FACTORS CONTRIBUTING TO STUDENTS' POOR ACADEMIC PERFORMANCE IN MATHEMATICS AT SENIOR SECONDARY SCHOOL CERTIFICATE EXAMINATION IN TOTO LOCAL GOVERNMENT AREA, NASARAWA STATE, NIGERIA

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Abstract
Performance in Mathematics by students has persistently been poor for many years. This study was aimed to identify the factors contributing to the poor academic performance and to establish the strategies that can be adopted to improve performance in Mathematics by students in secondary schools in Toto local government area. The study to determine the school based factors that affect students' performance in Mathematics in secondary schools, socio-cultural factors that affect them and their personal factors that affect academic performance in Mathematics, and established the strategies that can be adopted to improve performance in Mathematics. Descriptive survey research design was adopted for the study. The sample of the study was 120 respondents which comprised of SSCE students in Toto Local Government Area of Nasarawa State, and 18 Mathematics teachers. The major instruments used for data collection for this research was; student, and teacher questionnaires, while descriptive statistics was used for data analysis. The results revealed that factors contributing to poor academic performance include under staffing, inadequate teaching/ learning materials, lack of motivation and poor attitudes by both teachers and students, retrogressive practices. Improving on these factors and sensitization of the local community to discard practices which prohibit student's effective participation in learning mathematics could improve performance in Mathematics. It is anticipated that the findings of this study will give curriculum developers new insights into emerging issues on performance and influence the Ministry of Education on policy formulation. Students are also expected to benefit from the findings; because improved mathematics performance will give them opportunities to pursue science related courses in higher institutions of learning and middle level colleges. Therefore, recommendations were made as a means of proffering solutions the problem of poor academic performance in mathematics.

Keywords: Academic poor performance, Mathematics, Factors, Students

Introduction

Long ago before the coming of Arabs and Europeans to Africa, the African people had developed their own systems of education, although the systems varied from one community to the other, their goals were often strikingly similar. At independence in 1960 education was viewed as the means to eradicating poverty, ignorance and diseases from Nigeria. Mathematics is seen by society as the foundation of scientific and technological knowledge that is vital in social economic development of the nation. Because of this, mathematics is a compulsory subject at both primary and secondary levels in Nigeria. Mathematics is also used as a basic entry requirement into any of the prestigious courses such as medicine, architecture and engineering among other degree courses. Despite the important role that mathematics plays in society, there has always been poor performance in the subject at public/ national examinations.

Table 1: Mean Percentage of Students Performance in (SSCE) from 2012 to 2015 in Toto Local Government Area.

Year	2012	2013	2014	2015
Mean Grade	D7	E8	C4	D7

SSCE Results: 2012 - 2015

Performance in Mathematics as indicated by the SSCE results above has remained poor for the five (5) years. Hence, the need to investigate factors contributing to poor performance in Mathematics at SSCE examinations by students in Toto local government area in order to reverse or minimize poor academic performance in mathematics.

Students need to be encouraged to acquire, and be provided with, the necessary academic skills to enter mathematics and science related professions. Mastering mathematics has become more important than ever before in the world. Students with a strong background in mathematics have an advantage over those students who struggle when competing in the job market. In the job market, workers who have a strong mathematics and science background are more likely to be employed and earn more than those with lower achievement even if they have not gone to college. To compete in our 21st century global economy, it is critical that students leave high school knowledgeable and proficient in mathematics.

In concluding this section therefore, Mathematics Education must contribute towards the acquirement of these values: knowledge and skills, intellectual habits and power, desirable attitudes and ideals that are indispensable tools for a successful and balanced human existence. Therefore, this study intends to identify the factors that contribute to secondary school students' poor academic performance in mathematics and to establish the strategies /methods that can be adopted to improve performance in Mathematics by students in secondary schools in Toto local government area of Nasarawa state, Nigeria and the world at large.

Purpose of the study

The purpose of this study was to identify the factors that contribute to secondary school students' poor academic performance in mathematics at Toto local government area of Nasarawa State. Specifically, the objectives of the study include:

(i) To determine the school based factors that affect students academic performance in mathematics in secondary schools

(ii) To identify demographic factors that affect students academic performance in mathematics in secondary schools

(iii) To identify student personal factors that affect students academic performance in mathematics in secondary schools

Research Questions

The following research questions were formulated and answered in this study:

(i) What are the school based factors that affects students academic performance in mathematics in Toto secondary schools?

(ii) Does demographic factors have an effect on students academic performance in mathematics in secondary schools?

(iii) Do student personal factors affect academic performance in mathematics in secondary schools?

Significant of the study

The findings/results of the study are considered important because it may provide school authorities in secondary schools in Toto Local Government Area with significant factors that are affecting student poor academic performance in SSCE mathematics. Therefore, school authorities may begin implementing educational innovations and interventions to directly address those factors within their own schools to deter future hindrances.

Methodology

The descriptive survey research design was adopted for this study. This approach was seen as ideal, because the aim was to capture in depth views of both the mathematics teachers and their students. The sample of 120 students and 18 mathematics teachers were randomly selected from both public/private secondary schools and were involved in the study. The student questionnaire comprised sections on demographic data with items such as gender, age,

secondary school entry marks, socio-economic status and cultural, school based factors with items such as method of teaching by teachers, availability of teaching / learning materials, academic qualification, and teaching experience of mathematics teachers and motivation. Mathematics teacher's questionnaire had sections on demographic data items such as gender, age, academic qualification, and teaching experience. Socio-economic and cultural, and school based factors with items such as method of teaching, availability of teaching/learning materials, workload and motivation and finally strategies to be adopted to improve achievement in Mathematics. Descriptive statistics were used to analyze the collected data.

Results and Discussion

The following results were obtained based on the analysis of the data collected. The research questions investigated students' perceptions whether or not demographic factors including gender, parents' educational level, and socio-economic status have an effect on academic mathematics performance. Participants' responses were reviewed to identify the most frequently answered responses for demographic factors:

Demographic Characteristics of respondents:

Data on table 3 indicate gender of the participants of the study where male were the majority in all categories.

Table 3: Gender of Participants

Respondents	Male (%)	Female (%)	Total
Students	65.0	35.0	100.0
Mathematics Teachers	73.0	27.0	100.0

Performance at Basic Education Certificate Examination (BECE):

The Basic Education Certificate Examination (BECE) is entrance examination to the senior secondary school in the country. Data obtained indicate that students had a mean aggregate of five (5) in mathematics performance which means the total scores of students all over the number of students involved in this study. This partly explains why there is poor academic performance on mathematics at the Senior Secondary Certificate Examination (SSCE***).***

Age of Students

Information obtained indicate that most of students (74.2%) were between 17 and 19 years of age, 23.8% were between 14 and 16 years, 1.9% were over 20 years and only 0.3% were below 13 years. These results are normal since the Nigeria system of education is that pupils join class one at age six, primary education is six years and secondary six years. Therefore, the students' academic performance would be negatively affected if the pupils / students join classes below the required age.

Mathematics Teachers Demographic Characteristics

The following information was obtained about mathematics teachers;

(i) The mathematics teachers who participated in the study were 27.0% female and 73.0% males. Thus there are more male teachers in secondary schools than female teachers. The same pattern was with students. More girls need to be encouraged to take mathematics so as to have more female mathematics teachers to teach the subject in schools.

(ii) Information obtained shows almost all teachers (66.7%) are professionally trained with Bachelor of Education degrees while 33.3% are unprofessional. Therefore, their out output is expected to be good. This finding is in line with Wayne & Young (2000) who hinted that secondary school students appear to learn more Mathematics from teachers with degrees or significant coursework in Mathematics

(iii) Ages of mathematics teachers; between 21 to 30 years of age (16.7%), between 31 and 40 years (66.7%) and over 40 years of age (16.7%). These shows mathematics teachers are very young and are energetic in teaching the subject (mathematics).

School Based Factors that Contribute to Poor Performance in Mathematics:

The data was collected and analyzed;

(i) Methods of Teaching Mathematics: Data obtained indicate that 7% of the teachers use lecture method, 2% use project, 61% use discussions, discovery method is used by 3% while 27% of the teachers use the question/ Answer method. According to Costello (1991), lecture method is ineffective in that it turns the learners into passive participants in the learning process. However despite the disadvantage, lecture method is useful in covering large content SMASSE (2007). Discussions, project and discovery methods creates an enabling environment for the learners and ensures that individual differences are taken care of.

(ii) Teaching/Learning Materials for Mathematics: Information obtained on availability of teaching/learning materials for mathematics in secondary schools indicate that text books are leading with 94.1%, followed by mathematics geometrical sets (28.4%) and colored chalk (25.3%). Whereas, charts and mathematics models take 10.5% and 6.2% respectively.

According to Psacharopolous and Woodhall (1985), textbooks are a major input for performance in examinations. This view is shared by Chepchieng (1995) who observes that availability of and quality of textbooks in a secondary school is strongly related to achievement among children from lower income families especially those in rural boarding schools. that physical facilities contribute positively to students academic performance (Munda, Tanui & Kaberia, 2000). Also 43.5% of all students indicated that schools lacked physical facilities and the ones existing were poorly used. According to Munda, et al (2000), physical facilities contribute positively to students' academic performance.

(iii) Effectiveness of Mathematics Teachers in Teaching: Student's opinion on the effectiveness of their Mathematics teachers in teaching the subject shows that 43% indicated that they are highly effective, 27% indicated that they are average and 30% indicated that they are not effective.

(iv) Teachers' Attitude towards Mathematics: Data obtained after analyzing teachers' responses on items soliciting their attitude towards mathematics indicate that they have a positive attitude towards the subject. The overall mean perception of Mathematics by the Mathematics teachers was 4.18 out of maximum possible score of 5.00. This implies that Mathematics teachers have a positive attitude towards Mathematics (4.18>2.50).

(v) Mathematics Teachers' Workload: Data obtained shows that 5.6% of Mathematics teachers teach below 15 lessons per week, 50.0% teach between 16 to 30 lessons, while 44.4% teach more than 30 lessons in a week. According to the Ministry of Education (2008), a teacher in a secondary school is supposed to teach at most 30 lessons in a week. This indicates that 44.4% of mathematics teachers are overloaded. This percentage is high and may contribute to poor performance in mathematics.

(vi) Mathematics Remedial Lessons: Information obtained shows that 55.6% indicate that remedial lessons are required in order to have mathematics syllabus completed. This means that the mathematics syllabus is overloaded, teachers do not plan well or learners are slow in learning mathematics.

Socio economic Factors affecting Performance in Mathematics at SSCE:

The following information was obtained on social economic factors affecting secondary school students' performance in Mathematics at Toto SSCE.

(i) Students' Parents/Guardians Education background:

Results obtained indicate that most parents/guardians (73%) do not have education beyond secondary school education, and only 17% have college/university education. This result reflects the high illiteracy rate in study area. Thus, they may not be good role models for their children in academic matters. This result agreed with Desarrollo (2007) who indicated that the extent to which parents or other family members are actively engaged in a student's education had appositive influence on the student's achievement.

(ii) Source of Income for Students' Parents/Guardians: Student's parents/Guardians sources of income are farming (41%), salary (38%), Business (18%) and casual labour

(5%). However, it was clearly indicated that the income is not consisted; therefore students whose parents rely on them are likely to get inadequate learning resources, and other essential requirements. Performance from such student will always be poor. This finding is in line with Conger, et al (1999) which indicated that low parental socio-economic status is associated with diminished resources hence contributing to lower academic achievement. Table 5 below represents Students' Parents/Guardians Education background.

(iii) Cultural Factors: Mathematics teacher's responses on socio-economic factors contributing to poor performance in Mathematics cited secret circumcision (initiation) (12%), beliefs (43%), early marriage (8%) and family income (62%). Also, cultural constraints negatively impacts on achievement level among students. Children who come from insecure environments caused by socio-cultural practices such as cattle rustling, early marriages and female genital mutilation (FGM) show emotional problems at school. They lack concentration in class and confidence in whatever task they are given to do (Durojaiye, 1976).

Students Personal Factors Contributing to Poor Performance in Mathematics at SSCE:

Students' personal factors contributing to poor performance in Mathematics at WASSCE were found to be gender, economic factors and attitude towards mathematics. Students' attitude towards mathematics was measured using likert scale and the results obtained indicated that they have a positive attitude towards mathematics. Mwamwenda (1995) argued that the achievement of students in a subject is determined by their attitudes rather than inability to study. Haimowitz (1989) indicated the cause of most failures in schools might not be due to insufficient or inadequate instruction but by active resistance by the learners. This argument suggests that favourable attitudes towards Mathematics should be developed for achievement in the subject to improve.

Strategies to Improve Achievement in Mathematics:

The strategies suggested by the students on how to improve achievement in mathematics were grouped into five areas, which comprised of staffing, teaching and learning materials, curriculum, motivation and attitudes, and fees and levies. The same strategies were identified by mathematics teachers. All mathematics teachers (100%) and all students (100%) suggest improvement in teaching/learning materials and motivation respectively, may improve achievement in the subject (mathematics)

Recommendations

In respect of the findings carried out in this study, the researcher made the following recommendations:

(i) The government and other stakeholders such as Non Governmental Organizations need to sensitize the local community to discard beliefs and practices such as FGM and *moralism* that prohibit effective participation which result to poor performance in mathematics.

(ii) The Ministry of Education and schools managements should motivate teachers especially after the release of examination results. This includes recommendation for promotion, subsidizing of house rents. The provision of incentives towards mathematics courses in universities and teacher training colleges through grant-in-aids and scholarships should be considered. This will help in training more mathematics teachers.

(iii) To mitigate on the inadequacy of teaching/learning materials and equipment the government needs to enhance their provisions to schools. It should extend loan facilities and bursaries to secondary school students from poor families.

(iv) The Ministry of Education should review the curriculum to make it relevant and flexible to the diverse needs of different regions and background of the students. Also, allocate more time to the teaching of mathematics on school time tables so that mathematics syllabus can be completed on time.

Conclusion

In the study, the following objectives were set to be achieved. The first objective was to determine the school based factor that affects mathematics performance in SSCE. Therefore, the survey established that teaching method was not wholly effective, learning/teaching are inadequate, and there is a heavy workload on teachers in teaching the subject.

The second objective was to establish demographic factors that affect students' mathematics performance in SSCE. The survey revealed that cultural factors (secret society initiation, early marriage, belief and family income), parents' educational level and socioeconomic status are having negative bearing on the students' mathematical achievement in SSCE.

Furthermore, the study intended to establish students' personal factor. Therefore, gender, economic factor, and the careless attitude towards mathematics are affecting performance in the subject. Therefore, all the objectives set were achieved.

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