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Gender Issues and Academic Performance of Senior Secondary School Students in Mathematics Computation Tasks in Ekiti State, Nigeria

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Abstract: The study investigated into gender issues and academic performance of Senior School students in Mathematics computational tasks in Ekiti State, Nigeria, in order to final out whether boys perfromed better than girls in Mathematics computational tasks and that type of school a student attends enhances his performance in Mathematics computation. The sample of this study consisted of 500 students in Senior Secondary School three classes randomly selected from eleven secondary schools in Ekiti State, Nigeria. Stractified sampling technique was used to divide the state into three strata. Three hypotheses were generated and tested with students t-test analysis at $\alpha = 0.05$ level of significance. The result of the study showed that students in single sex schools perfromed better than those students in mixed schools in Mathematical computation and boys in boys' schools did not perform significantly better than girls in girls' schools.

Key words: Gender issues, academic performance, student in mathematics, computation tasks, Nigeria

INTRODUCTION

Mental analysis carried out by Friedman (1994) showed that differences in outcomes decrease according to the time at which research results have been collected. Across time, there is a slight but consistent tendency to actually observe lower gender differences than was the case before. Such results support the hypothesis of the intervention of society influences. It also means that attempts to create equal opportunities for girls are succeeding to a noticeable degree.

Mathematics computational task items according to Kolawole (1998) is one of the components of Kolawole's four ability process dimension an alternative to Bloom's taxonomy of Educational objective for mathematics and defined it as testee's ability of knowledge of specific facts to carry out algorithms to handle mathematical instrument with case and take necessary precautions in using them. to make measurement with accuracy and speed draw geometric figure and graph.

The type of mathematics tasks to be solved also appealed to be related to the extent of the differences observed between boys and girls. Several of the contributors have focused their attentions of these differences. For instances (in this issue) Drura-Roush (1994) cited specific domains where differences do exist, girls do outshine boys on computational tasks and do less well problem solving. Moreover, boys out perform on spatial tasks.

Oftentimes students commit various errors in their computations. Once any of these errors are omitted the resulting solutions would be wrong. Many researchers have made attempts to identify causes of students' difficulties in computations in mathematics. De-Corte (1981) pointed out a major difficulty of first and second graders in elementary arithmetic problems. He observed that the pupils stated to perform arithmetic operations almost immediately the task was presented to them. He noted further that a lot of the pupils performed the procedures blindly, or by note, without being conscious of exactly what they were doing: The pupils justify their actions by saying "the teacher has told us to do it as follows" Clements (1980) identified other sources of errors in computation as application of faculty, algorithms, reading errors, transformation errors, motivation errors and careless errors. While, Chapman and Taylor (1964) observed that Nigerians students failed their examinations in mathematics because they are too slow and make too many mistakes in computation. Brandford asserted in his study in virgins on what he called individual pattern of thinking or computational energy, the poor computer have difficulty remembering the convectional operational algorithms.

Efficient computational ability is essential in solutions to perform because it enables students to perform accurate calculations, which will enhance better problem solving. Kilpatric (1969) opined that success in

solving mathematics problems depend upon skill in reading and computation. He added through that the relative contribution of each skill was not clear. Akpan (1987) and Oladunni (1991) found that students' ability to compute correlates significantly with mathematical problem solving ability of secondary school students. Akpan (1987) found also that ability to compute is the second variable considered in order of importance and it made a significant contribution to prediction of the dependent variable in mathematical problem solving ability.

Research questions: Based on the above information, the following questions were generated:

- Do girls perform better than boys in mathematical computation?
- Do girls perform better than students in mixed schools in mathematical computation?
- Do boys perform better than students in mixed schools in mathematical computation?

Research hypotheses: The following hypotheses were generated and tested:

Hypothesis 1: There is no significant difference between academic performance of students' girls' school and those of boys schools in mathematical computation.

Hypothesis 2: There is no significant difference between the academic performance of students in girls, schools and those students in mixed schools in mathematical computation.

Hypothesis 3: There is no significant difference between the academic performance of students of boys' schools and those of mixed schools in mathematical computation.

Purpose of the study: The purpose of the study, is to investigate into the differential performances of students in Girl's, boys' and co-educational schools so as to find out the probable better sex in computational skills in mathematics.

MATERIALS AND METHODS

The research design is ex-post-facto design. The design is the collection and administration of data without treatment.

The population of this study consisted of all SS 3 students in Ekiti State. The sample for the study consisted of 500 students in SS 3 classes randomly chosen from eleven secondary schools in Ekiti State. One hundred and sixty eight students are randomly selected from each of male and female schools 164 co-educational schools. Stratified sampling technique was used to divide the state into three strata. These include: Mixed school, female school only and male school only.

Students were randomly selected from each of the male schools, 42 from each of the boys' school and 41 from each of the co-educational schools.

The researcher constructed the instrument. The instrument was made up of fifty multiple choice test items with 5 options. The test tested students' ability, knowledge of specific facts, ability to carry out algorithms. The item also intended to find procedures and methods students would employ to solve problems after receiving problem-solving treatments. Test experts and mathematics lecturers from Ekiti State College of Education, Ikere-Ekiti and those from University of Ado Ekiti judged the content validity of the instruments. The con-current validity procedure was used. The criterion measure was the 2006 Nov/Dec. West African School certificate objective test items. This instrument was correlated with 2006 Nov. /Dec. WAEC and the result indicated 0.85 of relationship.

One day was set aside for the administration of the instrument in all the centres in Ekiti State. There was an orientation for the selected supervisors who were mathematics teachers from the centres. The researcher did the orientation by personal contact with the supervisors in the entire centres. The scripts were collected and marked by experienced mathematics teachers (all of whom were WAEC examiners) from University of Ado-Ekiti and Ekiti State College of Education, Ikere-Ekiti. The data collected were subjected to analysis of variance, scheffe's post-hoc test analysis.

RESULTS

Hypothesis 1: There is no significant difference between academic performance of students in girls' schools and those of boys' schools in mathematical computation.

Table 1 shows that t-calculated is less than t-table value, thus the null hypothesis is accepted at $\alpha = 0.05$ level of significant. Hence, there is no significant difference between the mean scores of boys and girls in Mathematical computation test items. By implication boys did not perform better than girls in mathematical computation of test items.

Hypothesis 2: There is no significant difference between the academic performance of students in girls' schools and those students in mixed schools in mathematical computation test items.

Table 1: Student's t-Analysis of students' performance of Boys and Girls in Mathematical computational tasks

Sources of variation	Mean	S.D	t-calculated	t-table	Result
Boys	44.96	16.70	1.15	1.96	N.S
Girls	42.78	18.43			

p<0.05

Table 2: Student t-test of students in Girls' school and mixed schools in Mathematical computational test items

Source of variation	Mean	Standard deviation	t-calculated	t-table	Result
Girls	42.78	18.43	3.129	1.96	*
Mixed school students	36.91	15.67			

Table 3: Student t-test Analysis of Students of mixed schools and Boys' Schools in Mathematical computational test items

Sources of variation	Mean	N	t-calculated	t- table	Result
Boys	44.96	18.43	4.61	1.96	*
Mixed school	36.91	15.67			

p<0.05

Table 2 shows t-calculated is greater than t-table, thus thenull hypotheses is rejected at $\alpha = 0.05$ level of significant. Hence, there was a significant difference between the academic performance of students in girls' schools and those in mixed schools in favour of the girls. By implications, students in girls' schools performed significantly better than their counterpart in mixed schools.

Hypothesis 3: There is no significant difference between the academic performance of students in boys' schools and those of mixed schools in mathematics computation test items.

Table 3 shows that t-calculated is greater than t-table, thus the null hypothesis is rejected at $\alpha = 0.05$ level of significance. Hence, there was a significant difference between the academic performance of students in boy's schools and those in mixed schools in Mathematical computation tasks in favour of boy's. Hence, students in boy's schools performed significantly better than their counterpart in mixed schools at $\alpha = 0.05$ in mathematical computation test items.

DISCUSSION

The findings of this study, showed that there was no significant difference in academic performance of students in Boys' school and Girls' school, that is Boys did not perfrom better than girls in single sex schools in mathematical computation, this might be due to the National Policy in Education which states that all teachers in our secondary schools must be professional teachers with at least National Certificate in Education. Though the finding of Drura-Roush (1994) who asserted that boys perfromed better than girls in Mathematical computation.

The result of the study also revealed girls' school performed better than students in mixed schools and also Boys in boys' schools perfromed better than students in mixed schools. This is in line with Oladunni (1991) and Akpan (1991) who found the students' ability to compute correlates significantly with mathematical problem solving ability of secondary schools in Ekiti State, Nigeria.

A student variable that has attracted considerable attention is sex, studies ranged from how sex affects the selection of courses in schools (Alonge, 1985) to cognitive and non-cognitive performance. Though there are conflicting reports as to whether or not there is a sex influences in mathematics performance among pupils, some studies nonetheless associate better performance with boys while some proved other wise. Also, Kolawole and Adeyeye (1999) confirmed the assertion of this study that boys performed significantly better than girls in both chemistry and mathematics at SSCE level in Ekiti State. In line with the result of this study, Daramola (1992) found that both male and female received equal encouragement to use fully their intellectual gifts. He asserted that gifted girls do not differ from gifted boys in study behaviour, achievement motivation and other cognitive tasks.

Some statistics revealed that differences in mathematical achievement better in boys are of less advantage now than they were in the past. In elementary and middle schools, girls performed slightly better than boys in computation. Sex difference in mathematics is a sex difference in science and the sex difference in science favours boys. When science knowledge is distinguished from science processes. Sex differences occur purportedly on science knowledge.

Finally, the study revealed that the type of school a student attends influences his academic perfromance in mathematics computational tasks.

CONCLUSION

The following conclusions could be made from this study:

- Girls did not perform significantly better than boys in Mathematical computation tasks.
- Girls in Girls' Schools did perform better than their counterparts in mixed schools in mathematical computation tasks.
- Boys performed significantly better than girls in Mathematical computation tasks.
- The type of school a student attends enhances his performance in mathematical computation tasks.

RECOMMENDATIONS

Based on the findings, it is hereby recommended that the teachers should cultivate the culture of the teaching their students with definitions of specific facts, how to carry out algorithms, principle and rudiments that would enhance their performance in Mathematics computational tasks.

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