

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

MUHAMMAD BABUGA BINJI

Department of Mathematics

Shehu Shagari College of Education, Sokoto State, Nigeria

Phone no: +2348030787197, e-mail: babugabinji@gmail.com

&

ABDULLAHI MUHAMMAD SOKOTO

Department of Mathematics

Shehu Shagari College of Education, Sokoto State, Nigeria

Phone no: +2348030425946, e-mail: amsokoto.am@gmail.com

&

UMAR U. DANKAL

Department of Mathematics

Adamu Augie College of Education, Argungu, Kebbi State, Nigeria

Phone no: +2348032146011

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 to 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; Adeosun, 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 Abiodun, 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

H₀₁ There is no any significant difference in mathematics performance between students of boarding and day senior secondary schools in Sokoto State.

H₀₂ There is no any significant difference in mathematics performance between male and male students of Boarding senior secondary schools in Sokoto State.

H₀₃ 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. Osaolu (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 Abdussalami (2005) on purposeful random sampling technique. Two main categories of schools chosen were:

Table 1: List of sample schools and their category

Category	School	Gender
Boarding Schools	SaniDingyadi Unity Secondary School Sokoto	Male
	Sokoto Science College, Sokoto.	Male
	Hafsatu Ahmad Bello Model Arabic Secondary School Sokoto,	Female
	Unity Girls' Secondary School Bodinga	Female
Day Schools	Sultan Bello Secondary School, Sokoto.	Male
	Sultan Atiku Secondary School, Sokoto	
	Nana Girls Secondary School, Sokoto.	Male
	Asma'u Girls Islamic Secondary Schoool, Sokoto	Female
		Female

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

School	2015/2016	2016/2017	2017/2018	Total	Sample size
Sani Dingyadi Unity Sec. Sch.	604	572	673	1849	91
Sokoto Science College	310	482	353	1145	56
Hafsat Ahmad Bello Sec. Sch.	922	763	971	2656	130
Gov't Girls' Unity Sec. Sch.	650	573	603	1826	90
TOTAL	2486	2390	2600	7476	367

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

School	2015/2016	2016/2017	2017/2018	Total	Sample size
Sultan Atiku Secondary School	557	572	673	1802	103
Sultan Bello Secondary School	504	382	573	1459	84
Nana Girls' Secondary School	576	507	673	1756	100
Asma'u Girls' Islamic College	499	372	473	1344	77
TOTAL	2136	1833	2392	6361	364

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

Grade	Range marks	Equivalent
A	70-100%	Excellent
B	60-69%	Very Good
C	50-59%	Good
D	49-45%	Pass
E	40-44%	Pass
F	00-39%	Fail

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 $\alpha=0.05$ 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 (H_{01})

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 (H_{01}).

Variables	No. of students	Mean score($\bar{x}$)	Standard deviation(σ)	df	α	t_{cal}	t_{crit}
SS	367	49.03	13.44	728	0.05	13.18	1.965
Boarding SS Day	363	56.13	16.03				

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 (H_{01}) is rejected. This shows that the Day senior secondary students performed better in mathematics in Sokoto State.

Hypotheses two (H_{02})

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}).

Variables	No. of students	Mean score($\bar{x}$)	Standard deviation(σ)	df	α	t_{cal}	t_{crit}
Male SS Boarding	147	48.70	14.08	365	0.05	0.5082	1.9659
Females SS Boarding	220	49.24	13.03				

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})

Variables	No. of students	Mean score($\bar{x}$)	Standard deviation(σ)	df	α	t_{cal}	t_{crit}
Male SS Day	186	54.88	16.26	361	0.05	2.4394	1.9659
Females SS Day	177	57.45	15.73				

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.

References

- Agwagah, U.N V. (1993) *Instruction in Mathematics Reading as a Factor of Student's achievement and interest in wore problem solving*, Unpublished Ph.D. thesis UNN.
- Audi M.(2013), *An analysis of Female Students' Performance in Mathematics in Secondary Schools in Sokoto Metropolis*, Unpublished PGDE project, Department of Curriculum Studies and Educational Technology, Usmanu Danfodiyo University, Sokoto.
- Okpala, P.N., Onocha, C.O. and Oyedeji, O.A. (1993). *Measurement and Evaluation in Education*, Edo: Stirling-Horden Publishers.
- Ozokeraha C. P.R., Ozokerah, B.A. and Wakme, F.O. (2010), *Gender in Science, Technology, Mathematics and Fine/Applied Arts Education: The Benin Journal of Gender Studies* 2(2) 35.
- Willingham, W.W. and Cole, N.S. (1997), *Gender Assessment*, Mahwah, N.J.: Lawrence Evibaum association.
- Abdussalami, A.S. (2008), *Statistical Principles for Research in Education and Social Sciences*, S.Askome & Co. Publishers, Printers & bookbinders, PP. (132-138)
- Abiodun. P. (2007), *Students' Seemingly Difficult Areas in Mathematics in Nigerian Secondary Schools*, *International Journal of Research in Education*, 4(1&2), 319-324.
- Abubakar, R.B. and Alao, A.A. (2010), *Gender and Academic Performance of College Physics Students; A case study of Department of Computer/Physics Science Education*,

- Federal College of Education (Technical) Omoku, Nigeria. *Journal of Research in Education and Society, International Perspective*, VL (1):129-137.
- Adeosun, O.A. (2008), Gender differences in the Achievement and Retention of Nigerian Students exposed to concepts in Social studies through multi-media packages. *Asian Journal of information Technology*, 7(5), 240-244.
- Bawa,M. and Abubakar, B.(2008) The Effect of using Weighing Balance Approach on Junior Secondary School Students' Performance in the Learning of Linear Equations, *Abacus, The Journal of Mathematical Association of Nigeria(MAN)* Mathematics Education Series, 33(1)
- Kajuru Y.K. (2008), A systematic attempt to Establish the Fear and Poor Performance of Senior Secondary School Students in Geometry and Trigonometry Concepts, A case study of WAEC Candidates. *Journal of Educational Research and Development*, Faculty of Education, AhmaduBello University Zaria, 3(2), 46-49.
- Kurumeh, M.S. and Iji, C.O.(2009), Improving Students' Achievement in Solving Algebraic Word Problems using Aesthetic Value Approach(AVA), *Abacus, The Journal of Mathematical Association of Nigeria(MAN)*,Mathematics Education Series, 34(1), 37-43.
- Muhammad,A.U., Gwandu,A.D., and Bagna, E(2010), Improvisation: A must in Science Teaching in a Recessive Economy, *Sardauna Journal of Multi-Discipline Studies*, 1(1), 306-311.
- Nkpono H.P. (2001),Low Representation of Women in Science, Technology and Mathematics Education in Nigeria, *STAN 42nd Annual Conference Proceedings(2001)*,*Women in Science, Technology and Mathematics Education in Nigeria*, Heinemnn Educational Books.
- Sharfi A. and Areelu F. (2010) The Effect of Improvised Instructional Materials on students performance in Soli Geometry, *Abacus, The journal of the Mathematical Association of Nigeria*, Mathematics Education Series35(1), 46-50.
- Wasagu, M.A. (2000), Improvisation as a good source of Enriching Science Lessons, *STAN 41st Annual Conference Proceedings, Enriching Science, Technology and Mathematics Education in Nigeria*, Heinemn Educational Books. 54-57.
- Waziri A. F. (2002) *Improvisation in Primary Science Teaching and Learning*, A paper presented at a Felt Need Workshop for Teachers Participating in Pep II Project, UBEC, Sokoto State. 23rd March 2005.
- Yusha'u, M.A. (2004), *Diagnosing and Remediating Mathematics Learning Difficulties of Senior Secondary School Students in Sokoto State*, Unpublished Masters Degree dissertation, Usmanu Danfodiyo University, Sokoto.