
Analysis of the Performance of Secondary School Students in Mathematics Based on the School-Size and Gender-Difference in Gombe Metropolis of Gombe State

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Abstract

This paper analyses the performance of secondary school students in Mathematics based on school-size and gender-difference of the students using the SSCE results of two thousand five hundred students between 2008 and 2012 from Gombe metropolis selected using stratified and purposive sampling techniques. The two postulated hypotheses were tested using t-test statistical tool and the results show that, there is significant effect of each of school-size and gender-difference of students on the performance of secondary school students in Mathematics. The use of the given recommendations by teachers, parents, students and government will not only improve the performance of students in Mathematics and other science related subjects but also brings about the scientific and technological developments and enhance millennium development goals and fulfillment of mission of Nigeria to become one of the twenty developed economy by the year 2020.

The role of mathematics towards the realization of the scientific and technological aspirations of the country is unquestionable therefore, it is high time to look within to tap the latent potentials of the Nigerian youths in order to ensure real indigenous technology advancement. It has been stressed that if any nation is to attain her highest propensity, science and technology which constitute the bases for industrial activities, must be emphasized in the education of the youths. As such, the role of Mathematics cannot be denied in the realization of this goal.

According to Fajemidagba (1986), the significance of Mathematics to other sciences such as Biology, Chemistry, Physics and Geography is very great, for Mathematics is often referred to in the teaching of these subjects. Similarly, Musa (2012), described Mathematics as the mother of all sciences and as the science of numbers and space. He further stressed that Mathematics is included in the school curriculum in order to form a good foundation for Advanced Mathematics and other science related subjects.

Furthermore, Ngwa (2001), put it that Mathematics is an important and basic subject for scientific and technological progress of any country. It is a subject that cannot be divorced from the key to progress and development.

Despite the fact that Mathematics is the bedrock of scientific and technological developments of the country, a compulsory subjects in both Junior and Senior levels of Secondary School education and a basic requirement for gaining admission into tertiary institutions, the performance of secondary school students in examinations, most especially West Africa School Certificate Examination (WASCE) and National Examination Council (NECO) is alertly poor and this is a great concern to both teachers, educators, parents government and all other stake holders in education.

In general, reasons for such persistent poor performance in the subject by the secondary school students have been traced to attitude of students towards the subject, school- size and location, gender-difference of the students, teachers-variables, government, lack of motivation in teachers, students' level of mental development, etc. However, the outstanding factors have been attributed to the school-size and gender-difference of the students on which this study is based. The investigator therefore, focused attention on these factors that influence the educational development of the youths. It probes the school-size and gender-difference of the students (that is, large and small schools along with male and female students) because of the great roles they play in making progress or retarding the performance of secondary school students in Mathematics and in teaching/learning situation.

Purpose of the Study

The purpose of this study is to analyze the performance of secondary students in Mathematics based on the school-size and gender-difference of students in Gombe metropolis of Gombe State, Nigeria. The researcher is motivated to carry out this study by reason of the divergent and at times conflicting opinions that have been expressed by various scholars on the performance of the secondary school students in Mathematics. The principal purpose of this work is to determine whether or not the variables like school size and gender-difference have any effect on the secondary school students' performance in Mathematics. Such effect when properly identified and

determined, will hopefully bring about submissions, conclusion and recommendations that will help secondary school students to improve their performance in Mathematics and to make the resultant findings and recommendations available to future researchers through its publication.

Hypotheses

The following postulated hypotheses were tested in this study at 0.05 alpha level of significance:

- (1) There is no significant effect of school- size on the performance of the secondary school students in mathematics.
- (2) There is no significant effect of gender-difference of students on the performance of secondary school students in mathematics.

Methodology

In order to obtain the required findings, the study was carried out as follows:

Research Design

The study was basically a descriptive survey. A survey research enables information to be obtained from a representative sample of the population to describe the population as they exist; this study is based on the collection of recorded information from appropriate quarters.

Population and Sampling

The target population for this study comprised of all the secondary school students from the eleven (11) Local Government Areas of Gombe State between 2008 and 2012. However, stratified and purposive sampling techniques were used to select six (6) local Government areas from the state. Ten (10) out of sixty (60) existing secondary schools from these local government areas were also randomly selected. Four (4) were single sex schools while the remaining six (6) were co-educational schools. As regards to school-size, five (5) small and five (5) large schools were selected with sixty (60) and forty (40) students respectively total two thousand and five hundred (2500) students from the ten (10) schools covering a period of five years (2008-2012), and consist of one thousand three hundred male and one thousand two hundred female students out of the six thousand and two hundred students of the schools within the period under study.

Instrumentation

For the purpose of this study, of the Senior School Certificate Examination (SSCE) results of the **randomly** selected students were used. These results were obtained from the examination officers, the Vice Principals (Academic) with the

assistance of their Principals. The grades of these results were converted to stanine scales and used as the instrument to obtain the required findings for this study. The table below shows the conversion of the SSCE result grades of A1,B2,B3,C4,C5,C6,P7 and E8 to the stanine scales of 9,8,7,6,5,4,3,2 and 1 respectively

Table 1: The Converted Results of SSCE Grades (2008-2012) to Stanine Scales Used as Instrument for the Study

SSCE RESULT	F9	E8	D7	C6	C5	C4	B3	B3	A1
STANINE SCALE	1	2	3	4	5	6	7	8	9

Procedure

The Senior Secondary School Certificate Examination (SSCE) results of the students between 2008 and 2012 of the randomly selected secondary school students in mathematics were obtained from their respective school examination officers through the Vice Principals (Academic) and the School Counselors with the permission of their school Principals. These results were converted to stanine. Those from large and small size schools as well as male and female students were separated and used as the required data for the study.

The descriptive statistical analyses used were means and standard deviation. Table-t test was used to test of the two postulated hypotheses at 0.05 alpha level of significance.

Results

The analysis of grades obtained by secondary school students in their SSCE results used for the study between 2008and 2012 is shown in the table below.

Table 2: Analysis of the SSCE Result Grades Obtained by the Selected Secondary School Students in Mathematics (MAY/JUNE 2008/2012)

Grades	Frequency	Percentage	Cummulative Percentage
Distinction A,B ₂ , B ₃ ,	93	3.7	3.7
Credits C ₄ ,C ₅ ,C ₆	240	9.6	113.3
Pass D ₇ ,E ₈	804	32.2	145.5
Fail F ₉	1363	54.5	100.0
Total	2500	100.0	

From the above table 2, it can be seen that 3.7% students passed with Distinction, 9.6 with Credits while 32.2% with ordinary Pass and 54.5% failed. From the above analysis, the statement of some scholars about the abysmal and dismal performance of students in mathematics is hereby confirmed.

Hypothesis 1

There is no significant effect of school-size on the performance of secondary school students in mathematics. The result of the analysis is shown below.

Table 3: Comparison of the Performance of Students Based on Size of School.

Variables	Number of Cases	Mean	Standard Deviation	Df	CALCULATED-t	TABLE-t	Sign-Level	Decision
Large School	1300	2.40	1.85	2498	6.0	1.96	0.05	S
Small School	1200	1.98	1.64					

From the table 3 above, it can be seen that the calculated-t of 6.0 is greater than table-t value of 1.96 why df=2498 at 0.05 alpha level of significance. Hence, the first hypothesis is hereby rejected and it can be concluded that there is significant effect of school-size on the performance of secondary school students in mathematics.

Table 4: Comparison of the Performance of Male and Female Secondary School Students in Mathematics

Variable	Number of Cases	Mean	Standard Deviation	Df	CAL-t	TABLE-t	Sign Level	Decision
Male	1000	2.55	1.96	1998	4.34	1.96	0.05	S
Female	1000	2.18	1.85					

Critically, looking at the above table 4, it could be seen that the calculated-t value of 4.34 is greater than the table-t value of 1.96 at 0.05 alpha level of significance df=1998. Hence, the hypothesis 2 of no any significant effect is thereby rejected and can be deduced that, there is significant effect of gender-difference of students on the performance of secondary school students in mathematics.

Discussion

From the data analysis using percentage, mean, mode and median, the outcome of the study revealed that there was poor performance of students in Senior School Certificate Examination in mathematics between 2008 and 2012. This is similar to the work of Ale (1984), that presents poor performance of secondary school students in mathematics, most especially in Senior School Certificate Examination is become alarming and needs urgent attention and solutions.

The results obtain from the hypothesis one showed that there was significant effect of school-size on the secondary school students in mathematics. This is similar to the findings of Ukoje (1973) and Tupper (1981), who reported that the larger the school population, the better the performance of students in the school subjects including mathematics.

The finding of Tupper (1981), also stressed that there is a very high tendency for students in larger schools to attain better results in mathematics than those in thinly populated schools. But contrary to the above opinion, Kalejaiye (1977), asserted that the small-size school may lead to better performance of students in mathematics because the disciplinary problems would be fewer and much more individual attention could be given by the teacher couple with easier interactions between the students themselves.

From the result obtained in hypothesis 2 testing, it was shown that there is significant effect of gender-difference of students on the performance of secondary school students in mathematics. This finding is supported by the submissions of Abdullahi (2005) and Musa (2012) who identified superiority of male over that of their female students .

In conclusion, school- size and gender-difference of students could be said to be some of the variables that affect the performance of secondary school students in mathematics.

Implications of the Findings for Teaching and Learning

The emerging fact from this investigation coupled with the observation of the researcher indicate that the deplorable conditions of many of our schools are sure culprits responsible for the dismal performance of secondary school students in mathematics. Since school- size and gender-difference of students collectively contribute greatly to the performance of secondary school students in Senior Secondary School Certificate Examinations in Mathematics and other school subjects.

All hands should be on deck by both the government, teachers, parents and the students and leave no stone untouched in order to improve the performance of secondary school students in mathematics so as to obtain both the technological and scientific developments of the nation as well as assisting the nation to achieve her millennium development goals and also fulfilling her mission of becoming one of the twenty developed economy by the year 2020. Since everybody has vital roles to play in meeting the requirements of the large and small size schools as well as male and female secondary school students.

It follows then that proper planning and administration, adequate funding and supply of suitable equipment and materials, and better remuneration of teachers will encourage/motivate the teachers to work for better performance of students not only in mathematics, but in all other school subjects.

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