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School Factors and Mathematics Phobia among Secondary Schools Students in Ibiono Ibom Local Government Area, Nigeria

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Abstract

School factors and mathematics phobia among secondary schools' students in Ibiono Ibom local government area, Nigeria is a study with three research questions and three null hypotheses. Literature was reviewed on the relationship between teachers, students' study habit, peer group and mathematics phobia. It was a descriptive survey design. The population of the study comprised of all senior secondary school students in Ibiono Ibom local government area. A sample size of 200 respondents was selected for the study using Criteria sampling technique. Data was collected using a researcher's developed questionnaire with Cronbach Alpha reliability index of 0.73 and analyzed using Pearson Product Moment Correlation for the research questions and hypotheses tested at 0.05 level of significance level. The results revealed that there is a significant relationship between teachers, peer group and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area. It was recommended that deliberate efforts must be made by teachers to motivate their students towards the study of mathematics which will in turn reduce mathematics phobia among them.

Keywords: Math Phobia; Mathematics Learning; Mathematics Teaching; Study Habits; Teacher Factors

1. Introduction

Mathematics is one of the key subjects in both the primary and secondary school education system in Nigeria. Its usefulness in science, mathematical and technological activities as well as commerce, economics, education and even humanities is almost at par with the importance of education as a whole. Mathematics liberates the mind. Mathematics is about finding solutions to problems. All decisions taken are based on such questions as ''what and how'' and these questions are best answered by converting every statement to mathematical statement before solution is sought. The depth of mathematical knowledge an individual has dictates the level of accuracy of his/her decision. This implies the fact that before an individual can function well in the society, he/she must possess or have relatively good knowledge of mathematics especially in this technological era. The technological development is highly rooted in the study of mathematics. Mathematics is the, language of science technology and commerce. Application of mathematics cut across all areas of human knowledge. Despite these wide applicability and importance of mathematics many pupils and students still do not find their feet in the subject as a result of their perennial failure in the subject (Udofia & Etuk,2014; Udofia & Udoh, 2017; Udofia & Etuk 2010).

Science Mathematics educators and researchers like (Emenalo, 1984; Nwoke & Ugwuegbulam, 2016; Ashcraft, 2002; Suárez-Pellicioni, Macarena; Núñez-Peña, María Isabel; Colomé, Àngels, 2016, Hembree,1990; Schar & Kirk, 2001; Trezise, Kelly; Reeve,& Robert 2016; Trezise, Kelly; Reeve, Robert ,2018; Beilock & Willingham 2014; Blazer,2011), have over the years carried out researches on factors that are responsible for poor performance in mathematics at primary and secondary school. These factors ranges from shortage of qualified mathematics teachers, poor facilities, equipment and instructional materials for effective teaching, use of traditional chalk and talk methods, large pupils to teacher ratio and mathematics fright/phobia to mention but a few. Just few of these studies if at all, consider Teacher's variables such as Teacher self –efficacy, interest, attitude, qualification and experience.

Several factors have generally been identified as predictor of poor academic achievements. (Agyeman, 2003; Adekun, 2008; Eraikhueme, 2005; Longman, 2000; Mduka, 2002; Ngwokabuenui, 2015; Yenagi, 2009; Opare, 2015; Ukeje, 2004; Upong, 2010). reported that a teacher who does not have both the academic and the professional teaching qualifications would undoubtedly have a negative influence on the teaching and learning of his/her subject. Apart from qualifications, other teacher's variables still exit which can either positively or negatively predict pupils' mathematics performance. However, research particularly in the Nigerian context is being silent about them.

Students have a part to play in their academic performance in mathematics also. In the field of educational

psychology learning has been discovered all over the world to be a highly complex process. Several researchers have tried to explain it differently and the description of each is partially true. Over the years, researches on factors that influence academic performance of students have attracted the interest of not only researchers but concern teachers, counsellors, psychologist, and school administrators(Akinboye, 2008; Riaz, Asma, and Niaz, 2002)..

Additionally, Peer as a concept can be described as a person of the same age, status or ability or specified people. On a second note, peer group is a community in which most of or all of the members have roughly the same characteristics, such as age, class, education, merit, rank, standing or status. The peer group is an informal primary group of people who share a similar status and who are usually of roughly the same in social aggregate. It can also be described as a sub-group of a society in which membership is determined by similar age, sharing the same social status with authority to employ legalized force. Members of a particular peer group often have similar interest and background bounded by the premise of sameness.

Odhiambo (2012) conducted a study on the influence of teacher's quality on academic performances of students in mathematics in selected public secondary schools in Molo Sub County, Nakuru County, Kenya. The study adopted an Expo-Facto research design and targeted 1385 students and 24 teacher-counsellors in 24 public secondary schools in Molo Sub County. Random sampling technique was used to select a sample of 86 students and 12 teachers. Data was collected by the use of questionnaires. Descriptive statistics comprising mean and standard deviation were used to analyze the data. Pearson's Product Moment Correlation was used in data analysis. The hypotheses were tested at 0.01 level of significance. The findings of the study found that teachers' quality has a positive impact on the academic performance of students in mathematics. Based on the study findings, it was recommended among others that qualified teachers should be employed in all schools. The study of Odhiambo (2012) is related to the present study, in that both considered mathematics teachers as one of their variables.

Ngwokabuenui (2015), investigated the influence of mathematics teachers on mathematics phobia among students: the case of secondary schools in Cameroon. The study made use of descriptive survey research design. The sample comprised of 3240 participants drawn from 120 schools (of the public, lay, private and denominational schools) in four region of Cameroon which were chosen by applying equal probability sampling technique. Percentage and means were used in answering the research questions while One Way Analysis of Variance (ANOVA) was employed to test the hypotheses at 0.05 level of significance. The result showed that teacher's teaching methods influence students 'academic performance in chemistry. It was recommended among others that the government of Cameroon, and school authorities should be organized for school teachers to improve their teaching methods. The study of Ngwokabuenui (2015) is in line with the present study in that both considered mathematics teachers as variables for their study although; there is variation in the geographical setting of the study.

Mduka (2002) conducted a study on students' study habits and students' academic performance among people of Primary School, Delta State. The study adopted survey design. The population of the study comprised 120 pupils. A sample of 60 pupils was used for the study. A 9-item structured questionnaire was used for data collection. The mean score and standard deviation were used in answering the research questions while the null hypotheses were tested using t-Test statistic. The finding of the study revealed that students' study habits had a great influence on students' academic performance. This study is related to the current study because both studies focus on students' study habits although; there is variation in geographical location of the study.

Longman (2000) investigated the effect of peer group on students' academic performances in mathematics among students in Lagos metropolis. Expo-Facto research design was adopted for the study. The population of the study comprised of 80 students. A sample size of 20 students was used for the studies. A questionnaire with 19 items was used for data collection for the study; Chi-square was used to test the hypotheses. The finding of the study indicated that peer group had an effect on students' results. Although, this study was carried out in a different area it is related to the current study in that both studies take peer group as one of its variables.

In a study by Charles (2015), the 2015 WACE was taken by 404,863 students in Akwa Ibom State with 226,658 candidates, representing 60.86% obtained credits and above in mathematics and has been one of the best results in recent years. From this result the performance of students in mathematics in WACE is fairly good. Failure of students in mathematics may be attributed to any factor which mathematics phobia is one of them. Several factors contribute to mass failure in mathematics namely; apathy or hatred for the subject, laziness/lazy attitude to studying the subject, poor study habits and lack of textbooks and other materials. This study seeks to investigate factors responsible for mathematics phobia among students in secondary schools in Ibiono Ibom

Local Government Area.

1.1 Research Questions

The following research questions guided the study:

1. What relationship exists between teachers and mathematics phobia among students in Ibiono Ibom Local Government Area?
2. What relationship exists between students 'study habit and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area?
3. What relationship exists between peer group and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area?

1.2 Research Hypotheses

The following hypotheses were testes in the study:

1. There is no significant relationship between teachers and mathematics phobia among students in Ibiono Ibom Local Government Area.
2. There is no significant relationship between students' study habit and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area.
3. There is no significant relationship between peer group and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area.

3. Research Methods

This research work adopted the descriptive survey design.. It was conducted in Ibiono Ibom a Local Government Area in Akwa Ibom State in the South-South region of Nigeria. Its administrative headquarters is at Oko Ita. The territorial unit and geographical area called Ibiono Ibom consist of 9 clans, 33 groups and 193 villages. It covers a total land surface of 2761.76 sq., kilometers; it has a total population of 385,145. The Local Government Area was created out of Itu Local Government Area in December 1996. Mary Slessor died in this area in 1915. People here are predominantly Christians.

The population of the study comprises of all Senior Secondary II students in all public schools in Ibiono Ibom in Akwa Ibom state. The population amounts to 1,787 students of which 978 are females and 809 are males according to Akwa Ibom state Universal Education Board (SUBEB).

Criteria sampling technique was used in the study. Those selected for the study where students who agreed that they have phobia for Mathematics. The sample of this study consists of two hundred (200) respondents. The two hundred (200) respondents were selected from ten (10) public secondary schools with the use of stratified sampling technique to avoid the chance of obtaining only typical samples. Thus, cap and draw system was applied to give every member of the population the chance of being selected (Udoh & Joseph, 2005).

The research instrument of the study was a questionnaire which made up carefully designed questions developed by the researcher titled "Mathematics Phobia and Students' Contributions Questionnaire" (MPSCQ) to elicit required information from the respondents, while section B required information from the respondents using self-structured questions on mathematics phobia and students' remedial contribution. A four-response scale format was adopted which includes: Strongly Agree (4 points), Agree (3 points), Strongly Disagree (2 points), and Disagree (1 point), to quantify sample responses.

Face and content validity were established for the instrument by instrument development experts in the Department of Educational Foundations Guidance and Counselling, University of Uyo, Uyo who scrutinized the instrument and signed it adequately without making corrections, showing that the research instrument was efficient to measure the hypotheses. In order to test the reliability of the instrument, twenty (20) students who were not to take part in the study were administered the instrument and the Cronbach's Alpha reliability index of reliability was 0.73.

The questionnaire was administered on the respondents by the researcher together with the help of two research assistants who were taught on the procedure for administering the questionnaire. The respondents were given enough time to complete the questionnaire and same was retrieved from them after completion, giving 100 percent retrieval rate. Pearson Product Moment Correlation Coefficient for testing the variables on the three (3) hypothesis and the research questions.

4. Results

Table 1: Summary of Pearson Product Moment Correlation Coefficient for there is no significant relationship between teachers and mathematics phobia among students in Ibiono Ibom Local Government Area.

Variables	ΣX ΣY	ΣX² ΣY²	ΣXY	N	R. Cal	R. Critical	df
Teachers (X)	323	21165	1135	200	0.74	0.196	198
Math Phobia (Y)	177	6565					

Table 1 indicates that the relationship of teachers on mathematics phobia using PPMC was 0.74, which was very high and positive.

The Table 1 also revealed that the calculated 'r' value of the Pearson Product Moment correlation coefficient of 0.74 was greater than the critical value of 0.196 at 199 degree of freedom and 0.05 level of significance. Thus, the null hypothesis was rejected. Therefore, there is a very high and positive. significant relationship between teachers and mathematics phobia among students in Ibiono Ibom Local Government Area.

Table 2: Summary of PPMC for the significant relationship between students' study habits and mathematics phobia in Ibiono Ibom Local Government Area

Variables	ΣX ΣY	ΣX² ΣY²	ΣXY	N	r. Calc.	r. Critical	df
Study Habit(X)	297	18557	25650	200	0.78	0.196	199
Math Phobia (Y)	203	10157					

Table 2 indicates that the relationship of study habit on mathematics phobia using PPMC was 0.74, which was very high and positive.

The Table 2 also revealed that the calculated 'r' value of the Pearson Product Moment correlation coefficient of 0.78 was greater than the critical value of 0.196 at 199 degree of freedom and 0.05 level of significance. Thus, the null hypothesis was rejected. Therefore, there is a very high and positive. significant relationship between study habit teachers and mathematics phobia among students in Ibiono Ibom Local Government Area.

Table 3: Summary of PPMC for the relationship between peer group and mathematics phobia among secondary school students in Ibiono Ibom Local Government Area

Variables	ΣX ΣY	ΣX² ΣY²	ΣXY	N	r. Calc.	r. Critical	df
Peer Group(X)	279	81225	25650	200	0.66	0.196	199
Math Phobia(Y)	90	8100					

Table 3 indicates that the relationship of peer group on mathematics phobia using PPMC was 0.74, which was very high and positive.

The Table 3 also revealed that the calculated 'r' value of the Pearson Product Moment correlation coefficient of 0.66 was greater than the critical value of 0.196 at 199 degree of freedom and 0.05 level of significance. Thus, the null hypothesis was rejected. Therefore, there is a very high and positive significant relationship between peer group teachers and mathematics phobia among students in Ibiono Ibom Local Government Area.

5. Discussion of the Findings

Table 1 shows that there is significant relationship between teachers and mathematics phobia. Teachers play important role in the realization of the high standards which are increasingly emphasized in schools and school systems across the world. Despite the general agreement about the importance of high-quality teachers, researchers, practitioners, policy makers and the public have been unable to reach a consensus about what specific qualities and characteristics makes a good teacher. The profession of teaching is becoming more and more complex and the demands placed upon teachers are increasing with the ever-changing world. Hanushek (2007) estimated that the difference between having a good teacher and having a bad teacher did exist in annual achievement growth. It is therefore important that both pre-service and in-service training are essential for the professional development of the teacher. Teachers employers should also note that lack of motivation and inducement for teachers may affect their professional commitment which would induce poor attendance and unprofessional attributes towards students which in turn affect the students developing phobia for mathematics in them and affecting their academic performance.

Ukeje (2004) also sees teachers as the centre of any academic program. A qualified teacher and dedicated in teaching would reduce anxiety, tension and phobia for mathematics. Effective teaching will minimize phobia. Adesina (2008) perceived the need for improving teacher's qualification and according to him teaching experience determine students' achievement to a great extent affecting their study habits in mathematics. The finding in this work is supported by Farrant (2009), who reported that today's Teachers mourn that their profession is not respected and complain that they are inadequately paid for the duties they are required to do. This assertion by Farrant (2009) results in lack of motivation on the part of both teachers and students. More so, it may contribute to ineffectiveness and inefficiency in academic work and its affects poor performance.

In Table 2, there is a positive relationship between students' study habits and mathematics phobia. The results also show that study habits contribute to students' achievement in mathematics. The reason students are not doing well in mathematics is because of ineffective study habits and phobia for the subject. Most students do not solve or practice mathematical problems because they assume that mathematics consume their time and the consequence is low achievement. Riaz (2002) observed that there is positive relationship between study habits and mathematics achievement. With this, we can conclude that study habits are a predictor of students' achievement in mathematics and also influences mathematics phobia, that for a student to do well in the subject he/she must use an appropriate method for studying the subject mathematics (Akinboye, 2008).

Riaz et al (2002) in their research work on the relationship between study habits and achievements concluded that there exist a significant and positive relationship between achievements of students and study habits. The study habits of students could be positive and yielding high level of cognition while their negative attitudes can be distorting, repulsive and consequently lead to poor performance; as well as affecting the impact on students' acquisition of reasoning skills. Udofia & Etuk,2014; Udofia & Udoh, 2017; Udofia & Etuk 2010) confirms an obvious observation that students' interest on things that he or she needs to learn determines his or her acquisition of certain skills or abilities. Indicators of good study habit among students are organized notes, lessons and materials, having a regular time and place for studying lessons, making decisions about priorities concerning time and goals, good parental models and personal responsibility over what one does or does not do (Nwoke & Ugwuegbulam 2016).). In order to improve students' study habit, Beilock, & Willingham (2014) , Blazer (2011) and Emenalo (1984) suggested the use of learning partnership group discussions and case studies for students to maintain a consistent pattern of learning behaviour.

The result presented in table 3 showed that there is a significant influence of peer group on mathematics phobia among secondary school students in Ibiono Ibom Local Government Area. The result is in line with the study done by Okorodudu (2010) who posited that peer group which has to do with the age-mates and friends of an individual plays an important role in influencing their studies and all aspect of their lives. According to the author, peer groups are responsible for students' successes in school as it either encourages the student to study or to be truant which leads to success or failure respectively (Schar& Kirk, 2001; Trezise & Reeve, 2016; Trezise &Reeve, 2018).

Peers who surrounds one also play a part in both the study habit and success in school. From this one can deduce that peer groups are partly responsible for success of students in schools. From this one can boldly say that peer group influences mathematics phobia among secondary school students in Ibiono Ibom Local Government Area.

6. Conclusion and Recommendations

Based on the result of the findings, it is concluded that teachers, students' study habit and peer group all have significant relationship with mathematics phobia in Ibiono Ibom. It is therefore imperative to recommend that:

1. Deliberate efforts must be put in by teachers to motivate their students towards the study of mathematics which will in turn reduce mathematics phobia and improve their academic performance in the subject.
2. Teacher's training should enhance academic performance of students in mathematics by reducing mathematics phobia among students.
3. Teachers should employ teaching methods which enhance better understanding of mathematics.
4. Teachers, especially mathematics teachers should have good personal and social characteristics which will in turn improve the love of students for and reduce the dislike of the subject he/she teaches.
5. Parents can also help develop love for mathematics in their children by encouraging them to study the subject.
6. Students should be encouraged to study mathematics not just to pass examinations but as for the love of the subject.

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