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PROBLEMS ASSOCIATED WITH TEACHING AND LEARNING OF MATHEMATICS IN AGUATA L.G.A OF ANAMBRA STATE

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ABSTRACT

The study examined the problems associated with teaching and learning of mathematics in secondary schools in Aguata local government area of Anambra state. The study was a descriptive survey. The population of the study was drawn from the fourteen communities that make up the local government area that have public and private secondary schools. The population of the study was 4,150 respondents. After ten percent (10%) sampling, the number was reduced to 415 respondents made up of 135 teachers and 280 students. The instrument for data collection was 16-item questionnaire. The data was collected using the four-point rating scale and were analyzed using mean and standard deviation (SD) scores and z-test statistics. The findings of the study revealed that anxiety, phobia, lack of instructional materials, adequate training for teachers, lack of curriculum pacing and sequences and poor methodology were problems often associated with the teaching and learning of mathematics. On the other hand, transitional challenges, cultural bearing of the content, inability of teachers to develop and adopt appropriate methods of teaching mathematics symbols and concepts and how to stimulate and make mathematics lessons interesting, friendly and pleasant, possess a lot of challenges to the study while suggestions on how to improve on mathematics teaching through staff training and development programs for teachers and collaborative learning amongst other findings were mentioned. Conclusions, recommendations and contributions to knowledge were made on the way forward.

Keywords*:* Problems, Associated, Teaching, Learning Mathematics.

Introduction

There is no organization whether big or small without problems. It can be the problems of organization and management, training and development, recruitment, instructional materials and equipment, physical facilities or personnel welfare. In schools, it can be how to impart knowledge and skills to the students or how to meet up with the student's needs, expectations and inspirations or how to maintain classroom discipline and general school administration.

In teaching and learning, there are a lot of problems facing classroom teachers in

attempt to deliver teaching and learning. This is because each discipline or course or subject has its own peculiar problems associated with the main trust of this paper has its own problems. It ranges from teacher's qualifications to lack of knowledge and skills of the subject amongst other problems. The question now Is, how do we solve these problems in this age of science and technology in where Information and Communication Technology (I.C.T) and Artificial Intelligence (AI) has revolutionalize the educational system. This brings us to the issue of what mathematics is all about.

Mathematics is regarded as the king of all subjects. According to Udegbe (2018), it is an abstract representational system used in the study of numbers, shapes, structure, change and the relationships between these concepts. To Odigwe (2020), it is a person's ability to count, calculate and use different systems of mathematics at different levels. Without the knowledge of it, a student aspiring to read any course in any of the tertiary institutions in Nigeria will not be admitted.

It is in realization of its importance of it in evolution of science that the Federal Republic Nigeria through the National Policy on Education (2013) (revised) made it one of the core subjects that a student must pass at senior secondary school certificate examinations (S.S.S.C.E). A lot of incentives has been offered to teachers of this subject as a way of motivating them to put in their best in teaching and learning of mathematics. This include; scholarship hadzard allowance, study leave with pay, free accommodation and organization of in-service training, seminars, conferences and workshop for mathematic teachers. All in a bead to make them more committed and dedicated to their duty and responsibility while teaching the subjects in the classroom.

Unfortunately, these efforts to motivate them have not yielded the desire results it is envisage to achieve due to a lot of problems usually associated with its teaching and learning. According to Okpara (2021), anxiety couple with development of aversion and phobia to mathematics based on negative experience the students acquired over the years which makes it difficult for students to engages with the learning of mathematical symbols and concepts. This means that how the teachers interact with the student in the classroom can easily invite or repel the learner. It is therefore expected that the teacher's attitude and personality should be a key factor that should motivate the students to learn because the teacher as a role model should be sympathetic when something is going wrong in the class as he teaches friendly, resourceful, loving, show a lot of understanding to the student's needs, accepting him for what he is, warm, firm, sincere, tolerance and flexibility in course of his teaching (Edoumiekumo and Nenbee; 2017).

Another problem usually associated with the teaching and learning of mathematics as a subject in schools is the issues of lack of conceptual understanding of what mathematics is all about. This is because traditional approach to mathematics instruction, emphasize memorization more than practical procedures and formulators

over developing a conceptual understanding of underlying mathematical principles, concepts and symbols. This lead to students struggling to apply mathematics education in real world contex.

Njoku (2019), associated the problem of teaching mathematics in schools to teacher's inability to follow curriculum pacing and sequencing. The pace of covering mathematical curriculum is often too fast for an average student to understand, leaving gaps in student's knowledge and understanding of the skills needed to grasp mathematical symbols and concepts. This is because the sequence of the topic may not align well with how students learn and built connections of what mathematics is all about in real world.

The methodology adopted by the mathematics teacher also creates a lot of problems to the student. According to Njoku (2019), teachers emphasis on traditional lecture-based method then active based methodology or engaging teaching methods can impact student's attitudes negatively. Therefore there is need for mathematics teachers in secondary schools to varies his methodology of teaching and teaching techniques. Emphasis should be more on the use of instructional materials and equipment. This is where the teacher's competency, demonstration ability, knowledge, teaching skills and enthusiasm is highly needed.

Genuine passions for mathematics are more likely to cultivate positive student's attitudes towards the subject. Therefore relevance and applicability of the subject are more likely to have a positive attitude towards if they can see its relevance and practical applications in their lives and future careers. This means teachers over reliance on lecture method approach, role practice and passive learning approach can fail to engage students cater to different learning styles. More interactive learning, hands-on learning and discovery based on different approaches are often needed in a situation like this (Okpara; 2021).

Equity and access issues have been attributed to be a problem associated with the mathematics education in Nigeria. According to Aremu and Mpa (2020), certain demographic factors both known and unknown such as student's socio-economic background of their parents who are from low-income group or minority groups, faces systematic barriers that tend to limit their access to high quality of mathematics education and support as a result of resource constraints. This means that when a school, parent and teachers lacked sufficient funds to purchase instructional materials (textbooks, flash cards, pictorial materials for demonstration and illustrations, models or charts or cardboard, pencils, crayon, chalkboard and other resources needed to effectively teach mathematics), students will face transitional challenges.

As Njoku (2019) noted, transitional problems in student's learning of mathematics because it left them often struggling with the increasing complexity and abstraction of mathematics as they progress through the grades, leading to difficulties in making smooth transition to mathematics symbols, concepts abstractive nature. It is therefore necessary that mathematics teachers should be hard

working, ready to make sacrifices, initiate innovations and adopting appropriate mathematics lessons. In other words, the teacher needs to make his lesson stimulating, interesting and pleasant by organizing it in such a way that the students will have pleasure in learning it. This is because poor background and comprehension of mathematics, determines how the child's experience or horizon will be widened as good quality instructional materials helps to concretized what is been taught (Udensi and Oteh; 2023).

Finally, cultural bearings of the contents tend to create problems for students learning and studying of mathematics in schools as they cannot experience what is taught to them to real life situations; outside the school. According to Nwaru (2008), the mathematics curricula is such that topics taught are not elements of the students indigenous culture. That is why some mathematics topics such as computer language, vectors, correlation coefficient correlation, polynomials, abstractions, substitution, indices, standard deviation scores, partial fraction, proper and improper fractions, simple interest, determinants, reprogression, charts, bar chart and matrix multiplication, are difficult to understand and learn by students because they cannot either experience them outside the school environment or relate them to any of their cultural elements.

Addressing these problems will requires a multi faceted approach involving curriculum reforms, improved teacher's training, evidence-based instructional strategies and addressing equity and access issues, ongoing research and collaboration between educators, policymakers and the mathematics community are essential to improve the teaching and learning of critical subject. Emphasis therefore should be on growing the mind sets of students towards the study and learning of the subject, fostering the mind set of students to know that having mathematics ability can improve students efforts and practice, helps to counter the debilitating efforts of man's anxiety or phobia for mathematics. Teachers should explicitly teach and model student's mind sets towards the study of students.

According to Odogwuetal (2017), active and engaging instruction using active learning strategies such as problem solving, hands on activities, group work and discussion will helps keep students engaged and reduces mathematics anxiety. This will shifts focus from passive memorization to active participation. This can be done by reducing timed tests and pressure by emphasing on time test and high-stakes assessment which can alleviate the performance pressure that tend to exacerbates mathematics anxiety. Allowing more flexible pacing and alternative assessment methods can be beneficial in solving the problems associated with the study, teaching and learning of mathematics.

Another way toward solving the problems associated with mathematics is by Integrating technology into the learning of mathematics. Incorporating technological know-how such as educational software, simulations and virtual manipulations can make mathematics more accessible and interactive while also helping to reduce the

fear of making mistakes in front of members of his peer groups. According to Nwaru (2008), focusing on developing conceptual understanding rather solely on memorizing procedures, will help students feel more relax, more confident and more comfortable in their ability to reason through mathematical problems.

Through collaborative and communication efforts, students will be provided with the opportunity to work together as a team, expand their thinking and learning skills, learn from their peers and help reduce isolation and self-consciousness associated with the mathematics phobia, uncertainty and anxiety. According to Marae (2011), this can be done through personalized and differentiated instruction by tailoring instructions to meet the unique needs and learning styles of each student which if implemented will aid build their confidence and reduce mathematics fear.

There is therefore the need to highlight real word applications to the study and learning of mathematical concepts through fostering a supportive classroom environment by creating a classroom culture that values efforts and makes students feel safe to take risks, make mistakes, learn from it and improve on it by engaging with their peers.

In a nutshell, implementing these teaching methods, teachers and educators can creates a more positive and supportive learning environment that addresses the remote and immediate causes of student's developing phobia and anxiety and empowers students to developing a deeper appreciation and confidence in their mathematical abilities .

Statement of the problem

The attitude of most students in primary, secondary and even tertiary institutions towards the study and learning of mathematics is disheartening to many of them but to a few of the subject is interesting, meaningful and challenging. A major reason for this can be attributed to lack of instructional methodology, materials and instructional techniques uses by teachers on one hand and the too theoretical and simplistic nature of many text books in the area on the other hand. To remove the bridge and the gap existing in its teaching and learning as a subject and make students to become mathematics friendly and subsequently apply its logic, principles, concepts and theories towards solving mathematics problems and challenges through step by step method of teaching is what this study is set out to do with a view to improving both the students and teacher's problems associated with the subject.

Purpose of the study

The main purpose of the study is to examine the problems associated with teaching and learning of mathematics and its challenges in Aguata local Government Area of Anambra State.

Specifically, the study, sought to;

- Identify the problems associated with the teaching and learning of mathematics subject.
- Find out the challenges associated with teaching and learning of mathematics subject.

- Ascertain ways for improving the teaching and learning of mathematics subject.

Research Questions

The following research questions guided the study.

- What are the problems associated with the teaching and learning of mathematics subject?
- What are the challenges associated with the teaching and learning of mathematics subjects?
- What are the ways for improving the problems associated with the teaching and learning of mathematics subject?

Research Hypotheses

The following null hypotheses were formulated at 0.05 level of significance to guide the study.

Ho1, There is no significant difference in the mean rating of teachers and students on the problems associated with the teaching and learning of mathematics subject.

Ho2, There is no significant difference in the mean rating of teachers and students on the challenges associated with the teaching and learning of mathematics subject.

Ho3, There is no significant difference in the mean rating of teachers and students on the ways of improving the teaching and learning of mathematics subject.

Research Method

The scope of the study is Aguata local government area of Anambra state. The areas of stuly are the fourteen communities that make up Aguata local government area of Anambra state namely; Akpo, Achina, Uga, Igbo-ukwu, Isuofia, Umuchu, Agulu-Ezechukwu, Ezinifite, Ikenga, Amesi, Oraeri, Umuona, Nkpologwu and Ekwulobia the local government headquarter. The population of the study was drawn from two hundred and forty (240) public and private secondary schools in the local government area used for the study. The population is 4,150 respondents made up of 1,350 and 2,800 teachers and students teaching and learning mathematics in senior secondary school class III (SSS III) in the local government area. Ten percent of the entire population of the study was sampled using stratified random techniques. The sizes of the population of the study after randomization were 24 public and private secondary school, 135 teachers and 280 students. The total population size of the study is 415 respondents. The 4-point type rating scale of Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (D) 2 points and Strongly Disagree (SD) 1 point was used for the study. A 2.50 average point is regarded as accepted while any point below 2.49 was rejected. The study was a descriptive survey research. A-16 item questionnaire was constructed by the research titled "Problems Associated with Teaching and learning of Mathematic Questionnaire (P.A.T.L.M.O) to elicit information about the study. The instrument was validated by three experts in

AJEMATES
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the department of mathematics and an expert from the department of Educational Administration and Planning. The comments, suggestions and criticism were used to improve the quality of the final draft of the instrument.

Copies of the questionnaire were administered to the respondent by the researcher who waited and collected the filled questionnaire from the respondents. The reliability test was trial tested outside Aguata local government to Awka south local government area of Anambra State because they possess the same characteristics. This was done to ensure the reliability of the instrument using Cronbach alpha method. The result of the coefficient was 0.74. This shows that the instrument was reliable and could measure what it was supposed to measure. The research questions were answered using mean score and standard deviation scores (SD) while the three null hypotheses was accepted as not significant if the value of calculated value is less than the critical value. z-test score will be used to test the three mill hypotheses.

Presentation of Results

Research Question 1: What are the problems associated with the teaching and learning of mathematics subject?

Table 1: Mean responses on the problems associated with the teaching and learning of mathematics subject.

		Teachers: N = 135			Students: N = 280		
S/N	**Item Questionnaire**	**X̄**	**SD**	**Dec**	**X-**	**SD**	**Dec**
1	Anxiety and phobia.	2.62	0.96	A			
2	Lack of conceptual understanding of what mathematics is all about.	2.66	0.69	A	3.04	0.08	A
3	Inability of mathematics teachers to follow curriculum pacing and sequencing so as to align it to their real world.	3.00	0.74	A	3.07	0.75	A
4	Poor methodology, equity and access.	3.07	0.76	A	3.00	0.69	A
5	Lack of instructional materials.	3.07	0.76	A	3.10	0.83	A
6	Lack of qualified teachers and staff development program.	3.14	0.81	A	3.10	0.74	A
	Grade mean	**2.92**	**0.78**	**A**	**2.55**	**0.63**	**A**

Table 1 revealed the opinions of respondents (teachers and students) on problems associated with the teaching and learning of mathematics. The ratings are 2.62, 2.66, 3.00, 3.01, 3.07 and 3.14 with the standard deviation (SD) score of 0.96, 0.69, 0.74, 0.76, 0.76 and 0.81 with grand mean score of 2.92 and SD score of 0.78. The students on the other hand rated the same items 1-6, 3.00, 3.07, 3.00, 3.10, 3.10 with standard deviation (SD) of 3.04, .07, 3.00, 3.10, 3.10 with standard deviation (SD) of 0.80, 0.75, 0.69, 0.83, 0.74 with the grand mean score of 2.55 and 0.63 meaning accepted.

AJEMATES
African Journal of Educational Management, Teaching and Entrepreneurship Studies
VOL.13 (1), September-December, 2024 https://ajemates.org

Research Question 2: What are the challenges associated with the teaching and learning of mathematics subject?

Table 2: Mean responses on the challenges associated with the teaching and learning of mathematics subject.

S/N	Item Questionnaire	Teachers.			Students.		
		X̄	SD	Dec	X-	SD	Dec
7	Transitional challenge posed by student's inability to align it to real world situations.	3.00	0.77	A	3.04	0.76	A
8	Cultural bearing of the contents as they cannot relate it to people's ways of life.	2.77	0.78	A	3.11	0.74	A
9	Teacher's inability to make his lesson stimulating, interesting, pleasant and interactive.	3.04	0.74	A	2.65	0.71	A
10	Teacher's inability to make his lesson stimulating, interesting, pleasant and interactive.	3.05	0.85	A	3.14	0.85	A
11	Lack of funds to purchase the needed instructional materials.	2.92	0.59	A	3.06	0.89	A
	Grade mean	**2.95**	**0.74**	**A**	**3.00**	**0.79**	**A**

Table 2 revealed that items 7-11, ratings by teachers and students are high. The teachers rated it 3.00, 2.77, 3.04, 3.05 and 2.92 with standard deviation score of 0.77, 0.78, 0.74, 0.85 and 0.59 with grand mean score of 2.95 and SD score of 0.74. The students rated the same items 7-11 high with mean score of 3.04, 3.11, 2.65, 3.14 and 3.06 and SD mean score of 0.76, 0.74, 0.71, 0.85 and 0.89 with the grand mean score of 3.00 and SD score of 0.79. This means accepted.

Research Question 3: What are the ways for improving the problems associated with the teaching and learning of mathematics subject?

Table 3: Mean responses on the ways for improving the problems associated with the teaching and learning of mathematics subject.

S/N	Item Questionnaire	Teachers.			Students.		
		X̄	SD	Dec	X-	SD	Dec
12	Improved teacher's training, growth and development.	3.03	0.70	A	3.07	0.71	A
13	Using evidence based instructional materials and equipment.	3.08	0.87	A	3.00	0.69	A
14	Introducing collaboration between policy makers and mathematics community.	2.77	0.78	A	2.85	0.85	A
15	Engaging in active learning instruction using active learning strategies.	2.92	0.59	A	3.10	0.83	A
16	Integrating technology and collaborative communication into the learning of mathematics.	2.66	0.66	A	3.07	0.71	A
	Grade mean	**2.89**	**0.72**	**A**	**3.01**	**0.75**	**A**

AJEMATES
African Journal of Educational Management, Teaching and Entrepreneurship Studies
VOL.13 (1), September-December, 2024 https://ajemates.org

Table 3 revealed that items 12-16 were rated high by both teachers and students. The teacher's ratings are 3.03, 3.08, 2.77, 2.92 and 2.66 with standard deviation score of 0.70, 0.87, 0.78, 0.59 and 0.66 with grand mean score of 2.89 and 0.72. The students on the other hand rated the same items 12-16, 3.07, 3.00, 2.85, 3.10 and 3.07 with standard deviation score (SD) 0.71, 0.69, 0.85, 0.83, 0.71 with grand mean score of 3.01 and SD score of 0.75.

Hypothesis *1:* There is no significant difference in the mean ratings of teachers and students on the problems associated with the teaching and learning of mathematics subject.

Table 4, summary of z-test analysis on the problems associated with the teaching and learning of mathematics subject.

Source	N	$\bar{X}$	SD	Df^0	z-cal	z-val	Lev	Dec
Teachers	135	2.92	0.78					
				413	0.06	1.96	0.05	A
Students.	280	2.55	0.63					

Table 4 indicates that the calculated z-value of 0.06 at 413 degree of freedom and at 0.05level of significance is less than the table value of 1.96. Science the z-calculated value is less than the table value, the null hypothesis is accepted. Therefore, there is no significant difference in the mean ratings of teachers and students on the problems associated with the teaching and learning of mathematics subject.

Hypothesis *2:* There is no significant difference in the mean ratings of teachers and students on the challenges associated with the teaching and learning of mathematics subject.

Table 5, summary of z-test analysis on the challenges associated with the teaching and learning of mathematics subjects.

Source	N	$\bar{X}$	SD	Df^0	z-cal	z-val	Lev	Dec
Teachers	135	2.95	0.74					
				413	-7.96	1.96	0.05	A
Students.	280	3.00	0.79					

AJEMATES
African Journal of Educational Management, Teaching and Entrepreneurship Studies
VOL.13 (1), September-December, 2024 https://ajemates.org

Table 5, indicates that the calculated z-value of -7.96 at 413 degree of freedom and at 0.05 level of significance is less than the table value of 1.96. Since the z-calculated value is less than the table value, the null hypothesis is accepted. Therefore, there is no significant difference in the mean ratings of teachers and students on the challenges associated with the teaching and learning of mathematics subjects.

Hypothesis *3:* There is no significant difference in the mean ratings of teachers and students on the ways to improve the teaching and learning of mathematics subjects.

Table 6, summary of z-test analysis on the ways to improve the teaching and learning of mathematics subjects

Source	N	$\bar{X}$	SD	Df^0	z-cal	z-val	Lev	Dec
Teachers	135	2.89	0.72	413	-0.02	1.96	0.05	A
Students.	280	3.01	0.75					

Table 6 indicates that the calculated z-value of -0.02 at 413 degree of freedom and at 0.05 level of significance is less than the table value of 1.96. Since the z-calculated value is less than the table value, the null hypothesis is accepted. Therefore, there is no significant difference in the mean ratings of teachers and students on the ways to improve the teaching and learning of mathematics subject.

Discussion of Findings

The findings of this study shows that the problems associated with teaching and learning of mathematics in schools include anxiety couple with development of aversion and phobia to mathematics, due to not engaging the students enough by their teachers, lack of funds to purchase instructional materials and equipment needed in school, lack of conceptual understanding of mathematics symbols, concepts and skills and inability to align or follow curriculum pacing by teachers. Others are poor methodology, equity and accessibility, poor use of instructional materials, students and teachers attitude towards the teaching and learning of the subject and lack of qualified teachers, teacher's growth and development, training and knowledge of the subject. The findings are in line with what Nwaru (2008), Marae (2011), Okpara (2021) and Edoumiekumo and Nenbee (2017) stated in their respective work. This shows that secondary school mathematics teachers should avoid these problems for students to develop interest in the subject.

Another finding of the study is that students face the transitional challenge of not being able to align the teaching of mathematics to real life world situation.

Secondly, that due to cultural bearing of the contents they cannot relate what they are being taught to the present day realities and teachers inability to make his lessons interacting, stimulating, interesting and pleasant so as to meet the needs and expectations of students as well as how teachers can use and appropriate mathematics concepts, methods and symbols to stimulate learning as well as lack of funds to purchase the needed instructional materials. This finding is in line with Njoku (2019), Okpara (2021) and Aremu and Mkpo (2020) that these are challenges teachers face in the course of teaching and learning.

Curriculum reforms, improve teacher's training, growth and development through organization of seminars, conference workshops, in-service training, using evidence-based instructional materials and equipment, introducing collaboration between policymakers and mathematics community, engaging in active learning instruction using active learning strategies and integrating, incorporating and collaborative communication into the learning of mathematics are ways of improving the teaching and learning of mathematics as a subject. This finding is in line with Nwaru (2008), Njoku (2019) and Udensi and Oteh (2023) observation that students can remove anxiety and phobia by teachers and government policy makers. All the tested hypotheses return no significant difference meaning acceptance to all the items 1-16.

Conclusion

Mathematics is the king of all sciences. The teaching and learning of the course can only remove anxiety and phobia among students if all the problems discovered in the cause of the study identified and challenges posed to the teachers and students tackled head long, there will be remarkable improvement and teaching and learning of the subject. If these problems and challenges are tackled, students will be in better position to withstand the challenges posed by the learning of the subject.

Recommendations

Based on the results of the study, the following recommendations were made:

1. Efforts should be directed to government and community to enhance public awareness on the problems facing the teaching and learning of mathematics in schools.
2. Government should from time to time collaborate with Nigerian Union of Teachers (NUT) and other related science agencies to organize seminars, conferences, workshops, in-service training and in-house training for teachers of mathematics so as to improve their knowledge and skills about the course.
3. Encourage teachers to improve themselves academically in form of scholarship, study-leave with pay and other incentives.
4. Educate the teachers on the challenges posed by teaching and learning of mathematics and the

strategies to adopt in order to improve on it.

5. Government should make funds available for the purchase of relevant instructional materials and equipment so as to remove mathematics phobia and anxiety among students.

Contributions to knowledge

Learning can only take place where there is relatively peaceful classroom for a student to utilize his or her full potentials. This study therefore will serve as a base for the identification, solving problems associated with the teaching and learning of mathematics as a subject and how these problems and challenges can be improved upon. It will also serve as a tool/strategies for public and private schools' mathematics teachers and students to know how to enhance the knowledge and skills of the subject as well as serve as a spring board for future research.

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