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**PROBLEMS AND FACTORS AFFECTING THE TEACHING OF MATHEMATICS  
IN SECONDARY SCHOOLS**

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**ABSTRACT**

The purpose of the study is to find out the problems and factors affecting the teaching of mathematics in secondary schools in Awgu Local Government Area of Enugu State. In the course of study, the researcher formulated five research questions to guide the study. The population for the study was 46 mathematics teachers in the fourteen secondary schools in Awgu Local Government Area. The instrument for data collection was structured questionnaires developed by the researcher and distributed by hand to the mathematics teachers. The reliability of the instrument was measured using Cronbach Alpha, which was used to establish the index of reliability of the instrument used. The data collected were analyzed by use of mean and standard deviation. From the analysis of the result, the following findings were observed; most of the schools have insufficiency of teachers, lack of textbooks, lack of incentives for the mathematics teachers, lack of instructional materials and non-existence of mathematics laboratory. The educational implication and recommendations were made.

**KEYWORDS:** Mathematics, Secondary schools, Problems, Factors, Teaching

## INTRODUCTION

The formation of the Universe by the Creator was numbered ranging from Day I to Day 6, 7 and the world was completed including other things that exist in it. Applications of numerical values were first applied by the nature, introducing mathematics into the human life proving that mathematics is the science of number, also bedrock to all other sciences. Therefore, world, nation, state, society or an individual without mathematics rather exists to no avail in technological development. Mathematics as a science of a number counts very important in educational system and development our country, Nigeria and world at large, deserves proper attention by the federal government, state government, teachers, principals, ministries of education, supervisors and monitoring teams including students themselves to ensure adequate and effective understanding of mathematics.

Notwithstanding, the poor performance of students in mathematics in our educational system since the study and the practice of mathematical work in the school system, cannot be over emphasized. It has been generally observed that the enrollment of students in higher institutions keep deteriorating because of the failure of students to credit mathematics in their senior school certificate examination (SSCE). It was observed by the research that in 2006 admission, 11 students were applied for mathematics education while 2 students were applied for industrial mathematics at Ebonyi State University (EBSU). The researcher was not satisfied with the figure he saw, he further to go through the details on the performance of students on West African Examination Council (WAEC) starting from 2007 to 2010. On August 20, 2010 by 13:4933pm, it was observed that only 24.94% of candidates who sat for the May/June 2010 West African Senior school Certificate Examination (WASSCE), made five credits in mathematics including English Language representing 337071 of the 1278843 candidates. The result was released by Dr. Iyi Uwadie. The details of the results are shown below. In 2010, 560974 (41.50%) made credit in mathematics. In 2009, 25.99% made credit in mathematics. Then 2008, 13.76% made credit in mathematics. Therefore, in 2007, 22.54% made credit in mathematics.

After observing all these performance of students that are studying mathematics, it pains the writer; such triggered him to investigate into the problems encountered by the teachers in teaching the subject “mathematics”. The researcher aims at finding out the problems of teaching mathematics and solution to it. Viewing the importance of mathematics, it cannot be laid down. In the words of Jegede (1984), the importance of mathematics education in Nigeria’s education system and the Nations technological development has been recognized. Agreeing with Ezeilo (1985), noted that there can be no real development technologically

without a corresponding development in mathematics both as conceived and practiced. While Kline (1984) noted that progress of science could be determined by the extent to which Mathematics has entered into-fits method and content.

Mathematics according to Aminu (2005) is not only the language of science, it is the essential nutrient for thought, logic, reasoning and therefore progress. It is a systematized, organized and exact branch of science. It is a creation of human mind, concerned primarily with ideas, processes and reasoning. However, despite the importance of mathematics in Nigeria education, the students continue to deteriorate year after year and in turn lead to school dropout, low enrollment in mathematics as course of study in our higher institutions into colleges of Education, Polytechnics, and Universities.

Recounting from an experience, Adeniyi (1988) stated that one's involvement in marking of mathematics for WAEC is enough to get any one sorrowful at the state of mathematics in Nigerian secondary school today. Many candidates according to her submit their answer scripts without writing anything in them. Some merely recopy the questions, while a high percentage of the researcher was in the secondary school, boys and girls do ask this.

Although, the previous works of people several reasons have been proffered for the high failure rate in mathematics. According to Adeniyi (1988) the cause of the wide spread low level performance in mathematics of secondary school students could be largely ascribed to mechanical and uninteresting teaching devoid of understanding of the real meaning of mathematical concepts. The problems of teaching mathematics thus; problems of trained mathematics teachers, problems of instructional materials, lack of mathematical laboratory, problems of methodology, problems of expatriate teacher, problems of textbook, societal problems, lack of incentive, problems of classroom, problems of time and problem of language. The researcher is going to investigate into the problems on how it affect teaching in students and proffer solution to it, in order to promote high productivity in teaching and learning of mathematics in our educational system.

### **1.1 STATEMENT OF PROBLEM**

Mathematics has been in a core curriculum (compulsory subject) in our secondary schools, this has made students to be studying it by force even when they are not interested as one cannot further studies in higher institution in any course without at least a pass in mathematics. Students study it with grudges in mind, if it were possible for them to delete mathematics from school curriculum, they would have done that.

Some of the students implore the use of machinery (malpractices) to write their SSCE (to pass by all means)

Notwithstanding, the incentive the governments and private bodies created for the promotion of mathematics such as the mathematics teachers science allowance, accommodation MAN annual prize for best 25 mathematics secondary school students in Nigeria, Prof (Mrs) Bukunola Osibodu memorial prize in mathematics, the Afribank annual prize for the best four mathematics secondary school students in the country, the governor offers scholarship to the best mathematics degree students to study his/her masters in Overseas. Yet, students are not ready to study mathematics. The researcher began to ponder what might have caused the problems.

It is therefore, the wish of the researcher to find out:

- i. Whether the cause of the problems is as the result of lack of trained mathematics teachers.
- ii. Could it be as the result of no instructional materials in teaching mathematics?
- iii. Could it be the problem of textbook?
- iv. Could be it be as a result of lack of incentive for mathematics teachers.
- v. Could it be the periods allotted for mathematics in the school time table?
- vi. Could it be the problem of no mathematics laboratory?
- vii. Could it be as the result of the problems of methodology in teaching mathematics?

In this chapter, the researcher therefore subdivided the problems into the following headings for effective discussion under the following conceptual framework.

- i. Teachers qualification
- ii. Instructional materials
- iii. Methodology
- iv. Mathematics laboratory
- v. Lack of interest
- vi. Poor background
- vii. Problem of curriculum changing

## **LITERATURE REVIEW**

### **TEACHERS' QUALIFICATION**

Shortage of adequate trained and qualified science teachers especially mathematics teachers is one of the problems militating against effective teaching of mathematics. It is widely known that one cannot teach what one does not know or familiar with effectively. Eminent scholars and educationist are of the view that, mathematics and indeed science teachers in general should possess a good certificate in the area of study he wants to teach such as Degree or NCE qualification.

Nwana (1981) stated that science teacher should undergo a sound University study. Emphasizing the same point, Ezike et al (1991) stated that shortage of suitable qualified teachers will result in poor teaching which invariably will result in the production of incompetent students. Adewni (1982) portrays this; he said that there was shortage of qualified mathematics teacher in our schools. Usually, specialist from other related disciplines such as Physics, Chemistry, Biology, Integrated science etc are co - opted to teach mathematics. Most of these borrowed teachers of mathematics are not probably the basic knowledge needed in teaching the subject. They tend to make the subject more difficult as they neglect the subject concept and teach the topics they remember. They tend to follow textbooks without enough explanation of the concepts to the students. Nworgu (2003), portrays that most teachers do not possess the necessary competence or skill s in developing valid assessment instrument for evaluation of the behavioural out come in their domains.

To support the above opinion, Graig (1982) stated that no one can do job well unless he understands all the processes involved. Igwe (2003) stated that some teachers lack adequate cognitive knowledge of their subject area. Hence they are ill equipped to direct the students' right. That teacher should be retrained in the collage of education and university. This shows the need of good training for our mathematics teachers who want to be competent in their area of study. This can be achieved by regular workshop, seminars to up-date the knowledge and skills of the serving teachers.

Balogun (1982) stated that unqualified science is incompetent of drawing diagrams on the chalkboard, afraid of science laboratory hazards, thereby denying students of the application of cognitive domain. To support the above opinion, Nwani et al (2000) stated that most students enter mathematics laboratory with little or no knowledge of what they are expected to perform example plot a graph, construction of locus.

Shiri (1995) stated that inability band incompetent level of mathematics teacher is a disease that eats up the bones of demonstration mathematics teaching in our secondary schools. Mojoram (1994) opined that poor foundation given to pupils in the primary school is not easy to amend when the pupils enter into secondary school. In support, Abdulahi (1982) observed that the cause of poor enrollment in mathematics should be traced from primary to secondary school where the subject is not well taught or treated, due to lack of well trained teachers and facilities.

In support of the above, Ogbodo (1999) said the general por performance of students in mathematics in West African Certificate and other examinations in the country is due to the poor foundation for teaching the subject during the early years of children in primary and

post- primary schools. He suggested that in order to improve the knowledge of mathematics in schools, teachers should provide opportunity for their children to play with numbers in a meaningful way and also relate mathematics with life situations.

Lassa (1998) on his own said mathematics is widely acknowledged in Nigeria as a very important subject yet it is a subject many students dislike and fear. The results in external examinations are generally poor and few people pursue the subject after secondary school or after teachers training college. He stressed that poor enrolment and poor performance is due to inadequacy of teachers and students fear for the subject. This leads to the students getting poor examination result which does not qualify them for course in mathematics in higher institutions therefore; it is problems facing the parents and the society, the issue of inadequate and untrained teachers who claims to be a mathematics teacher in our secondary school.

### **INSTRUCTIONAL MATERIALS**

The importance of instructional materials (teaching aids) in the teaching learning process cannot be over emphasized, they are primarily used to supplement and aid the teacher in teaching mathematics, since mathematics is an abstract subject. It need a concretized materials to aids both the teachers and the students to comprehend the subject.

Agu (2002) noted that irrelevant instructional aids will no doubt result to the distraction of the pupils/students. She stressed that for instructional material or teaching aid to achieve the desired objective they must be effectively managed therefore, if instructional aides are not used to concretize a concept. Will bring about problem in teaching of mathematics especially in junior secondary school?

Nwanekwe (2002) stressed that when a chalkboard is not properly darkened will result to noise, the teacher s position when writing on the chalkboard may equally result noise leading to poor performance of students in mathematics fields of study.

Okorie (1998) posits that audio-visual aids helps drastically in the reduction of verbalization and repetition on the part of the teacher, adds variety to the teaching reinforces verbal messages in a multi-media format and equally gives the learners a direct contact with the realities of their immediate socio-physical environment.

According to Cobun (1985) learning through the sense of sight accounts for 83.6%, taste 1%, touch 15%, smell 3.5 and hearing 11%. Through these percentages may differ from one individual to another, the fact remains that the use of only one sense medium in learning and teaching of mathematics to great extent will retard learning and teaching of mathematics.

Abuba et al (1990) stated that poor performance in mathematics at secondary school level was as a result of ineffective use of instructional aids in the teaching of the subject matter

(mathematics) this statement is valid because, teaching of mathematics as well as other science subjects requires the use of instructional materials such as textbook, garboard, probability kits etc. that will help to concretize some of the concept in the subject area, which would otherwise appear vague to the students.

According to Ezike, (1991), the activities in laboratory, classroom can stimulate and maintain the interest of the students further stated that, when the truth of abstractions is shown in a concrete manner, then the students more readily. For instance in the teaching of circle geometry, we use geoboard and graph board for simultaneous equation etc. The problem of mathematics will be minimized at the greater rate.

Teaching aids are materials used by the teachers in the classroom, and in fact, the entire class uses them for the effective teaching and learning process. According to Piaget's observation of children's thinking insists that children's intellectual growth is augmentable when relationships are established between real world experiences and action. This gives credence to the need for concrete experience in teaching students in mathematics class.

The role of experience in concept formation by the school child is most important. And most often, the provision of concrete materials gives the child that experience that enables him to form his ideas. And when he lacks such concrete materials like teaching aids, his comprehension is greatly hindered. But unfortunately, one of the facilities most lacking in the Nigerian educational system is teaching aids.

Oji (1980) writing about his questionnaires on teaching aids said that more than half of the teaching aids available in the schools, consisted of black board instruments and only about a quarter were geometrical models. Blackboards rules in squares for graph work were met in 3 cases out of 101. In 10 cases out of 101 there is nothing in the way of the four basic teaching aids of geometrical models, wall charts, blackboard instruments and graphs.

## **METHODOLOGY**

In this chapter the design and methodology used in the execution of this research work are being discussed under the following headings: Design of the study, Area of the Study, Population of the Study, Sample and Sampling techniques, Instrument for data Collection, Validation of the instrument, Reliability of the instrument, method of data collection, method of data analysis.

## **DESIGN OF THE STUDY**

The design for this study is the survey research design. The survey research is the collecting and analyzing the data. A survey design was used in carrying out this study. It involves the use of questionnaire in collection of information on mathematics teachers of secondary

school and students of mathematics department in the secondary school. All the questions are geared on the factors and causes responsible for the problems that teachers are encountering in the teaching of mathematics in our junior secondary schools. The reason for choosing this type of design (survey) is because it is less expensive and saves times.

### **AREA OF THE STUDY**

The study was conducted in 14 secondary schools in Ikwo Local Government Area. The fourteen secondary schools are used for this research. The schools are: (i) Urban Community Secondary school, (ii) Model Comprehensive Secondary School, (iii) Community Secondary School Abina, (iv) Girls High School Agubia, (v) Community Secondary School Ndufu Alike, (vi) Unity Community secondary school Item Amagu (vii) Community secondary School Etam (viii) Community Secondary School Odomowo (ix) Community Secondary School Eka-Awoke (x) Premier Secondary School Ndiagu Amagu (xi) Community Secondary School Noyo (xii) Community secondary Ndiagu Echara, (xiii) Community Secondary school Omege (xiv) Community secondary school Nzashi. The area was chosen because of proximity and convenience for effective research work. The schools consisted of male and female teachers and co-educational schools in the area.

### **POPULATION OF THE STUDY**

The population of this study consisted of 50 mathematics teachers in all the secondary schools in Ikwo Local Government.

### **SUMMARY OF FINDINGS**

Based on the analysis carried on this research work, the researcher discovered the following that:

1. From the findings of the study in Table 1, it is obvious that the respondents strongly agree that insufficient of teachers pose problem to effective teaching of mathematics with the research 'question having a grand mean of 2.51.
2. From the findings of the study in Table 2, it shows that the respondents agreed with item statements that lack of textbook utility a hindrance to effective teaching of mathematics with grand mean of 2.94.
3. From the Table 3, it is also discovered that the respondents agreed that lack of instructional materials hinder effective teaching of mathematics with average mean score of 2.5.
4. From the findings of the study in Table 4, it is obvious that the respondents strongly agreed that lack of incentive for mathematics teacher hinder effective teaching of mathematics with average mean score of 2.51.



5. From the findings of the study in Table 5, it is obvious that the respondents agreed that non-existence of mathematics laboratory constitute a hindrance to effective teaching of mathematics with grand mean of 3.03.

### **5.1 DISCUSSION OF FINDINGS**

The findings show that most of the schools studied have insufficient mathematics teachers with the average mean score of 2.57 which is above the cut-off point of 2.5. Though, item I in table I shows that secondary education board employs teachers in schools because the item has the mean score 2.37 which is below the cut-off point. And item 2 in the same table not accepted because the item has mean score of 2.32 which is below the cut-off point. This constitute to ineffective teaching of mathematics hence mathematics teachers are lacked. Adewni (1982) portrays this, he said that there were shortage of qualified mathematics teachers in our school usually specialist from other related disciplines are co-opted to teach mathematics.

However, it was also found that lack of textbook constitute a hindrance to effective teaching of mathematics in junior secondary schools with average mean scores of 2.94 which is above the cut-off point of 2.50. With the findings, it was obvious that some teachers do not follow the content of text book according to the scheme of work in each class, also some teachers do not buy or use textbook recommended by the ministry of education and examination board (WAEC and NECO) and this can lead to poor performance of students in mathematics.

The findings in research question three of chapter four shows that lack of instructional material hinder effective teaching of mathematics with average mean score of 2.50 which is the cut-off point. Instructional materials contribute to effective teaching of mathematics since students learn easily when using concrete material than abstract. Therefore, Abuba et al (1990) stated that poor performance in mathematics at secondary school level was as a result of ineffective use of instructional aid in the teaching of the subject matter (mathematics).

The findings in research question four of chapter four shows that lack of incentive for mathematics teacher hinder effective teaching of mathematics with average mean score of 2.51 which is above the cut-off point of 2.50 when teachers are paid well they will put all their effort in teaching the students. When the government offers incentive to the mathematics teachers, then such will motivate them to do well in teaching the student.

The findings in research question five of chapter four shows that non-existence of mathematics laboratory constitute a hindrance to effective teaching of mathematics with average mean score of 3.03 which is above the cut-off point of 2.50. From the findings the researcher discovered that all the schools he visited has no mathematics laboratory and major

concept of mathematics such as construction, using graph board in teaching quadratic equation is no more applied. Due to lack of mathematics laboratory in our school system today, students are no more interested since teachers skip those areas that involve teaching aids. According to Ezike (1991), the activities in the laboratory classroom can stimulate and maintain the interest of the students in mathematics teaching including some of the students who have lost interest in mathematics classroom.

### **EDUCATIONAL IMPLICATION OF THE STUDY**

Based on the findings of this research work, the educational implications of this research work are stated as follow:

It is obvious from the findings that insufficiency of mathematics teachers can cause the students to develop hatred in mathematics and other related sciences. These can lead to massive failure in mathematics both in internal examination and external examination like WAEC and NECO.

The educational implication of not using the recommended textbooks or using any textbook written by unqualified author is that it can mislead the students, due to errors in problem solved, some diagrams are wrongly represented and some answers are wrong. So, the implication is that any students or teacher that applies it will carry the mistake to other people and it will continue to spread.

Learning is best understood by students when concrete material that relate to the concept of what the teacher tend to teach is used. Therefore, if the teacher did not use any instructional material in teaching any concept in mathematics, then the implication is that the student will forget the principles or rules because the learning was not concretized and such can lead to poor performance in educational System.

Some teachers have joined business with teaching. They will come ha school once or twice in a week and use the remaining days for their personal business. The educational implication is that the teacher will not cover his termly work and what is expected of the students to cover will not be covered and the resultant effect is failure of students to gain admission into University, and poor performance and low in coordinating It also makes the students to have a hatred on the subject. Therefore, incentive should be made available to the teachers to avoid some of them exhibiting such character of combining teaching with business.

Furthermore, non-existence of mathematics laboratory constitute a hindrance to effective teaching of mathematics has an educational implication of massive failure in mathematics. Some concept that needs teaching aids may be abandoned by the teacher. It will hinder the students from studying some related science since mathematics concept was not made

concretized in the students. So they forget the principles, rules, formulars easily. These lead to poor performance in mathematics” in general.

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