

COMPARATIVE PERFORMANCE OF PUBLIC AND PRIVATE SENIOR SECONDARY SCHOOL STUDENTS IN THE SCIENCES IN RIVERS STATE

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Abstract

Science education promotes the development of intellectual qualities and acquisition of science process skills amongst students. The incessant poor performance of students in sciences have made the general public to contemplate on the type of school that can afford students better performance in the sciences. Hence, the objective of the study was to compare the academic performance of private and public secondary school students in the sciences. The study was carried out in Rivers State, Nigeria. Stratified random sampling technique was used on basis of (private and public senior secondary schools in Rivers State). While simple random sampling by balloting was used to obtain 640 SS3 students that participated in the study. Simple percentage mean and standard deviation were used to answer all the research questions, t-test inferential tool was used to test the hypotheses at .05 level of significance. The study found that, there was no significant differences between the mean academic performance of private and public secondary school students in the sciences in S.S.C.E. The t-calculated was less than the observed table t-value $0.65 < 2.28$ at degree of freedom of 10. Above all, government should boost the standard of science education by providing enough science equipments in schools. Educational sector should also be well funded. Also, government should allow more private schools to be established in the state.

Introduction

Good knowledge of science education could help Nigerian citizens to develop material reconstruction skills, self reliance, understanding of our environment and social development of a developing nation such as Nigeria depend on science and technological literacy of her citizens. According to Nwagbo, 2002 cited in Njoku (2013) scientific literacy is a necessity for better functioning in the society as well as achieving high academic performance in science subjects. All braches of science have contributions to make in the nation's economic and technological advancement.

Paramountly, the development in this context depends on the quality of science education at the senior secondary school level and the quality of educational system operating in the country. This can be measured by analyzing the performance of private and public senior secondary school students in his core sciences in senior school certificate examination, SSCE (Wagbara, 2002).

Also, academic performance of the students in the sciences can affect the rise in standard and popularization of science education in Nigeria. More than half the number of students who take science subjects each year fail the subjects in West African School Certificate Examination (WASC) (Alozie, 2012). Poor performance in Senior School Certificate Examination (SSCE) means scoring below 50%. In West African School Certificate Examination organized by West African Examination Council (WAEC), score of 45% - 49% is a pass level while score below

45% heads to a failure. The science Teachers Association of Nigeria (STAN) in 1986 Annual Conference outlined some of the causes of poor performance which include;

- Attitudinal problem of students
- Cognitive and socio economic problem of the teachers
- Administrative problem of the examination
- Psychometric problem of the examination.

Furthermore, some of the inadequacies in the academic performance of students in sciences were attributed to the following weaknesses; poor understanding of the demands of the questions; failure to adhere strictly to instructions; poor mathematical skills' poor attitude towards expressing numerical answers in approximate number of significant figures; rampant spelling mistakes; use of wrong units (WAEC, 2012). Another major factor that confront high performance of students in science subjects is lack of laboratory equipments (Wagbara, 2015). In Rivers State the laboratories of most secondary schools are not well equipped. Teachers purchase or borrow laboratory materials when they receive science practical instruction papers for senior secondary school certificate examination. Science subjects are practical oriented. Hence, effective learning takes place when science is taught through the medium of practical work.

It is easier to recall learned items when it has been initially presented through practical approach. Nbina (2011) notes that lack of practical skills among young school leavers could be due to lack of exposure to such activities. Such scenario will lead to high level of unemployment because it will be difficult to employ young school leavers that do not have good knowledge of practical skills into industries and companies. Also, those school leavers that do not have good practical skills knowledge may not have performed well in their senior school certificate examination and cannot be admitted into tertiary institutions to read science oriented courses like Engineering, Medicine, Pharmacy etc. This in turn will lead to dearth of engineers and doctors to mind the nations industries and hospitals.

It is obvious that the educational system that operated in Nigeria in the olden days was the traditional education system. This is because education was seen as an acceptable social mechanism that was designed by the society to transmit and inculcate desirable values, skills, norms, attitude, culture etc, to bring about in the citizens positive change that will ultimately lead to fulfilled life (Wosu, 2016). The reason for the traditional system of education in the society was to make the adults responsible members of the society that could uphold their values and culture as to be able to transmit such values to the younger generations. The traditional or informal education system was in existence until the 1840s that the missionaries came into Nigeria and introduced the formal western education.

Although, the formal missionary schools that was operated by the missionaries taught people how to explain the Bible, trained workers as Catchists and lay readers. It also helped to train people as clerks and record keepers. Furthermore, the missionary schools had a lot of lapses such as, lack of the provision of central laws to regulate the activities of the missionaries, inadequate teachers to teach in the schools, lack of facilities, textbooks etc (Ogbondah, 2002).

According to Fafunwa (1974) the new Director of education appointed in 1944 developed a comprehensive education plan. The comprehensive plan covered all levels of education and department institutions, finance, administration, control, local education

authorities, social welfare, languages, adult education and Islamic education. As a result of the comprehensive nature of this plan and its general adoption by all educational practitioners, the education ordinance of 1948 becomes the first enacted educational legislation to cover the entire country (Fafunwa, 1974, Ogbondah, 2002, Kosemani and Okorosaye-Orubite, 2008 cited in Wosu, 2016).

Furthermore, the political scramble for mass education in the old Western and Eastern region of Nigeria in the 1950s steered up the ambition to establish and run secondary school during the period made planned expansion very difficult to achieve. This led to the growth of three types of grammar schools, namely, Government, Grant-aided and Private schools. The Government schools were the best as they were well funded and tutored. The grant-aided schools were second to the best while the private schools were poorly organized (Adesina and Ogunsaju, (1984). One significant thing that happened in the policies of secondary education in Nigeria was the government take-over of schools in the 1970s. The effect of Richards Constitution in giving regional government autonomy over school organization was that each state government politically decided to move at its own pace. At this period of government take-over of schools from the missionaries, it was felt that government was responsible for 90% of financial burden of secondary schools administration and there was no reason for government to leave the control of education to those missionary bodies (Adesina, 1977).

In Rivers State, the government take-over of schools and the policies surrounding it hampered the establishment of private schools in the early 1960s and 1970s (Wagbara, 2002). Also, at the period of early 1970s only nine(9) approved private secondary schools existed in Rivers State while more than thirty (30) public secondary schools were in existence. The private secondary schools that existed in Rivers State as at 1970s include; Khana L.G.A

- Kids Community Secondary Commercial School which was established in 1969 at Zaakpo Bori.

OBIO/AKPOR L.G.A

- Comprehensive and Industrial Trade Centre, Rumuolumeni in 1963
- Sacred Heart Seminary, Rumuibekwe was established in 1963.
- Obio Comprehensive College, Rumumasi, established, 1978.

OVIGBO L.G.A

- Comprehensive Commercial School Oyigbo, established in 1964

EMOHUA L.G.A

- Ojims Secondary Commercial School Rumujji, established in 1964.

ELEME L.G.A

- Allen Commercial Secondary School Nchia Eleme, established in 1971.

IKWERRE L.G.A

- Okeh Memorial Secondary Commercial School Elele, established, 1972.

PORT HARCOURT L.G.A

- Mid Town College, No. 7 Emenike Street, Mile 1 Diobu, P.H. was established in 1972

Furthermore, National Policy on Education as contained in Onabanjo's Committee report, titled Report of the Panel Approved on Alternative Source for financing Education in Nigeria, volume one, February, 1982 page 108 reaffirmed that "Voluntary Agencies should be allowed to establish and manage schools under the strict control of state Government. This was in order for them to meet up with the curriculum and quality of educational facilities as well as the teaching standard required of them.

In Nigeria, a formal pull of bull by the horn towards the introduction of teaching and learning of science subjects in secondary schools dates back to the 1969 National Curriculum Conference held in Lagos. This conference clearly advocated for a flexible method of teaching the science subjects. It recommended among other things that, science and technical education requires more than teaching factors and impacting information. Science teaching should be flexible to inculcate into the students, healthy scientific attitude to work (Fafunwa, 1974). In order to achieve these goals it was outlined that senior secondary schools should offer; mathematics, Biology, Agricultural Science or Vocational Subject which were made compulsory and to serve as core subjects for all students at that level. When the blue print which fostered the implementation was released, education was no more a private enterprise but a huge government venture that has witnessed a progressive evolution and active participation.

However, it has been observed that the education system in the country to a great extent is not achieving the desired goals and objectives due to problem of high rate of failure in external examinations in science subjects. The Rivers State government has given boost to the teaching and learning of science subjects by equipping the science laboratories of most senior secondary schools. Also, government has employed many qualified science teachers into their public secondary schools.

Despite, enormous effort of the state government to improve students' performance in science subjects, students still perform poorly in external examinations. This incessant poor performance have made most parents and the general public to think whether the private secondary school students perform better than the public secondary school students in the sciences. Hence, it becomes necessary to investigate whether the public secondary school students perform better than the private sciences in S.S.C.E

Purpose of the Study

The main objective of this study was to investigate the academic performance of the private and public senior secondary school students in the sciences in Rivers State. Specifically, the study was designed to determine the;

1. factors responsible for high academic performance of students in SSCE in private and public secondary schools in the sciences.
2. academic performance level of private and public senior secondary school students in the sciences in S.S.C.E

Research Questions

Research questions for the study are:

1. What are the mean responses of the students on factors that are responsible for high academic performance of private and public secondary school students in the sciences in SSCE?

2. What are the percentage mean performance of private and public secondary school students in the sciences in S.S.C.E?

Hypotheses

The following null hypotheses for the study were tested at .05 level of significance.

1. There is no significant difference between the mean responses on factors that are responsible for high academic performance of private and public secondary school students in the sciences in S.S.C.E
2. There is no significant difference between the percentage mean performance of private and public secondary school students in sciences in S.S.C.E.

Methodology

The survey research design was adopted for the study. The investigation was carried out in Rivers State, Nigeria. A sample size of 640 SS3 students participated in the study, comprising 600 public secondary school students and 40 private secondary school students. The study was carried out in the three (3) educational zones in Rivers State. The educational zones were stratified on basis of (Private and Public Senior Secondary Schools) to obtain 12 senior secondary schools. 6 of the schools were private secondary schools while the other 6 were public secondary schools. Simple random sampling by balloting was also used to select 640 SS3 students that participated in the study. Simple percentage mean and standard deviation were used to answer all the research questions while t-test inferential tool was used to analyze the hypotheses of the data collected at .05 level of significance.

Results

Research Question I

What are the mean responses of the students on factors that are responsible of high academic performance of private and public senior secondary school students in the sciences in S.S.C.E?

Table 1” Mean and standard deviation scores of students responses on factors affecting students high academic performance in the sciences.

S/N	Factor	Category of school	Mean	SD	Decision
1.	School funding	Private	4.0	0.2	VH
		Public	2.8	1.0	H
2.	School facilities	Private	2.9	5.3	H
		Public	2.3	4.6	MH
3.	Quality and quantity of staff	Private	1.9	2.9	MH
		Public	1.9	3.0	MH
4.	Student and staff motivation	Private	3.4	0.5	H
		Public	3.1	1.1	H
5.	Student and staff discipline	Private	2.6	4.0	MH
		public	3.1	3.1	H
6.	School supervision	Private	2.3	3.5	MH
		Public	1.6	2.7	MH

Table I shows that school funding accounts for very high academic performance of the students as the factor had a mean score of 4.0 for private schools with corresponding standard

deviation of 0.2 while the public school was high with a mean of 2.8 and standard deviation of 1.0. School facilities was high for private schools with a mean score of 2.9 and standard deviation of 5.3 while for the public schools it was moderately high with mean score of 2.3 with associated standard deviation of 4.6. Quality and quantity of staff showed a moderately high effect on performance of students as the private schools had a mean score of 1.9 and standard deviation of 2.9 while the public schools students responses was also moderately high as the mean score was 1.9 and standard deviation of 3.0. Student and staff motivation had a high effect as the mean score for private schools were 3.4 and standard deviation of 0.5 while for public schools which also indicated high effect, the mean score was 3.1 and the standard deviation was 1.1. Student and staff discipline shows a moderately high effect for private school students as their mean responses was 2.6 and standard deviation of 4.0 while for the public schools the factor was high and had a mean score of 3.1. School supervision showed a moderately high impact for the private school students and the public school students as private schools had a mean score of 2.3 and standard deviation of 3.5 while public schools had a mean score of 1.6 and standard deviation of 2.7

Hypothesis I

There is no significant difference between the mean responses on factors that are responsible for high academic performance of private and public secondary school students in the sciences in S.S.C.E

Table 2, T-test of the mean response difference of the students on factors that are responsible for the high academic performance of private and public secondary school students in the sciences in S.S.C.E

S/N	Factor	Category of School	N	Mean	SD	Cal T-value	Table T-value	Remarks
1.	School Funding	Private Public	40 600	4.0 2.8	0.24 1.0	4.8		Sig.
2.	School Facilities	Private Public	40 600	2.9 2.3	5.3 4.6	1.03		Not sig.
3.	Quality and quantity staff	Private Public	40 600	1.9 1.9	2.9 3.0	0.18	1.96	Not sig.
4.	Student and Staff motivation	Private Public	40 600	3.4 3.1	0.5 1.1	5.21		Sig.
5.	Student and Staff discipline	Private Public	40 600	3.6 3.1	4.0 3.1	1.19		Not sig.
6.	School supervision	Private Public	40 600	2.3 1.6	3.5 2.7	1.73		Not sig.

Table 2 shows that, critical t-value was 1.96 at .05 level of significance for the factors that account for high academic performance of private and public secondary schools in the sciences in SSCE. The table t-value was greater than 1.03, 0.18, 1.19 and 1.73 which were the

calculated t-values for the factors; school facilities, quality and quantity of staff; students and staff discipline and school supervision. Hence, those factors were not significant as they were less than the table t-value of 1.96 and the null hypothesis one H_{01} , accepted. For factors; school funding and student/staff motivation, the t-calculated were 4.48 and 5.21 which were greater than the table t-value of 1.96. Hence, they were significant and the null hypothesis one H_{01} rejected.

Research Questions 2

What are the percentage mean performance of private and public secondary school students in the sciences in S.S.C.E?

Table 3: Percentage mean and standard deviation scores of private and public secondary school students performance scores in the sciences in S.S.C.E

Years	2013		2014		2015		2016		2017		2018			
		% pass		% Pass		% pass		% pass		% pass		% pass		
Category of school	No. of Candidate		No. of Candidate		No. of Candidate		No. of Candidate		No. of Candidate		No. of Candidate		Means of passes (\bar{X})	Standard deviation (SD)
Private	736	3.80	1,60	0.19	880	6.36	710	6.62	742	17.2	591	2.71	6.13	5.38
Public	2,543	5.78	4,019	3.06	3,103	3.06	1,623	4.38	2,153	5.90	1,723	5.80	4.66	1.34
Mean Diff													1.47	

Table 3 shows that the private secondary schools recorded; 3.80%, 0.19%, 6.36%, 6.62%, 17.12% and 2.19% passes in SSCE from 2013 to 2018 with a mean percentage pass of 6.13 and associated standard deviation of 5.38 in the sciences. While public secondary schools recorded; 5.78%, 3.06%, 3.06%, 4.38%, 5.90% and 5.80% passes in SSCE from 2013 to 2018 with a mean percentage pass of 4.66 and standard deviation of 1.34 in the sciences. The percentage mean difference between the performance of private and public secondary schools was 1.47. The private secondary school students had a higher mean than the public secondary schools but the scores of, the private secondary school students deviated more from the mean than that of the public secondary school students, hence the higher mean of the private secondary school students may not be real as it appears.

Hypothesis 2

There are no significant differences in percentage mean performance of private and public secondary school students in the sciences in S.S.C.E.

Table 4: T-test of percentage mean score difference of students in private and public secondary schools in the sciences in S.S.C.E

Category of school	N	Mean % passes	SD	Df	t-cal	Table t-value	Remark
Private	6	6.13	5.38	10	0.65	2.28	Not. significant
Public	6	4.66	1.34				

The result of the analysis of data shown in Table 4 indicates that there is no significant difference between the percentage mean performance of private and public secondary school students in the sciences in S.S.C.E. Table 4 shows that at degree of freedom of 10, the calculated t-value was 0.65 while the observed table t-value was 2.28 at .05 level of significance. The calculated t-value of 0.65 was less than the critical table value of 2.28 hence, the null hypothesis two (H_{O2}) was accepted and inference drawn that, there is no significant difference between the mean academic performance of private and public secondary school students in the sciences in S.S.C.E

Discussion

The result of Table 2 which was used to test hypothesis one (H_{O1}) shows that, critical t-value was 1.96 at .05 level of significance for the factors that account for the high academic performance of private and public secondary school students in the sciences in SSCE. The table t-value was greater than 1.03, 0.18, 1.19 and 1.73 which were the calculated t-values of the following factors; school facilities, quality and quantity of staff, student and staff discipline and school supervision. Hence, hypothesis one (H_{O1}) was accepted for those factors. However, for factors such as school funding and student/staff motivation, their t-calculated were 4.48 and 5.21 which were greater than the critical t-value of 1.96. Hence, the two factors were significant and the null hypothesis one (H_{O1}), rejected for those two factors. The findings of Wagbara (2002) was in support of the findings of this study. Hence, this study have confirmed that the following factors: school facilities quality and quantity of staff, student and staff discipline and school supervision head no significant difference between the mean responses of private and public secondary school students high academic performance in the sciences in S.S.C.E. However, school funding and student/staff motivation had significant difference between the mean responses of private and public secondary school student's high academic performance in science in S.S.CE.

The result of Table 4 of this study shows that there was no significant difference between the academic performance of private and public secondary school students in the sciences in S.S.C.E. The result of the analysis indicates that t-table value was 2.28 while the calculated t-value was 0.65 which shows that the calculated t-value is less than the table t-value of 2.28. Hence, the null hypothesis two (H_{O2}) which states that there is no significant difference between the percentage mean performance of private and public secondary school students in the sciences in S.S.C.E was accepted. The findings of Wagbara (2002) agree with the result of this study as he stated that there is no significant difference between the academic performance of students in public and private secondary schools in the sciences in S.S.C.E. Kemenanabo-Emi (2019) did not agree with the findings of this study as he asserted that there was significant difference between the academic performance of private and public secondary school students in Basic Science. However, the findings of this study have confirmed that, there

is no significant difference between the academic performance of private and public secondary school students in the sciences in S.S.C.E

Conclusion and Recommendations

Firstly, the result of this study inferred that, factors which did not significantly show difference in percentage mean response of private and public secondary school students high academic performance in the sciences in S.S.C.E are; school facilities, quality and quantity of staff, student and staff discipline and school supervision. The reason was that the t-calculated value for these factors was less than the table t-value. Hence the null hypothesis (HO1) which states that, there is no significant difference between the mean responses on factors that are responsible for high academic performance of private and public secondary school students in the sciences in S.S.C.E was accepted for the above factors. While for the factors; school funding and student/staff motivation the null hypothesis one (HO1) was rejected. The t-calculated value for those factors was greater than the observed table t-value. Hence, the government and private school owners should ensure schools are well funded and staff and students are well motivated. School facilities, student and staff discipline, school supervision, quality and quantity of staff should be adequately taken care of by government and private school investors to ensure high academic performance of students in the sciences in S.S.C.E is achieved.

Secondly, there is no significant difference between the mean academic performance of private and public secondary school students in the sciences in S.S.C.E as the t-calculated was less than the observed table t-value ($0.65 < 2.28$). Hence, both government and private school owners should give a high boost to science education by ensuring that science facilities other things that will enable the students to do well in the sciences in S.S.C.E are provided in schools.

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