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Inter-proprietary differential analysis of senior secondary students' mathematics performance in external examinations

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Abstract

This study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in West African Senior Secondary Certificate Examination (WASSCE) and National Senior Secondary Certificate Examination (NSSCE) between 2000 and 2019. The study was conducted in Etche local government area of Rivers State, Nigeria. The expost-facto survey research design was adopted for the study. A sample of 5848 (private, 3163; public, 2685) students from 10 randomly selected sampled schools (3 private; 7 public) was used in the study. Systematic sampling technique was adopted in selecting the students and their Mathematics grades in the result master list. Students Mathematics Examination Grades (SMEG) was the instrument for data collection. SMEG had a criterion mean of 5.00 and adjusted criterion mean of 4.00. Two experts in Mathematics Education validated the SMEG instrument. The Cronbach Alpha method was used to obtain the reliability coefficient of 0.75 for SMEG, indicating 75% reliability. Mean and standard deviation were used to answer the five research questions; t-test was used to test hypotheses one and two, MANOVA was used to test hypothesis three while ANOVA was used to test hypotheses four and five. Findings of the study indicated that the performances of private and public senior secondary school students in General Mathematics in WASSCE and NSSCE were good. Further findings of the study revealed that students from private schools significantly outperformed their counterparts in public schools in General Mathematics in WASSCE. However, the difference in their performances in NSSCE was not significant. Also, the differences in the Mathematics performances of the male and the female students by school proprietorship and examination types were not significant. The study recommended among others that candidates should prefer enrolling in private schools for WASSCE and prefer either private or public schools for NSSCE for optimal performance in Mathematics.

Keywords: Inter-proprietary, differential, analysis, Mathematics, performance, external examinations

Introduction

Mathematics is indispensable in everyday life. Virtually every individual daily activity requires the application of some mathematical knowledge (Tsok, Shammah & Hwere, 2013) [9]. Mathematics is one of the compulsory cross-cutting subjects in the national curriculum offered by all students at the basic and post basic levels of education in Nigeria (Federal Republic of Nigeria, 2014) [1]. The relevance of Mathematics in advancing science, technology, engineering and the economy remains undisputable. Therefore, promoting Mathematics teaching and learning should be the business of all. The public and private sectors should necessarily be involved in the education of their citizens. According to Otikor and Zalmon (2019) [7], the public and private school proprietorship is necessary to achieve the goal of education for all.

School proprietorship refers to the form of school ownership. A school proprietor is someone who has legal right or exclusive ownership of a school (Otikor & Zalmon, 2019) [7]. There are public and private school proprietorship. Schools owned by government are known as public schools while private schools are owned and managed by individuals, cooperate groups, religious bodies or non-governmental organizations. The extent of involvement of the public and private school proprietors in the implementation of the senior secondary education Mathematics curriculum is high (Zalmon, Daso & Uranta, 2020) [14].

School proprietorship could play a major role in the performance of students (Otikor & Zalmon, 2019) ^[7]. Assessing the difference in the Mathematics performance of students from public and private schools in external examinations is the focus of this study.

External examinations are examinations administered by councils or boards established to provide uniform or horizontal examinations to students who are about completing their post-basic education or seeking admission into tertiary institutions of learning. Sequel to the implementation, assessment and development of the Mathematics curriculum and other subjects in secondary schools, Nworgu (1992) in Kpolovie (2002) ^[2] opined that examination agencies were setup to promote education, to coordinate educational programmes and to control and monitor the quality of education in both public and private educational institutions; the essence which is the organization of public examination so as to provide uniform standard examination to all students, having been exposed to the same curriculum even though the teaching methods might vary. The setting of public examination is highly skilled and professional which involves not only the setting of questions and devising activities of testing the achievement of a comprehensive range of curriculum objectives, but also of ensuring that many different examiners and script markers work to the same standard (Salako, Adegoke & Ogundipe, 2017) ^[8].

External examination bodies or agencies in Nigeria includes: National Examination Council (NECO), West African Examination Council (WAEC), National Business and Technical Examination Board (NABTEB) and Joint Admission and Matriculation Board (JAMB). NECO and WAEC were established to examine, certify and prepare students for tertiary education. NABTEB on the other hand was sheared with the responsibility to evaluate and certify students in technical and vocational colleges while JAMB conducts the Unified Tertiary Matriculation Examination (UTME) and offers admission to students into tertiary institutions in Nigeria. The NECO and WAEC conduct the school-based National Senior Secondary Certificate Examination (NSSCE) and West African Senior Secondary Certificate Examination respectively as well as the private-based General Certificate Examination (GCE). This study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in WASSCE and NSSCE between 2000 and 2019.

Several researchers had analysed students' performance in Mathematics in WASSCE and NSSCE, however, this study focused on inter-proprietary comparative analysis of students' Mathematics performance. Onipede (2003) as cited in Okoye and Nnamani (2018) ^[6] reported that the low achievement of day students in public examination results from lack of knowledge of subjects like English Language, Mathematics and Sciences. Zalmon and Otikor (2019) ^[7] analyzed students' Mathematics performance trends in WASSCE and NSSCE between 2000 and 2018 in Andoni local government area of Rivers State, Nigeria and revealed that students' performance in Mathematics in WASSCE and NSSCE were good. However, the trends of students' performance in Mathematics in both WASSCE and NSSCE were found to be irregular and decreasing spontaneously. On performance analysis by gender, the female students performed slightly better than the male students in WASSCE while the reverse was the case in NSSCE but the differences were not statistically significant in both examinations.

Otikor and Zalmon (2019) ^[7] investigated the impact of school proprietorship on undergraduate Mathematics students' performance in algebra in Ignatius Ajuru University of Education. Findings of the study showed that the performances of undergraduate Mathematics students from public and private schools in algebra were high with that of the private school students slightly higher. However, the difference in the algebra performance of undergraduate Mathematics students from public and private secondary schools was not significant. This study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in West African senior secondary certificate examination and National senior secondary certificate examination between 2000 and 2019. The difference in the performance of students in Mathematics by gender was also investigated.

Statement of the Problem

Several research reports analysing the performance of public school students in Mathematics in internal and external examinations exist. Some of the researchers reported that students perform abysmally in Mathematics while others revealed that students' performance in Mathematics improved with time. In addition to existing literature on students performance in Mathematics, this study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in West African senior secondary certificate examination and National senior secondary certificate examination to ascertain possible differences. With the high advocacy rate for gender equity in all spheres of life including education, this study also determined the difference in the Mathematics performance of private and public school students in WASSCE and NSSCE by gender.

Aim and Objectives of the Study

This study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in West African Senior Secondary Certificate Examination (WASSCE) and National Senior Secondary Certificate Examination (NSSCE) between 2000 and 2019. The objectives of the study were to:

1. Determine the difference between the performance of public and private school students in the WASSCE in General Mathematics.
2. Ascertain the difference between the performance of public and private school students in the NSSCE in General Mathematics.
3. Compare the performance of public and private school students in the WASSCE and the NSSCE in General Mathematics.
4. Determine the difference between the performance of public and private school students in WASSCE in General Mathematics by gender.
5. Find out the difference between the performance of public and private school students in the NSSCE in General Mathematics by gender.

Research Questions

Five research questions were asked and answered to guide the study.

1. What is the difference between the performance mean grades of public and private school students in the WASSCE in General Mathematics?

2. What is the difference between the performance mean grades of public and private school students in the NSSCE in General Mathematics?
3. What is the difference between the performance mean grades of public and private school students in the WASSCE and the NSSCE in General Mathematics?
4. What is the different between the performance mean grades of public and private school students in the WASSCE in General Mathematics by gender?
5. What is the difference between the performance mean grades of private and public school students in the NSSCE in General Mathematics by gender?

Hypotheses

Five null hypotheses were formulated and tested at 0.05 significant level to guide the study:

H₀₁: There is no significant difference between the performance mean grades of public and private school students in the West African senior school certificate examination in General Mathematics.

H₀₂: There is no significant difference between the performance mean grades of public and private school students in the National senior school certificate examination in General Mathematics.

H₀₃: There is no significant difference between the performances mean grade of public and private school students in WASSCE and NSSCE in General Mathematics.

H₀₄: There is no significant difference between the performance mean grades of public and private school students in West African senior school certificate examination by gender.

H₀₅: There is no significant difference between the performance mean grades of public and private school students in NSSCE in General Mathematics by gender.

Methodology

Research design

The ex-post-facto survey research design was adopted for the study because variables data were collected retrospectively.

Population of the study

The population of the study comprised all the students who sat for the WASSCE and the NSSCE Mathematics between from 2000 to 2019 from the 26 (18 public and 8 private) senior secondary schools in Etche local government area of Rivers State, Nigeria.

Sample and sampling technique

A sample of 5848 (private, 3163; public, 2685) students from 10 randomly selected sampled schools (3 private; 7 public) was used in the study. Systematic sampling technique was adopted in selecting the students by their names and examination numbers and their Mathematics grades in the result master list.

Instrument for data collection

Students Mathematics Examination Grades (SMEG) was the instrument for data collection. SMEG consisted of parts A and B. Part A was used to generate the data of the candidates on school type, candidate’s name and examination number, examination agency, examination year and gender while part B was used to elicit information on the students’ Mathematics grades in WASSCE and NSSCE from 2000 to 2019. WAEC and NECO use the 9-point grading system as follows: A1 = Excellent; B2 = Very Good; B3 = Good; C4 = Credit; C5 =

Credit; C6 = Credit; D7 = Pass; E8 = Pass; F9 = Fail. However, the grading system was revised in this study as follows: A1= 9 points, B2 = 8 points, B3 = 7 points, C4 = 6 points, C5 = 5 points, C6 = 4 points, D7 = 3 points, E8 = 2 points and F9 = 1 point. SMEG had a criterion mean of 5.00 with an adjusted criterion mean of 4.00 because C6 (4 points) is the minimum credit pass in both WAEC and NECO. In this study, the adjusted criterion mean of 4.00 was used for decision rule. Students with criterion mean below 4.00 failed General Mathematics while those with mean of 4.00 and above passed.

Validity of the instrument

Two experts in Mathematics Education validated the SMEG instrument.

Reliability of the instrument

The Cronbach Alpha method was used to obtain the reliability coefficient of 0.75 for SMEG, indicating 75% reliability.

Method of data analysis

Mean and standard deviation were used to answer the five research questions; t-test was used to test hypotheses one and two, Multivariate Analysis of Variance (MANOVA) was used to test hypothesis three while Analysis of Variance (ANOVA) was used to test hypotheses four and five.

Results

Research Question One: What is the difference between the performance mean grades of public and private school students in the WASSCE in General Mathematics?

Table 1: Descriptive statistics of Mean (M) and Standard deviation (Std.) on the difference between the performances mean grades of public and private school students in the WASSCE in General Mathematics

SSCE	School Proprietorship	n	Mean	Std.	Difference	
					Mean	Std.
WASSCE	Private	1597	5.05	2.03	0.23	0.11
	Public	1570	4.82	1.92		

Data in table 1 showed that the performances of private (M=5.00, Std.=2.03) and public (M=4.82, Std.=1.92) senior secondary school students in General Mathematics in WASSCE were good. The difference between the performance mean grades of public and private school students in the West African senior secondary certificate examination in General Mathematics was 0.23, Std.=0.11 in favour of the private school.

Research question two: What is the difference between the performance mean grades of public and private school students in the NSSCE in General Mathematics?

Table 2: Descriptive statistics of mean and standard deviation on the difference between the performances mean grades of public and private school students in the NSSCE in General Mathematics

SSCE	School proprietorship	n	Mean	Std.	Difference	
					Mean	Std.
NSSCE	Private	1566	4.94	2.09	0.07	0.90
	Public	1115	4.87	2.99		

Data in table 2 showed that the performances of private (M=4.94, Std.=2.09) and public (M=4.87, Std.=2.99) senior secondary school students in General Mathematics in NSSCE were good. The difference between the performance mean grades of public and private school students in the National

senior secondary certificate examination in General Mathematics was 0.07, Std.= 0.90 in favour of the private school.

Research question three: What is the difference between the performance mean grades of public and private school students in WASSCE and NSSCE in General Mathematics?

Table 3: Descriptive statistics of mean and standard deviation on the difference between the performances mean grade of public and private school students in WASSCE and NSSCE in General Mathematics

SSCE	n	Public school		Private school		Difference	
		Mean	Std.	Mean	Std.	Mean	Std.
WASSCE	3167	4.82	1.92	5.05	2.03	0.23	0.11
NSSCE	2681	4.87	2.99	4.94	2.09	0.07	0.90

Data in table 3 showed the difference between the Mathematics performance mean grades of public and private school students in WASSCE (M=0.23, Std.=0.11) and NSSCE (M=0.07, Std.=0.90).

Research question four: What is the difference between the performance mean grades of public and private school students in the WASSCE in General Mathematics by gender?

Table 5: Descriptive statistics of mean and standard deviation on the difference between the performances mean grades of private and public school students in NSSCE in General Mathematics by gender

SSCE	Gender	Private school Difference					Public school			Difference	
		n	Mean	Std.	Mean	Std.	n	Mean	Std.	Mean	Std.
NSSCE	Male	790	4.84	1.98	0.20	0.20	555	4.88	2.16	0.01	1.46
	Female	776	5.04		2.18		560	4.87	3.62		

Data in table 5 showed that the female students in private school had the best NSSCE Mathematics performance (Mean=5.04, Std=2.18) followed by the male students in public school (Mean=4.88, Std=2.16), the female students in public school (Mean=4.87, Std.=3.62) and the male students in private school (Mean=4.84, Std.=1.98). The table showed that the mean difference between the male and the female students in private school was 0.20, Std=0.20 in favour of the female student while the mean difference between the male and the female students in public school was 0.01, Std= 1.46 in favour of the male students.

H₀₁: There is no significant difference between the performance mean grades of public and private school students in the West African senior secondary certificate examination in General Mathematics.

Table 6: Summary of t-test on the difference between the performance mean grades of public and private school students in the WASSCE in General Mathematics

School proprietorship	n	Mean	Std.	df	t-test	Sig.	Remark
Private	1597	5.05	2.03	3165	3.286	.001	Significant
Public	1570	4.82	1.92				

Data in table 6 showed that there is a significant difference between the performance mean grades of public and private

Table 4: Descriptive statistics of mean and standard deviation on the difference between the performances mean grades of public and private school students in the WASSCE in General Mathematics by gender

SSCE	Gender	Private school Difference					Public school			Difference	
		n	Mean	Std.	Mean	Std.	n	Mean	Std.	Mean	Std.
WASSCE	Male	796	5.01	1.99	0.08	0.08	784	4.95	1.90	0.26	0.04
	Female	801	5.09		2.07		786	4.69	1.94		

Data in table 4 showed that the female students in private school had the best WASSCE Mathematics performance (Mean=5.09, Std=2.07) followed by the male students in private school (Mean=5.01, Std=1.99), the male students in public school (Mean=4.96, Std.=1.90) and the female students in public school (Mean=4.69, Std.=1.94). The table showed that the mean difference between the male and the female students in private school was 0.08, Std=0.08 in favour of the female student while the mean difference between the male and the female students in public school was 0.26, Std= 0.04 in favour of the male students.

Research question five: What is the difference between the performance mean grades of private and public school students in NSSCE in General Mathematics by gender?

school students in the West African senior secondary certificate examination in General Mathematics ($t_{(0.05, 3165)} = 3.286, p < 0.05$).

H₀₂: There is no significant difference between the performance mean grades of public and private school students in the National senior secondary certificate examination in General Mathematics.

Table 7: Summary of t-test on the difference between the performances mean grades of public and private school students in the NSSCE in General Mathematics

School proprietorship	n	Mean	Std.	df	t-test	Sig.	Remark
Private	1566	4.94	2.09	2679	.674	.500	Not Significant
Public	1115	4.87	2.99				

Data in table 7 showed that there is no significant difference between the performance mean grades of public and private school students in NSSCE in General Mathematics ($t_{(0.05, 2679)} = 0.674, p > 0.05$).

H₀₃: There is no significant difference between the performances mean grade of public and private school students in WASSCE and NSSCE in General Mathematics.

Table 8: Summary of Multivariate Analysis of Variance (MANOVA) on the significant difference between the performances mean grade of public and private school students in WASSCE and NSSCE in General Mathematics.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	WASSCE	51.876 ^a	1	51.876	12.912	.000
	NSCCE	1.645 ^b	1	1.645	.261	.609
Intercept	WASSCE	61927.892	1	61927.892	15414.355	.000
	NSCCE	61810.426	1	61810.426	9822.756	.000
School Proprietorship	WASSCE	51.876	1	51.876	12.912	.000
	NSCCE	1.645	1	1.645	.261	.609
Error	WASSCE	10638.464	2648	4.018		
	NSCCE	16662.738	2648	6.293		
Total	WASSCE	75350.000	2650			
	NSCCE	80654.000	2650			
Corrected Total	WASSCE	10690.340	2649			
	NSCCE	16664.383	2649			

Data in table 8 showed that there is a significant difference between the performance mean grade of public and private school students in WASSCE ($F_{(1, 2648)} = 12.912, p < 0.05$) while there is no significant difference between the performance mean grades of public and private school students in NSSCE ($F_{(1, 2648)} = 2.61, p > 0.05$).

H₀₄: There is no significant difference between the performance mean grades of public and private school students in WASSCE in General Mathematics by gender.

Table 9: Summary of Two-way ANOVA on the difference between the performances mean grades of public and private school students in WASSCE in General Mathematics by gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	48.601 ^a	2	24.300	6.213	.002
Intercept	77094.729	1	77094.729	19709.739	.000
Gender	6.357	1	6.357	1.625	.202
School Proprietorship	42.275	1	42.275	10.808	.001
Error	12376.000	3164	3.912		
Total	89553.000	3167			
Corrected Total	12424.601	3166			

The data in table 9 showed there is no significant difference between the performance mean grades of students in WASSCE based on gender ($F_{(1, 3164)} = 1.625, p > 0.05$), but there is significant difference between the mean grades of students in WASSCE based on school proprietorship ($F_{(1, 3164)} = 10.808, p < 0.05$).

H₀₅: There is no significant difference between the performance mean grades of public and private schools students in NSSCE in General Mathematics by gender.

Table 10: Summary of Two-way ANOVA on the difference between the performances mean grades of public and private schools students in NSSCE in General Mathematics by gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	11.893 ^a	2	5.947	.951	.387
Intercept	62697.115	1	62697.115	10024.663	.000
Gender	9.052	1	9.052	1.447	.229
School Proprietorship	2.909	1	2.909	.465	.495
Error	16748.979	2678	6.254		
Total	81427.000	2681			
Corrected Total	16760.872	2680			

Data in table 10 showed there is no significant difference between the performance mean grades of students in NSSCE based on gender ($F_{(1, 3164)} = 1.447, p > 0.05$), also there is no significant difference between the mean grade of students in NSSCE based on school proprietorship ($F_{(1, 3164)} = 0.465, > 0.05$).

Discussion of Findings

Mathematics performance of public and private school students in WASSCE

Data in table 1 showed that the performances of private (M=5.00, Std.=2.03) and public (M=4.82, Std.=1.92) senior secondary school students in General Mathematics in WASSCE were good. The difference between the

performance mean grades of public and private school students in the West African senior secondary certificate examination in General Mathematics was 0.23, Std.=0.11 in favour of the private school. Data in table 6 showed that there is a significant difference between the performance mean grades of public and private school students in the West African senior secondary certificate examination in General Mathematics. The private school students performed significantly better than the public school students in WASSCE General Mathematics. Similar result was obtained by Nsirik-Abasi and Kenneth (2017) ^[5], that there was significant difference between the Mathematics performance of the public and the private school candidates in West

African senior secondary certificate examination in favour of the private school.

Mathematics performance of public and private school students in NSSCE

Data in table 2 showed that the performances of private (M=4.94, Std.=2.09) and public (M=4.87, Std.=2.99) senior secondary school students in General Mathematics in NSSCE were good. The difference between the performance mean grades of public and private school students in the National senior secondary certificate examination in General Mathematics was 0.07, Std.= 0.90 in favour of the private school. Data in table 7 showed that there is no significant difference between the performance mean grades of public and private school students in NSSCE in General Mathematics. The difference between the Mathematics performance of private and public school students in NSSCE is not significant. This result is different from earlier report by Nsikak-Abasi and Kenneth (2017) ^[5] that significant difference exists between the Mathematics performance of private and public school students in National senior secondary certificate examination.

Mathematics performance of public and private school students in WASSCE and NSSCE

Data in table 3 showed the difference between the Mathematics performance mean grades of public and private school students in WASSCE (M=0.23, Std.=0.11) and NSSCE (M=0.07, Std.=0.90). Data in table 8 showed that there is a significant difference between the performance mean grades of public and private school students in WASSCE while there is no significant difference between the performance mean grades of public and private school students in NSSCE. Nsikak-Abasi and Kenneth (2017) ^[5] reported that there were significant differences between the Mathematics performances of private and public school students in the West African and National senior secondary certificate examinations. Kpolovie, Ololube and Ekwebelem (2011) ^[3] found a statistically significant positive relationship between candidates' performance in WASSCE and NSSCE in Mathematics. Zalmon and Otikor (2019) ^[7] found out that students' performances in Mathematics in West African senior secondary certificate examination and National senior secondary certificate examination were good and statistically indifferent.

Mathematics performance of public and private school students in WASSCE by gender

Data in table 4 showed that the female students in private school had the best WASSCE Mathematics performance (Mean=5.09, Std=2.07) followed by the male students in private school (Mean=5.01, Std=1.99), the male students in public school (Mean=4.96, Std.=1.90) and the female students in public school (Mean=4.69, Std.=1.94). The table showed that the mean difference between the male and the female students in private school was 0.08, Std=0.08 in favour of the female student while the mean difference between the male and the female students in public school was 0.26, Std= 0.04 in favour of the male students. The data in table 9 showed there is no significant difference between the performance mean grades of students in WASSCE based on gender. The result of this study is consistent with those of Brown and Kanayong (2010) and Zalmon and Otikor (2019) ^[7] but inconsistent with that of Madu (2015) ^[10] who reported that there was significant gender difference in the performance of

Mathematics in WASSCE in favour of the male students in both private and public senior secondary schools in Gombe metropolis, Gombe State. The inconsistency in the results could be due to the type of examination administered to the students. Madu (2015) ^[10] investigated the Mathematics performance of students in internal examination while this study analysed the performance of students in external examinations (WASSCE and NSSCE) which have high standard.

Mathematics performance of public and private school students in NSSCE by gender

Data in table 5 showed that the female students in private school had the best NSSCE Mathematics performance (Mean=5.04, Std=2.18) followed by the male students in public school (Mean=4.88, Std=2.16), the female students in public school (Mean=4.87, Std.=3.62) and the male students in private school (Mean=4.84, Std.=1.98). The table showed that the mean difference between the male and the female students in private school was 0.20, Std=0.20 in favour of the female student while the mean difference between the male and the female students in public school was 0.01, Std= 1.46 in favour of the male students. Data in table 10 showed there is no significant difference between the performance mean grades of students in NSSCE based on gender. Findings of this study corroborated with earlier finding by Zalmon and Otikor (2019) ^[7] that the female students performed slightly better than the male students in WASSCE while the reverse was the case in NSSCE but the differences were not statistically significant in both examinations. On the contrary, Madu (2015) ^[10] revealed that there was significant gender difference in the performance of Mathematics in internal examination in favour of the male students in both private and public senior secondary schools in Gombe metropolis, Gombe State. Internal and external examinations do not have the same standard which explains the reason for the different results in both studies.

Conclusion

This study comparatively analysed the performance of private and public senior secondary school students in General Mathematics in West African and National senior secondary certificate examination between 2000 and 2019. Students from private schools significantly outperformed their counterparts in public schools in General Mathematics in WASSCE but the difference in their performances in NSSCE was not significant. The female students performed slightly better than the male students in private school while the male students performed better than their female counterparts in public school in WASSCE and NSSCE Mathematics but their differences were not significant.

Recommendations

Recommendations of this study are as follows:

1. Candidates should prefer enrolling in private schools to public schools for West African senior secondary certificate examination for optimal performance in Mathematics.
2. Candidates should prefer registering in either private or public schools for National senior secondary certificate examination for maximal performance in Mathematics.
3. Proprietors of public senior secondary schools should ensure improved instructional quality comparable to private schools through adequate provision of learning materials and qualified Mathematics teachers to enable

students in public schools thrive in their performance in WASSCE in General Mathematics.

4. Mathematics teachers should sustain the gender equity among students in WASSCE Mathematics in private and public schools through the use of gender friendly innovative instructional strategies.
5. The male and the female students should sustain their equitable performance in NSSCE Mathematics in private and public schools through positive attitude and hard work.

References

1. Federal Republic of Nigeria. National policy on education (6th ed.). Lagos: NERDC Press, 2014.
2. Kpolovie PJ. Test, measurement and evaluation in education. Port Harcourt: Emhai Printing and Publishing 2002.
3. Kpolovie PJ, Ololube N, Ekwebelem P. Appraising the performance of secondary school students on the WAEC and NECO SSCE from 2004 to 2006. *International Journal of Scientific Research in Education* 2011;4(2):105-114.
4. Brown LI, Kanyongo GY. Gender differences in Mathematics performance in Trinidad and Tobago: Examining affective factors. *International Electronic Journal of Mathematics Education* 2010;5(3):113-130.
5. Nsikak-Abasi U, Kenneth IU. Comparative analysis of WAEC and NECO senior secondary school Mathematics examination. *Mathematical Theory and Modeling* 2017;7(6):41-52.
6. Okoye FO, Nnamani PC. Extent of academic achievement of day and boarding secondary schools students in Anambra State, Nigeria. *International Journal of Scientific Research and Management* 2018;6(1):20-26.
7. Otikor MA, Zalmon IG. School proprietorship and undergraduate Mathematics students' performance in algebra in Ignatius Ajuru University of Education. *International Journal of Science, Technology, Engineering, Mathematics and Science Education* 2019;4(1):40-46.
8. Salako RJ, Adegoke BO, Ogundipe LO. Performance appraisal of NECO and WAEC SSCE: An empirical evidences from Mathematics and Physics. *International Journal of Innovative Social & Science Education Research* 2017;5(3):1-10.
9. Tsok SH, Shammah SK, Hwere MS. A comparative study of student's performance in S.S.C.E Mathematics and Pre-National Diploma (PRE-ND) programmes Mathematics: A case study of Nasarawa State Polytechnic Lafia. *Journal of Education and Practice*, 2013;4(27):69-81.
10. Madu TY. Gender differences in the performance of students in Mathematics among senior secondary school students in Gombe Metropolitan of Gombe State. *Knowledge Review* 2015;32(1):1-7.
11. Zalmon IG, Otikor MA. Trends analysis of students' Mathematics performance in senior secondary certificate examinations: 2000-2018. *International Journal of Science, Technology, Engineering, Mathematics and Science Education* 2019;4(1):57-66.
12. Zalmon IG, Daso PO, Uranta GA. Evaluation of the Nigerian senior secondary education Mathematics curriculum implementation. *International Journal of Research and Scientific Innovation* 2020;7(12):138-147.