

Comparative Analysis of Gender Academic Performance in Mathematics among Senior Secondary School Students

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Abstract

The study investigated comparative analysis of gender academic performance in mathematics among senior secondary students. Based on the purpose of the study, one research question and one hypothesis were formulated to guide the study. The researchers selected a population of 127 and 217 male and female students using simple random sampling technique. Data collected were analyzed using mean and standard deviation while t- test were used to test the hypothesis at 0.05 level of significance. From the analysis, the result showed that male students performed better than female students during promotion examination on mathematics. It was recommended that female students should take their studies serious. It is further recommended that government should make the environment conducive for learning and parents should reduce the number of domestic workload assigned to these students after school hours.

Keywords: Gender, Academic Performance and Mathematics

Introduction

Education is the basic instrument for economic growth and technological improvement of any nation. According to National Policy on education (2009), education is the nation's greatest asset toward the development of economic potentials, sociological and human resources. It is also a pillar through which national development are built and served as an instrument that set the pace for growth and development. However, the growth and development of the society through education is achieved by the academic performance of the students in the primary, secondary and tertiary institutions. This is justified through the classroom activities of the students. According to Epunam (1995), the academic performance of students is attained through the learning outcomes that include the knowledge, skills and ideas acquired and retained during the course of the study and outside the classroom situation and understanding of issues in the society. According to Ferla, *et al*, (2009) academic performance depicts an individual's knowledge and perception he or she possesses with respect to his or her academic capability in performing successfully a given academic task at a designated level.

Mathematics occupies central position in education because mathematics is a science and the nucleus of all other sciences, which lays strong emphasis on both theory and practical. Mathematics is also called the science of reasoning. There were a few premises on which we based our reasoning. Reasoning in Mathematics is of two types: Inductive and deductive. When statements containing mathematical truths were based on general observations and experience, reasoning is called inductive whereas deductive type the statements are products of mind. The method of teaching is very important for teacher of any subject generally and for the mathematics teacher particularly. Method is nothing but a scientific way of presenting the subject, keeping in mind the psychological and physical requirements of the children. For effective learning of mathematics, the method has to be as good as the content. It is through method only that it is possible to make a subject interesting and useful. While teaching a set of pupils with varying interests, aptitudes and attitudes, one should be aware of the psychological basis of teaching learning process. Communication of ideas and development of concepts in a precise manner based on a logical development of subject is the most important pre-requisite in teaching a subject like mathematics. Generally, students were afraid of studying mathematics, as there are various reasons for that method being one of them. Students tend to learn mathematics through a meaningful approach rather than by a mechanical process. Education has many aspects e.g. learning, guidance and counseling, evaluation, teaching and testing. Testing is a process for accurate evaluation. An instrument used for testing is called test. Tests may be used as an evaluative, teaching, guiding, supervisory and research device (Garrison, 1960). Tests are used to measure the quality or genuineness. Achievement tests are used to measure students' knowledge (Aiken, 1985), actual learning in education subject matter (Freeman, 1965).

Moreover, in the secondary school, the academic performance of the students has great implications in the field of mathematics. This is because; the subject is a core compulsory subject for all the students in the senior secondary curriculum. It plays indispensable role in the economic and technological improvement of every nation. According to Iyekekpolor and Buleis, (2005), mathematics is very important in the advancement of science and technology of any nation. Therefore, in achieving the expectations of the society through education, it is one of the reasons the subjects need to be taught, understood and gender academic performance appreciated mostly in the secondary school level. As a result, this research focuses on the gender academic performance of the students in the promotion examination on mathematics.

Several research studies have shown that gender differences in mathematics learning are not clear during the elementary school years (Hyde & Geiringer, 1975; Mann, Sasanuma, Sakuma, & Masaki, 1990), but girls begin to fall behind boys during the intermediate school years, and they fall further behind during the high school years (Fennema, 1974, 1980; Leder, 1985). Kimball (1989) cited many studies showing that boys in high school generally achieved higher scores than girls on standardized tests. Studies of gender differences in mathematics achievement (Hedges & Nowell, 1995; Peterson & Fennema, 1985; Randhawa, 1994) found that, in general, males outperformed females in mathematics during the high school years. Other studies (Fox, Brody, & Tobin, 1980) emphasized high mathematics achievement being dominated by males. Leder (1992) has also reported the existence of gender differences in science subjects, in general, as well as in mathematics the evidence reported so far indicates that males appear to do better than females in mathematics performance; however, recent studies have challenged this trend by showing that this gap has declined (Barker, 1997; Hyde, Fennema, & Lamon, 1990; Knodel, 1997). Catsambus (1994) believes that it persists for some race and ethnic groups, and among high-performing students who may constitute a nation's mathematics talent pool. These changes in the magnitude of the overall trend seem to have reduced, whereby, gender differences in areas traditionally favoring boys are diminishing or shifting to favour girls. Other studies have shown no gender differences in mathematics performance (Bronholt, Goodnow, & Conney, 1994; Ma, 1995; Guiso, Monte, Sapienza, & Zingales, 2008; Hyde, et al, 2009).

Statement of the problem: Despite of the qualified and trained personnel employed in education sector, yet there is drastic fall in the gender academic performance in Nigeria. It has become worrisome to the educators, government and parent, because, the importance of education in the economic and technological improvement cannot be over emphasized. This leads to the researchers to develop keen interest and concern in the gender academic performance of the senior secondary II students in Orsu local Government Area.

Purpose of the Study

The main purpose of this study is the compare gender academic performance in the promotion examination on mathematics among senior secondary students. Specifically, the study sought to;

1. Compare the mean scores of male and female students on promotion examination on mathematics for senior secondary II students.

Research Question

1. What are mean scores of male and female students in the promotion examination on mathematics for senior secondary students?

Hypothesis

H_{01} ; There is no significant difference in the mean scores of male and female students in the promotion examination on mathematics.

Method

This study adopted descriptive research design. The population of the study comprise all the male and female senior secondary II students selected in Orsu local government area. The sample for the study was 127 male and 217 female students selected purposively among three schools; Ihitenansa secondary, Orsu-Ihiteukwa secondary and Sacred Heart secondary

Amaruru. The instrument used for data collection was a self-developed mathematics achievement test (MAT). The MAT consists of two sections A and B. Section A comprises of the demographic data of the respondents while section B contains the objectives of the study. The items were developed by the researchers with special attention on simultaneous linear equation; one linear, one quadratic and word problems leading to simultaneous. The construction of the instrument was guided by a table of specification to ensure adequate coverage of the content area covered in the study as well as maintain even spread across the different levels of the cognitive domain. To determine the degree to which the instrument used for the study measured accurately what is was expected to measure, face and content validity were assess by two experts in educational planning and administration and one expert in mathematics education. In establishing the reliability of the instrument used for the study, a pilot study was conducted; the result of the pilot study tested how reliable the instrument was and ensured good constructions of the items in the questionnaire. In addition, inter-item coefficient of reliability at standardized item alpha was calculated. Reliability analysis scale for teachers gave inter-item coefficient of reliability at 0.70. The data collected were analyzed using mean and standard deviation for research question while t-test was used to test the hypothesis at 0.05 level of significance.

Results

Research question one: What are mean scores of male and female students in the promotion examination on mathematics for senior secondary students?

| Gender | N | Scores | Mean |
|--------|-----|--------|--------|
| Male | 127 | 19522 | 153.72 |
| Female | 217 | 17971 | 82.81 |

The result in table 1 shows that the mean score of the male is 153.72 while the female students is 82.81. This indicates that male students outperform the female students in mathematics examination.

Hypothesis testing

H_{01} ; There is no significant difference in the mean scores of male and female students in the promotion examination on mathematics for senior secondary II students.

| Gender | N | Mean | SD | t-cal | t-tab | | Remark |
|--------|-----|--------|------|-------|-------|------|--------------|
| Male | 127 | 153.72 | 5.67 | 0.005 | 1.96 | 0.05 | Reject HO |
| Female | 217 | 80.81 | 2.12 | | | | |

From the result of the analysis, t-Cal was greater than t-crit at 5percent significant level. This implies that there was significant difference in the scores of male and female students in the promotion examination on mathematics for senior secondary II students. Therefore, the null hypothesis was rejected.

Discussions

The result of the study showed that male students performed better than female students during promotion examination on mathematics. The hypothesis was rejected because male students performed better than female students. The study has a backup from Tasisa and Tafesse (2013) study which showed that there are significant differences between male and

female students in academic achievement in both Ethiopian General Secondary Education Certificate Examination (EGSECE) and college cumulative GPA. Empirical findings supported better performance of male students than females.

Conclusion

The study concludes that there were gender differences in academic performance among senior secondary II students during promotion examination on mathematics.

Recommendations

1. Government should ensure that necessary amenities are provided in the school to maintain enabling environment for learning.
2. Parents and teachers should ensure that they play their roles in the upbringing of the children.
3. Students should take their studies more serious; especial the female students.

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