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The Influence of Gender on Junior Secondary School Students Attitude towards Mathematics in Ovia North East Local Government Area of Edo State

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Abstract

This paper is on the influence of gender on junior secondary school student's attitude towards mathematics in Ovia North East local government area of Edo state. The descriptive survey design was employed for the study. The population of the study comprised of all the JSS3 students, a total of Three Thousand Six Hundred and Ninety (3690) students in the 12 public junior secondary schools in in Ovia North East local government area of Edo State. Three schools selected from the 11 wards in the local government constituted the sample of the study. The simple random technique was used to select one hundred and fifty students (fifty from each of the three schools) in the Local Government

Area. The instrument that was used for this study was the Secondary Student Mathematics Questionnaire (SSMQ). Mean score, t-test and analysis of variance was used to analyze the responses from the respondents. It was revealed that the attitude of the student towards mathematics was positive. The study also revealed that there is a difference between the attitude of male and female students in mathematics.

Key words: Mathematics, gender, attitude, and performance

Introduction

The academic performance of students in secondary schools has been a subject of concern to many people including parents, administrators, educators, psychologist and counsellors. The poor performance of students in science especially Mathematics has continued to be a major concern to all and particularly those in the main stream of science education (Ariyo, 2006). The major obstacle to the development of education in Edo state is persistent poor academic performance of students' in senior school certificate examination. The problem of poor academic performance is so great that it has resulted into tension, depression and social maladjustment among some secondary school students who are not able to attain the desired grades required for admission into higher institutions (Akinbode, 2005). Government, parents and guardians are complaining about this situation. Mass failure of students in external examination has been attributed to a number of factors which include teacher factors (low qualification, lack of experience, poor salaries and allowances, poor supervision, organizational climate (open and close), student factors (poor ability of student underage, unwillingness to learn, bad peer groups influence, among others).

The lack of attention in Mathematics curriculum has led to the Students' perception of Mathematics as a difficult subject (Iloputaife & Nworgu, 2003) and has subsequently led to underachievement in Mathematics at the Secondary School level (Iloputaife & Nworgu, 2003). The assessment of students regardless of the Mathematics teaching strategies adopted in the past was not in accordance with the systematic (planned and organized) attitude of continuous assessment. There has been much concern expressed about the low standard of science education in Nigeria of which Mathematics is a key part.

Students' attitude towards some school subjects are measured based on their academic performance. Students whose performance are low, lack positive attitude towards such subjects and do not show interest in the subject. Similarly, some studies linked poor academic performance of students to their attitude towards the subjects. In analyzing the factors that contribute to students' indifferent attitude in mathematics as a school subject (Akinbode, 2005) asserts that teachers' approaches of teaching mathematics are complex whereby making the comprehension of the subject difficult. The unavailability of instructional materials in teaching the subject stands as barriers to the level of their attitude. Mathematics teachers should use the recommended teaching approach and styles in teaching the student mathematics as a subject.

Studies on students' attitude towards the teaching of mathematics are non-availability of instructional materials. In schools where there is non-availability of instructional materials, student's comprehension becomes a tedious task and this affect student's attitude. Thus, students' attitudes tend to increase in subjects taught with instructional materials and therefore understanding the subject help the students to internalize knowledge. Students' attitude towards a school subject tends to increase due to the approaches of teaching the subject; availability of instructional materials and clear definition of the subjects by the subject experts. In other words, knowledge is understood and internalized when integrated but not compartmentalized. There has been the need for urgent upsurge in the awareness level of mathematics among the secondary school students. In order to achieve this goal, students should be made to appreciate the subject. This will enhance their attitude and interest towards the subject. Teachers of mathematics should employ teaching methods that will make the subject gain more attention than ever before. One basic problem that would make students to probably have indifferent and lack of enthusiasms in mathematics in the secondary school is the apathy of the individuals, lack of instructional materials and the integrated nature of the subject. These are some of the reasons why students have indifferent attitude towards mathematics as a secondary subject in the school curriculum.

The persistent poor performance in Mathematics at School Certificate level has given rise to the assumption that most science teachers especially Mathematics in Secondary Schools in Nigeria do not use good methods that will enhance students' attitude towards Mathematics. However, other factor such as gender may have its contributions to the issue.

Consequently, this study attempts to elucidate gender as a factor in student's attitude towards Mathematics in junior secondary schools in Ovia North East local government area of Edo State. Gender refers to social/cultural construction that assigns role and values considered appropriate for each sex.

Gender disparity as it exists in the schools either on the part of the student or the teacher has great influence on student attitudes towards any given subject (Nworgu 2005); Ukwungwu 2006). Both males and females are affected by the physical environment and their individual difference especially in attitude plays a major role in determining their level of performance in education.

The social interaction that exists between the teacher and the students form effective interaction in the school. The interactions which may be direct or indirect have a lot of influence on the student's attitude to learning which also affects performance. It is against this background that the study investigates gender as a factor in student attitude to Mathematics as a background to effective performance in Mathematics in Benin City.

Concept of Gender

Ordinarily, gender is an English word for classifying nouns into male, female or neuter. However, its present usage specifically refers to the social construction of the relations between male and female in terms of role such that certain roles are seen as exclusively females and others for males. It refers to social differentiation or cultural distinction between male and females and the attribution of certain roles on the basis of that differentiation. It seeks to explain the apparent commonality in the relationship between male and female in terms of roles in power sharing, decision making, division of labour and remuneration on labour both at home and in the workplace. According to Gupta (2000). It refers to the widely shared expectations and norms within a society about appropriate male and female behaviour, characteristics and roles. It is a social and cultural construct that differentiates women from men and defines the ways in which women and men interact with each other.

Therefore, if we want to understand the concept of gender we must look at it in terms of the social construction and the allocation of roles and expectations to men and women in any given society. Gender is culture specific.

Gender issues are not women issues alone, they are issues of men and women and the attendant power relations between the sexes.

Gender as One of the Factors that Affects Performance

Gender factor is responsible factor that challenges educational sustainability development in Nigeria. To eradicate illiteracy in Nigeria and enhance sustainable development, gender disparity or factor in science education especially physics education must be overcome. Research findings showed that gender disparity in science education is a research trend that stretches back to pre-historic culture. It has also been revealed that the subjugation of female is in built in tradition, culture, and customs and in very real sense of the way of life of many human communities. Other case of gender disparity factor in science education include opportunity cost of education, early marriages among girls, lack of female role models, poor self-concept, sex stereotype and so on. For the past decades, awareness has increased on the need to involve the girl child on national development hence, the need to provide equal educational opportunity for all irrespective of gender at all level of education also increase.

Purpose of the Study

The purpose of the study is to investigate gender influence in student's attitude towards Mathematics. Specifically, the study aims to:

1. To determine students' attitude to Mathematics
2. Determine the influence of gender on student's attitude to Mathematics.

Statement of the Problem

The Educational system in Nigeria over the years has been beset by poor performance of students in Mathematics at the senior secondary schools. Could this be as a result of the students' attitudes to Mathematics? Most of the time girls tend to avoid science related subjects especially mathematics? As a result, many girls like English and biology because they do not involve calculations. It is therefore based on this issue that this paper wanted to ascertain what influence gender have on students' attitude towards Mathematics.

Research Questions

1. What is the student's attitudes towards Mathematics?

Hypotheses

1. Student's attitude towards Mathematics will not be positive.
2. There will be no significant difference between the attitude of male and female students in Mathematics

Methodology

The descriptive design was used in the study. This design was used to investigate the extent to which gender and school type influence students' attitude towards mathematics.

The target population for this study consisted of all the JSS3 students, a total of Three Thousand Six Hundred and Ninety (3690) students in the 12 public junior secondary schools in in Ovia North East local government area.

The sample for this study consists of one hundred and fifty students which was gotten from three out of the twelve secondary schools in in Ovia North East local government area. A purposive sampling technique was used to take care of both gender and school type variables. Three schools constituted the sample of the study.

The simple random technique by balloting without replacement was used to select one hundred and fifty students (fifty from each of the three schools) in in Ovia North East local government area. This makes the total number of students needed for the research to be (150) one hundred and fifty only.

The instrument that was used for this study is the Secondary Student Mathematics Questionnaire (SSMQ) constructed by Owiti (2011) and was adapted by the researcher.

The questionnaire consists of two sections. Section A which is a brief biodata of the student and B which starts by giving explanations and instruction to the students about the questionnaire and proceeds to give a 17 items to enable the researcher to get information about the students' attitude towards mathematics.

The Secondary Student Mathematics Questionnaire (SSMQ) instrument has been validated by Owiti (2011). In addition, the instrument was further validated by other lecturers/experts to ensure face and content validity. In establishing the reliability, the researcher used the test –retest

method. He administered twenty (20) copies of the instrument to some secondary school students and after three weeks he re-administered the questionnaires to the same set of students. A reliability coefficient of 0.75 was computed using the Pearson correlation formula.

Mean score, t-test and analysis of variance were used to analyze the data. The attitude measure was calculated by adding together scores on items of attitude scale. The maximum score possible is 85. Half of this is 42.5. Therefore, this served as an interpretative norm. That is, if mean attitude is greater or equal 42.5 then attitude is positive.

Results

Table 3: mean and standard deviation of student's attitude towards mathematics

Attitude of Students	Number	Mean	Standard deviation
	150	52.35	6.01

Table 3 showed the mean and standard deviation of the attitude of students towards mathematics. The mean score of 52.35 is above the interpretative norm (42.5) hence the attitude of the students towards mathematics is positive.

Hypothesis one: Students' attitude towards mathematics will not be positive.

Table 6: One-Sample t Statistics

	N	Mean	df	t	p-value
Attitude of Students towards Mathematics	150	52.35	149	10.52	0.000

Table 6 show a t value of 10.52 and a p-value of 0.000 with 149 degree of freedom. Since $p < 0.05$ we conclude that the attitude of students towards mathematics is positive.

Hypothesis two: There will be no significant difference between the attitude of male and female students in mathematics

Table 7: independent t- test of the difference between the attitude of male and female students in mathematics

	Gender of Students	N	Mean	df	t	p-value
Attitude of Students towards Mathematics	Male	58	52.07	148	-0.445	0.655
	Female	92	52.52			

The results in table 7 showed a t value of -0.448 and a p-value of 0.655 with 148 degree of freedom. Since $p > 0.05$, we conclude that there is a difference between the attitude of male and female students in mathematics.

The results in Tables 3 and 6 showed that the student have a positive attitude towards mathematics. This could be attributed to the method of instruction employed by the teachers and the level of awareness of the importance of mathematics in nation building. In addition, Mohamed and Waheed [2011] when reviewing literature aimed at understanding attitudes and the influences on their development in relation to differences between students, identified three groups of factors that play a vital role in influencing student attitudes: factors associated with the students themselves (e.g., mathematical achievement, anxiety, self-efficacy and self-concept, motivation, and experiences at school); factors associated with the school, teacher, and teaching (e.g., teaching materials, classroom management, teacher knowledge, attitudes towards mathematics, guidance, beliefs); finally factors from the home environment and society (e.g., educational background, parental expectations).

Nicolaidou and Philippou [2003] showed that negative attitudes are the result of frequent and repeated failures or problems when dealing with mathematical tasks and these negative attitudes may become relatively permanent. According to these authors when children first go to school, they usually have positive attitudes towards mathematics. However, as they progress their attitudes become less positive and frequently become negative at high school. They went further to say that there are a number of factors which can explain why attitudes towards mathematics become more negative with the

school grade, such as the pressure to perform well, over demanding tasks, uninteresting lessons and less than positive attitudes on the part of teachers.

The result from table 7 showed that there is a difference between the attitude of male and female students in mathematics.

Gender differences are a recurrent theme throughout the literature in academic studies in general and in mathematics studies in particular. Mathematics is often considered to be a domain in which boys are higher achievers, both in terms of attitudes and self-concept. This similarity in performance between males and females is clear in the meta-analysis conducted by Lindberg et al. [2010] with data from 242 studies representing 1,286,350 people, indicating gender differences. There are, however, noticeable differences in the beliefs held by boys and girls.

Research has consistently shown that girls have lower mathematics self-concept than boys (Skaalvik and Skaalvik, 2004). Results concerning gender differences in attitudes are less consistent than those in self-concept. Some studies have reported significant differences when we compare girls' and boys' attitudes towards mathematics [Eshun, 2004; Asante, 2012, Sanchez, 2004; Ma and Kishor, 1997], Also Hyde et al. [1990] in their meta-analysis confirm small gender effects, which increase among older students (high school and college), with females holding more negative attitudes. Asante [2012] states that, when compared with boys, "girls lacked confidence, had debilitating causal attribution patterns, perceived mathematics as a male domain, and were anxious about mathematics". The research carried out by this author in Ghana, showed that boys had more positive attitudes towards mathematics than girls. Also Sanchez et al. [2004] in a study with North American students found significant gender differences in eighth grade students' attitudes towards mathematics. American boys showed more interest in mathematics than girls, but girls perceived mathematics as more important than boys. Girls also presented higher scores on items with regard to difficulties with mathematics. According to Asante [2012] school environment, developmental changes in gender identity, and teacher and parent attitudes and beliefs towards mathematics are factors that may contribute to the differences identified between boys and girls in their attitudes towards mathematics.

Conclusion

Based on the data collected and analyzed, it was concluded that gender has a significant difference in students' performance and achievement in mathematics.

It is recommended that for effectiveness in students' performance in mathematics, teachers (science teachers in general) have to improve on his/her interaction with students in the classroom. This can be achieved through workshops, talk-shows and conferences organized for that purpose. Science Teachers Association of Nigeria (STAN) can take up this challenge by adoption of it as a theme or sub-theme in their workshops on a regular basis.

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