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Factors Contributing to Students Poor Performance in Mathematics at West African Senior School Certification Examination (A Case Study: Kenema City, Eastern Province Sierra Leone)

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ABSTRACT: Performance in Mathematics by students has persistently been poor. This study sought to investigate the factors contributing to the poor performance and to establish the strategies that can be adopted to improve performance in Mathematics by students in secondary schools in Kenema City, Sierra Leone. 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 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 target population was 100 respondents which comprised of WASSCE students in Kenema District, and 15 Mathematics teachers. The data for the research was collected by use of three questionnaires; student, and teacher questionnaires. Factors contributing to poor 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.

KEYWORDS: Poor Performance; Factors; Student and Teacher

ACKNOWLEDGMENT

I owe depth of gratitude to God Almighty through Jesus for giving me knowledge, wisdom and understanding throughout my academic pursuit.
My sincere thanks go to Miss Marian Johnson who works assiduously as a typist to ensure that this work comes to an end. I am particularly grateful to my wife for her architectural role in my academic activities. Thanks and appreciations go to my mother and late father, they nurtured me to the level I am today.

INTODUCTION

As soon as children begin talking, parents begin teaching their children to recite the ABCs and count from 1 to 10. Even at an early age, parents realize the importance of teaching their children the beginning basics of reading and mathematics before they enter school (Sheldon & Epstein, 2009). Sheldon and Epstein stated, "In every school across the country, students are taught and expected to learn mathematics, beginning with number recognition in kindergarten" (p. 196). For Africa, many problems for students begin before they even enter school (Education Trust, 2008). Many children enter school with very little beginning knowledge. They come from homes in which the parents are uneducated, often cannot speak English, and possibly struggling economically. These students are entering school already at a disadvantage (Education Trust). While many young students begin mastering reading, mathematics often becomes a subject area that countless students will have difficulties and problems mastering.

Students need to be encouraged to acquire, and be provided with, the necessary academic skills to enter math and science related professions (Cavanagh, 2007b). 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 (Department of Education, 1997). To compete in our 21st century global economy, it is critical that students leave high school knowledgeable and proficient in mathematics.

Today's graduates need to have solid mathematics skills regardless of whether they enter the workforce or continue into higher education (USDOE, 2008b).President Bush's National Mathematics Advisory Panel, convened in 2006, stated America's math education system is broken and must be fixed. This has been the same in Sierra Leone Mathematics instruction in our educational system is not preparing today's students with the skills necessary to become engineers and scientists (USDOE, 2008a). Schools must find ways to improve instruction and provide students with rich experiences in mathematics as they progress through the school system (Newton, 2007). To produce a generation of students who can compete globally will require schools to prioritize the effective teaching of mathematics (Brown. & Center for Comprehensive School Reform and Improvement, 2009). If not, then students are likely to repeat the cycle of poor learning experiences, inadequate foundational knowledge and skills, and weak educational outcomes in mathematics (Newton). One factor that may affect a student's ability to succeed academically has been associated with low self-efficacy and lack of motivation (Margolis & McCabe, 2006). Low self-efficacy causes motivational problems that hinder academic achievement. Margolis and McCabe stated, "It is not surprising that many struggling learners have low self-efficacy for academics. They believe that they lack the ability to succeed" (p. 218). Therefore, students will avoid academics and give up quickly when faced with difficulties. Other possible factors that may affect student achievement are socioeconomic status conditions and ineffective instructional strategies (Colvin, 2003). Colvin stated, "The link between socioeconomic status and academic achievement in the United States is among the strongest in the world" (p. 14). A statistical study done in Texas found that6 if economically disadvantaged students were lucky enough to have five consecutive above average teachers in term of effectiveness, the tight link between socioeconomics and academic achievement could be broken (Colvin). Too many students today are not learning the mathematics they will need to be successful outside the classroom. In many instances, students do not have the opportunity to learn significant mathematics.

In others, students lack the commitment or are not engaged in learning due to ineffective instruction or curriculum (National Council of Teachers of Mathematics [NCTM], 2000). Mathematical skills are a lifelong necessity. It is unclear what innovations, strategies or factors have the most impact on student achievement in mathematics on the TAKS test. Prevention and intervention programs are essential to support at-risk students. The overwhelming majority of school and district leaders do not know how to help teachers better prepare students to succeed in mathematics (Wagner, 2003). The implementation of NCLB has impacted how school districts are judged. The new law fundamentally redefines what it takes to be a successful school system, and district leaders would be wise to begin taking steps now to meet the new demands (Jerald & Haycock, 2002). Schools will no longer be judged as successful unless all students regardless of race or socioeconomic status can be taught successfully.

Statement of Problem

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 1961 education was viewed as the means to eradicating poverty, ignorance and diseases from Sierra Leone. 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 Sierra Leone. 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 examinations.

Table 1.Shows the mean grades of student in WASSCE over 6 years in Kenema District.

Year	2007	2008	2009	2010	2011	2012
Mean Grade	E8	D7	D7	D7	C6	D7

Aim and Objectives of the Study

The main aim of this study was to investigate the factors that contribute to students poor performance in mathematics at the WASSCE in five (5) selected secondary schools in Kenema District. Specifically, the objectives of the study were to;

- Determine the school based/ institutional factors that affect student performance in Mathematics in secondary schools
- Establish demographic factors that affect student performance in Mathematics in secondary schools
- Establish student personal factors that affect student performance in Mathematics in secondary schools

- Devise strategies that can be adopted to improve performance in Mathematics by students in secondary schools

Significance of the Study

This study sought to identify factors contributing to student poor performance in mathematics at the WASSCE in selected secondary schools in Kenema District. Once a school is labeled by the West African Examination Council as academically unacceptable in terms of performance in WASSCE, the school must begin, almost immediately, seeking answers to why students are not successful at the WASSCE. The immediate goal is to raise exam scores and continuously search for ways to maintain exam scores. If schools can determine what factors may be hindering student achievement, then they can begin creating and implementing intervention measures that will assist in student achievement. Considering that most secondary schools in Kenema are currently rated as academically unacceptable, it is reasonable to think these schools could have lower exam scores the next school year falling victim to WAEC's lowest accountability label of academically unacceptable. The findings from this study may provide school authorities in secondary schools in Kenema with significant factors that are impacting student poor performance on the mathematics portion of the WASSCE. Therefore, school authorities may begin implementing educational innovations and interventions to directly address those factors within their own campuses to deter future hindrances.

Assumptions For the study

Several assumptions were made. The data collected from WAEC for this study were accurate. The data were uniformed and not bias. The WAEC math exam was an accurate and reliable estimate of student mathematics achievement. The data used in this study would identify factors impacting student poor performance in mathematics at the WASSCE.

1.5 Limitations of the Study

The following limitations were applicable to this study. The findings of the study were limited to Kenema District and are only applicable to large secondary schools. The validity and reliability of the data collected from WAEC were dependent on the information given at the WAEC website and regional office in Kenema. Finance was a major challenge in carrying out this study, gathering and compiling the findings.

RESEARCH METHODOLOGY

In this study, a qualitative, non-experimental, exploratory and descriptive (Babbie, 1998) approach was followed. This approach was seen as ideal, because the aim was to capture in depth views of both the mathematics teachers and their students. Such views would hopefully put into perspective, the context in which the teaching and learning of mathematics takes place. Also, the views would provide an empirical basis of what could be done to counter the contributory factors to poor performance in mathematics.

Data Sources

Both primary and secondary data were used in this research. Secondary data were obtained from books, articles, newspapers and internet sources to review literature. These were analyzed in chapter two. Secondary data were also obtained from WAEC regional office in Kenema.

Primary data were collected through questionnaire survey and face-to-face interviews.

Participants and study context

The targeted populations for the present study were students preparing for the 2014 WASSCE examination. Consent to conduct the present investigation was given by authorities in all the schools. A convenient sample of five (5) schools from Kenema was chosen. This sample was chosen in respect of poor average performance by all schools in this area. In fact, the five schools had produced low pass rates in WASSCE mathematics since 2004. Also, targeting the five schools allowed for coverage of different areas of Kenema

The participants for the study included 100 senior secondary school students randomly retrieved from five government supported schools. 40% of the student participants were females, and 60% were males.15 mathematics teachers were also interviewed across the selected schools. The sample size was determined by financial limitations of the researcher.

Procedure

The data collection instrument was organized and pilot-tested to obtain reliability. Course calendar was reviewed to identify the most appropriate date and time of participants for the subjects' retrieve. Prospective participants were reached through randomly visits to classes at a mathematics department of a government secondary school. The purpose of the study was explained to mathematics department students, and their voluntary participation was requested. All students in these mathematics classes volunteered to participate in the study. Printed survey instruments were distributed to the students. All students completed and returned survey on the same day.

Sampling Techniques Used

The following sampling techniques were employed to select the participants for the study. These were: cluster and simple random sampling.

Cluster Sampling

Firstly, the study subjects were zoned into five clusters according to the school they attend. The sample size of 100(for students) and15 (for math teachers) were divided equally among the five selected schools. This give a sample size of twenty (for students) and three (for math teachers) for each school, which means that 20 students and 3 math teachers were interviewed in each school.

Simple random sampling

This was used to select participants for interview. That is the first student to be contacted in each school was interviewed. If the first student was not ready, the next available student was interviewed.

Table 2. The distribution of samples from the various targeted secondary schools

School	Number of Students	Number of Teachers
Luke's Commercial Secondary School.	20	3
Holy Rosary Secondary School	20	3
Islamic Secondary School	20	3
Government Secondary School Kenema	20	3
Ansaru Secondary School	20	3
Total	100	15

Administered questionnaires were examined to check completeness, accuracy and consistency of responses in order to detect and eliminate errors. The Statistical Package for Social Science (SPSS) was used to process the quantitative data. The data were processed into statistical tables for interpretation and discussion. Processed data were analyzed both quantitatively and qualitatively. Collected instruments were reviewed for any missing data entry or errors. No missing data or error was detected. Then collected data were imported to the statistical analysis package (SPSS 13) for later analysis. Descriptive analysis, ANOVA and Post Hoc Multiple Comparison LSD test were used to answer the research questions. All statistical analyses were conducted with a significant level of 0.05.

Location and Size

Kenema is located in the Eastern Province of Sierra Leone and surrounded by the Kamboi Hills. Its coordinates in Sierra Leone are 7° 55" north and 11° 11" west. Kenema is the third largest city in Sierra Leone (after Freetown and Bo) and the Headquarter of the Eastern Province. The city lies approximately 200 miles east of Freetown and about 500 miles south of Bo. The municipality of Kenema had a population of 128,402 in the 2004 census (Sesay et al, 2006) and a more recent estimate of 188,463.

Socio-Economic Background

The city is a major trade centre and is one of Sierra Leone's six municipalities that is governed by a directly elected city council form of government, headed by a mayor. Like the rest of Sierra Leone, football is by far the most popular sport in the city.

The Sierra Leone professional football club called Kamboi Eagles, which is based in Kenema, represents the city in the Sierra Leone Premier League. Kenema is an intense commercial centre. The city has nightclubs, bars restaurants, big markets like the Kamboi Shopping Plaza that caters for different household needs. The city is characterized by deplorable road network and intermittent power supply.

Education

As in the rest of Sierra Leone, Kenema has an educational system with six years of primary school (Class 1-6), and three years of junior secondary school (JSS 1-3); four years of senior secondary school (SSS 1-4).Primary school usually starts from ages 6 to 12 and secondary school usually starts from ages 13 to 18. Primary Education is free and compulsory in government-sponsored schools. Prominent schools in Kenema include: Government Secondary Schools (GSSK), Holy Trinity Secondary School, Ahmadiyya Secondary School, Holy Rosary Secondary School, and Islamic Secondary School.

The Eastern Polytechnic, situated at the main Combema Road is the highest learning institution in the city, offering certificates and degree courses

Health

Kenema and Bo are endemic areas of a highly contagious tropical hemorrhagic fever known as Lassa fever and recently Ebola. Kenema hospital is a centre of an international effort to combat the diseases with support from The World Health Organization (WHO) and UNAMSIL. New laboratories to improve rapid diagnosis are being installed at the hospital, which admits between 250 and 500 suspected cases per year.

The District has 16 Chiefdoms and 121functioning PHUs (which include 24 CHCs, 3 clinics located at the Kenema Government Hospital (Under 5 and School Health Clinics), 31CHPs and 62 MCHPs, and 1 mission hospital).

RESULT AND DISCUSSION

The research questions investigated students' perceptions whether or not demographic factors including gender, parents' educational level, and socio-economic status have an effect on mathematics achievement. 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 in majority in all categories.

Table 3: Gender of Participation

Respondents	**Male (%)**	**Female (%)**
Students	55	45
Math Teachers	73.3	26.7
Total	57.4	42.6

Field Survey, 2014

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. This partly explains why there is poor performance on mathematics at the West African Senior School Examination (WASSCE***).***

Age of Students:

Information obtained indicate that most of students (74%) were between 17 and 19 years of age, 23% were between 14 and 16 years, 3% were over 20 years, and none were below 13 years, as shown in figure 1 below.

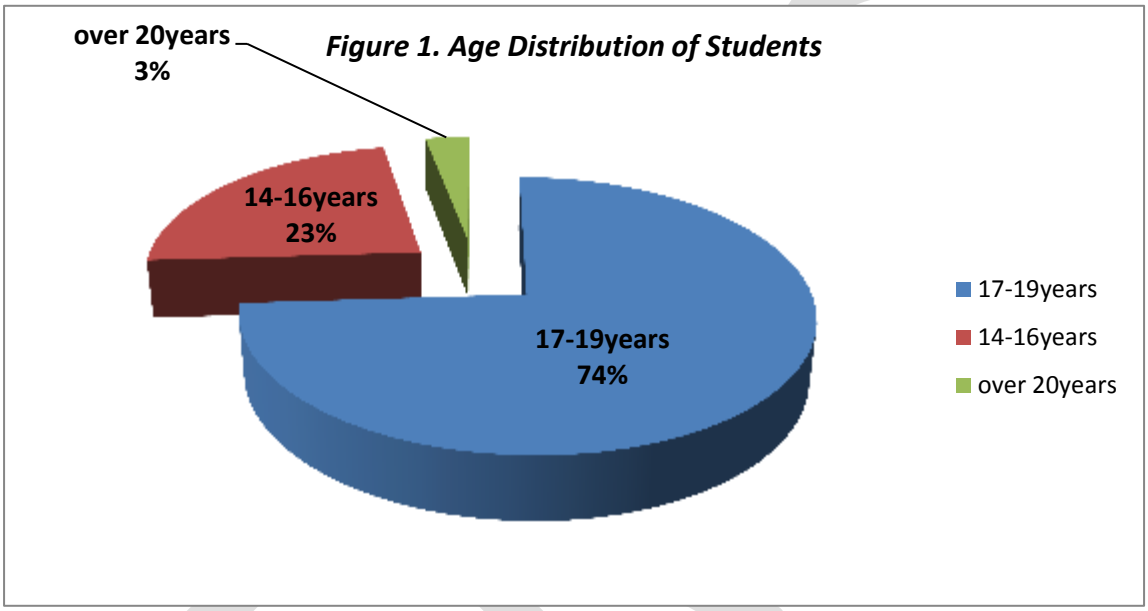


Figure 1. Age Distribution of Students

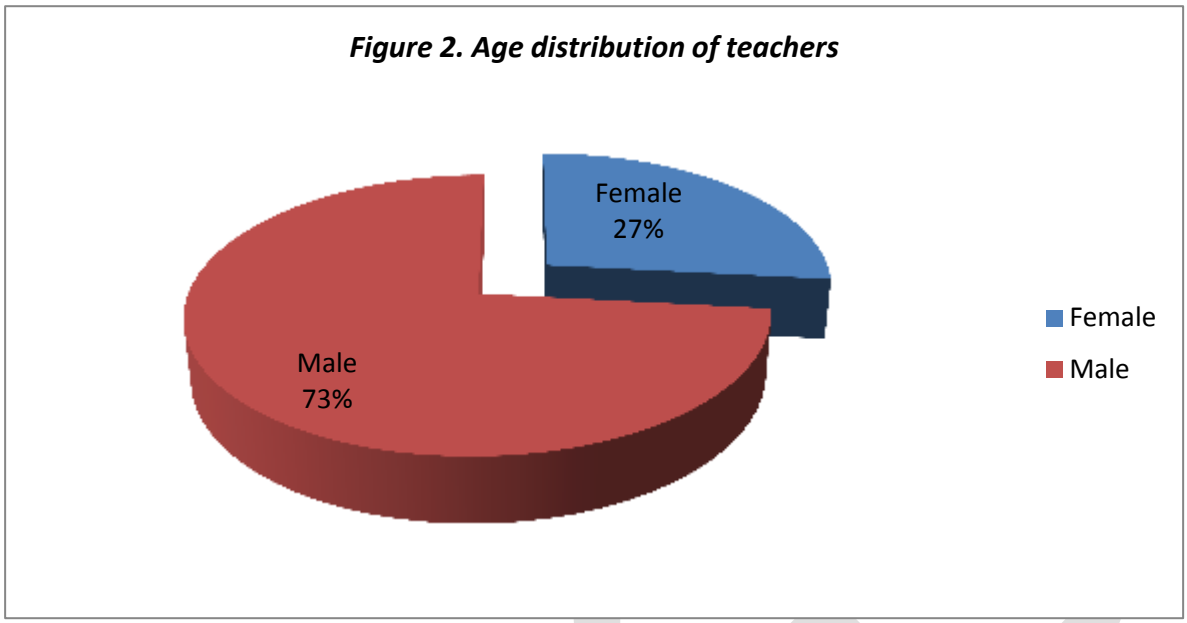
These results are normal since the Sierra Leone system of education is that pupils join class one at age six, primary education is six years and secondary six years.

Mathematics Teachers Demographic Characteristics:

The following information was obtained about mathematics teachers;

i) The mathematics teachers who participated in the study were 26.7% female and 73.3% 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. This data is shown in figure 2 below.



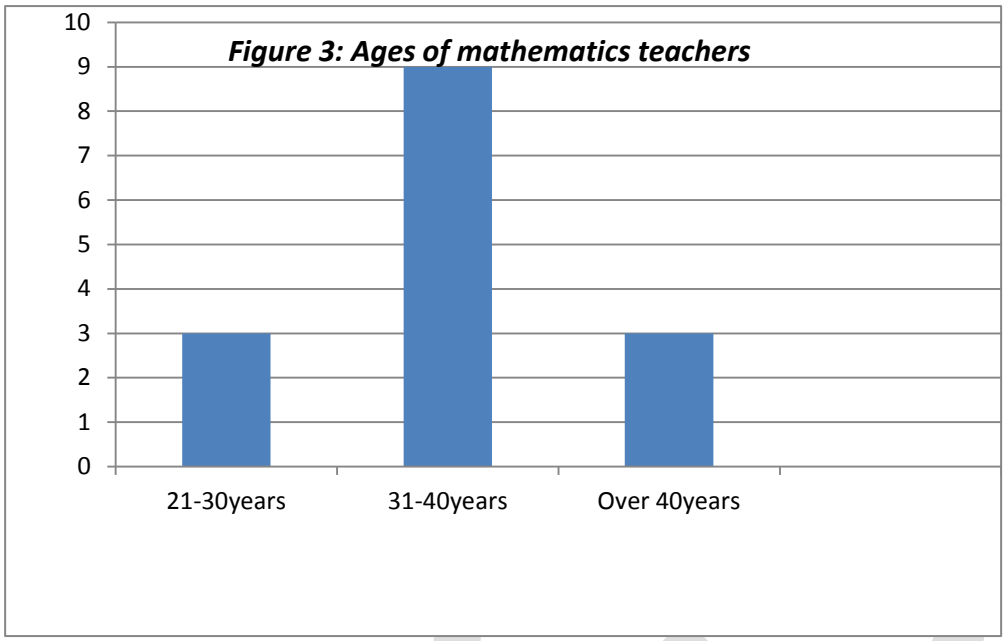
ii) Information obtained shows that 60% of the teachers are professionally trained with Bachelor of Education degrees, 40% are untrained and unqualified. Therefore, their out output is expected to be average. Secondary school students appear to learn more Mathematics from teachers with degrees or significant coursework in Mathematics (Wayne & Young, 2000). Table 4 represents this information below.

Table 4: Qualification of teachers

Respondents (Teachers)	**Frequency (%)**
Professionally Trained	9(60)
Untrained & Unqualified	6(40)
Total	15(100)

Field Survey, 2014

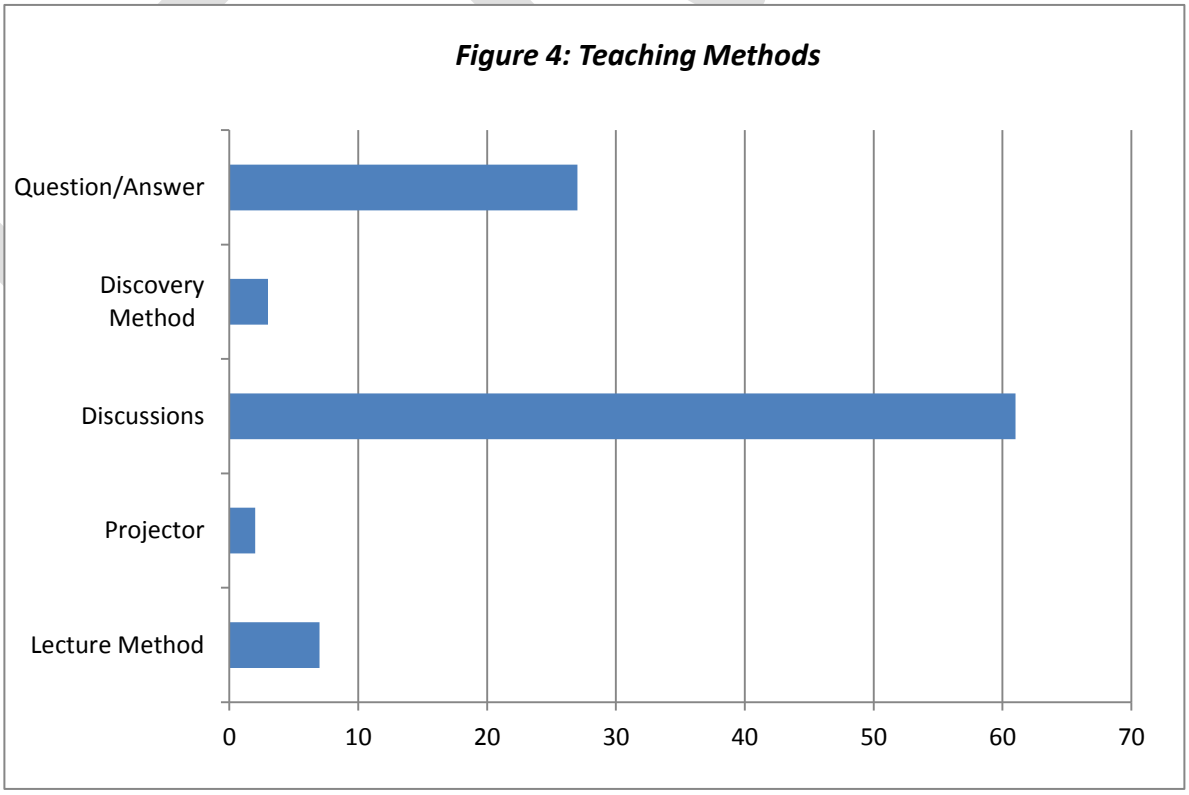
iii) Ages of mathematics teachers; between 21 to 30 years of age (20%), between 31 and 40 years (60%) and over 40 years of age (20%). These shows mathematics teachers are fairly young and are expected to be energetic in teaching the subject. The bar chart below represents the data.



School Based Factors that Contribute to Poor Performance in Mathematics:

The data was collected and analyzed;

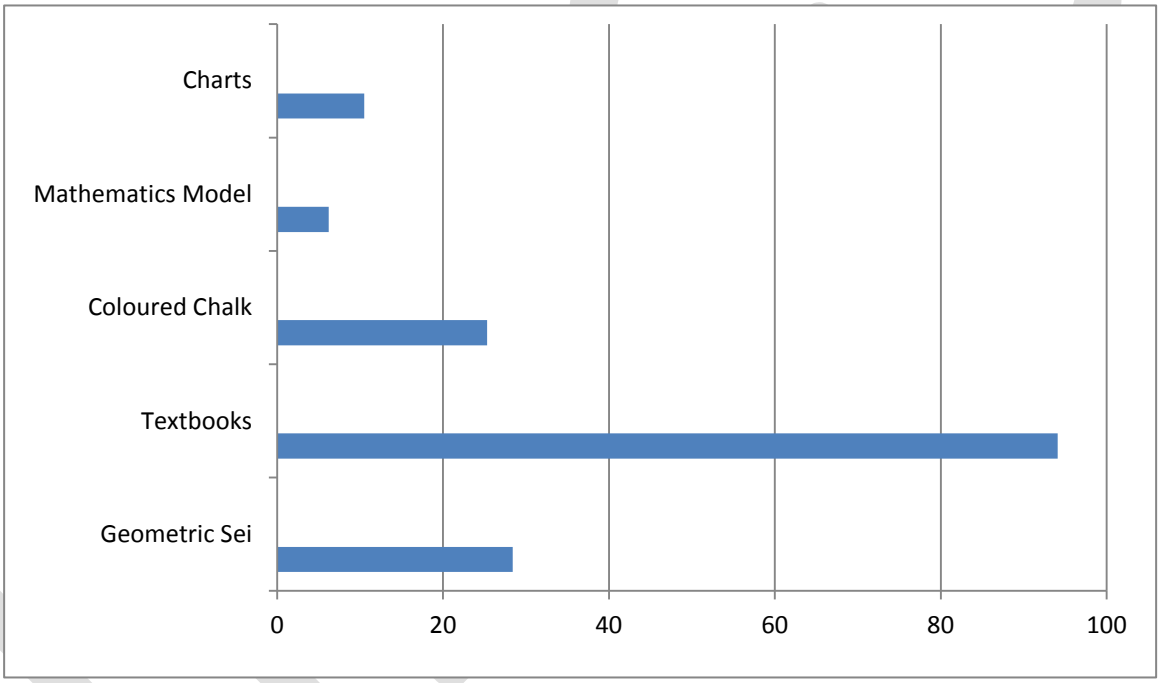
i) **Methods of Teaching Mathematics:** Data obtained indicate that 7% of the teachers use lecture method, 2% use project, 61% use discussions, discovery method is used by 3% while 27% of the teachers use the question/ Answer method. According to (Costello, 1991) lecture method is ineffective in that 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



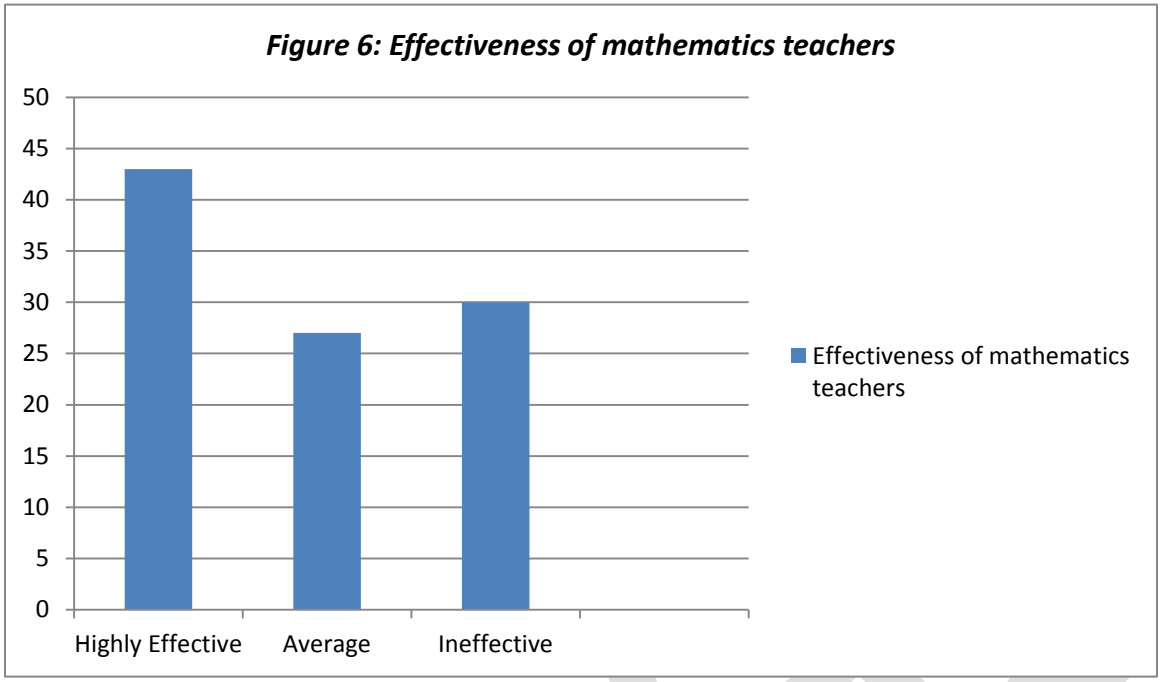
differences are taken care of.

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, Tanui and Kaberia, (2000) physical facilities contribute positively to students' academic performance. This result is illustrated in the figure below.

Figure 5: Learning materials for mathematics



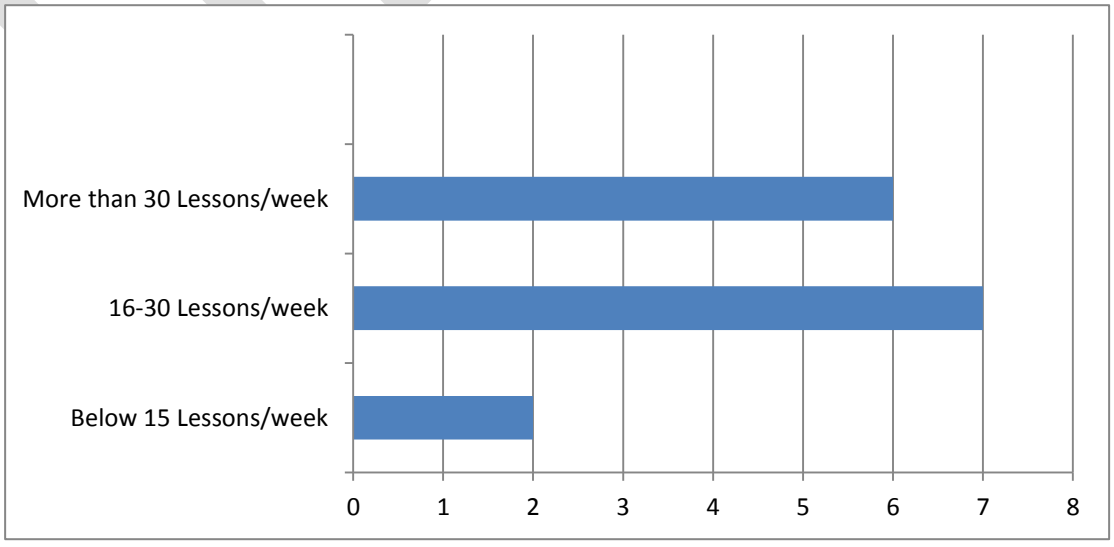
iii) **Effectiveness of Mathematics Teachers in Teaching:** Student's opinion on the effectiveness of their Mathematics teachers in teaching the subject shows that 43% indicated that they are highly effective, 27% indicated that they are average and 30% indicated that they are not effective.



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 13% of Mathematics teachers teach below 15 lessons per week, 47% teach between 16 to 30 lessons, while 40% 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 40% of mathematics teachers are overloaded. This percentage is high and may contribute to poor performance in mathematics.

Figure 7: Mathematics Teachers Workload



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 WASSCE:

The following information was obtained on social economic factors affecting secondary school students' performance in Mathematics at KCSE;

i) **Students' Parents/Guardians Education background:**

Results in figure 7 below indicated 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. Desarrollo (2007) 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

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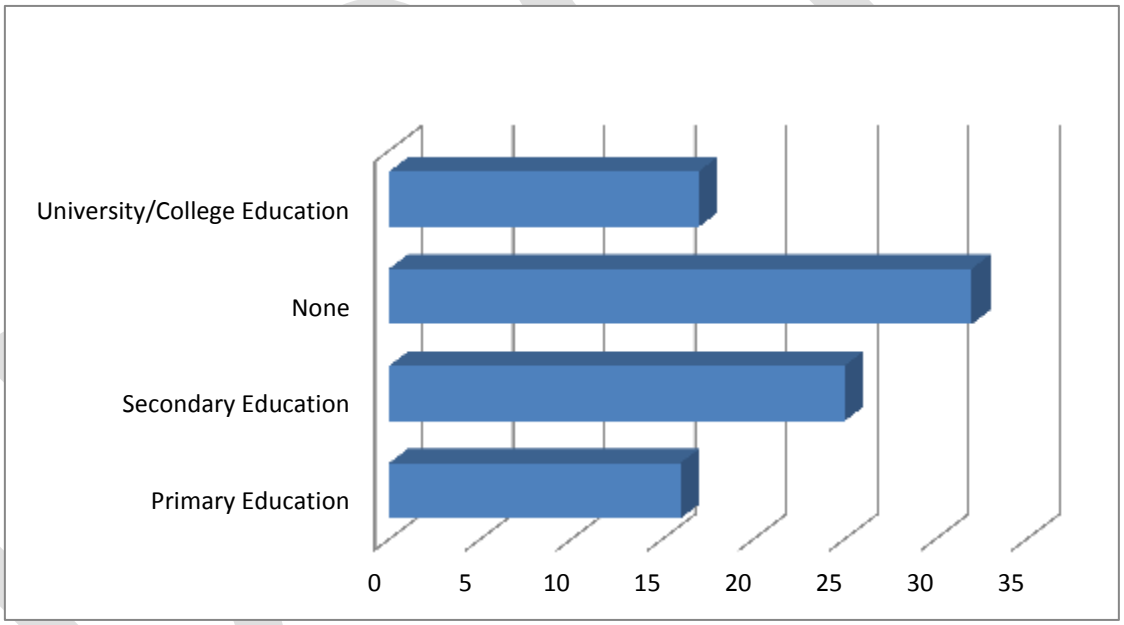
Figure 8: Students' Parents/Guardians Educational background



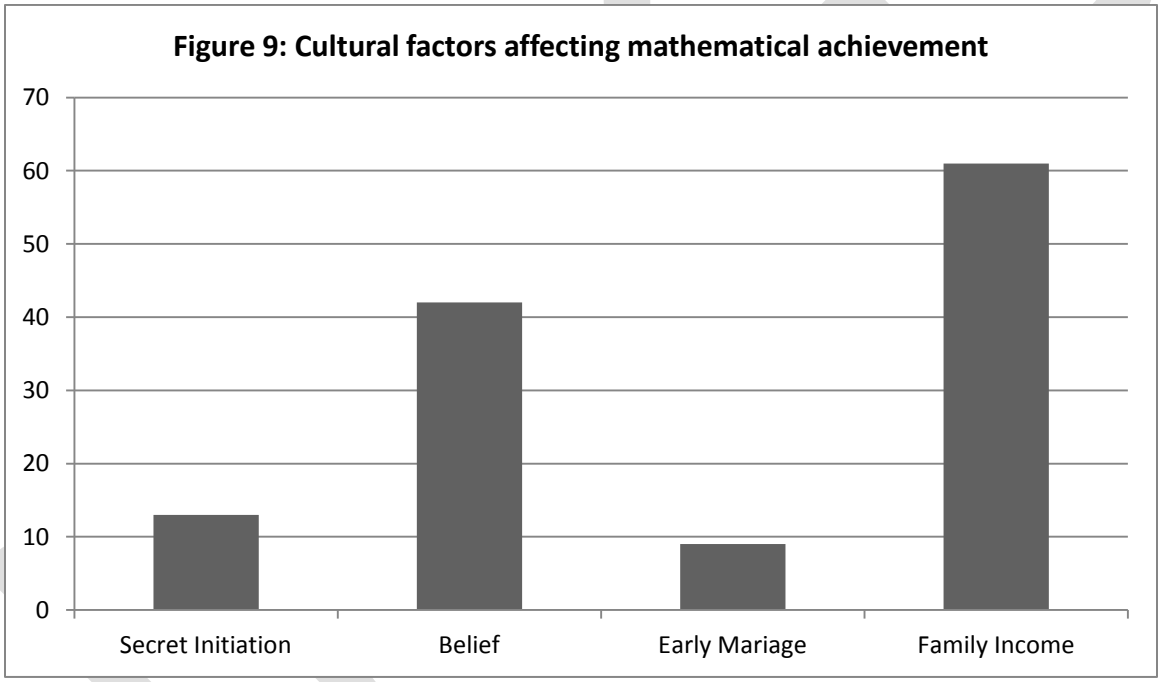
ii) **Source of Income for Students' Parents/Guardians:** Student's parents/Guardians sources of income are farming (40%), salary (37%), Business (17%) and casual labour (6%). However, it was clearly indicated that the income is not consisted; therefore students whose parents rely on them are likely to get inadequate learning resources, and other essential requirements.

Performance from such student will always be poor. According to Conger et al 1992, 1993, 1999 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.

Table 5: Students' Parents/Guardians Education background

Occupation	Percentage (%)
Farming	40
Salary	37
Business	17
Casual Labour	6
Total	100

i) **Cultural Factors** Mathematics teacher's responses on socio-economic factors contributing to poor performance in Mathematics as shown in figure 8 cited secret initiation (13%), beliefs (42%), early marriage (9%) and family income (61%). 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 WASSCE:

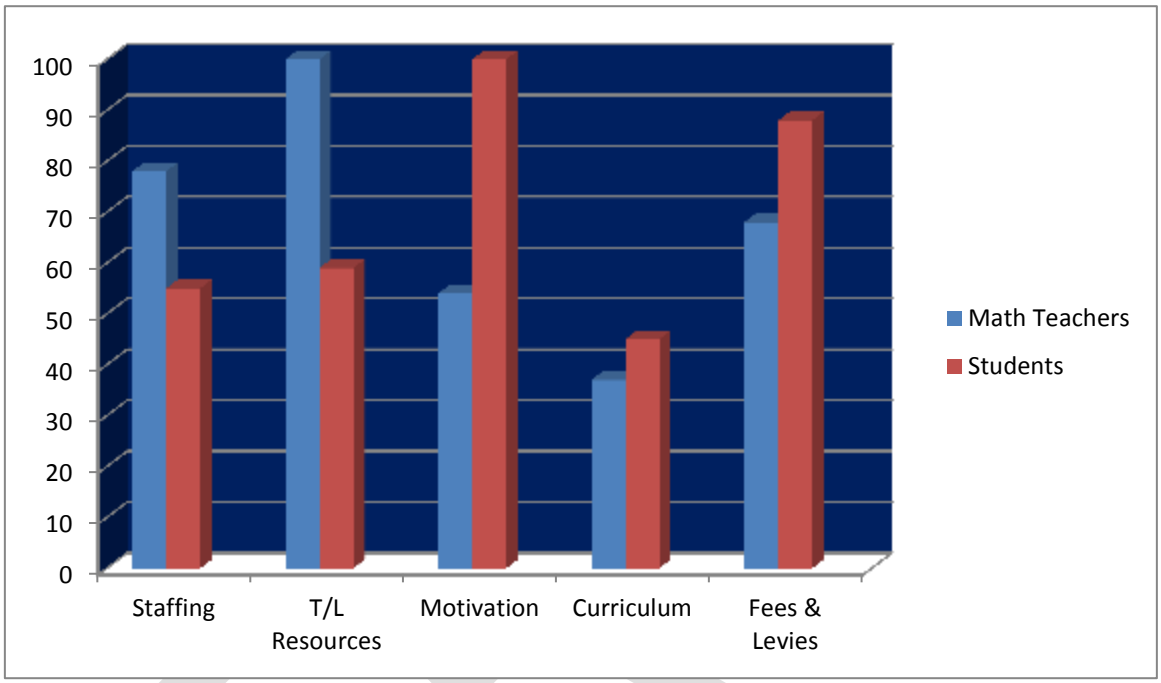
Students' personal factors contributing to poor performance in Mathematics at WASSCE were found to be gender, economic factors and attitude towards mathematics. Students' attitude towards mathematics was measured using likert scale and the results obtained indicated that they have a positive attitude 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 as shown in figure 9. All mathematics teachers (100%) and all students (100%) suggest improvement in teaching/learning materials and motivation respectively, may improve achievement in the subject.

Figure 10: Strategies to improve achievement in mathematics



SUMMARY OF KEY FINDINGS, RECOMMENDATIONS AND CONCLUSION

Through the analyses, the following are the key findings of the study. These are discussed below:

Key Findings:

- Poor mathematical foundation: Most students in senior secondary school do not get a grade better than 5 in their BECE mathematics. This affects their understanding of the subject in the senior school level.
- Male domination: 73.3% of mathematics teachers in the study area are male while the remaining 26.7% are female. This gap need to be bridged if girls are to stop believing that mathematics is for boys mainly. This will brings the need for more girls to be encouraged to take mathematics seriously so as to have more female mathematics teachers.
- More mathematics teachers are needed in schools: Although a good number (60%) of mathematics teachers are trained and qualified with a Bachelors of Education in the subject, a considerable 40% who teach mathematics are still untrained.
- Teaching method: 7% of mathematics teachers are still using an ineffective lecture method in teaching the subject. This method turns the learners into passive participants. Discussion method make up for the most percentage in teaching methodology with 61% of teachers using it.
- Availability of teaching/learning materials: Textbooks are the leading available learning/teaching materials in senior secondary schools with a percentage of 94.1%. Mathematics model and charts make a combined percentage of 16.7%. Also, 43.5% of students indicated that schools lack the physical facilities and existing ones are poorly used.
- Effectiveness of mathematics teachers: A good number (57%) of mathematics teachers are not effective in their teaching. They are either average or completely ineffective in their performance.

- Mathematics teachers' workload: Mathematics teachers are overloaded with too many teaching lessons. 40% of teachers teach more than 30 lessons per week and only 15% of them teach less than 15 lessons per week.
- Mathematics Syllabus: The mathematics syllabus is overloaded and teachers do not plan well or learners are slow in learning mathematics. Therefore 56% of students indicated that remedial lessons be organized to have mathematics syllabus completed on time.

- Students' parents'/guardians' educational background: A good number (73%) of students' parents/guardians do not have education beyond secondary school. This reflects the high illiteracy rate in the study area. Parents' education level was found to be an effective factor in achievement of students in math courses similar to the results of Coleman, (1966) and Campbell, Hombo, & Mazzeo, (2000). Parents with higher level of education could be a role model for their children to accomplish high levels of achievement in math courses.
- Low parental socio-economic status: Majority of students' parent/guardians are not sustained income earners. Low parental socio-economic status is associated with diminished resources hence contributing to lower academic achievement. Socio-economic status in this study was reported as an important factor affecting the math achievement of students in math courses. Parents with high income seem to provide richer instructional resources to their children which may eventually help to improve the math scores of students. As the grade level increases, math students' opinion about the effects of socio-economic status on the math achievement increases. This finding illustrates that math students need more financial resources as they get close to graduate in math department. Deficiency of financial resources is reported as a factor that has an effect on their math achievement
- Cultural factors: Cultural practices such as secret initiation during school days, belief, early marriage, and family income are still affecting academic achievement in Kenema.
- Students' personal factors: Factors such as gender, economic factors and careless attitude towards mathematics are affecting performance at WASSCE.

Recommendation

Based on the findings of the study, the following measures are recommended for an improved performance in mathematics at WASSCE.

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

ii) 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 *moranism* that prohibit effective participation which result to poor performance in mathematics.

iii) 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.

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.

v) Allocation of 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 WASSCE. 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 WASSCE. The survey revealed that cultural factors (secret society initiation, early marriage, belief and family income), parents' educational level and socio-economic status are having negative bearing on the students' mathematical achievement in WASSCE.

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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