

Comparison of Boarding and Day Senior Secondary School Students' Performance in Biology in Owo, Ondo State, Nigeria

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Abstract

Evidence from empirical studies has in recent time shown repeated poor performance of students in science subjects in Nigeria. This assertion called for the concern of stakeholders and findings from research studies linked this poor performance to school type, government, examination bodies, teachers, parents and the students themselves. In line with this general assertion, this study compared the performance of boarding and day senior secondary students in biology in Owo Local Government, Ondo State, Nigeria. The study was a descriptive research of the ex-post-facto type. A purposive sampling technique was used to select six schools. A total number of three hundred and ninety five (395) students' results in West African Senior School Certificate examination conducted in 2012 were utilized. The data obtained were analyzed using t-test inferential statistics and Analysis of Variance (ANOVA). All hypotheses were tested at 0.05 level of significance. The results revealed that there was a significant difference in the Biology students' academic performance in private and public boarding and day secondary schools. It could be deduced that significant difference does exist among the schools. The calculated t-value for male and female students' performance in boarding ($t = 0.091$) and day ($t = 0.257$) schools are greater than p-value ($p > 0.05$). This implies that significant difference does not exist between the Biology performance of male and female students in boarding and day secondary schools. Based on the findings of this study, it was recommended that parents should not discourage their children from going to either boarding or day school. Rather, they should encourage their children to study hard. Though parents' financial capability determines the type of school a child attends; parents can still take the sole decision in making a choice between boarding and day school. Students should also be involved in decision making as this would help them to have a positive attitude towards learning process at school. Proprietors of schools should try to establish single sex boarding school which could either be mixed boarding or full boarding since students' performance in single sex school differs significantly in the sampled schools in favour of full boarders. Public schools are encouraged to monitor learning achievement in schools; provide schools with adequate facilities and other fringe benefits so as to encourage and motivate students to learn more effectively and efficiently, thereby improving students' academic performance.

Key words: Boarding, Day, School, Mixed Boarding, Performance.

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Introduction

Science plays prominent roles in extending the scale and scope of global, national and local economic activities. The role of science and technology in the development and industrialization of a nation is enormous. Science is receiving great emphasis in education because of its significance and relevance to life and society.

The world is in the epoch of science and technology which had made it possible for important discoveries such as; curing leukaemia with gene therapy, earth like exoplanets, mechanism which causes human allergy to cats among others. The superstitious beliefs about albinism have been disapproved and this could be traced to the knowledge of the science of biology. According to (Olorundare, 2014) "knowledge from science has also been used for emancipatory as well as oppressive purposes" (p.8). The role of science subjects, especially Biology being taught at the senior secondary school level in this modern era of technology is wide and profound.

Ahmed et al., (2011) affirmed that the world is made up of those things that are living and those that are not living. These researchers emphasized the linkage between living components and non-living components by the fact that substances that made up living things are directly or indirectly from water, air and soil which are non living. Life is not a simple concept, which is one of the reasons why the knowledge and understanding of biology is important in students so as to improve their living and improve their academic performance. The study of Ahmed & Abimbola (2011) stated that Biology is beneficial to human beings in many ways. These ways include promoting understanding of the relationships between humans and their environment, preparing the individual for choice of career and stimulating interest in Biology based hobbies, etc.

Students' performance is judged by individuals from various perspectives. Most persons use the performance of students in public examinations to pass judgment on school type, government, teachers, parents and students themselves. Given the government inability to provide residential schooling at primary level, which is the basic level where firsthand knowledge that builds up the child for secondary education is been acquired; the roles have been taking over by educational entrepreneurs investing heavily on boarding schools.

Boarding school is a school where students are provided with accommodation to live in school hostel within the environment of the school during school term. Boarding schools could be full boarding or the mixture of both boarders and day students that attend the institution by day and return to their different houses after school hours. Day school is a school where all the students go for studies and return to their homes after school hours. Both boarding and day schools could either be privately or publicly owned. According to Ngeno et al., (2012), parents and guardians lack guiding principles on making informed decisions on the choice of schools amid limited financial resources. The researchers revealed that boarding schools gradually attain the status of providing systemic and quality education that can better students' academic performance.

According to Abimbola (2013), "The system of education in Nigeria provides little opportunities for students to engage in self instruction because they are always being taught by either teachers in schools or coaching classes, or parents and siblings at home, without knowing how to study by themselves, with the exception of, perhaps, students in boarding schools" (p.26). Therefore, all students should be encouraged to imbibe good reading culture which would in turn inspire their learning interest in biology.

Biology is one of the various subjects that explain science. Despite its importance to humankind and efforts of all researchers to improve students' performance in the subject, yet poor performance still prevail among secondary school students. Researchers had adduced the observable problem on a number of factors (Ezekwesili, 2006). Among these factors are the kind of schools attended, system of operation in the secondary school in terms of ownership, school location, teachers' competence and poor teaching method.

Ngeno et al., (2012) also reported that the percentage of performance figures of students in biology in May/June senior school certificate examination from 2007 to 2011 fell below 35%, except for the year 2011 which rose to 38.50%. (Ezekwesili, 2006) stated that "what Nigerians see at the moment is that education administrators make a noise after every bad outing in external examinations; then doze off, waiting for the next disaster to happen, after which they call for education submits". In spite of the importance and popularity of Biology among Nigeria students, performance at senior secondary school level had been poor (Ahmed, 2008). Thus, this study compared the academic performance of student's in Biology in boarding and day schools in Owo Local Government Area of Ondo State using the students' WASSCE results.

Purpose of the Study

Specifically, the research found out:

1. The difference in the performance of biology students in boarding and day secondary schools.
2. What is the level of performance of Biology students in mixed boarding secondary schools with day and boarding students?
3. Difference in the performance of male and female Biology students in boarding schools.
4. The difference in the performance of male and female Biology students in day secondary schools.

Research Questions

Answers were sought to the following research questions in the study:

1. What is the level of performance of Biology students in boarding and day secondary schools?
2. What is the level of performance of Biology students in mixed boarding secondary schools with day and boarding students?
3. What is the level of performance of male and female students in biology in boarding schools?
4. What is the level of performance of male and female biology students in day secondary schools?

Research Hypotheses

In this study, the following hypotheses were tested:

HO₁: There is no significant difference between the performance of boarding and day secondary schools Biology students in Owo Local Government, Ondo State, Nigeria.

HO₂: There is no significant difference between the performances of Biology students in mixed boarding schools in Owo Local Government, Ondo State, Nigeria.

HO₃: There is no significant difference between the performance of male and female Biology students in boarding secondary schools in Owo Local Government, Ondo State, Nigeria.

HO₄: There is no significant difference between the performance of male and female Biology students in day secondary schools in Owo Local Government, Ondo State, Nigeria.

HO₅: There is no significant difference among Biology students' academic performance in private and public owned boarding and day secondary schools.

Methodology

This study is a descriptive research of the ex-post-facto type. The population for this study comprised of all secondary school biology students in Owo Local Government Area of Ondo State. Senior Secondary three (SS3) Biology students were the target population. These schools were made up of full time boarding secondary schools, mixed boarding system comprising of both boarders and day students and day secondary schools which are either public or private owned. Purposive sampling technique was used to select the school. The sample size comprised all students that took part in 2012 Senior Secondary School Certificate Examinations to avoid been bias in selection of students and scores from each selected schools.

The measuring device that the study utilized is the West African Examinations Council students' results of 2012 in Biology. Stanine rating scale was used for easy coding and categorisation of scores. The statistical program used was the Statistical Package for Social Sciences (SPSS), version 20.0. The instrument was validated by the researcher's supervisor and two other lecturers in the Department of Science Education to ensure the adequacy full authenticity of the content. In analyzing the data, research questions were answered with their corresponding hypotheses, inferential statistic of t-test and Analysis of Variance (ANOVA) was used in testing hypothesis. SSCE results were used to measure the differences in students' performance for full boarding, mixed boarding and day secondary students in Biology in Owo Local Government Area of Ondo State.

Results

Research Question 1: What is the performance of Biology students' in Boarding and Day secondary schools? This translates to the corresponding hypothesis 1(HO₁) which states that:

Research Hypothesis 1: There is no significant difference between the performance of boarding and day secondary schools Biology students in Owo Local Government, Ondo State, Nigeria.

Table 1: t-test analysis showing the significant difference in the performance of boarding and day secondary school students in Biology

	School Type	N	Mean	Std. Deviation	df	T	Sig
Performance	Boarding	81	2.20	1.50	146	-3.93	0.32
	Day	67	3.21	1.61			

NOTE: NS = Not Significant, S = Significant at 0.05. Remark: 0.32 is NS, Ho1 is not rejected.

Table 1 revealed that the t-value = -3.93 at df (146) shows a significant difference that is greater than p-value ($p > 0.05$); Hence, HO1 which stated there is no significant difference between the performance of boarding and day secondary school students in Biology was not rejected. This result implies that significant difference does not exist.

Research Question 2: What is the performance of student in mixed boarding school with day and boarders? This is translated to the corresponding hypothesis.

Research hypothesis 2: There is no significant difference between the performance of Biology students in Boarding schools running Boarding and Day.

Table 2: t-test analysis showing the difference in the performance of male students in mixed boarding school and female students in mixed boarding School.

	Mix-school	N	Mean	Std. Deviation	Df	T	Sig
Performance	Boys only	121	1.90	1.344	245	3.01	0.00
	Girls only	126	1.46	.927			

NOTE: NS = Not Significant, * = significant at 0.05. Remark: 0.00 is S, Ho2 is rejected.

Table 2 revealed the test for significant difference between the performances of secondary school students of male only mixed boarding school and female only mixed boarding school. The table shows that df (245) = 3.01 shows a significant difference which is less than P-value ($P < 0.05$). Hence, there exists a highly significant difference between the two variables tested and the null hypothesis four stated above is been rejected.

Research Question 3: What is the level of performance of male and female Biology students in boarding school? This is translated to the corresponding hypothesis.

Research hypothesis 3: There is no significant difference between the performance of Male and Female Biology students in Boarding Secondary School.

Table 3: t-test analysis showing the difference between the Biology performance of male and female students in boarding secondary school

	Gender in Boarding	N	Mean	Std. Deviation	df	t	Sig
Performance	Male	39	3.64	2.580	79	-0.09	0.32
	Female	42	3.69	2.290			

NOTE: NS = Not Significant, S = Significant at 0.05. Remark: 0.32 is S, Ho3 is not rejected.

Table 3 shows that the df (79) with t-value of -.091 shows a significant difference at 0.32 level of significance which is greater than p-value ($p > 0.05$). Hence, the researcher did not reject the H_0 , which stated there is no significant difference between the performance of Male and Female Biology students in Boarding Secondary School. The mean score for both genders as shown in the table does not significantly differ from each other. This result implies that significant difference does not exist between the performance of male and female students in boarding secondary school.

Research Question 4: What is the performance of male and female biology students in Day secondary school? is translated to the corresponding hypothesis.

Research Hypothesis 4: There is no significant difference between the performance of male and female Biology students in Day secondary school.

Table 4: t-test analysis showing difference between the Biology performances of male and female students in day secondary school

	Gender in Day	N	Mean	Std. Deviation	Df	T	Sig
Performance	Male	39	3.92	2.15	65	0.26	0.58
	Female	28	3.79	2.18			

NOTE: NS = Not Significant, S = Significant at 0.05. Remark: 0.58 is S, H_0 is not rejected.

Information in table 6 indicate that the df (65) = 0.26 shows a significant difference at 0.58 which is greater than P-value ($P > 0.05$). This implies that significant difference does not exist between the Biology performance of male students in Day secondary school and performance of female students in Day secondary school. Hence, the research Hypothesis above that stated significant difference does not exist between the Biology performance of male and female secondary school students in day school is not rejected.

Research Hypothesis 5: There is no significant difference among Biology students' academic performance in private and public owned boarding and day secondary schools.

Table 5: ANOVA table showing the comparative analysis of Biology students' academic performance in private and public boarding and day secondary schools

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	154.109	3	51.370	31.170	.000
Within Groups	237.316	144	1.648		
Total	391.426	147			

NOTE: NS = Not Significant, S = Significant at 0.05. Remark: 0.00 is S, H_0 is rejected.

From table 5 it was revealed that $F(3, 144) = 31.17$, shows a significant difference at 0.00 which is less than the p-value ($p < 0.05$) for Biology students' academic performance in private and public boarding and

day secondary schools was significant. The table reveals that there was a significant difference in the Biology students' academic performance in private and public boarding and day secondary schools.

Scheffe post-hoc analysis was also used to locate the direction of the differences among the groups. This was done to establish the direction of the differences in the Biology students' academic performance in private and public boarding and day secondary schools.

Table 6: Scheffe Analysis of the differences among Biology students' academic performance in private and public boarding and day secondary schools

Scheffe	N	Subset for alpha = 0.05	
		1	2
PUB	56	1.6429	
PUD	37	2.3514	
PRB	25		3.4400
PRD	30		4.2667
Sig.		.166	.076

NOTE PUB= Public Boarding, PRB= Private Boarding, PUD= Public Day and PRD=Private Day. Table 13, reveals that there was a significant difference between Biology students' academic performance in private and public boarding and day secondary schools with PUB having a mean of 1.64, PUD with the mean of 2.35, PRB with the mean of 3.44 and PRD with the mean of 4.27. This means that Biology students' in PRD performance better than those in PUD; More so, Biology students' in PRB performance better than those in PUB.

Discussion

The discussion for the study was based on the findings of the research questions and hypotheses formulated which revealed that both Boarding and Day schools performed equally in Biology. In testing the hypotheses, it was found that the t-value = -3.93 at df (146) shows a significant difference that is greater than p-value ($p > 0.05$); Hence, H_0 which stated there is no significant difference between the performance of boarding and day secondary school students in Biology was not rejected. This result implies that significant difference does not exist. This finding is in accordance with the study of Adetunji & Oladeji (2000) on the comparative of the reading habit of boarding and day secondary school students in Osogbo, Osun State, Nigeria. The study revealed almost equal percentage of male and female students in all the secondary schools selected. The findings from both schools may be because of the merits and facilities of boarding schools and the influence of parents who deem it necessary to motivate their day school children to study at home. Hence, both schools can produce good students' outcome but it depends on students' construction of knowledge.

The findings on H_{O2} which states that there is no significant difference between the performances of Biology students in mixed boarding schools with day and boarders. The result obtained shows that the df (255) = 3.009 is less than P -value ($P < 0.05$) in the mixed boarding schools. Hence, there exists significant difference between the two variables because boys only mixed boarding performed better than the girls only mixed boarding school with their mean score. Therefore, H_{O2} is not rejected. Whaten (2012) affirmed that differences in gender have been associated with various tendencies in how students take in information, process information and communicate their ideas. A study conducted by Onasanya et al., (2011) buttresses this finding because it asserted that a significant difference existed between the cognitive achievement of male and female students in Biology. Though Karen (2003) asserted that gender does not determine one's potential but Yoloye (2004) observed that gender has influence on science achievement. Thus, it can be deduced that social interaction among students of the same sex influences students' intellectual efficiency because both schools are single sex school.

It was also found out that significant difference does not exist between the performance of male and female students in boarding and day school because the t -value for H_{O3} and H_{O4} showed a level of significant (0.32 and 0.58) which is greater than p -value ($p > 0.05$). Hence, these hypotheses are not rejected. This supports the study Adetunde & Asare (2009) which revealed that gender has no significant influence on students' achievement in science. This result is contrary to the submission of Ezirim (2006) & Babajide (2010). The results of these hypotheses may be because of the fact that male and female are equally intellectual and gender does not in any way determine one's academic attainment.

Lastly, findings from this research further indicate from the anova table comparing school type among boarding and day Biology students' academic performance in private and public secondary schools that there was a significant difference in the Biology students' academic performance in private and public boarding and day secondary schools. This agrees with the study of Ezirim (2006), Babajide (2010) & Onasanya et al., (2011) which revealed that significant difference does exist between a boarding student and day student. Therefore, school type plays a significant role in students' academic achievement. From this, it can be said that the differences that exist among school type, system of operating a school, facilities and school policy could create variation in students' academic performance. McEwan (2000) revealed that Private schools vary widely in the outcomes of the performance of their students. This heterogeneity may have as much to do with internal features of private schools, including the objectives and preferences of school managers, as with external features of policy environments. This was justified in the mean scores and significant values obtained in each Scheffe post-hoc analysis tables that compared each school type and system.

Conclusion

It could be concluded from the major findings and discussion that:

Boarding and day school students have performed equally in Biology and significant difference does not exist between the performance of boarding and day secondary school students in Biology. This indicates that there was no significant difference between a student been a boarding student or day student. Hence, the performance of a student may not be determined by the kind of school attended rather by his or her self-construction of knowledge.

There was significant difference between the performance of students in males' only and females' only mixed boarding school in Biology. There exist significant difference between the two variables tested; male mixed boarding school and female mixed boarding schools. Hence, single sex school has significant influence on students' performance.

Finally, significant difference does not exist between the performance of male and female students in boarding and day secondary schools because the calculated t-value is greater than the p-value. Hence, gender stereotype does not significantly influence students' performance; though male students performed below in boarding school while female students performed below in day school. The results further revealed a significant difference among the performance of boarding and day secondary schools in public or private.

Recommendations

Based on the findings and conclusions drawn in this study, the following recommendations have been put forward.

Parents should not discourage their children from going to either of the boarding or day school rather encourage them to read.

Government should increase funding of boarding secondary schools to make it affordable to the masses. Hall tutors or house master's in public schools are encouraged to give counselling to the boarding students so that they may know the reason for their been in boarding school.

Proprietors of schools should try to establish single sex boarding school which could either be mixed boarding or full boarding because students' performance in single sex school highly differs significantly between the sampled schools. Schools are recommended to have review practices for the purpose of observation and gathering information about normal practices in schools system; be it boarding or day on a regular basis as a way of improving the quality of students' outcomes.

Public schools are encouraged to monitor learning achievement in schools; provide schools with adequate facilities and other fringe benefits so as to encourage and motivate students to learn more effectively and efficiently thereby improving students' academic performance.

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