COMPARATIVE ANALYSIS OF STUDENTS’ PERFORMANCE IN MATHEMATICS BETWEEN BOARDING AND DAY SECONDARY SCHOOLS IN SOKOTO STATE, NIGERIA

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Abstract
This study compared the mathematics performance of Boarding and Day secondary school students’ in Sokoto State. The target population of the study was all SS-2 students promoted to SS-3 in Boarding and Day secondary schools in Sokoto State. Eight secondary schools were selected for the study. Proportionate sampling technique was used to sample 728 SS-2 students from eight secondary schools which consist of 2 males’ Boarding senior secondary schools, 2 females’ Boarding senior secondary schools, 2 males’ Day senior secondary schools and 2 females’ Day senior secondary in Sokoto metropolis. Results of mathematics promotion examination of 2015/2016, 2016/2017 and 2017/2018 sessions were used for the research. Data collected were analyzed using t-test. The study generally found that female students performed better in mathematics than male students in Sokoto State. Some recommendations were given to teachers, education managements, stakeholders in educations and Sokoto state government on how to increase teacher’ and parents’ awareness in student’ education especially mathematics which is one of the basic requirement for studies in tertiary institutions.

KEYWORDS: Comparative Analysis, Boarding Schools, Day Schools, Performance, Mathematics.

Background to the study
The present educational system 6-3-3-4 designed by Nigerian educational policy makers which kicked up in 1980s, highlighted the number of years a child is expected to spent in the
process of acquiring his education from primary up to university education (FRN, 2013). This was categorically spelt out from the numbers. Nigerian child is expected to spend six years for his primary education, three years for his first secondary education known as junior secondary school education, three years for his senior secondary education and four years for his University education, (Adewole, 2014). This shows that every Nigerian child is expected to have his first university degree at twenty three years of age. Sequel to the Federal Government policy, education for all (EFA), many Day and Boarding secondary schools were opened in each state in Nigeria.

The present government of Sokoto State introduced State of Emergency on Education (SEE). This is with the view checkmate the falling standard of education in primary and secondary schools in the state and also to bridge the gaps for obtaining quality education between urban and rural children in the state. Sequel to this programme more number of Boarding primary schools and Day junior secondary schools (JSS) were increased in the state and some existing junior secondary schools (JSS) were uplifted to senior secondary schools (SSS). This brought about serious competition between boys and girls in pursuing their education in the two set of schools.

Statement of the Problem
In view of the importance of mathematics which prepares learners for science and technology related professions such as engineering, technology and computer science, etc, many researches were conducted comparing performances of students base on genders (Audi, 2013; Abubakar&Alao, 2010; Sharif &Areelu, 2010; Garba, 2009; Adeosum, 2008; Bawa&Abubakar, 2008; Yusha’u, 2004). Other researches focus instructional materials and competence of teachers in the classrooms (Muhammad, Gwandu&Bagna, 2010; Waziri, 2016; Kuremeh&Iji, 2009; Kajuru, 2008 and Abiodum, 2007).

But despite the emphasis led by Federal and State governments of Nigeria, educational stake, educational policy makers and private individuals, yet very few researches was carried out elsewhere in Nigeria comparing the performances of students in the present Boarding and Day secondary. This study therefore sought to compare the performance of students in mathematics between Boarding and Day secondary schools in Sokoto State.

Objectives of the Study
The objectives of this study are:
1. To assess students’ performance in mathematics between boarding and day secondary schools in Sokoto State.
2. To assess the performance of male and female students in mathematics in boarding secondary schools in mathematics in Sokoto State.
3. To assess the performance of male and female students in Day secondary schools in mathematics in Sokoto State.

Research Questions
In an effort to achieve the stated objectives of this study, the following questions were set:

1. Is there any significant difference in mathematics performance between students in Boarding and Day Senior Secondary Schools in Sokoto State?
2. Is there any significant difference in mathematics performance between male and male students in boarding senior secondary schools in Sokoto State?
3. Is there any significant difference in mathematics performance between male female students in day senior secondary schools in Sokoto State?

Research hypotheses

\( H_01 \) There is no any significant difference in mathematics performance between students of boarding and day senior secondary schools in Sokoto State.

\( H_02 \) There is no any significant difference in mathematics performance between male and male students of Boarding senior secondary schools in Sokoto State.

\( H_03 \) There is no any significant difference in mathematics performance between male and female students of Day senior secondary schools in Sokoto State.

Significance of the Study

This study compared the level of students’ performance in boarding secondary schools and those of day secondary schools in mathematics in Sokoto State. Thus, this study will

1. Gear both students in each category whether male and female students to improve and compete in their mathematics performance and other subject areas. This which will help them greatly in studies.
2. It will also provide important information that will be of help not only to teachers and parents but also to education administrators, policy makers and government in the task of improving the teaching and learning of mathematics.

Research Design

This study employed an ex-post facto research designs. This is because the study used recorded students’ results which have already been conducted for their promotion exercise. Osalu (1993) described an ex-post facto design as an after facts research design which does not permits artificial manipulations of the subjects. Gay (1996) also described an ex-post facto research as an after fact study which does not involve the manipulation of variable.

Population of the study

The target population of this study was the whole SS-2 students promoted to SS-3 in Sokoto metropolis. It was found that there are sixty-seven (67) Senior Secondary Schools in Sokoto State. Twenty-five (25) schools were situated in Sokoto metropolis. However, only eight schools in Sokoto metropolis was selected using stratified sampling method.

Sample and Sampling Techniques

Purposeful random sampling technique was used to select the schools for this study. This was in line with the advice of Abdussalam (2005) on purposeful random sampling technique. Two main categories of schools chosen were:

1. Boarding schools
2. Day schools
Table 1: List of sample schools and their category

<table>
<thead>
<tr>
<th>Category</th>
<th>School</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boarding Schools</td>
<td>SaniDingyadi Unity Secondary School Sokoto</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Sokoto Science College, Sokoto.</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Hafsatu Ahmad Bello Model Arabic Secondary School Sokoto, Unity Girls’ Secondary School Bodinga</td>
<td>Female</td>
</tr>
<tr>
<td>Day Schools</td>
<td>Sultan Bello Secondary School, Sokoto</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Sultan Atiku Secondary School, Sokoto</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Nana Girls Secondary School, Sokoto</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Asma’u Girls Islamic Secondary School, Sokoto</td>
<td>Female</td>
</tr>
</tbody>
</table>

The tables below show the proportionate sample allocation of students in each of the selected school.

Table 2: Sample size of students in selected Boarding Senior Secondary Schools

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sani Dingyadi Unity Sec. Sch.</td>
<td>604</td>
<td>572</td>
<td>673</td>
<td>1849</td>
<td>91</td>
</tr>
<tr>
<td>Sokoto Science College</td>
<td>310</td>
<td>482</td>
<td>353</td>
<td>1145</td>
<td>56</td>
</tr>
<tr>
<td>Hafsatu Ahmad Bello Sec. Sch.</td>
<td>922</td>
<td>763</td>
<td>971</td>
<td>2656</td>
<td>130</td>
</tr>
<tr>
<td>Gov’t Girls’ Unity Sec. Sch.</td>
<td>650</td>
<td>573</td>
<td>603</td>
<td>1826</td>
<td>90</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2486</strong></td>
<td><strong>2390</strong></td>
<td><strong>2600</strong></td>
<td><strong>7476</strong></td>
<td><strong>367</strong></td>
</tr>
</tbody>
</table>

Table 3: Sample size of students in selected Day Senior Secondary Schools

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sultan Atiku Secondary School</td>
<td>557</td>
<td>572</td>
<td>673</td>
<td>1802</td>
<td>103</td>
</tr>
<tr>
<td>Sultan Bello Secondary School</td>
<td>504</td>
<td>382</td>
<td>573</td>
<td>1459</td>
<td>84</td>
</tr>
<tr>
<td>Nana Girls’ Secondary School</td>
<td>576</td>
<td>507</td>
<td>673</td>
<td>1756</td>
<td>100</td>
</tr>
<tr>
<td>Asma’u Girls’ Islamic College</td>
<td>499</td>
<td>372</td>
<td>473</td>
<td>1344</td>
<td>77</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2136</strong></td>
<td><strong>1833</strong></td>
<td><strong>2392</strong></td>
<td><strong>6361</strong></td>
<td><strong>364</strong></td>
</tr>
</tbody>
</table>

Table 2 and 3 shows the total population of students and their proportionate sample size in the selected Boarding and Day senior secondary schools and were found to be 7476 and 6361 respectively while their proportionate sample students was 367 and 364 respectively.

Instrumentation

The instruments used in the study was the results of end year Mathematics promotion examinations of 2015/2016, 2016/2017 and 2017/2018 sessions.

Validity and Reliability of the instrument

The instruments merit used were validated. This is because the promotional examination used in the study was conducted by the state Ministry of education, Ministry of Science and technology and Arabic and Islamic Education board respectively. The examination is
therefore standard and accepted because it is the main instrument used for promoting or demoting the students in secondary schools.

**Method of Data Analysis**
The statistical method employed in analyzing the data was t-test because the data used was students’ examination results conducted in 2015/2016, 2016/2017 and 2017/2018 sessions.

**Data Presentation and Analysis**

Table 4: Summary of grades and Interpretation

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range marks</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>70-100%</td>
<td>Excellent</td>
</tr>
<tr>
<td>B</td>
<td>60-69%</td>
<td>Very Good</td>
</tr>
<tr>
<td>C</td>
<td>50-59%</td>
<td>Good</td>
</tr>
<tr>
<td>D</td>
<td>49-45%</td>
<td>Pass</td>
</tr>
<tr>
<td>E</td>
<td>40-44%</td>
<td>Pass</td>
</tr>
<tr>
<td>F</td>
<td>00-39%</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Source: Grading format used by the selected schools

The presentation of data was based on the six hypotheses raised that were generated from the three objectives of the study. Each of the six hypotheses was tested using t-test analysis at α=0.05 level of significance. For the purpose of scoring to measure the relative performance of students, the ordinal grading system from A – F was coded as A = 5, B = 4, C = 3, D = 2, E = 1 and F = 0. The analysis is shown in the following order:

**Hypotheses one (H₀₁)**
There is no significant difference in mathematics performance between Day and Boarding Senior Secondary Students in Sokoto State.

Table 5: T-test analysis of null hypothesis one (H₀₁).

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of students</th>
<th>Mean score(x)</th>
<th>Standard deviation(σ)</th>
<th>df</th>
<th>α</th>
<th>t_cal</th>
<th>t_crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS Boarding</td>
<td>367</td>
<td>49.03</td>
<td>13.44</td>
<td>728</td>
<td>0.05</td>
<td>13.18</td>
<td>1.965</td>
</tr>
<tr>
<td>SS Day</td>
<td>363</td>
<td>56.13</td>
<td>16.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 represents the summary of the t-test compared the mathematics between the students of Day and Boarding Senior Secondary School Students in Sokoto State.

The results of the analysis showed that the calculated value of t (t_cal) =13.18 is greater than the critical value of t (t_crit) =1.965. The result revealed that there was significant difference in mathematics performance between Day and Boarding Senior Secondary School Students in Sokoto State. Therefore the null-hypothesis (H₀₁) is rejected. This shows that the Day senior secondary students performed better in mathematics in Sokoto State.

**Hypotheses two (H₀₂)**
There is no significant difference in mathematics performance between female and male students in Boarding senior secondary schools in Sokoto State.
Table 6: t-test analysis of null hypothesis one ($H_{03}$).

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of students</th>
<th>Mean score($\bar{x}$)</th>
<th>Standard deviation($\sigma$)</th>
<th>$df$</th>
<th>$\alpha$</th>
<th>$t_{cal}$</th>
<th>$t_{crit}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male SS Boarding</td>
<td>147</td>
<td>48.70</td>
<td>14.08</td>
<td>365</td>
<td>0.05</td>
<td>0.5082</td>
<td>1.9659</td>
</tr>
<tr>
<td>Females SS Boarding</td>
<td>220</td>
<td>49.24</td>
<td>13.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6 represents the summary of the t-test analysis for difference in mathematics performance between Male and female students of Boarding Senior Secondary Schools in Sokoto State.

The results of the analysis showed that the calculated value of $t (t_{cal}) = 0.5082$ is less than the critical value of $t (t_{crit}) = 1.9659$. The result revealed that there was no any significant difference in mathematics performance between Female and Male of Boarding Senior Secondary Students in Sokoto State. Therefore the null-hypothesis ($H_{03}$) is also not rejected.

Hypotheses three ($H_{03}$)
There is no significant difference in Mathematics performance between Female and Male students in Day Senior Secondary schools in Sokoto State.

Table 7: t-test analysis of null hypothesis four ($H_{04}$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of students</th>
<th>Mean score($\bar{x}$)</th>
<th>Standard deviation($\sigma$)</th>
<th>$df$</th>
<th>$\alpha$</th>
<th>$t_{cal}$</th>
<th>$t_{crit}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male SS Day</td>
<td>186</td>
<td>54.88</td>
<td>16.26</td>
<td>361</td>
<td>0.05</td>
<td>2.4394</td>
<td>1.9659</td>
</tr>
<tr>
<td>Females SS Day</td>
<td>177</td>
<td>57.45</td>
<td>15.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 represents the summary of the t-test analysis for difference in mathematics performance between female and male students of Day Senior Secondary Schools in Sokoto State.

The results of the analysis showed that the calculated value of $t (t_{cal}) = 2.4394$ is greater than the critical value of $t (t_{crit}) = 1.9659$. The result revealed that there was significant difference in Mathematics performance between Female and male students of Day schools Senior Secondary in Sokoto State. Therefore the null-hypothesis ($H_{04}$) is rejected.

Summary of Major Findings
The three null hypotheses generated from the three objectives of the study were tested using simple t-test analysis. The following are the major findings;

1. There was significant difference found in mathematics performance between Day and Boarding Senior Secondary School Students in Sokoto State.
(2) There was no any significant difference found in mathematics performance between Female and Male of Boarding Senior Secondary Students in Sokoto State.

(3) There was significant difference found in Mathematics performance between Female and male students of Day schools Senior Secondary in Sokoto State.

Recommendations
Based on the comparism made, the following recommendations are proffered towards improving the performance of students in mathematics subject.

(1) Despite the fact that both the students in the two categories performed well there is still need for Government to provide more qualified mathematics teachers to bridge the gabs of educational imbalance between male and female especially in mathematics subject which was considered as the bedrock of science and technology.

(2) Government, parent, and other educational stakeholders should join hands together in providing education for all especially in the rural areas by expanding and increasing the number Day schools in the local communities since children can perform better in them.

(3) Government, parent, teachers, educational managers, and other educational stakeholders should try and assist the students to become more interested in mathematics by providing them with educational materials such as relevant mathematics textbooks, conducive classrooms etc that will motivate and influence them to pay more attention to their studies.

(4) Transition of students to the next educational level should be given adequate attention and their educational records should be monitored to ensure positive achievements in their educational pursuits.

(5) Students should put more effort by practicing what they are being taught in the class, this will greatly assist them during their external examinations.

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