Trend on Students' Performance in Mathematics at the Senior Secondary Certificate Examination in Nigeria

Udonsa, A. E.

ABSTRACT

The purpose of this work is to examine the factors that contribute to the consistent poor performance of students in SSCE Mathematics. The study is a descriptive research. The study analyses of the forgoing trend and familiar rates of failure in mathematics especially at the public examinations was made and hypotheses were formulated and tested based on the factors that seemed to be the major impediment. The findings have explicitly established among others inadequate teaching materials, unqualified mathematics teachers and large class size as the major factors responsible for the students' poor performance in SSCE mathematics. A conceptual review of related literature has also shown that there are a number of factors that impeded students' achievement in Mathematics in the senior secondary schools examinations. It is recommended among others that small group delivery method should be adopted for the teaching of mathematics because it provides useful insights and solutions to some problems that cannot be adequately handle in the larger class and also paves way for close interaction and careful and better understanding of individual students.

Keywords: *Students Performance, Mathematics, examination, senior secondary school*

INTRODUCTION

Available records of West African Examination Council results from national level has shown that in 2004, a total of 1,019,524 students enrolled for Mathematics, 33.97% of them had credit pass (A1-C6), 28.16% had ordinary pass (D7-E8), while 34.47% had F9. An ordinary pass in mathematics is almost equivalent to failure as the candidate will have to re-write the paper in another examination. In 2005, out of 1,054,853 candidates that enrolled for the subject, 38.20% had credit pass, 25.36% had ordinary pass, while 34.41% had F9. The result of 2006 shows that 41.12% had between A1 to C6, 31.09% had between D7 to E8, while 24.95% had F9. In 2007, a total number of 1,249,028 candidates sat for the examinations, but 46.75% had credit pass, 26.75% had ordinary pass, while 24.24% failed. In 2008, out of a total of 1,340,907 candidates that wrote the examinations, 57.24% got credit pass, 23.74% had ordinary pass while 17.07% got F9 (WAEC, extracted from FRN 2009, Jaiyeoba, 2011). A breakdown of the May/June SSCE 2010/2011 examination results shows that only 560,974 candidates (representing 41.50%) of 1,351,557 who sat for the examinations obtained credit in Mathematics. A similar poor performance was also recorded in NECO 2010 as the result reveals that a total of 1,132,357 candidates sat for mathematics, but only 279,974 (24.72%) passed it

Udonsa, A. E*. is a Lecturer in the Mathematics Department, Federal College of Education, Yola, Adamawa State, Nigeria. E-mail: efiokside@yahoo.com*

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(Osuagwu, 2012). Statistical data from NECO 2004-2008 recorded similar low success in mathematics. For instance, 34.6% failure was recorded in 2004; 25.7% in 2005; 21% in 2006, 21% in 2007 and 8.3% in 2008. Mathematics has been percieved as the study of qualitative relations in areas of numbers, space, relationships about counting, measuring and describing of shapes and objects. A conceptual review of related literature has shown that there are a number of factors that impeded students' achievement in Mathematics in the senior secondary schools examinations. Some of the observed factors as submitted by scholars include; shortage of qualified Mathematics teachers, poor facilities, inadequate equipment and instructional materials, method of teaching such as the use of traditional chalk and talk methods, large class size, mathematics phobia/fright, limited background preparation in Mathematics, lack of teaching aids, low level of interest by students, parental factors, undue distraction from unproductive use of social network like facebook, twitters, etc, lack of problem solving skills, poor self-concept and achievement motivation and some government policy. These conceptions are validated by empirical studies on related subject (Akpan, 1987, Odogwu, 2002, Edwards and Knight, 1994; Abimbade, 1995; James 2012; Salman, Mohammed, Ogunlade and Ayinla, 2012; First Tutor 2012; Etuk, Etudor, Nwaoku and Etuk, 2006).

Table 1: WAEC **Key and their interpretations** towards the trend of students' performance

Grades	**Interpretation**	**Marks Range (100%)**
Grade A1	Excellent	75% above
Grade B2	Very Good	70 – 74%
Grade B3	Good	65 – 69%
Grade C4	Credit	60 – 64%
Grade C5	Credit	55 – 59%
Grade C6	Credit	50 – 54%
Grade D7	Pass	45 – 49%
Grade E8	Pass	40 – 44%
Grade F9	Fail	0 – 39%

Attainment in a subject is indicated by a grade: Grade **A1** being the highest and Grade **F9** the lowest. The interpretation of the various grades and the mark range has been standardized.

METHOD

This study shows a proper understanding of the present situation on ground and how this situation affects performance of mathematics at senior secondary school level. As such, the study adopts a descriptive research design. The researcher uses proportional stratified random sampling which involves the selection of individuals in a sample from the subgroups in proportion to the size of each subgroup in the population. The population of this study comprises the all candidates who wrote Senior Secondary Certificate Examination between 2004 and 2012 in Nigeria.

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The sample for this study is made up of students (male and female) selected at random from six secondary schools. Take-a-pick lottery method was used. In this method, the individual schools are assigned numbers which are written on pieces of paper folded properly put in a container and properly mixed. The required number of school is then picked. Data for the study were collected through collation of West African Examination Council (WAEC) results of students in mathematics from the selected schools (male and female separately for a period of nine years). This study used Chi-square to analyse the data collected and used student t-test for further analysis to justify hypotheses formulated for the study. Each hypothesis was tested at 0.05 (or 5%) level of significance. Results were presented in histogram charts.

RESULTS AND DISCUSSION

Hypothesis 1 was analyzed using students t-statistics and computation from the data was 27.33 while the table value was 3.84 at 0.05% significance level and degree of freedom being 1. Statistically, when the computed value is more than the critical value (table value), the effect is statistically significant. The hypothesis was further tested using teachers' responses. The calculated value was arrived at 17.15 while the critical value was 3.84 at 0.05% significant level. The findings showed significant effects of inadequate teaching materials on students' performance in SSCE mathematics. Thus, the null hypothesis that there is no significant effect of inadequate teaching materials on students' performance in mathematics in SSCE is rejected. It is therefore, established from the findings, that inadequate teaching materials have attributed to students' poor performance in SSCE mathematics. The findings agree with the opinion of Aina (2006), who argues that the consistent poor performance in mathematics has been attributed to factors such as non availability of instructional materials. The findings is also in consonance with the view of Akinyemi (1983), who notes that teaching without relevant and adequate instructional aid is one of the causes of students' failure in mathematics.

The computed data for hypothesis 2 stood at 7.96 while the critical value was 5.99 at 0.05% significance level. The hypothesis was also tested on the basis of teachers' opinions and the result showed a computed value of 10.26 while the table value was 3.84. Since the computed is greater than the critical value, the null hypothesis that there is no significant effect of unqualified mathematics teachers on students' performance in SSCE mathematics is rejected. This implies that unqualified mathematics teachers are significantly responsible for student poor performance in mathematics in SSCE. The findings are in consensus with the work of Odili (2006) who opines that there are shortages of qualified mathematics teachers in most public schools thus culminating in poor quality of learning outcome .The findings also support the views of Ohuche (1989) and Fakuade (1973) who submit that the shortage of qualified mathematics teachers leads to the production of poor students which eventually resulted in poor achievement. For Hypothesis 3 tested and computed, the result was 9.08 while the table value was 3.84. The hypothesis was further tested using teachers' responses the result gave a calculated value of 16.83 while the table

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value remains at 3.84. Since the calculated value is greater than the critical value, the null hypothesis that there is no significant effect of class size on students' performance in SSCE mathematics was rejected. This implies that the nature of class size (large class size) has significant negative effect on students' performance in mathematics in SSCE. The findings consolidate the work of Koroau (2006) who observes that no effective teaching can take place under a chaotic situation where one cannot handle a larger number of students effectively. The findings also agreed with Aina (2006) and Alele-William (1988) identify over crowded classroom as the major causes of students' failure in mathematics. The findings have explicitly and conclusively established that inadequate teaching materials, unqualified mathematics teachers and large class size as the major factors responsible for the students' poor performance in SSCE mathematics. The findings are in corroboration with the previous findings of Aina (2006), Akinyemi (1983), Odili (2006) who report on inadequate teaching materials as causes of students' failure in mathematics. It also supported the work of Ohuche (1978) and Fakuade (1976) who argue that shortage of qualified mathematics teachers hampered students' productivity and subsequently affect their performance. The findings also commensurate with the work of Koroau (2006) and Alele-William (1988) who submitted that overcrowded classroom impeded effective teaching and eventually resulted in students' poor performance.

CONCLUSION AND RECOMMENDATIONS

The primacy for this research was to determine the factors that attribute to the consistent poor performance of students in SSCE Mathematics. To this effects, it is concluded that strategies such as the provision of adequate instructional materials, adequate supervision of mathematics activities, regular practicing of past WAEC questions, etc will improve students performance in mathematics. Based on the findings, the following recommendations are made to effect significant positive changes in students' performance in SSCE mathematics:

i. Government should equip schools with necessary facilities that would mitigate on the inadequacy of teaching/learning materials. In addition, Federal and State governments should both commence payment of bursaries to secondary school students in order to supplement the provision of materials by indigent students.

ii. Small group delivery method should be adopted for the teaching of mathematics because it provides useful insights and solutions to some problems that cannot be adequately handle in the larger class and also paves way for close interaction, careful and better understanding of individual students.

iii. Mathematics teachers should use effective teaching aids for lessons so as to make concrete the abstract nature of Mathematics, stimulates learning and foster quick mastery of concepts as well as enhance quick retention to memory.

iv. Mathematics teachers should make the class lively by developing Mathematics humours in the presentation of some concepts in Mathematics so as to draw the

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attention of students and gain their interest in the subject. Students' interest in a subject is, sometimes, drawn by the attitudinal disposition of the teacher in the teaching-learning process. This agrees with Yahya (2012) who opines that the classroom needs to be a happy place and teachers should be persons with whom children could have normal friendly human relationship.

v. The use of traditional chalk and talk delivery methods is no longer relevant in modern era of "practical mathematics". Students tend to learn more when they are actively involved in the teaching-learning process. Absence of students' participation makes the lesson boring and unexciting. The lesson should be students centred.

vi. The school and the parents should complement the efforts of teachers in the classroom by organizing extra-lesson and home studies programme to help slow learners.

vii. The use of teaching aid in teaching mathematics should not be optional. Schools should purchase the relevant teaching aids such as mathematics games to facilitate students' learning.

viii. During examinations, students should attempt simple questions first and avoid wasting much time on questions they cannot immediately solve.

ix. Students should spend more time on questions with high marks and should not answer more than what is required as penalty could be attached to such.

x. Mathematics teachers should present mathematics lesson in variety of ways such as play acting, visual aids, etc. This tends to support the earlier view of Aina (2006) who points out that a child who is exposed to a lot of learning equipment and teaching aids like concrete materials, pictures, etc. will easily master the concept and recall it in due course than the one who has none of such facilities.

xi. The SSCE objective test is meant to last for 1 hour 30 minutes; therefore, students should plan their time and ensure that at least 40 questions are answered within one hour in order to meet up with the timing.

xii. Through a consolidated effort of government, schools and professional bodies such as the Mathematical Association of Nigeria (MAN), periodic seminars and workshops should be organized for students and mathematics teachers for an update on current trend in the subject.

xiii. No matter the amount of materials provided, no matter how professional a teacher is, students success in the subject is also determined by their preparedness for success. Without the students exhibiting the right attitude and learn with a strong determination for success, all other efforts become unproductive. Therefore, students should create enough time for personal practice and be familiar with examinations format.

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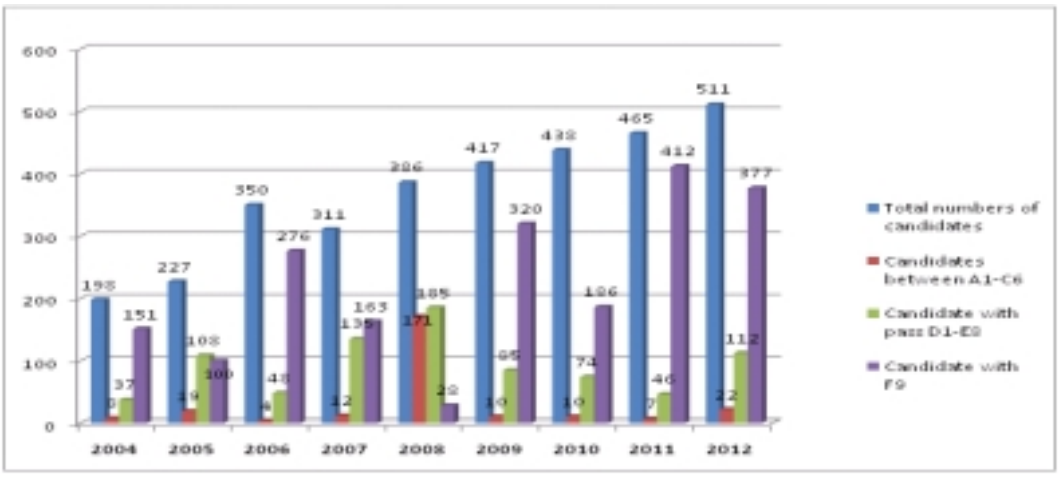

Figure 1: Trends of Students' achievement in WAEC mathematics in School A from 2004 - 2012

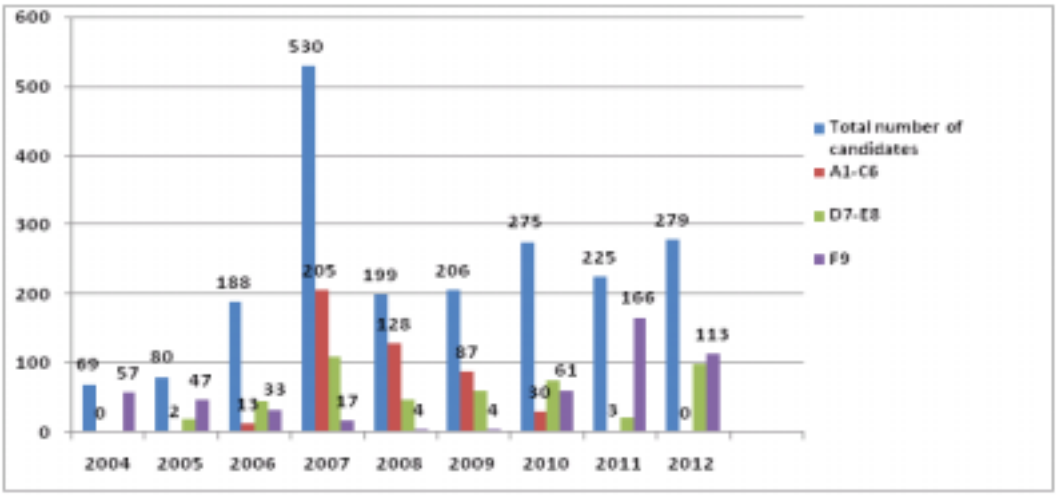

Figure 2: Trends of Students' achievement in WAEC mathematics in School B from 2004 - 2012

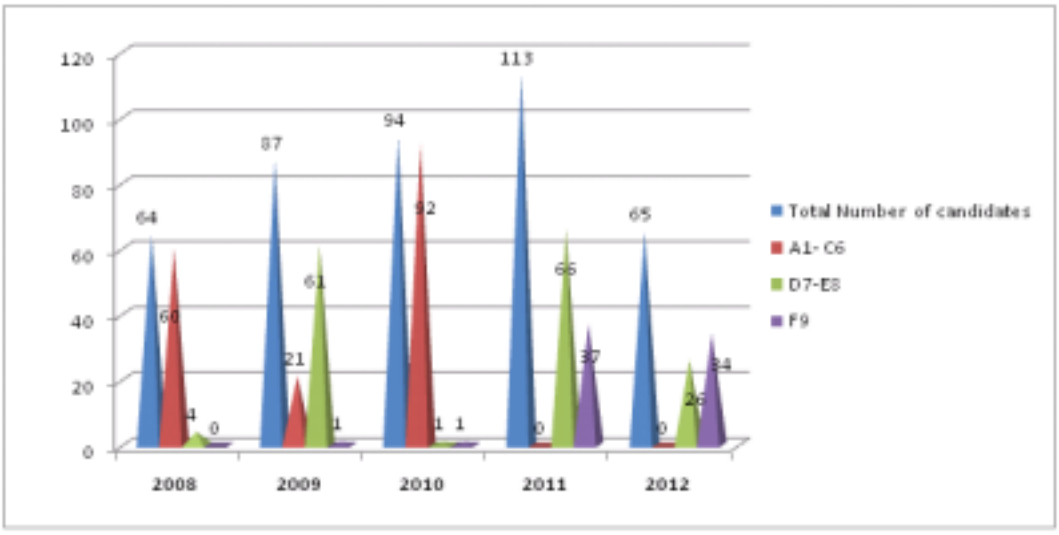

Figure 3: Trends of Students' achievement in WAEC mathematics in School C from 2008 - 2012

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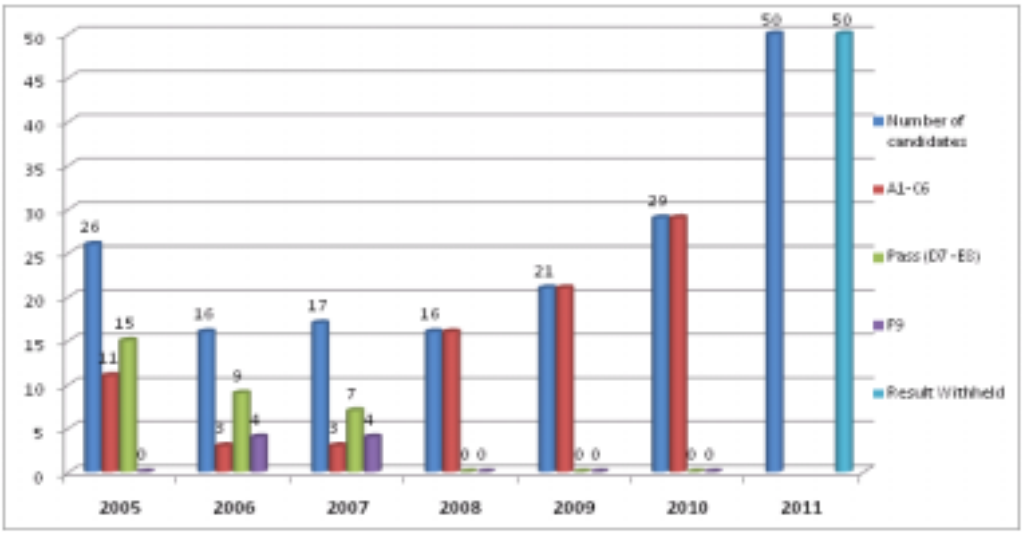

Figure 4: Trends of Students' achievement in WAEC mathematics in School D from 2004 - 2012

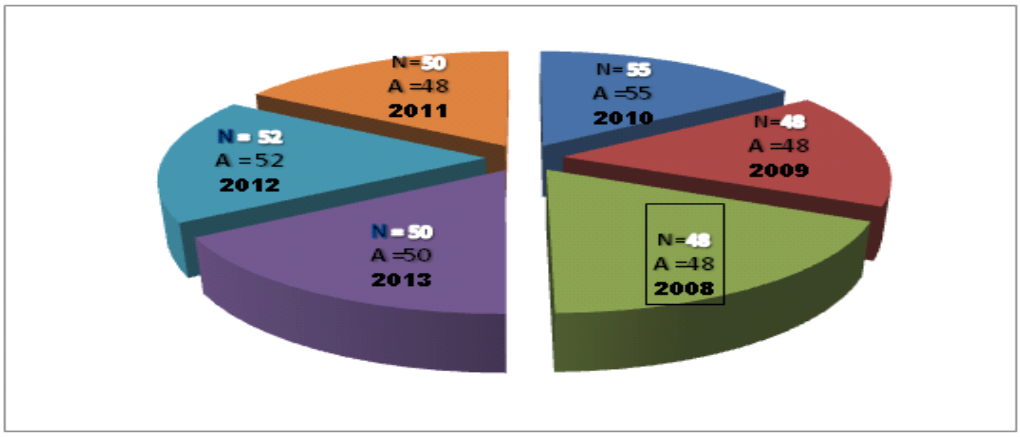

Figure 5: Trend of students achievement in WAEC mathematics in School E from 2008 - 2013

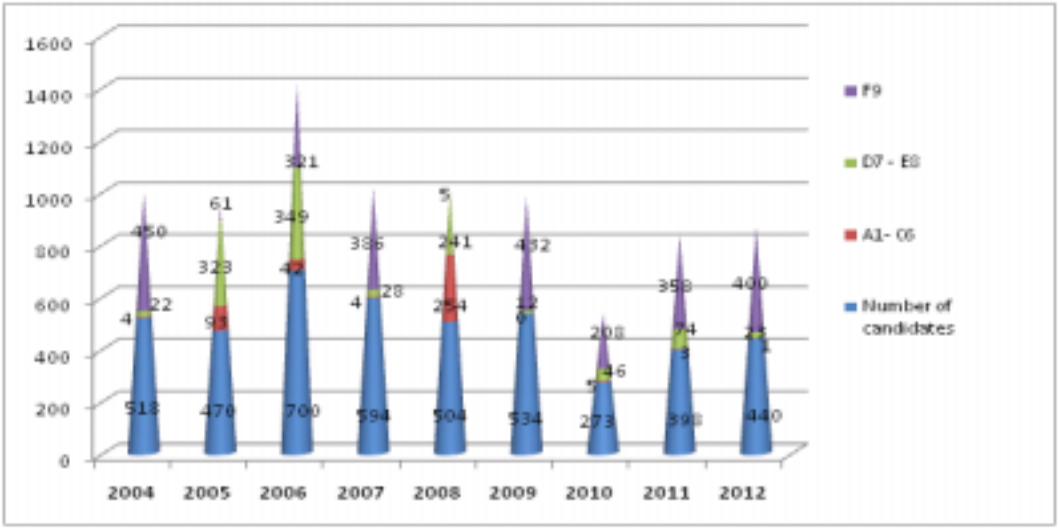

Figure 6: Trends of Students' achievement in WAEC mathematics in School F from 2004 - 2012

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REFERENCES

Abimbade, A. (1995). *Mathematics Method 2*. Centre for External Studies, Faculty of Education, University of Ibadan (TEE 333).

Aina, M. E. (2006). Instructional Techniques and Methods in Schools Mathematics: MED 518, National Open University of Nigeria, the REGENT (Printing & Publishing) Ltd.

Akinyemi, D. (1983). *Improving Mathematics Teaching in our School*. Ibadan: Heinemann Books Ltd.

Akpan, A. A. (1987). *Correlates of Mathematical Problem-solving ability among Secondary School Students*. Unpublished Ph.D. Thesis, University of Ibadan, Ibadan.

Allele-Williams, G. (1988). Keynote Address Delivered at the Silver Jubilee Meeting of Mathematics Association of Nigeria (MAN) Sept. 1982, *Abacus* 18(1).

Edwards, R. and **Knight, P.** (1994). *Effective Early Years Education: Teaching Young Children*. Bucklingham: Open University Press.

Etuk, K. G, Etudor, E. E., Nwaoku, A. N. and **Etuk, U. R.** (2006). Teaching Staff Quality and Teaching Effectiveness: A Panacea for Quality Assurance in Akwa Ibom State Higher Institutions. *Nigerian Journal of Educational Administration and Planning,* 6(2), 107-119.

Fakuade, A. (1976) .Uses of Mathematics, Journal of Curriculum Studies, 2(2), 2-4.

First-Tutor, (2012). Education Has Now Become a Weapon In Nigeria, (Online) at *www.firsttutor.blogspot.com* Retrieved on 28th April, 2013.

Jaiyeoba, A. O. (2011). Primary School Teachers' Knowledge of Primary Education Objectives and Pupil Development. *The African Symposium: An Online Journal of the African Educational Research Network,* 11(1), June 2011.

James, O. A. (2012). Effect of Formative Testing on Students Achievement In Junior Secondary School Mathematics. *European Scientific Journal,* April Edition vol. 8, No.8. (Online) Retrieved at *http://www.eujournal.org/index.php/esj/article/view/134*

Korau, Y. K. (2006). Educational Crises Facing Nigerian Secondary Schools and Possible Solutions, being a paper presented at Faculty of Education National Conference 10th - 14th July, 2006.

Odili, G. A. (2006). Mathematics in Nigeria Secondary Schools. A Teaching Perspective. Port-Harcourt: Rex – Charles and Patrick Ltd.

Odogwu, H. N. (2002). The Mathematics teachers factor in achievement of goals of the Universal Basic Education (UBE). *Journal of Mathematics Association of Nigeria* 27(1), 72-78

Ohuche, R. O. (1989). Changes in Mathematics Education since the late 1950's ideas and realization. *Nigeria Education Studies in Mathematics* 9, 271-281, (Online), Retrieved at *http// link.springer.com/journal,* on 6th June, 2013.

Osibodu, B. M. (1988). An Investigation of Teachers Instruction Problems in Mathematics Teaching. *Journal of Educational Studies 11* (2) 22 – 27.

Osuagwu, U. (2012). The rot in Nigeria's educational sector. *The Economy* (Online) Retrieved at, *http://theeconomyng.com/news200.html* on July 16, 2013.

Salman M. F., Mohammed A. S., Ogunlade A. A. and **Ayinla J. O.** (2012). Causes of Mass Failure in Senior School Certificate Mathematics Examinations As Viewed By Secondary School Teachers and Students in Ondo, Nigeria. *Journal of Education and Practice,* 3(8). (Online), Retrieved at *www.iiste.org* on July 16, 2013.

Yahya, A. S. (2012). Strategies to Reduce Pathological Fear in Mathematics among Secondary School Students in Adamawa State, Nigeria. *JPAIR: Multidisciplinary Journal,* Vol. 8 · March 2012.

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