning, while anxiety produced by other factors such as fear will tend to act as inhibitor to learning. Such negative anxiety could lower the academic achievement of students and decrease their self-esteem. Children with anxiety are helpless, uncertain and afraid of failure.

It is established by research that students do not perform well in mathematics. They do not show more interest in mathematics. Many researchers like Aburime (2003), Agwagah (2001), Amoo (2002) and Okubodejo (2001) employed various methods of interest in solving the problem of poor performance in mathematics. These include games, simulation and other activity methods of teaching that will make students develop interest in mathematics which can help to solve the problem of low performance in mathematics. Some students perform fairly well in their continuous assessment and show positive interest in mathematics. Some show interest in mathematics during final examination but their performance is poorly low.

The problem of the study is could it be test anxiety that is influencing the students' poor performance in mathematics in examination? Also, is it the urban or rural areas students that perform fairly well in mathematics? The provision of the answer to this question is therefore the major concern of this research. There is therefore the need to find out whether there is relationship among test anxiety and academic achievement of students of different school locations in Senior Secondary School Mathematics in Rivers State.

Purpose of the study:

The purpose of this study was to determine the "Relationship between Test Anxiety and Academic Achievement of students of different location in senior secondary school mathematics in Rivers State".
Specifically, the researcher seeks to:

1) Find out the relationship between test anxiety and academic achievement of mathematics students in the urban areas.
2) Determine the relationship between test anxiety and academic achievement of mathematics students in the rural areas.

Scope of the study:

The study was focus/delimited to the relationship between test anxiety and academic achievement of students of different location in Senior Secondary School Mathematics in Rivers State.

Research Questions:

In this study, the researcher will attempt to provide answers to the following research questions:

1) What is the relationship between test anxiety and academic achievement of mathematics students in the urban areas?
2) What is the relationship between test anxiety and academic achievement of mathematics students in the rural areas?

Hypothesis:
Based on the research questions, the following hypotheses will be tested at 0.05 alpha levels in order to make decisions in the issues investigated.
1) There is no significant relationship between test anxiety and academic achievement of mathematics students in the urban areas.
2) There is no significant relationship between the test anxiety and academic achievement of mathematics students in the rural areas.

Method
The design for the research was purely correlational survey. The study established the nature of relationship between the criteria variable (students' test anxiety) and the predictor variable, which is the academic achievement of senior secondary school mathematics students. To support this Nworgu (2006) stated that correlational survey study is the type of study that seeks to establish what relationship exists between two or more variables. He further said that it indicates the direction and magnitude of the relationship between the variables. They employ a special group of statistics known as correlational coefficient for the data analysis.

Area of Study
The study was conducted in Rivers State of Nigeria. This State consists of 23 Local Government Areas, which are Abua/Odual, Ahoada-East, Ahoada-West, Akuku-Toru, Andoni, Asari-Toru, Bonny, Degema, Emohua, Eleme, Gokana, Ikwerre, Khana, Obio/Akpor, Ogba/Egbema/Ndoni, Ogu/Bolo, Okirika, Omumma, Opobo/Nkoro, Oyigbo, Port Harcourt and Tai Local Government Areas. The justification of choosing the areas was informed by the fact that the researcher is quite conversant with the area.

Population for the Study
The population for this study consisted of all the male and female mathematics students in senior secondary two (SSII) in all the public secondary schools in Rivers State. They were three thousand, one hundred and twenty (3120) in number in the year 2005 when the study was conducted. Source: Department of Statistics (2005), Rivers State, Senior Secondary Schools' Board, Port Harcourt.

Samples and Sampling Techniques
A sample of three hundred and sixty (360) senior secondary two (SSII) mathematics students (180 males and 180 females) was used for the study. The simple random sampling technique through simple balloting was used to draw samples for the study. Out of the 23 Local Government Areas (LGAs) in Rivers State, the researcher randomly selected only 6 LGAs where 3 of such LGAs were from the urban areas and the other 3 LGAs are from the rural areas. In each of these LGAs, two public secondary schools that are co-educational were

randomly chosen. From each school, 30 SSII mathematics students (15 males and 15 females) were also selected because the researcher was interested in the correlation between the test anxiety and academic achievement of male and female students. The researcher used the simple random sampling through simple balloting because all the LGAs, secondary schools and students have the characteristics of the population, and secondly to avoid selection biases.

Instrument for Data Collection
The two major instruments used in gathering data for the study were: Mathematics Test Anxiety Scale (MTAS) and Mathematics Achievement Test (MAT). The Mathematics Test Anxiety Scale is a 20 items questionnaire constructed by the researcher to measure mathematics test anxiety. This was 4-points of Likert type scale. For the MTAS, the students were requested to indicate their level of agreement or disagreement with various items. The MTAS comprised of two sections. Section A elicits the personal data of the students while section B measured the students' Anxiety. The scoring of the instruments was in this order: Strongly Agree (SA) - 4, Agree (A) - 3, Disagree (D) - 2 and Strongly Disagree (SD) -1. The mean score is 2.50; values from 2.50 and above shows high anxiety, which leads to low academic performance. The total scores obtained by each student were considered as an index of this students' anxiety level for mathematics.

The Mathematics Achievement Tests (MAT) is a 20 items test of mathematics ability. This instrument was constructed by the researcher and used for this study. The instrument is a 5 points rating scale ranging from Outstanding (Excellent) to Not-Satisfactory (Fail). The scoring of the instrument is as follows: 70% - 100%: 5-Outstanding (Excellent), 60% - 69%: 4-Above Average (Very Good), 50% -59%: 3-Average (Good), 40% - 49%: 2-Below average (Pass), and 0% - 39%: 1-Not Satisfactory (Fail). All the percentage scores were converted to 5-points rating scale. The mean score is 3-point. A value from 3-point and above implies high academic achievement and score below 3-point implies low academic performance.

Validation of the Instrument
Copies of the Mathematics Test Anxiety (MTAS) and Mathematics Achievement Test (MAT) were sent to two specialists in Mathematics and two experts in measurement and evaluation of the Department of Science Education, University of Nigeria, Nsukka for face and contents validation. These resource persons were requested to vet items of the instrument in terms of clarity of items (words), simplicity of vocabulary and relevance of items to the study. The Mathematics teacher vetted items of MAT in term of difficulty and plausibility of the distracters in addition. All their comments and recommendations were incorporated in the final version of MTAS and MAT.

Reliability of the Instrument
On the reliability of the instruments used in gathering data for the study, reliability coefficients of the MTAS and MAT were established with the use of test-retest techniques. The researcher administered copies of the instrument to 30 SSII mathematics students in public secondary schools, which were not used in the main study. After two weeks, these students were re-administered with the same instruments. The data generated in these two administrations of the instruments were respectively used in computing test-retest reliability coefficients for them. Pearson's Product Moment Correlation (r) was used and the coefficients obtained for anxiety section was 0.84. For Mathematics Achievement Test, the instrument is considered to have high construct validity because its content is composed of mathematics exercise. The instrument also passed through my supervisor. The test-retest

reliability coefficient of the instrument was computed by employing the Pearson's Product Moment Correlation (r). The value obtained from this computation was 0.81 and therefore the research instrument was considered to be reliable in eliciting of the students' aptitude and ability for mathematics.

Method of Data Collection

In collecting data for this study, the researcher went personally to the 12 secondary schools involved in the study and administered copies of the MTAS and MAT to the students. The Mathematics Test Anxiety Scale (MTAS) was administered first, followed immediately by the Mathematics Achievement Test (MAT). The reason for this is that the achievement test with its content is likely to arouse anxiety in the students thus increasing the chances of students' objective report of their level of anxiety-feelings. All the copies administered were collected back at the spot. The students' responses were then scored and the data generated were collected for statistical analysis.

Method of Data Analysis

The Data for the study were analyzed as follows:
1) Research question 1 and 2 were analyzed with Pearson's Product Movement Correlation Coefficient (r).
2) The two null hypothesis analysis were tested at 0.05 alpha-levels with t-test (all the correlation coefficient i.e. value were transformed to the t-statistics) in order to test for significant.

Results:

Research question one: *What is the relationship between test anxiety and academic achievement of students in the urban areas?* Data collected for this research question were analyzed using Pearson's Product Moment Correlation (r) and the results obtained were summarized in Table 1 below. Table 1 showed that the correlation coefficient obtained for the urban students' anxiety (x) and their academic achievement (y) was 0.80. This means that the relationship between the urban students' test anxiety and their academic achievement was very high and positive one.

Table 1: Test of significant relationship between test anxiety (x) and academic achievement (y) of students in the urban areas.

Variable	Y x	$\bar{y}$ $\bar{x}$	Sdy Sdx	Se	r-cal	t-cal	t-crit	Result	Decision
Academic Achievement (y)	11030.4	61.28	14.75						
Versus (x, y)				2.7051	0.80	7.52	1.960	Sign	Rejected
Urban Students' Anxiety (x)	7369.2	40.94	33.16						

Sample (n) = 180   ($\square$) = 0.05   df = 358

H0₁: *There is no significant relationship between test anxiety and academic achievement of students in the urban areas.* Data collected were analyzed using Pearson's Product Moment Correlation (r) and the correlation coefficient obtained was converted to a t-test statistics to

test for its significant relationship. The means and standard deviation of each variable was also as summarized in the Table 1 above.

In Table 1 above, the calculated r-value of 0.80 was converted to a t-test statistics to test the statistical significance. The calculated t-test was 7.52 which was greater than the critical t-value of 1.96 at degree of freedom (df) = 358 and 0.05 level of significance. The null hypothesis was rejected. This means that significant relationship exist between the urban students' test anxiety and their academic achievement.

Research question Two: *What is the relationship between test anxiety and academic achievement of mathematics students in the rural area?* Data collected for this research question were analyzed using Pearson's Product Moment Correlation (r) and the results obtained were summarized in Table 2 below.

Table 2 showed that the correlation coefficient (r) obtained for the rural students' anxiety (x) and their academic achievement (y) was 0.71. This means that there was a high positive relationship between the rural students' test anxiety and their academic achievement in mathematics.

Table 2: Test of significant relationship between test anxiety (x) and academic achievement (y) of students in the rural areas.

Variable	Y X	$\bar{y}$ $\bar{x}$	Sdy Sdx	Se	r-cal	t-cal	t-crit	Result	Decision
Academic Achievement (y)	8877.6	49.32	17.43						
Versus (x, y)				1.2992	0.71	3.55	1.960	Sign	Rejected
Rural Students' Anxiety (x)	9707.4	53.93	21.45						

Sample (n) = 180   (□) = 0.05   df = 358

H0₂: *There is no significant relationship between test anxiety and academic achievement of students in the rural areas.* Data collected were analyzed using Pearson's Product Moment Correlation (r), and the value obtained was converted to a t-test statistics to test for its statistical significance. The results obtained were summarized in Table 2 above.

Table 2 showed that the correlation coefficient of r = 0.71 was converted to a t-test statistics to test its statistical significance. The calculated t-value was 3.55 which was greater than the critical t-value of 1.96 at df = 358 and at 0.05 level of significance. The null hypothesis was rejected. This means that there was significant relationship existing between test anxiety and academic achievement of students in the rural areas.

Discussion:

Relationship between test anxiety and academic achievement of students in the urban areas: The results of this study showed that there was a significant relationship between test anxiety and academic achievement of urban students in senior secondary school mathematics. This means that there was a very high positive relationship between the urban students' test anxiety and their academic achievement. It was statistically significant when tested with a t-test statistics. The degree of association between them was found to be 0.80. The percentage of association (r^2 x 100) was found to be 64% while their coefficient of alienation $1 - r^2$ is 0.36 representing their degree of lack of association between them. The magnitude of their

relationship was very high and percentage of one variable from other is also high. This means that as the urban students' test anxiety scores in mathematics increases so also their academic achievement scores in mathematics increases. The high positive relationship between the urban students' test anxiety and the academic achievement can be due to probably the influence of some environmental factors like school location, school types, classroom, field, teachers/students among others.

In another dimension Fraser and Fisher (1982), conducted a research study on psychosocial classroom learning environment in various countries and established the fact that students' classroom environment participation account for appreciable amount of variance in cognitive and affective learning outcomes. Similarly in research studies carried out by Worgu (1995) and Wali (1995), learning environment, learning facilities and instructional materials were identified as factors influencing students' academic achievement in mathematics.

However, Jahun and Momoh (2001) found that urban students performed better than rural students in both form of Ahmadu Bello University Mathematics Achievement Test (ABUMAT). This might be due to the areas delimited as urban and rural in each study. Medinnus and Johnson (1976), revealed that the child rearing practice of a secondary security (urban) vary in an even increasing degree from those of a primary group (rural). They therefore, observed that an urban culture is dynamic and rapidly changing; hence have great influence on the students' academic achievement. Mgbajiaka (1998) in her findings reported that urbanization has a positive effect on students' academic achievement. This finding was in agreement with that of Ezeudu (2003), who work on academic achievement and location found that students in the urban environment (area) performed better than those in the rural areas that is urbanization has a positive effect on students' academic achievement.

Relationship between test anxiety and academic achievement of students in the rural areas: The result of this study showed that there was a positive relationship between the rural students' test anxiety and their academic achievement in senior secondary school mathematics. It was statistically significant when tested with a t-test statistics. Their magnitude of association or relationship, percentage of association and their coefficient of alienation were found to be 0.71, 50.41% and 0.50 respectively. This means that their magnitude of relationship and percentage of association was high. The positive relationship between the rural students' test anxiety and their academic achievement implies that as scores on rural students' test anxiety increases, there is corresponding increases in rural students' academic achievement. The finding was similar to that of Edebor (2002) who conducted a research on test anxiety and academic achievement of students in the rural areas. A sample of 300 SSII biology students (150 males and 150 females) was constituted. In her findings, she concluded that rural students' test anxiety positively correlated with rural students' academic achievement. This means increases in rural students' test anxiety leads to increases in rural students' academic achievement. The positive relationship may probably be due to conducive environments in the rural areas which may include school locations, school types, classroom, qualified teachers, good water and electricity which may increase students' test anxiety which may also leads to increases in students' academic achievement.

The present study did not have any urban-rural comparison. The finding from the result of the present work indicates that the magnitude of the relationship was high and their percentage of prediction was also high. The finding of the present study was similar to the finding of Obioma's cited by Jahun and Momoh (2001) who found that most mathematically deficient learners were found in major urban centres rather than other locations (rural). Based on the mentioned findings, there is no fixed pattern in the mathematics achievement of students with regards to urban-rural factors.

Conclusion

It has been established that there is a positive relationship among test anxiety and academic achievement of students in terms of location in Senior Secondary School Mathematics in Rivers State. The implication of the finding is that government, teachers, parents and all other stakeholders in education of children should work together towards enhancing the academic achievement of students in mathematics to meet the required standards in future academic work and the scientific and technological development of Nigeria. Based on the results and findings of this research work, the researcher therefore, advocates that adequate career education should be given to the general public so that further positive interest towards Mathematics would be developed. The career education will also assist the general public to avoid discriminating among careers or programme of studies.

Another aspect of the results of the study reveals that there is a positive relationship between the urban and rural students' test anxiety and their academic achievement. The implication of this finding is that school location (learning environment) must have influenced their test anxiety thereby increases the level of students' academic achievement in Mathematics. These school locations (learning environment) could be the presence of classroom space, teachers' qualifications and experiences, urban-rural location, present of well-equipped library, teaching methods, teaching aids, availabilities of water and electricity.

Recommendation

Based on the educational implications of findings of this study, the researcher had made the following recommendations;

1. Due to the fact that students have high positive test anxiety towards their learning environment (School location) and their academic achievement, it is recommended that the Government should ensure that a conducive environment is created for their students. This will assist the students to have good rest of mind thereby moderate the level of test anxiety of these students. If adequate attention is directed towards solving these problems, it will go a long way in improving the academic achievement level of the mathematics students.
2. The State Government and professional bodies should regularly organize seminars, symposia and workshop for mathematics students in other to minimize their anxiety rate so as to achieve high standard of education.

Limitations of the Study

This study has some limitations:-

(1) Inadequate sample: Out of 3120 SS II mathematics students only 360 students were used as respondents for the study.
(2) The use of students' self-rating inventory. This may leads to the introduction of error responses, which may probably be different from the opinions of the respondents.

REFERENCES

Abone, O. M. (1986). "*Teacher Management of Classroom Problem*", In Nwachukwu V. C. (ed). Educational Psychology; A.C.E Series Ibadan, Heinenmann Educational Books Nig. Ltd.

Aburime, F. E. (2003). Geometrical Manipulative as Mathematics, Resource for Effective Instruction in Junior Secondary Schools: *The Journal of WCCL Nigeria Chapter, Vol. 4(2).*

Adigwe, J. C. (2000): Ethnicity, School Location and Type and Attitude of girls towards Science Education, Jos. *Journal of Education 5 (1), 37 – 41.*

Aguele, L. E. (1999). Towards a Humanistic Approach to the Teaching and Learning of Mathematics in the 90's Science Teachers' Association, Annual Conference Proceeding 151-163.

Agwagah, U. N. V. (1996). Instructional materials: Deficiency in Some Secondary Schools Mathematics. Challenge of Mathematics Educators for Future Mathematics Education, Paper Presented at the 3rd Annual Conference of MAN held at Ilorin 2nd – 6th September, 1996

Agwagah, U. N. V. (1993). *Instrument in mathematics reading* as *factor in students' achievement and interest in world problem solving*: Unpublished Ph.D. Thesis University of Nigeria, Nsukka.

Agwagah, U. N. V. (2001). *Mathematical games for primary schools*. Nsukka; Mike Social Press.

Akale, Mathias A. G. (2004) ed. *Science Teachers Association of Nigeria Reforming Research in Science Technology and Mathematics (STM) Education: Proceedings of the 45th Annual Conference 2004.* Heinemann Educational Book (Nig.) Plc.

Ale, S. O. (1989): A key note Address: War against Poor Performance in Mathematics. *ABACUS 19 (1) 3 – 9.*

Ali, A. (1994). Mathematics Methods In S. C. Anith, Olaitan, S. O; Akubuilo, C. J. C, and Anadi, C. C. (eds). Approach to Creative Teaching. Onitsha, Summer Educational Publishers.

Amoo, S. A. (2001). *An appraisal of Problems Encountered in Teaching and Learning of Mathematics in Secondary Schools:* Being a paper presented at the 1st Annual State Conference of Lagos Chapter of the Mathematical Association of Nigeria (MAN) August, 2001

Amoo S. A. (2002). Analysis of Problems Encountered in Teaching and Learning of Mathematics in Secondary Schools. *ABACUS* 27(1), 30-36.

Chauhan, S. S. (1985). *Advances Educational Psychology*. New Delhi, Vikas, Educational Books.

Department of Statistics (2005): *Rivers State, Senior Secondary Schools' Board,* Port Harcourt.

Edebor, F. (2002). *Relationship between Anxiety, Self-Concept and Academic Achievement in Biology*. Unpublished M.Ed Thesis, Uniport.

Elliot, S. N., Kratochwill, T. R., Cook T. L., & Travers J. L (2002). *Educational Psychology; Effective Teaching Effective Leaning 3rd (Ed):* Mc Graw-Hill companies.

Ezeudu, S. A. (2003): Classroom Environment as Correlate of Students' Cognitive Achievement in Senior Secondary School (SSS) Geography: *Journal of WCCI Nigeria Chapter Vol. 4 (2). Oct. 2003, 65 – 73.*

Ezike, R. O. & Obodo, G. C. (1991). *The Teaching of Mathematics in Schools and Colleges*: Eha-Amufu.

Fakunade, R. A & Abata, O. (1988). *Primary School Mathematics Methods.* Ibadan. Heinemann Educational Books.

Fraser, B. J. & Fisher, D. I. (1982): Effect of classroom Psychological Environment on Students' learning. *The British Journal of Educational Psychology 52 (3). P: 474.*

Gerow, J. R. (1992). *The Psychology. An Introduction* (3rd ed): New York. Harper Collins Publishers Inc.

Harbor-Peters, V. F. (1999). *Note Worthy Points on Measurement and Evaluation*: Enugu, Snaap. Press Ltd.

Harbor-Peters, V. F. (2000). *Mathematics Language for the New Millennium Implication to the Society; Proceedings of Annual Conference of Mathematics Association of Nigeria*.

Harbor-Peters, V. F. (2001). *Attitude and Interest of the Students to the Mathematics, Science in Nigeria. A Commissioned Paper for the Mathematical Science Education Summit, 2002 Organized by NMC*, Abuja on Improving the State of the Mathematics Science Education in Nigeria 4th -5th October, 2002.

Jahun, I. U. & Momoh, J. S. (2001): *The Effects of Environment and sex on the Mathematics Achievement of Junior Secondary School Students in Kwara State.* ABACUS Vol. 26 (1), 53 – 58.

Kurumeh, Maria, S. C. (2004). *Effects of Ethno-mathematics; Approach on students' Achievement and Interest in Geometry and Menstruation*. Unpublished Ph.D. Thesis, University of Nigeria, Nsukka.

Maduabum, M. A. & Odili, G. A. (2006). Analysis at students' performance in General Mathematics at the Senor School Certificate Level in Nigeria 1991-2002. *Journal of Research in Curriculum and Teaching*. *Vol. 1 (1). 64-68.*

Magbajiaka, C. I. (1998). *Some Correlates of Test Anxiety Among Secondary Schools Mathematics Students in Enugu State.* Unpublished. M.Ed Thesis, Uniport.

Medinnius, G. R. & Johnson, R. C. (1976): *Child and Adolescent Psychology New York:* John Wiley & Sons Inc.

Nigerian Educational Research and Development Council (NERDC), December (1997). *National Feedback on Curricula*, E.O., Adenyi (ed).

Nwankwo, O. C. (1990) *Development and Validation of an Instrument for Measuring Test Anxiety Among Secondary School Students*. Unpublished Ph.D Thesis, University of Nigeria, Nsukka.

Nwankwo , O. C. (1996). The relationship between Test Anxiety and Class level of Secondary School Students Port Harcourt. *Journal of Psychology and Counseling (1) 3, 11- 15.*

Nwankwo, O. C. (2001). *The Psychology of Learning: The Human Perspective.* Port Harcourt, Plan Unique Publishing Coy Ltd.

Nwachukwu, T. A. (1999). *Psychology of Learning*, Nsukka Ike and Awice.

Nwobu, I. E. (1998). *An Investigation of the Relationship between the Students' Achievement in Mathematics and Test Items Formats among Some Secondary Schools in Obio-Akpor Local Government Area, Rivers State.* Unpublished M.Ed Thesis, Uniport.

Nworgu, B. G. (2015). *Educational Measurement and Evaluations*: *Theory and Practice (2nd ed)*. Nsukka; University Trust Publishers.

Nworgu, B. G. (2006). *Educational Research: Basic Issue & Methodology (2nd & Enlarged Edition).* Nsukka; University Trust Publishers.

Obodo, G. C. (1991). Implementation of the JS Mathematics Curriculum in Nigeria; Problem and Remediation: *Journal of strategies in Education II (1) January.*

Obodo, G. C. (2002). Developing Positive Attitude and Interest of Mathematics Students in Nigeria Secondary Schools. *A paper presented at NMC, Abuja during the summit workshop 4-6th October.*

Ogbonnaya, E.P. (1986). *Prevalence of Mathematics Anxiety among Secondary School Students in Imo State*. Unpublished M.Ed Thesis, University of Nigeria, Nsukka.

Okubodejo, 1,(2001). *Mathematics teachers seek Usman,* I. C. Government Support Sunday Vanguard Newspaper July.

Seldon, A. A. (1998). Teaching the Doing Mathematics. *ABACUS; The Journal of the MAN-September, PP 42-53.*

Stones, E. (1981). *Introduction to educational psychology*, Ibadan spectrum books Ltd.

The New International Webster's Comprehensive Dictionary of the English Language (2003). Encyclopedic (Ed). Columbia, Trident Press International.

Ubulom, W. J. (1997). C*orrelates of Academic Achievement in Secretariat Education*. Unpublished M.Ed. Thesis, Uniport.

Wali, G. C. (1996): *Analysis of students' Attitude towards Academic Achievement. Secretarial Studies in Rivers State Polytechnic.* Unpublished HND Thesis, Rivers State Polytechnic, Bori.

Worgu, F. E. (1995): *Problems Associated with the Academic performance of Business Education. Students in Nigeria Tertiary Institution. A Survey of Rivers State College of Education.* Unpublished B. Ed: Thesis Rivers State College of Education.