GENDER COMPARISON OF ATTITUDE OF SENIOR SECONDARY SCHOOL STUDENTS TOWARDS MATHEMATICS IN EKITI STATE, NIGERIA

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Abstract

This study investigated the comparison of male and female Senior Secondary School students' attitude towards mathematics. The study employed descriptive research design of the survey type. The population for the study consisted of all senior secondary school students in Ekiti state, Nigeria. The sample for the study was six hundred [600] senior secondary school students consisting of 300 males and 300 females selected from 12 senior secondary schools using multistage, stratified and purposive random sampling techniques .The mathematics attitude scale constructed and validated by the researchers was adopted and used as instrument for gathering data . The study shows that the attitude of students towards mathematics did not depend upon sex. Therefore, it is recommended that sex should not be considered as a factor influencing the attitude of students towards mathematics and those teachers should teach mathematics freely among the students of different sexes.

Keywords: Gender, Attitude, Mathematics, Single and Mixed Sex Schools, Students

Introduction

Mathematics is the bedrock, queen and king of all sciences (Kolawole, 2004). Despite the relationship between mathematics on one hand and science and technology on the other, the performance of students in mathematics certificate examinations and in the number of applicants wishing to study mathematics or pursue science related courses in tertiary level of education in Nigeria is not encouraging. The cause of students' poor performance in mathematics has not yet been fully identified in Nigeria even

though different efforts have been made by researchers, educationist, government and nongovernmental organization (NGOS). They have suggested various instructional strategies that could improve students' performance in mathematics, for example, the National Mathematical Centre has provided a lot of teaching aids to improve the teaching and learning of mathematics in Nigeria. Also non-governmental organisations have been organising mathematics competitions e.g. cowbell mathematics competition in order to foster the interest of students in the subject.

However, perceived attitude of students towards success in mathematics affect the idea of mathematics as a subject. Again fear of future failure or experience of past failure in mathematics is also a serious problem working against mathematics education. Academic problems affecting teaching and learning of mathematics in Nigeria secondary schools include unparallel hatred, indifference and poor attitude toward mathematics among others (Adebule 2004). Improving instruction in mathematics education has been a major topic of interest for teachers, researchers, administrators and the public (Popoola, 2004). According to Adedoyin (1998), poor state of mathematics in the country was brought to a sharp focus and was partly seen as a long- term effect of playing down of affective domain in mathematics lessons, very often, many mathematics teachers tend to over-look this affective domain in their teaching to the detriment of the learners. Adebule (2004) explained that various factors affecting the teaching and learning of mathematics in Nigeria especially at the secondary school level include: political, economic and academic problems. He stressed further that the academic problem include students unparalleled hatred, indifferences and poor attitude towards mathematics among others.

Attitudes are affective variables of paramount importance for the well being of the individuals and the society. Individuals have to acquire the right types of attitudes towards self, work, other people and objects. There has always been an interest in the development of positive students' attitude towards mathematics. The objectives of teaching and learning mathematics include fostering favourable feelings towards mathematics as well as imparting cognitive knowledge.

Gender has being one of the major factors perceived to be influencing performance of students in mathematics, perhaps, the reason why males are pursuing mathematics related disciplines and professions than females.

However, the view by a cross-section of people that mathematics is a male dominated subject is devastating especially on parts of women folk. At secondary school level, experience shows that girls deliberately or erroneously shy away from mathematics on the flimsy excuse that their "heads" are not made for mathematics (Aborisade, 2009). Gire (1988) stated that "the more a student believes that mathematics is a male or female

domain, the lower the performance will be" according to him, some people also feel that mathematics and sciences are of male students and that female students are destined to pursue languages and arts related subjects. Frost (1984) mentions the fact that large gender differences do exist with respect to attitude towards mathematics. Therefore; this study compares the attitude of male and female students toward mathematics in Nigerian secondary schools.

Research Questions
        The study answered the following questions:
   1. Can there be any disparity in students' attitude toward mathematics based on gender classification?
   2. Can there be any disparity between the attitude of students in single and mixed sex schools toward mathematics?

Hypotheses
HO1: - There is no significant difference between the attitude of male and female students toward mathematics.
H02: - There is no significant difference between the attitude of students in single and mixed sex schools toward mathematics.

Research Method
        The study employed descriptive research design of the survey type. This was deemed appropriate because it enabled the researcher to obtain the opinion of the representative sample of the target population. The researcher intended to see the attitude of the male and female students toward mathematics using the survey design.

Population
        The population of the study consisted of the students in all the public senior secondary schools in Ekiti State. As at the time of this study, there were about 220 public secondary schools in Ekiti State.

Sample and Sampling Techniques
        A total number of 600 students consisting of 300 males and 300 females were selected from 12 senior secondary schools using multistage, stratified and purposive random sampling techniques. At the first stage, ten local Government areas were randomly selected out of the 16 local government areas in Ekiti State. At the second stage, 12 senior secondary schools were randomly selected from the ten local government areas and from each of the sampled schools, 50 students were selected. The stratified

random sampling technique, allowed for the stratification of the population in t gender (male or female).

Instrument for Data Collection

The Mathematics Attitude Scale (MAS) constructed and validated by the researcher was adopted and used as instrument for the purpose of data collection to test the hypotheses of the study. The instrument contained 28-attitude generating statements or expression of desired behaviour designed to find out the attitude of senior secondary school students toward mathematics. The students were requested to respond to each of the items which were purely mathematics not minding their personal bias on the attitude generating statements on a 5-points continuum; strongly agree, agree, undecided, disagree, and strongly disagree. The reliability index of the instrument was 0.81 and the construct validity coefficient of the instrument using discriminant procedure was 0.29, this shows that the instrument has construct validity.

Administration of the Instrument

The instrument was administered to the students by two trained research assistants and senior mathematics teachers of the selected schools under the supervision of the researcher.

Method of the Data Analysis

The research questions were analysed using frequency count, mean and standard deviation while the hypotheses generated were tested at 0.05 level of significance using students' t-test analysis.

Analysis of Data and Results

Question One: - Can there be any disparity in attitude of students based on gender classification?

Table 1: Mean and Standard Deviation of Male and Female students on their attitude towards mathematics

Sex	No of cases	Mean	SD
Male	300	84.47	11.37
Female	300	84.94	13.16

Table 1 shows that the mean score of male respondent to the mathematics attitude scale was 84.47 with a standard deviation of 11.37 while the mean score of the female respondents was 84.94 with standard deviation of 13.16. This clearly showed that more female students show positive attitude toward mathematics than their male counterpart. However both male and female students have almost the same attitude toward mathematics.

Question Two: - Can there be any disparity in the attitude of students in single and mixed sex schools?

Table 2: Mean and Standard Deviation of single and mixed sex schools

Type of School	No of cases	Mean	SD
Single sex	300	86.05	14.10
Mixed sex	300	84.29	10.42

Table 2 shows that mean score of students from single sex schools on the mathematics attitude scale was 86.05 with a standard deviation 14.1 while the mean score of the students from mixed school was 84.29 with a standard deviation of 10.42. From the analysis, students from single sex schools had higher mean scores than those from mixed schools. However, students in both single and mixed sex schools have almost the same attitude toward mathematics.

HO1: - There is no significant difference between the attitude of male and female students toward mathematics.

Table 3: Students t-test summary table for Male and Female students.

Sex	No of cases	Mean	S.D	Df	Tc	Tt
Male	300	84.47	11.37	598	0.52	1.96
Female	300	84.94	13.16			

p >0.05(Result not significant)

The result in table 2 showed that t-calculated for male and female students' attitude ratings was 0.52 which is less than the t-table value of 1.96 at 0.05 alpha level. The result was therefore not significant and thus the null hypothesis was not rejected. Hence there was no significant difference between the attitude of male and female students towards mathematics.

H02: - There is no significant difference between the attitude of students in single and mixed sex schools toward mathematics.

Table 4: Students t-test summary table for Single and Mixed sex Schools.

Types of School	No of cases	Mean	S.D	Df	Tc	Tt
Single sex	300	86.05	14.10	598	1.74	1.96
Mixed sex	300	84.29	10.42			

p >0.05(Result not significant)

The result in table 4 showed that t-calculated for students' in single and mixed sex schools on the mathematics attitude scale was 1.74 which is less than the t-table value of 1.96 at 0.05 alpha level. The result was therefore not significant. Hence, the null hypothesis was not rejected. This shows that there was no significant difference between the attitudes of students from single and mixed sex schools towards mathematics.

Discussion

The findings of this study on hypothesis one showed that there was no significant difference between ratings of male and female students on their attitude towards mathematics. Therefore gender issues did not affect the attitude of students toward mathematics. The finding agreed with the findings of Omirin (1999) and Adebule (2002) who found that there was no significant difference between the rating of male and female students of some instruments developed for measuring attitude and anxiety toward mathematics respectively. Bandele (1988) also found that there was no significant difference between the performance of male and female students in mathematics achievement test. Student variable that has attracted considerable attention is sex according to Alonge (1985). Studies ranged from how sex affects the selection of science courses in school to rating of attitude scale and to cognitive and non - cognitive performance. Daramola (1992) found that both male and female students received equal encouragement to use fully their intellectual gifts. He asserted that gifted girls do not differ from gifted boys in study behaviour, and other cognitive tasks. Some studies associated better performance with boys while some proved otherwise. In another study, Oloyede (1984) indicated that male students performed better than female students in a programmed performance of female students. Also the finding of this study disagreed with the result of Kolawole and Adeyeye (1999) as they showed that boys performed significantly better than girls in both chemistry and mathematics at the senior secondary certificate examinations in Ekiti state.

The finding on hypothesis two showed that there was no significant difference between the attitude of students from single and mixed sex schools towards mathematics. The findings was in agreement with the result of Bandele (1988) in a comparative investigation of the performance of students from boys and girls school on a locally standardized mathematics achievement tests that showed a case of no significant difference on the standardized scale. The type of school made no difference on the standardized scale. Kolawole (1998) also found no significant difference in academic performance of students in boys' schools and mixed school. However, there were some research findings that contradicted the result of the study. Adebule (2002) found a significant difference between the rating of students from single sex and mixed schools. Ravitch (1983) wrote that schools made a difference with regards to student's performance on an achievement scale. In other words, the type of school a student attended influenced his or her ratings.

Conclusion
        The following conclusion was drawn from this study based on data analysis and interpretation of results.
        Both male and female students have almost the same attitude towards mathematics. The attitude of students towards mathematics did not depend upon sex. Also, both male and female students had the same opinion on the items of the rating scale as there was no significant difference in their attitudes towards mathematics.

Recommendations
        Based on the findings of this study, it is hereby recommended that;
(i) Since gender does not affect the attitude of students towards mathematics, teaching and learning of mathematics should be done freely among the students of different sexes.
(ii) The belief that mathematics is a male or female dominated subject should be discouraged by teachers and guidance counsellors in secondary schools.

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