Comparative Analysis of Students' Performance in Mathematics in West African Examination Council in Ekiti State, Nigeria

OJO Amos Adewale[1] & POPOOLA Odunayo Emmanuel[2]
[1,2]Department of Mathematics, College of Education, Ikere – Ekiti, Ekiti State, Nigeria.

Received: July 24, 2018 Accepted: October 09, 2018

ABSTRACT *This study comparatively analyzed the trends in students' performance in the May/June West African Examination Council (WAEC) examination in general mathematics in Ekiti State, Nigeria between 2013 and 2017 years. The study adopted survey design of the ex-post facto research type with a sample of 60,904 students in Ekiti State, Nigeria who sat for the May/June WAEC Examination in general mathematics between 2013 and 2017 years. Students' grade in WAEC general mathematics were collected from records and used for the study. Three research questions and a research hypothesis guided the study. The research questions were answered using percentage, mean and standard deviation while Chi-square analysis was used to test the null hypothesis at 0.05 level of significance. Findings from the study showed that the population of students that sat for WAEC in general mathematics decreased by 39.27% after a period of 3years and that improvement in performance was significant with time. Based on the findings, the study recommended among others, that the innovative instructional pedagogy and policies for mathematics teaching and learning to be sustained.*

Keywords: *Comparative, Analysis, Mathematics, Achievement, WAEC Examination.*

Introduction

Public examination was made necessary when the educational sector was clogged after the industrial revolution. It is now used as prerequisite examination to move students from one educational level to another (Udofia & Udoh, 2012). The essence of public examination is to provide unvarying assessment to all candidate who were exposed to a given curriculum. The councils saddled with the responsibilities of conducting this examination use standard scores to report the performance of the candidates. In Nigeria, public examinations are taken by candidates in the terminal classes for certification, namely: primary six, junior secondary and senior secondary schools. The aims of secondary school education in Nigeria, as stated in the National Policy on Education (FGN, 2004), are to prepare the individual child for (a) useful living in the society; and (b) for higher education. Senior secondary school certificate examinations are taken at the end of six years academic tenure of students in secondary school. The School certificate examinations, which determine the placement of Nigerian students in higher learning and/or employment, are of particular concerned (Ololube, 2008b).

The importance of mathematics in national development cannot be over emphasized. It is due to the relevance it commands in nation's building that made the Federal Government of Nigeria enshrined it in the National Policy on Education as a core (compulsory) subject for all primary and secondary schools students in Nigeria (FRN, 2004). Its inclusion as a pre-requisite for admission into science and technology based courses, and virtually all courses of study in the Nigerian tertiary institutions is basically because of the recognition of the indispensable role it plays in the advancement of science and technology of any nation (Iyekekpolor & Bulus, 2009). As a vital tool for the understanding and application of science and technology, mathematics plays the necessary role to the much needed technological and natural development of the developing nations of the world and undoubtedly the bedrock of the world's greatest innovations. Conversely, Popoola, Ojo, Nzeh & Olofinlae (2018) submitted in their findings on the relevance of ICT in teaching and learning of mathematics that ICT is a practicable tool in Nigeria educational system in teaching and learning of mathematics.

Internationally today, scientific methods persuade literally field of human endeavour and play a fundamental role in economic development of any country. In our modest quest toward scientific and technological advancement and following our aspiration to be among the first twenty economies in the world by the year 2020 (Obioma, 2009; NERDC, 2007, Abe & Popoola, 2015) we need, as a matter of necessity nothing short of good academic performance of our youths in mathematics at all levels of education. Consequently, this research paper is targeted at comparing analytically, students' mathematics performance in the West African Senior Secondary Certificate Examination (WAEC) between 2013 and 2017years to be sure that Nigerian students are improving in mathematics knowledge over time.

The West African Senior Secondary Certificate Examination is a school-based ordinary level school certificate examination conducted by the West African Examinations Council (WAEC) in Nigeria every May/June. According to Asuru (2006), the West African Examination Council is one of the major examining bodies in Nigeria. The others are the National Teacher's Institute (NTI), National Business and Technical Examination Board (NABTEB) and Joint Admissions and Matriculation Board (JAMB). The West African Examinations Council was set up in 1952 as an Inter-territorial body to conduct examinations as would be best suited to the needs of West Africa and as required in the public interest for the four British West African Countries of Nigeria, Ghana, Sierra-Leone and Gambia. Its two functions are; to review and consider annually the examinations to be held in West Africa and to conduct such examinations and award certificates and diplomas on the results of the examination conducted. In Nigeria, WAEC conducted its first examination-the Public Service Executive Competitive Examination in May, 1953. The Lagos office was opened in September of the same year. The council in conjunction with the University of Cambridge Local Examination syndicate conducted for the first time the West African School Certificate Examination (WAEC) in December, 1955, and also the Teacher College grade II (TCII) in the same year. Liberia joined the council as an associate member in March, 1970 and as a full member in 1974.

Inspite of its inter-territorial structure of the council, however, the National office of each of the member countries administers the examinations within its own territory. In Nigeria, the WAEC conducts several examinations. In 1986 for instance, the council conducted thirty different examinations. At the moment, the council's two major examinations are the May/June School-based and November/December private candidates-based ordinary level school certificate examination. The establishment of the National Examinations Council (NECO) in April, 1999 by the Federal Government of Nigeria, broke the monopolistic dominance of WAEC on the conduct and certification in ordinary level examination.

The importance of Mathematics as pre-requisite subject to gain admission into higher institutions of learning in Nigeria and some West African Countries such as Ghana, Gambia, Sierra Leone and Liberia (These countries jointly established the WAEC) has made the subject compulsory or mandatory to be passed at credit level by secondary schools students in public examinations.

A credit level in the subject has been used as one of the criteria for measuring and establishing the brilliancy of a particular candidate in the Nigerian context. Undoubtedly, the poor performance of secondary school students in SSCE in Mathematics had made it difficult for majority of students to gain admission into higher institutions of learning.

The main thrust of this study therefore, was to establish the trend of students' performance in Mathematics at the WAEC in typical urban and rural secondary schools in Ekiti State, Nigeria. It also sought to find out the percentage of those students who obtained grades from A1 – C6 as well as D7 – F9 with a view to providing relevant data for educational planners, educational policy makers and curriculum planners on the strengths and weaknesses of students' performance in the subject areas.

Statement of the Problem

In spite of all the available qualified and trained teachers, the academic achievement of students in Nigeria has been a source of concern to researchers, educators, government and parents. This is understandably due to the great quality that education has on the national development of the country. Research report indicated a consensus of opinion about the fallen standard of education in Nigeria (Adebule, 2004). Parents and government are in total agreement that their investment in education is not yielding the desired dividend. The reports from the West African Examination Council chief examiners indicates that the general performance of the candidates in mathematics for the May/June 2011, 2012, 2014 and 2015 examinations did not differ significantly from those of the previous years (WAEC, 2011,2012, 2014& 2015). However, the Chief Examiners also reported that candidates' performance in mathematics for the May/June 2016 and 2017examinations appeared to have improved when compared to previous years. (WAEC, 2016&2017). From the foregoing, it becomes necessary to ask the question; is there any comparatively significant improvement of student achievement in the May/June WAEC in Nigeria from 2013to 2015 and 2016 to 2017 years?

Purpose of the Study

This study sets out clearly to comparatively analyzed the trends in students learning achievement in the May/June West African Senior Secondary Certificate Examination (WAEC) in general mathematics in Nigeria.

Specifically, the study shall:

1.Determine the percentage decrease in the population of students in Ekiti State, Nigeria that sat for the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years.
2. Ascertain the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 and 2017 years.
3. Compare the percentage of students in Ekiti State, Nigeria with respect to gender that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years.

Research Questions

From the purpose of the study stated above, the following three research questions were generated to guide the study;
1. What is the percentage decrease in the population of students in Ekiti State, Nigeria that sat for the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years?
2. What is the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 and 2017 years?
3.What is the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years?

Research Hypothesis

There is no significant difference in the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years.

MATERIALS AND METHODS

Research Design

The study adopted survey design of the ex-post facto research type.

Population, Sample and Sampling Technique

The population of the study consisted of all students in the five West African Countries of Nigeria, Ghana, Sierra-Leone, Gambia and Liberia who sat for the West African Senior Secondary certificate Examination (WAEC) between 2013 and 2017 years. A sample of 60,904students in Ekiti State, Nigeria who sat for WAEC between 2013 and 2017 years were used for the study. This sample was purposively selected.

Instrument for Data Collection

Data were collected from records. They are records of total number of students who registered and sat for WAEC with their achievement in general mathematics.

Method of Data Collection

The total numbers of students who entered and sat for WAEC and their percentage grade in general mathematics from 2013 to 2017 were collected from documents. The sources of these documents are both primary and secondary.

Data Analysis

Percentage, mean and Standard Deviation (SD) were used to answer the research questions while chi-square analysis was used to test the hypothesis at 0.05 level of significance.

RESULTS

Research Question 1: What is the percentage increase in the population of students in Nigeria that sat for the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years?

Table 1a*: Total number of students in Ekiti State, Nigeria that sat for the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017.*

S/N	Year	Total No. of Student Sat	Year	Total No. of Student Sat
1	2013	10,611	2016	11,351
2	2014	13,597	2017	11,660
3	2015	13,685		
	Total	**37,893**	Total	**23,011**

Source: *Ekiti State Ministry of Education, Science & Technology, Planning, Research & Statistics Department, Ado-Ekiti.*

Table 1a shows that a total of 37,893 students sat for WAEC in general mathematics between 2013 and 2015 while a total of 23,011 students sat for the same examination between 2016 and 2017.

Table 1b: *Percentage decrease in the number of students that sat for the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017.*

Year	Total No. of Student Sat	Decrease	Percentage Decrease
2013 – 2015	37,893	14,882	39.27%
2016 – 2017	23,011		

Source: *Ekiti State Ministry of Education, Science & Technology, Planning, Research & Statistics Department, Ado-Ekiti.*

Table 1b indicated that after a period of 3 years, the population of Nigerian students who sat for the WAEC in general mathematics reduced by 15,282 (39.91%)

Research Question 2: What is the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 and 2017 years?

Table 2: *percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 and 2017 years.*

Year	Total No.who Sat	No. of students that obtained Credit & above(A1 – C6)	% of students with Credit & above (A1 – C6)	No. of students with (D7 – F9)	% of students with (D7 – F9)
2013	10,611	5,376	50.66	5,235	49.34
2014	13,597	8,020	58.98	5,577	41.02
2015	13,685	8,536	62.37	5,149	37.63
2016	11,351	7,880	69.42	3,471	30.58
2017	11,660	10,544	90.43	1,116	9.57
		Mean (%)	66.37	Mean (%)	33.63

Source: *Ekiti State Ministry of Education, Science & Technology, Planning, Research & Statistics Department, Ado-Ekiti.*

Table 2 above reveals that between 2013 and 2017, a period of 5 years, 66.37% of students in Ekiti State, Nigeria obtained credit and above (A1 – C6) while 33.63% had pass and below (D7 – F9) in the May/June WAEC in general mathematics.

Research Question 3: What is the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years?

Table 3: *percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years*

Performance	2013 – 2015		2016 - 2017	
	Mean (%)	S.D	Mean (%)	S.D
Credit & above (A1 – C6)	57.34	137.17	79.92	207.18
Pass & below (D7 – F9)	42.66	87.19	20.08	13.26

Table 3 shows that the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1 – C6) is higher ($\bar{x}$ = 79.92) between 2016 and 2017 when compared to the period between 2013 and 2015 ($\bar{x}$ = 57.34). Also, the students' performance rate in general mathematics with pass and below (D7 – F9) is low ($\bar{x}$ = 20.08) between 2016 and 2017 as compared to the period between 2013 and 2015 ($\bar{x}$ = 42.66).

Research Hypothesis (H_0): There is no significant difference in the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years.

Table 4: *Chi-square analysis of the difference in the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1-C6) and pass and below (D7-F9) in the May/June WAEC in general mathematics*

	No. of students		
Performance grades	2013 – 2015	2016 – 2017	Total
A1 – C6	1,103,112	5,322,523	6,425,635
	1362653	4387361	
D7 – F9	4,275,761	9,278,029	13,553,790
	4286192	9462763	
Total	**5,378,873**	**14,600,552**	**19,979,425**

**= 358162.62 *= 3.291 df=1

Table 4 reveals that there is significant difference in the percentage of students in Ekiti State, Nigeria that obtained credit and above (A1 – C6) and pass and below (D7 – F9) in May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years. Hence, the null hypothesis was not upheld.

Discussion of Findings

On the basis of a critical observation made on the secondary data collected for the study which comparatively analyzed the learning performance of students in general mathematics in the May/June West Africa Examination Council (WAEC) in Ekiti State, Nigeria between 2013 to 2015 and 2016 to 2017 years. Certain facts are borne out and made more evident. The result obtained in table 1b indicated that the population of students in Ekiti State, Nigeria who registered and sat for the WAEC general mathematics decreased by 39.27% after a period of 3 years. The result obtained in table 2 revealed that students from Ekiti State, Nigeria performed well in May/June WAEC over the 5 years with 66.37% of them obtaining credit and above while 33.63% of them had pass and below. The result in table 3 however showed that the percentage of students in Ekiti State, Nigeria that obtained credit and above was higher (79.92%) between 2016 and 2017 when compared to the period between 2013 and 2015 (57.34%). Also, the students' performance rate in general mathematics with pass and below was low (20.08%) between 2016 and 2017 as compared to the period between 2013 and 2015 (42.66).

The statistical test from table 4 revealed that there was significant difference in the percentage of students in Ekiti State, Nigeria that obtained credit and above, and pass and below in the May/June WAEC in general mathematics between 2013 to 2015 and 2016 to 2017 years. The null hypothesis was not upheld at 0.05 level of significance. The findings of this study was in line with the findings of Zalmon and Wonu (2017) who comparatively analyzed students achievement in West African Senior Secondary Certificate Examination in Nigeria between the period of 26 years, 1991 to 2016. The findings of this study also corroborated that reports of WAEC chief examiners reports that candidates' performance in general mathematics for May/June 2016 and 2017 examinations was really encouraging when compared to previous years (WAEC. 2016 and 2017). This trend of improvement over time could be ascribed to integration of relevant method into the teaching and learning of mathematics, utilization of innovation instructional materials and resolute determination and quest for academic excellence on the part of the students amongst others.

Conclusion

From the findings, the number of students in Ekiti State, Nigeria who registered and sat for May/June WAEC in general mathematics decreased by 39.27% after a period of 3 years. Good performance of students in mathematics was observed in recent years compared to their performance some 5 years ago. This showed that there was significant improvement in students' mathematics performance over time. This significant improvement could be as a result of integration of relevant method into the teaching and learning of mathematics, utilization of innovation instructional materials and resolute determination and quest for academic excellence on the part of the students amongst others.

Recommendations

In line with the findings of the study, the following recommendations were made:

• Students should be expose to the use of relevant teaching pedagogy in learning of mathematics in secondary schools.

• Government agencies and professional bodies whose responsibility is to design and revise curriculum for secondary schools should incorporate and emphasize the use of relevant method in teaching and learning of mathematics in secondary schools.

• Teachers of mathematics should endevour to note that gender does not account for students' interest rather the method used by teachers in teaching a particular subject. Therefore they should often change their method of teaching in order to promote students' interest in mathematics and achievement in secondary schools in Nigeria.

References

1. Abe, T.O and Popoola, O.E (2015). Teachers' perception of relevance of the internet
2. services in reducing the mass failure of secondary school students in mathematics. Journal of Global Research in Education and Social Science, 5(2): 75 – 82. ISSN: 2454-1834
3. Adebule, S.O. (2004). Gender differences on a locally standardized anxiety rating Scale in
4. mathematics for Nigeria secondary schools in Nigeria. Journal of Counselling and Applied Psychology, 1, 22-29.
5. Asuru (2006). Measurement and evaluation in education and psychology. Port Harcourt, RS:
6. Minson publishers.
7. Federal Republic of Nigeria (2004). National Policy on education. Lagos: NERDC
8. Press.
9. Iyekekpolor, S.A.O. & Bulus, O.S. (2009). Teachers' perception of the problems of
10. Secondary school mathematics teaching in Southern Taraba State. ABACUS: The Journal of the Mathematical Association of Nigeria, 34(10), 106-111.
11. National Educational Research Development Council (2007). A study of the
12. problems and issues of mathematics teaching in Nigeria: A report of NERDC national task force on mathematics. Lagos, National Educational Research Development Council Press.
13. Obioma, G. (2009). The predictive validity of public examination: A case study of
14. Nigeria. A paper presented at the 33rdAnnual Conference of International Association of Educational Assessment (IAEA) held in Baku, 16-21.
15. Popoola, O.E, Ojo, O.O**,** Nzeh, M.Y & Olofinlae, O.O (2018). The relevance of ICT in
16. teaching and learning of mathematics in College of Education, Ikere - Ekiti. International Journal of Research and Analytical Reviews, 5(1): Jan. – March 2018E ISSN: 2348-1269, Print ISSN 2349-5138.
17. West African Examination Council (2010). Chief examiner's report. Lagos: WAEC.
18. West African Examination Council (2011). Chief examiner's report. Lagos: WAEC.
19. West African Examination Council (2012). Chief examiner's report. Lagos: WAEC.
20. West African Examination Council (2013). Chief examiner's report. Lagos: WAEC.
21. West African Examination Council (2014). Chief examiner's report. Lagos: WAEC.
22. West African Examination Council (2015). Chief examiner's report. Lagos: WAEC.
23. West African Examination Council (2016). Chief examiner's report. Lagos: WAEC.
24. West African Examination Council (2017). Chief examiner's report. Lagos: WAEC.