
Relative Analysis of Public and Private Senior Secondary Schools Students' Achievement in
Biology in Kaduna State, Nigeria

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ABSTRACT

This study relatively analysed senior secondary school students' biology academic achievement between public and private schools in Sabon-gari Local Government Area of Kaduna State, Nigeria. The research design was descriptive survey research. Two hundred and forty students (240) senior secondary school students were randomly selected for the study. One instrument, Biology Achievement Test (BPT) was used to collect data for the study. Data were analysed using mean scores and t-test statistics. Results showed that there is a significant difference between public and private secondary school students' academic achievement in biology. Also, private schools students performed significantly better than their public school counterparts. There is no significant difference between male and female students in biology achievement in public and private schools. Recommendations proffered among others, advised that more supervisory roles be intensified on public schools teachers to make them work better on their biology students.

Keywords: Academic, Biology, Public, Private, Secondary school students, Achievement

INTRODUCTION

The significance of secondary education cannot be over emphasized. Secondary education is the second institution in our education system that prepares students for a higher level of education. A very sound and solid secondary education is highly needed for the student ease of entry into tertiary education. Secondary education is designed for children between the ages of 12-18, to inculcate permanent literacy and numeracy, develop the needed abilities to communicate effectively and to lay a sound basic for scientific thinking.

Biology is a science of life. Encyclopedia Britannica (2011) define Biology as a branch of knowledge that deals with living organisms and vital processes. It is the knowledge of biology that gives us an appreciation of the essential parts of the body, the brain inclusive. Anyanwu and Alafiatayo (2016) noted that Biology is a continuously developing discipline which obtains information on the existence, development, modification and interrelations of the living things on earth. It also adds new information on the existing knowledge; health, diseases, marriage and family relationships. They further stated that even learning and memory could be solved only via biology education.

Thus, biology education is designed to guide the world towards a scientifically literate society. It is important for an understanding of biology as it offers personal fulfillments and excitements. Ellis (2010) opined that the world is confronted daily with issues that require scientific way of thinking for informed discussion, management and sharing of resources such as air, water and vegetation. Akporehwe and Onwiodukit (2013) noted that the World Summit on Sustainable Development (WSSD, 2002), affirmed the role of Biology and technology

education as an enabler for sustainable development. Nigerian government in acknowledging the strategic role biology holds for national development has directed universities as a matter of policy to admit candidates on a ratio of 60:40 in favour of biology related courses.

One of the major criteria for assessing scientific advancement through education is the students' academic achievement or achievement. Onwuegbuzie (2010) posited that technological development through education depends mostly on the achievement of secondary school students in related subjects. Olasehinde and Olatoye (2014) noted that biology education lays foundation for work in biology-related fields by acquainting learners with certain knowledge skills and attitudes. Ogbonna (2007) observed that there has been a worldwide recognition of biology and thereby biology education has found a central place in the curricula of school at all levels.

Public and private schools are institutions owned as the names connote. While the public schools in Nigeria have Federal, State and Local Governments as their proprietors, the private schools have individuals, associations or organisations as the owners. Ayodele and Adebisi (2013) asserted that private schools vary widely and level of parental involvement varies from one private school to the other. What is important for a parent is to choose private school that has characteristics that match what they are looking for as a family. Parents pay for the cost of educating their children in private schools and therefore tend to be more involved in dictating what the schools offer than parents whose children are attending public schools (Olatoye and Agbatogun, 2009).

Public secondary schools are supported and controlled by the government of the state. Adeyinka (2010) stated that public schools are those schools that were established, managed, financed, as well as supervised by the government. He further opined that those schools were established with taxpayer's money in order to educate the generality of the people irrespective of their economic, social or political status in the society. Public secondary schools are neither controlled by individuals, private interest groups, nor agencies, but by the government (Olasehinde & Olatoye, 2014). After the creation of the Nigerian state, all the schools that were established were under the management and control of either the federal and state government. All subjects were taught at the schools. But after some years most public schools started suffering repercussion of neglecting the teaching of some subjects in public secondary schools, subjects like French, history, computer science among others.

Consequently, private individuals, private groups and organizations started to establish, manage and finance private schools to educate children and make profit. These private schools include in their curriculum all the subjects especially those not done in public schools. Nwangwu in Olasehinde and Olatoye (2014) stated that the private schools offer what the public schools cannot provide and that they relieve parents the burden of having their children stay at home for long periods due to continuous strikes by teachers in public schools. He further stated that private schools run without disruption in the schools calendar thereby providing steady and quality education unlike the public schools.

Okpara (2010) observed that in NECO Examinations, the achievements of students in private schools are better than the achievement of students in public schools. He further stated that private schools are closely monitored and supervised by the school management boards. As a result, they perform better in external examinations. Lubienski, Lubienski and Crane (2009) identified the characteristics of private and public schools as tabulated below:

Table1: Characteristics of Private and Public Schools

S/N	Private School	Public School
1	Largely have small class size	Largely have big class size
2	Not accountability to the public	Accountable to the public
3	It is autonomous	It is not autonomous
4	Ignore recent curricular trends in education	Do not ignore curricular trends in education
5	Do not always hire certified teachers	Hire certified teachers
6	Most have religion inclinations	Do not have religious inclinations
7	Set no fund apart for teacher professional development	Set fund apart for teacher professional development
8	Set attraction to parents to show safe, neat and welcoming environment	Set no attraction beyond Government provision
9	Do not use up- to- date teaching methods	Use up to date teaching methods

Credit: Lubienski, Lubienski and Crane (2009)

It is however pertinent to state that the characteristics listed in the Table 1 may not be completely applicable to the various school types in some countries due to variance in education policy. Olatoye and Agbatogun (2009) reported that there exists a significant difference in mathematics and science achievement of public and private school pupils in which private school pupils performed better than their public school counterpart. The discussions so far show that there is a need to compare private and public school students' achievement in biology. This study therefore sought to analyse senior secondary school students' biology achievement between public and private schools in Sabon-gari Local government Area, Kaduna State, Nigeria.

Objectives of the Study

The objectives of this study are to determine whether:

1. The academic achievement of students in public school differs from those in private schools;
2. The academic achievement of male students in public schools differs from their female counterparts;
3. The academic achievement of male students in private schools differ from their female counterparts.

Research Questions

The following research questions are answered in this study:

1. Is there any significant difference between public and private school students' achievement in biology?
2. Is there any significant difference between male and female students' achievement in public schools?
3. Is there any significant difference between male and female students' achievement in private schools?

Research Hypotheses

- HO₁:** There is no significant difference between the academic achievement of public and private school students in biology
- HO₂:** There is no significant difference between the academic achievement in biology of male and female students in public schools
- HO₃:** There is no significant difference between the academic achievement in biology of male and female students in private schools.

METHODOLOGY

The descriptive survey research design was employed to carry out this study. The research is non-experimental and therefore variables were not manipulated. This makes descriptive survey research design suitable for this study. This design also accommodates generalization of findings of the study upon the target population from which only a representative sample was actually studied.

The population of the study comprised all SS II biology students in Sabon-gari Local Government Area of Kaduna State. As at the time of this study, there are 40 registered private and government schools in the study area, which have SSII, with student population of 24,464. The SS II students are used for this study because they have been taught a considerable size of concepts in biology.

Six (6) senior secondary schools was purposefully selected from the population to encompass the public and private (three each) schools needed for the study. From each school, forty SS II Science Students were randomly selected to participate in the study. Thus, 240 students participated in the study. This sample size agrees with Krejcie and Morgan (1970) recommendation of 10-15% of the research population reflecting in the research as sample. Details of the sample are presented in tables 3.1 and 3.2.

Table 2: Population of SSII Science Students in the Sampled Schools

Name of School	Type of School	No of Males	No of Females	Total
GSS, Chindit Zaria	Public	151	132	283
Aminu Sec. School	Public	113	97	210
GDSS, Kwangila Zaria	Public	128	112	240
Dagama's Legacy Schools	Private	50	46	96
Aunty Grace School	Private	42	32	74
First Baptist High Sch.	Private	45	35	80
Total		529	454	983

Table 3.2: Sample of the Study

Name of School	Type of School	No of Males	No of Females	Total
GSS, Chindit Zaria	Public	23	17	40
Aminu Sec. School	Public	19	21	40
GDSS, Kwangila Zaria	Public	22	18	40
Dagama's Legacy Schools	Private	17	23	40
Aunty Grace School	Private	21	19	40
First Baptist High Sch.	Private	19	21	40
Total		121	119	240

The instrument used to collect data for this study is Biology Achievement Test (BPT). BPT is a 35-item achievement test drawn from WAEC and NECO past questions in biology. The face and content validity of the BPT was censured by two senior lecturers at the Department of Biological Science, Ahmadu Bello University, Zaria. The items selected were only on the topics covered in all the schools selected for the study. The test-retest reliability co-efficient for the BPT was 0.83. Respondents were asked to indicate their gender and type of school on the achievement test. The venue for the test was ensured to be conducive for test administration. The test was administered twice at an interval of three weeks. The data collected were analysed using mean scores and t-test statistics.

RESULTS AND DISCUSSION

The results of the analysis are as shown in tables 4, 5 and 6.

HO₁: There is no significant difference between the academic achievement of public and private school students in biology

Table 4: Comparison of Public and Private Schools Academic Achievement in Biology

Variable	School type	N	Mean	Std dev	Std mean Er.	Df	T	p	Remark
BPT	Private	120	19.49	6.49	.548	239	-2.64	0.001	*
	Public	120	15.65	4.73	.225				

Significant ($p \geq 0.05$)

Result from the Table 4 shows that $t = -2.54$, $p < 0.05$. The mean achievement for public school students is 15.65 while that of private school is 19.49. Although the students' achievements between the public and private schools wasn't a wide margin, the private school students performed significantly better than their public school counterparts.

Thus, the null hypothesis is rejected, indicating that there is a significant difference between public and private secondary school students' achievement in biology.

HO₂: There is no significant difference between the academic achievement in biology of male and female students in public schools

Table 5: Comparison of Male and Female Students Academic Achievement in Public Schools

Variable	Gender	N	Mean	Std dev	Std mean Er.	Df	t	p	Remark
BPT	Male	64	16.31	3.63	.434	119	-1.54	0.810	NS
	Female	56	16.21	3.47	.428				

NS= Not Significant ($p > 0.05$).

The Table 5 sought to determine whether gender difference could affect academic achievement in biology (among the public schools students). The analysis in the Table 5 reveals $t = -1.54$, $p > 0.05$. This shows that there is no significant difference between male and

female students in biology achievement in public schools. Thus, the null hypothesis is hereby retained.

HO₃: There is no significant difference between the academic achievement in biology of male and female students in private schools.

Table 6: Comparison of Male and Female Students Academic Achievement in Private Schools

Variable	Gender	N	Mean	Std dev	Std mean Er.	Df	t	p	Remark
BPT	Male	57	17.59	5.73	.543	119	-1.61	0.816	NS
	Female	63	17.67	5.54	.525				

NS= Not Significant ($p > 0.05$).

The Table 6 considers gender differences on academic achievement in biology in private schools. Results show that $t = -0.161$, $p > 0.05$. The mean scores of the female students in BPT is 17.67 as against that of males which is 17.59. This shows that there is no significant difference between male and female students' biology achievement in private schools. The null hypothesis is hereby retained.

DISCUSSION OF FINDINGS

Findings from the research in Table 4 reveal that there is a significant difference between public and private school students academic achievement in biology ($t = -2.54$, $p < 0.05$). The findings show significant difference between the mean scores of the private school students' achievement in biology. The mean score for the private school students is 19.49 while the public school students' is 15.65. This shows that the private school students are better than the public school students in the Biology Achievement Test. Factors responsible for this may include, but not restricted to small class size, available facilities and aids, neat and welcoming environment in the private schools. In addition, the teachers devote more time for the teaching of the students. This is contrary to the poor attitude to teaching of the teachers in public schools. This finding is in agreement with that of Olasehine and Olatoye (2014), who reported a significant difference in the achievement of public and private schools in science.

Tables 5 and 6 reveal that there is no significant difference between male and female students' academic achievement in biology, in public and private schools ($t = -1.54$, and -1.61 , $p > 0.05$ respectively). This finding contradicts the findings of Olatoye and Agbatogun (2009); and Olatoye (2009), who reported that there is a significant difference between public and private school students' achievement in sciences.

CONCLUSION

This research has been able to establish that private school students in Zaria Metropolis, Kaduna State perform better in biology than their counterparts in the public schools. These findings tend to provide justification for parents who have found private schools as an alternative to government-owned public schools. It is however important to stress that students' mean achievement scores in both public and private schools are below average. This shows that a lot of work still needs to be done to raise students' achievement in

both schools. Furthermore, the no-difference in gender achievement is an assurance that there is hope that male and female students have the potential of benefiting from biology education.

RECOMMENDATIONS

From the findings of the study, the following recommendations were made:

1. Government at all levels should support the running of both public and private schools beyond the paintings of words.
2. More supervision should be intensified on the public schools to make teachers work better on the students and produce better results.
3. Retraining of the teachers in both school types to improve their biology instructional strategies should be the concern of the all education stakeholders.

REFERENCES

- Agbatogun, A. O. (2009). School Factors as Predictors of Junior Secondary School Students Attitude towards Social Studies. *An Unpublished M.Ed Dissertation*, Institute of Education, Olabisi Onabanjo University, Ago Iwoye.
- Akporehwe, J.N. & Onwioduokit F.A. (2013). Enhancing Scientific Attitude through Activity-Based Approaches. *Academia.edu Retrieved 24th June, 2013*
http://www.academiai.edu/719335/Enhancing_Scientific_attitude_Activity_Based_Approaches
- Anyanwu, R. I. & Alafiatayo, B. M. (2016). Study Habits and Self Concept as Predictors of Students' Academic Achievement in Biology for Sustainable Development among Senior Secondary Schools in Zaria Local Government Area. *A Paper Presented At The 3rd National Conference Of The School Of Science, Niger State College Of Education, Minna, Niger State, From The 11-13th May, 2016.*
- Ayodele, C.S and Adebisi, D.R. (2013). Study habits as influence of academic achievement of university undergraduates in Nigeria. *Research Journal in Organizational Psychology & Educational Studies*, 2(3): 72-75.
- Berkely Parent Network (2009). Parents' Involvement in Private Schools. Retrieved 22nd July, 2013. <http://parentberkelyedu/recommended/schools/parentinvolve.html>.
- Ellis, J. D. (2010). The Influence of the National Science Education Standards on Science Curriculum, University of Kansas. In: Wikipedia Free Encyclopaedia, *National Science Education Standards* http://en.wikipedia.org/w/index.php?titlenational_science_education_standardsaction=edit§ion
- Lubienski, S., Lubienski, C. and Crane, C. (2009). *Public Schools Outperformed Private Schools in Mathematics*, Publication of College of Education, Illinois University, USA. Retrieved online 13 April, 2013
- Obemeata, J. O. (1995). Education: An Unprofitable Industry in Nigeria. *Post graduate School Interdisciplinary Research Discourse*. University of Ibadan, Ibadan, Nigeria.
- Ogbonna, F. N. (2007). Influence of Parental Involvement and Self -Concept on Science Achievement of Junior Secondary School. Students in Ogun State, Nigeria. *A Pre-field Research Proposal Presented at Research Seminar of the Institute of Education*. Olabisi Onabanjo University, Ago Iwoye.
- Olasehinde, K. J. and Olatoye, R. A. (2014). A Comparative Study of Public and Private Senior Secondary School Students' Science Achievement in Katsina State, Nigeria

- Journal of Educational and Social Research*, MCSER Publishing, Rome-Italy, 4(3). 203-207.
- Olatoye, R A. & Agbatogun A. A. (2009). Parental involvement as correlates of pupils' achievement in mathematics and science in Ogun state, Nigeria. *Educational Research and Review*, 14 (10), 457-464.
- Olatoye, R A. (2009a). Study habit, Self-concept and Science Achievement of Public and Private Junior Secondary School Students in Ogun State, Nigeria. *African Research Review*, 13, (4), 492-506
- Olatoye, R. A. (2009b) Students' Test Anxiety. Motivation for examinations and science achievement in junior secondary schools in Ogun state, Nigeria. *International Journal of Psychology and Counselling*, 1 (10), 194-198.
- Olatoye, R.A, (2002). A Causal Model of School Factors as Determinants of Science Achievement in Lagos State Secondary Schools. An Unpublished PhD Thesis, University of Ibadan, Nigeria.
- Onwuegbuzie, A. J. (2010). Characteristics of graduate students' oral presentations. *Unpublished manuscript*, Sam Houston State University, Huntsville, Texas.
- Parlak, J. A. (2007). Academic Achievement in High School: Does Emotional Intelligence Matter? *Personality and Individual Differences*, 38(7), 111-118.