CAUSES 0F MATHEMATICS PHOBIA AMONG SECONDARY SCHOOL STUDENTS: IMPLICATION FOR COUNSELLING IN IJUMU LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

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Abstract
The study examined the causes of mathematics phobia among secondary school students and implications for counselling in Ijumu Local Government Area of Kogi State. Descriptive research design was adopted for the study. Simple random sampling techniques was used to sample one hundred and twenty (120) respondents of 40 each from the three Districts in the Local Government. Self-constructed instrument titled "Courses of Mathematic Phobia among Secondary School Students (CMPSS) was used to collect data from the respondents. The instrument was structured on four Likert scale of Strongly Agree (SA = 4 Points), Agree, (A = 3 Points), Disagree (D = 2 Points) and Strongly Disagree (1 point). The mean score and Standard Deviassion was computed. Any item with a mean score of 2.50 and above were regarded as agreed with the statement while the mean score of 2.50 bellow indicated disagreement of the statement and t-test statistical method was used to test the generated null hypotheses at 0.05 level of significant. The study revealed among others that, no significant difference between male and female as well as between junior and senior students on mathematic phobia, and with adequate counselling, mathematics phobia among the students could be reduced. The study recommends, among others that, the counsellors posted to the schools should be allowed to work in accordance with the professional ethics and mathematics should not be over emphasized or overloaded in both certificate awarding and in school curriculum.

Keywords: Counselling, intervention, mathematics, phobia

Introduction

Phobia can be said as a type of anxiety disorder or a mental illness that makes someone very worried about an event issues that affects their life. It involves an extreme fear of something or irrational fear of a specific situation, activity and object or that leads to compelling desire to avoid it (American Psychiatric Association, 2013). The term 'phobia' according to Arem (2010) is abstracted from the Greek word "phobos" meaning fear, panic fear, or terror. In the simple terms, the meaning of phobia is "fear". Mathematics phobia is regarded as mathematics weakness in students that deals with psychological dimension of learning (Olaniyan and Salman, 2015). Roy (2011) defined phobia as learned emotional responses and it causes frequent severe and intense anxiety. The mathematics phobia is classified into two types as general and specific arithmophobia or numerophobia. General arithmophobia is the fear of all numbers that can seriously affect the ability of the students to do or attend to mathematic problems. Mathematics phobia can occur due to different causes. As concluded by Ihechukwu, and Ugwuegbulam (2016), lack of different aspects related to teaching learning like: good teacher-student relationship, use of students-centered/innovative approach of teaching, counseling, positive attitude towards mathematics, improved mathematics curriculum, breaking down topics into units, application of ICTs in teaching mathematics and the likes,. can cause mathematics phobia. According to Foley, et al., (2017), mathematics anxiety is learned not from personal experience but from parents and teachers.

In the entire history of education, mathematics has held its leading position among other school subjects because, it is considered as an indispensable tool in the formation of Educated Man , yet, some student out of share ignorance and misconception fear the subject which leads to phobia because, mathematics' anxiety can cause avoidance, an empirical dilemma arises. For instance, when a highly math-anxious student performs disappointingly on a math question, it could be due to math anxiety or the lack of competency in math because of math voidance and later manifest in to mathematics phobia' Consequently, the Federal Government of Nigeria paid a particular attention to Mathematics by making it a compulsory subject at both primary and secondary education as

specified in the National Policy on Education (Federal Republic of Nigeria, 2014). Despite Government policy on the importance and usefulness of mathematics, it is a subject that is most feared by students. There is a common perception of Mathematics as a difficult subject and it is generally believed that only few students who are naturally gifted can study Mathematics (Caur 2017)

Ashcraf (2002) remarks that, highly anxious mathematics students will try to avoid situations in which they have to perform mathematical calculations. Unfortunately, math avoidance results in less competency, exposure and math practice, leaving students more anxious and mathematically unprepared to achieve. In college and university, anxious math students take fewer math courses and tend to feel negative towards math. In fact, Ashcraft found that the correlation between math anxiety and variables such as confidence and motivation are strongly affecting students to study mathematics.

There are overarching similarities concerning the acquisition of math skills, researchers have shown that, children's mathematical abilities and anxiety differ across countries. In Canada, students score substantially lower in math problem-solving and operations than students in Korea, India and Singapore. Trezise, Kelly; Reeve and Robert (2018) stressed that, in countries such as Taiwan and Japan, parents place more emphasis on effort rather than one's innate intellectual ability in school success. By parents placing a higher emphasis on effort rather than one's innate intellectual ability, they are helping their child to develop a growth mindset. People who develop a growth mindset believe that, everyone has the ability to grow and develop their intellectual ability, learn from their mistakes and become more resilient learners. Moreover, parents in these countries tend to set higher expectations and standards for their children. In turn, students spend more time on homework and value homework more than American children, (Beilock, and Willingham, 2014)

Another difference in mathematic abilities often explored in research concerns gender disparities. There has been research examining gender difference in performance on standardized tests in mathematics across various countries. Trezise, Kelly; Reeve and Robert (2018) have shown that children at approximately nine years of age do not show consistent gender difference in relation to math skills. Moreover, mathematics is often labeled as a masculine ability; as a result, girls often have low confidence in their math capabilities (Arem 2010). These gender stereotypes can reinforce low confidence in girls and can cause math anxiety as research has shown that performance on standardized math tests is affected by one's confidence. (Khing 2016). As a result, educators have been trying to abolish this stereotype by fostering confidence in math in all students in order to avoid mathematics phobia. (Soares, Evans,and Patel..2018)

Panthi and Belbase, (2017); Mahato, Morgan and Earnest,(2019) as well as NASA(2019) remarked that the cause of underperforming in mathematics is not clear, however, there may be different factors that could influence mathematics achievement. Arguably, one reason for this according to them is that students' perspectives are neglected in mathematics pedagogic practices and the causes may be the negative perception about mathematics, mathematics phobia that the students could be affected from beginning of child education in life. In the same way, another cause may be the lack up arousing students' positive attitude towards mathematics due to inadequate teaching materials, large classes, poorly motivated teachers, lack of laboratories and libraries, poor supervisory activities and lack of overall students' assessment system and the likes. As stated by Soares, Evans and Patel (2018), mathematical difficulties refer to the poor mathematics achievement of the children caused by a variety of factors from poor instruction to environmental factors, which is hypothesized to be due to an inherent weakness in mathematical cognition not attributable to socio-cultural or environmental causes.

Statement of the problem

Mathematics can be a very interesting and fun provoking subject for those learners who can really enjoy their learning (Fu Sai and Chin Kin, 2017). On the contrary, mathematics can also be a frustrating subject for many children who have problems with computation and application (Chinn, 2015). This shows that, many people have mixed feelings about mathematics and feel that mathematics as a boring and disengaging subject and they hate mathematics, and try to avoid it because of phobia they have created for mathematics.

Hence, the impact of mathematics phobia on mathematics performance has been studied in much recent literature. An individual with mathematics phobia does not necessarily lack ability in mathematics; rather, they cannot perform to their full potential due to the interfering symptoms of their phobia. Therefore, this study seeks to investigate the causes of mathematics phobia among secondary school students in Ijumu Local Government Area of Kogi State and counselling intervention on the problems

Objective of the study

The main objective of this study was to investigate curses of mathematics phobia among secondary school students in Ijumu Local Government Area of Kogi state, specifically, it examined;

1. The major causes of mathematics phobia among the secondary school students in Ijumu Local Government Area of Kogi state.
2. The relationship between male and female students on mathematics phobia.
3. The relationship between junior and senior secondary school students on mathematics phobia.
4. The counselling intervention on mathematics phobia among the secondary school students.

Research Questions

The following research questions were raised to guide the study.

1. What are the possible causes of mathematics phobia among secondary school students in Ijumu Local Government Area?
2. What are the relationship between male and female students on mathematics phobia?
3. What are the relationship between junior and senior secondary school students on mathematics phobia?
4. What are the counselling intervention on mathematics phobia among the secondary school students?

Research hypotheses

The following research hypotheses were formulated to guide the study.

1) There is no significant difference between male and female students on the perceived causes of mathematics' phobia
2) There are no significant differences between JSS and SSS students on the perceived causes of mathematics phobia.

Method

The population of the study consists of all the fourthy six (46) secondary schools in Ijumu Local Government Area of Kogi state. A sample of one hundred and twenty (120) students were drawn from the three geographical districts of Ogidi, Ijumu Aarin and Gbede districts comprising of 40 each through simple random sampling technique. This consists of 60 males, 60 females and 60 SSS with 60 JSS.

Descriptive research survey design was adopted to determine the causes of mathematics phobia among the secondary school students in Ijumu Local Government. The instrument used for data collection was self-structured questionnaire which centered on 20 items titled "Causes of Mathematics Phobia among Students (CMPS). The instrument was subjected to face and content validity by four experts of the psychologists and a mathematics educationist from Kogi State University, Anyigba. Their convections were embedded to boost the quality of the instrument.

The instrument was personally administered on the respondents by the researchers through the permission of the heads of the selected schools for study. The respondents were adequately briefed on the objectives of the study and were assured that any information given will be confidentially treated for the study. They were equally allowed to read through the instructions and fill the questionnaire as required. The instrument was collected on the spot after completion and all copies given out were retrieved.

The weighted responses on the questionnaire were structured on four point of modified Likert Scale of Strongly Agree (SA = 4 points), Agree (A= 3 points), Disagree (DS= 3 points) and Strongly Disagree (SD= 1 point). However, any items with a mean score of 2.50 and above were regarded as agreed with the statement while a mean score of 2.50 below indicated disagreement of the respondents with the statement. The raised research questions were analyzed using mean and a standard deviation while the hypotheses were analyzed using t- test statistical tool and tested at 0.05 levels of significance.

Result

Research Question One

What are the perceived courses of mathematics phobia among secondary school students in Ijumu Local Government Area?

Table 1: Perceived Causes of Mathematics Phobia among Secondary School Students in Ijumu Local Government Area

SN	ITEMS	Mean (x)	SD	Remark
1	Pear group influence on bed notion about mathematics cause phobia.	3.21	0.63	Accept
2	Misguided about the senior students that mathematics is a difficult subject cause's phobia.	2.63	0.80	Accept
3	Too much assignment given scared me away from mathematics	2.68	0.80	Accept
4	Placing mathematics in the afternoon on the schools' time table makes me loose interest.	3.00	0.68	Accept
5	Lack of encouragement form mathematics teacher makes me loss interest.	2.74	0.81	Accept
6	The classroom is not conducive for learning mathematics.	2.80	0.71	Accept
7	Inappropriate reading materials in mathematics causes phobia.	2.84	0.74	Accept
8	Abstract nature of teaching mathematics leads to phobia.	3.00	0.68	Accept
9	Nonuse of instructional materials leads to phobia.	3.03	0.66	Accept
10	Inadequate counselling service on mathematics promote phobia.	3.00	0.68	Accept
11	General negative of students attitudes lead to phobia.	2.90	0.71	Accept
12	Inadequate mathematics background leads to phobia.	2.72	0.86	Accept
13	Inability to solve mathematics problems lead to phobia.	3.10	0.65	Accept
14	Inability to arrive at the correct answer leads to phobia	2.93	0.67	Accept
15	Poor cordial relations between teacher and students lead to phobia.	2.68	0.80	Accept
16	Parents misguided on mathematics leads to phobia.	3.00	0.68	Accept
17	Non-systemic presentation of mathematics leads to phobia.	2.74	0.81	Accept
18	The use of abusive words by mathematics teachers leads to phobia.	3.03	0.66	Accept
19	Poor mathematic background causes phobia.	2.80	0.71	Accept
20	Long procedures of solving mathematics problems leads to phobia.	3.21	0.63	Accept
	Grand total	2.90	0.72	Accept

Table 1 shows that all the 20 items were above the bench mark of 2.50, this implies that all the questions rated as possible causes of mathematic phobia among the students were accepted. Hence the grand mean score was 2.70 with the standard deviation of 0.72 which is greater than criterion mean of 2.50

Hypothesis one

There is no significant difference between male and female students on the perceived causes of mathematics' phobia

Table 2: T-test analysis on the perceived causes of mathematics phobia among secondary school students based on gender.

Gender	No	ẋ	SD	DF	Cal-t value	Critical t-value	Dec
Males	60	86.84	4.598	118	0.70	1.96	Accepted
Females	60	87.57	5.735				

Table 2 shows that there is no significant difference in the mathematics phobia among male and female students in Ijumu Local Government Area of kogi state, because the calculated t-value of 0.70 is less than the critical t-value of 1.96 at 0.05 significance levels. Therefore the hypothesis which says that there is no significant difference between male and female mathematics phobia is accepted.

Hypothesis two

There are no significant differences between JSS and SSS students on the perceived causes of mathematics phobia.

Table 3: T-test analysis on perceived causes of mathematics phobia based on seniority level.

Class	No	ẋ	SD	DF	Cal t value	Critical t – value
JSS	60	87.48	5.63	118	0.71	1.96
SSS	60	86.82	4.586			

Table 3 shows that there is no significant difference in the mathematics phobia among the junior secondary school students and Senior Secondary School Students in Ijumu Local Government Area. The calculated t- value of 0.71 is less than the critical t-value of 1.96 at 0.05 significant levels. Therefore the hypothesis which says that there is no significant difference between junior and senior secondary school students on the causes of mathematics is accepted.

Discussion

The study revealed that majority of the secondary school students in Ijumu Local Government develop phobia towards mathematics for just no cause which invariably affect their studies habit in mathematics and negatively affects their academic performance in mathematics. This commensurate Hornigold (2015) who was recounting from experience remarked that one's involvement in the marking of mathematics in the WASSCE is enough to get any one sorrowful at the state of mathematics in secondary schools. He stated that candidates would even submit their answer scripts without writing anything in them; some merely recopy the questions; while a high percentage of those who try to write something are mostly involve in cheating.

The study revealed no significant difference between male and female students on the perceived causes of mathematics phobia. Both genders are prone to fear in mathematics. This is concomitants with Gafoor and Kurukka (2015) findings on why high school students feel that, mathematics is difficult and found that both male and female students do fear mathematics the same way. Rajendra (2020) equally found no significant difference in both male and female phobia in mathematics through his study on mathematics phobia; causes, symptoms and way to overcome. However, Nwoke and Chaelers (2019) on their findings on causes and solution of mathematics phobia among secondary school students found a slight difference in male and female fear in mathematics through the adjusted mean which is contrary to this study's findings.

The study revealed no significant difference among senior and junior students towards mathematics phobia. Both the junior and the senior classes do fear mathematics which collaborate with Capuno et al (2019) on attitude, study habit and academic performance of junior high school students in mathematics and could not find any significant difference between the junior and higher school

students as fear for mathematics and as well as Bashir, Muhammed and Umar (2016) findings on mathematics phobia among senior secondary school students and found that both the junior and senior students do fear mathematics despite prior knowledge on the implication for further their studies in higher education. The senior students had a slight high in the mean score which equally collaborate with Geary (2013) study on early foundations for mathematics learning and their relations to learning disabilities that the senior students have less fear for mathematics than the junior students.

The study revealed that inadequate mathematic background leads to phobia among the students which was affirmed by Mahato, Morgan and Earnest (2019) findings on early grade Mathematics in Nepal on steps towards stronger foundation and as well as Kolawole (2007) findings on cognitive entry grade as predictor of students' academic performance in mathematics in Nigeria

The result equally revealed that mathematics phobia cause mathematics avoidance among the secondary school students in Ijumu Local Government Area which is in line with Thomson (2005), Ihendinihu (2013), Kaur (2017), Khing (2016) and Kurumeh and Iji (2009) who on their separate findings revealed that, when a highly mathematics -anxious student performs disappointingly on a mathematics question. This could be due to mathematics phobia, or lack of competency in mathematics that makes the students to avoid the subject. This assertion was determined by administering a test that becomes increasingly more mathematically challenging, when (Khing 2016) particularly noticed that even highly mathematics-anxious individuals did well on the first portion of the test measuring performance. However, on the latter and more difficult portion of the test, there was a stronger negative relationship between accuracy and mathematics anxiety.

According the finding in this study, the students just create anxiety for mathematics for just no cause and decided to be avoiding the subject which is in line with Boaler and Dweek (2016) finding on mathematics mindset; understanding students potentials through creative mathematics, inspiring message and innovative teaching and found that majority of his respondents, that is 76.7 per cent of them do fear mathematics for just no cause, while Graves (2018) on his study on teacher knowledge and perception of mathematics disability and dyscalculia affirmed the same finding as well as(Hornigold 2015)

Counselling Interventions

Knowledge is a familiarity, awareness, of understanding of someone or something such as facts, skills that could be transfusing from one person to another and its start from birth to grave, and there is no one that is borne with certain area of knowledge that could not be changed, we acquire every things in live on earth, therefore, no students is boned to be good in one area and not to be good on another areas. The students orientations and attitude towards mathematics could be changed through adequate guidance and counselling services. This is in collaboration with (Nwoke and Cheals 2019) on causes and solution of mathematics phobia among secondary school students, who summed that student's orientation towards mathematics could be changed through appropriate counselling interventions

Undoubtedly, mathematics is not everyone's favorite subject at all levels of education even at the lower levels where it made compulsory. Some students have the feelings of tension and anxiety or fear toward mathematics and bothered not to strive toward improvement on it. Rajendra (2020) remarks that such negative feeling towards mathematics suffers student day by day and it can be difficult to shift from a mindset of failure to a more positive attitude. Different research shows that if teachers as well as the parents deal with the mathematics phobic student in time by different way to shift into positive mindset, it is not impossible. So many students may have suffered from mathematics phobia due to the result of several negative experiences and perception

in the past. It can be overcome by controlling anxiety, improving mathematics skills and developing positive attitude towards mathematics through adequate guidance and counselling services.

Interpersonal counselling program should be placed in the school where social interaction between the school and the community, the school and teachers, the teachers and mathematics teachers and between the mathematics teachers and the students. Through these, teachers-student relationship will exist which invariably enable the teachers to understand the students problem and students fear for mathematics would be less if they really understand their teachers.

Mathematics phobia could be reduced through Rational Emotional Therapy (RET) or through Behavioural Modification Therapy (BMT) thereby students' orientation and belief towards mathematics could be changed. This will work at best, by exposing the students through practical approach where they solve mathematical problems on their own, and the teachers stress the needs for mathematical process rather than mere arriving at solution. Mathematics curriculum should be broken down from topics into unit in sequential order. Application of ICTS in the teaching of mathematics should put in place and guided by the school counsellors. Through that, students' negative feeling for feelings for fear in mathematics would be reduced.

Mathematics teachers need to be counseled on the ways and manners of handling mathematics students, the teachers' approach can promote or mere phobia among the students. Counselling services should centered on teachers methods of teaching, teacher-student relationship, breaking down of mathematics concept into simple and understandable units, application of instructional materials to complement teaching, nonuse of abusive words on students, encouragement given to the students, using of negative and positive reinforcement appropriately, creation of mathematics enabling environment for learning, adequate methodology by starting from simple to complex, noting students' individual differences and mathematics background, reduction of long process in solving mathematics problems, provision of reading materials, allowing students participation in solving problem, application of modern facilities such as ICTS and the likes.

The school counsellors should organize seminars, workshops and mathematics exhibitions where the professionals should be invited to displace series methods of solving mathematics problems. Through that, mathematics would not be taught in abstract but through real life situation thereby, the fear or phobia in mathematics among the students would be reduced.

The general staff, the parents and other educational stake holders need to be counseled on mathematics. Periodical seminars and workshops should be organised focusing on how mathematics phobia could be reduced among the students

Conclusion

Despite the place accorded mathematics in the educational curriculum and the importance attached to its study at the levels of primary and secondary education, the students still create unnecessary phobia towards mathematics which has negative impacts on their academic performance. This fear in mathematics often lead the students to "bury" themselves before "death" hence they bothered not to study it and allow their faith to be determined by procrastination of mathematics been a difficult subject which is not actually what it is in the real sense. All these hallucinations about mathematics could still be overcome through adequate counselling programs in all schools

Recommendations

The study recommends that:

Guidance and counsellors should be posted to all schools and they should be allowed to operate within the code and ethics of counselling.

There should be guidance and counselling unit in all schools to offer orientation, reorientation, and re-direct students attitude towards mathematics thereby been exposed to the usefulness of mathematics not only on the academic sphere but in everyday life activities by practicing mathematics every days

Mathematics should not be overloaded both in the school curriculum and on the school's time table. The mathematics periods should be placed in the morning when the students are still fresh and at alert for study. This will reduce phobia in them.

Interval class-room counselling should be undertaking by the mathematics teachers and the school counsellors. One to two minutes counselling during morning assembly and during the period of teaching mathematics would be of a good help.

Apart from given the students' encouragement, supportive environment for learning mathematics, the curriculum should not be overloaded and the place in the school time-table should be morning periods when the students' memories would still be at alert. All these are to avoid boredom, fatigue, fear and phobia in mathematics.

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