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The Impact of Motivation on Pupils' Academic Achievement and Learning Outcomes in Mathematics among Secondary Schools in Sierra Leone: A Case Study Kori Chiefdom, Moyamba District Southern Sierra Leone

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Abstract

Motivation can be viewed as an internal state arouses, direct, and maintains behavior. *This simply means motivation is a reason of students' thinking in a given situation.* Mathematics teachers should wisely utilize available learning resources to enhance positive motivation, reinforce neutral motivation, if any, and neutralize any negative attitudes towards learning and performance in mathematics. The purpose of this study was to investigate the impact of motivation on pupils' academic achievement and learning outcomes in mathematics among secondary school pupils in Njala and Taiama kori chiefdoms Moyamba district. A total of 100 questionnaires were administered in the four schools and twenty five questionnaires from each school.

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Data was collected using Mathematics academic performance Questionnaires (MAPQ) for students and analyzed using Statistical Packages for Social Sciences (SPSS). The findings show the major problem face by students in learning mathematics is the language used by the teachers and inadequate mathematics textbooks and learning resources.

Keywords: Motivation; Achievement; and Learning

1. Introduction

Mathematics is a compulsory subject for all pupils at the secondary school level in Sierra Leone. This is necessitated by the fact that knowledge of mathematics is essential for all members of society [1]. In our match towards scientific and technology advancement, we need nothing short of good performance in mathematics at all levels of schooling. In an effort to achieve this, this study investigated *the impact of motivation on pupils' academic achievement and learning outcomes in mathematics among Secondary School in Sierra Leone.*

Learning mathematics can develop students' ability to think in quantitative terms but also can improve skills such as analysis and problem solving. People believe that mathematics is a subject that is difficult and unattractive, but through technical assistance and some ways with innovation approaches in teaching mathematics, mathematics can have an attraction and sharpen students' creativity as well. To be able to talk to students how important mathematics is having understanding students' beliefs in learning mathematics so as to find ways to improve students' performance and achievement in mathematics [2]. He state that there were significant different between students' beliefs base on institutions and mathematics grade and there were no significant differences among beliefs base on gender, secondary education, and major.

In the last fifty years, researchers had curiosity with the effect of motivation. They studied students' motivation and learned a great deal about the effect of motivational practices on school learning. It pointed to more simple aspect, such as achievement motivation, intrinsic motivation, and goal orientation as well as teacher practices which promote motivational beliefs. To be able to talk further about motivation in learning mathematics, it is essential to know what motivation actual mean. Motivation is defined as an internal state arouses, direct, and maintains behavior [3]. *This simply means motivation is a reason of students' thinking in a given situation.* In self-Determination Theory, motivation is distinguished between different types based on different reasons or goal-intrinsic and extrinsic motivation. Intrinsic motivation refers to doing something it is certainly interesting or enjoyable. While extrinsic motivations refer to doing something because it leads to separable outcome [4].The examples of intrinsic motivation are personal interest in a satisfaction, subject, or pleasure in learning tasks. Whereas the examples of extrinsic motivation are awards, parent and teacher praise, and value. Various factors have been adduced for poor performance of students in mathematics.

The interest of students in mathematics have been related to the volume of work completed, students task orientation and skill acquisition, students personality and self-concept[5]feeling of inadequacy [6], motivation and self-confidence [7], anxiety[8], shortage of qualified mathematics teachers [9], poor facilities, equipment and instructional materials for effective teaching [10], use of traditional chalk and talk methods [11], large

pupils to teacher ratio [12] mathematics fright/phobia [13] and so on. Reference [14] stated that interest in activities tends to increase the likelihood that individuals formulate goals relating to that activity and invest time and effort to achieve them. Moreover, individual characteristics such as intelligence, cognitive styles, and personality play an important role in learning and instruction as does the context of learning

Other research findings have shown that individual students' characteristics variables such as motivational orientations, self-esteem and learning approaches are important factors influencing academic achievements. In the effort to improve students cognition and affective outcomes in mathematics and/or school learning, educational psychologists and mathematics educators, have continued to search for variables (personal and environmental) that could be manipulated in favour of academic gains. Of all the personal and psychological variables that have attracted researchers in this area of educational achievement, motivation seems to be gaining more popularity and leading other variables [15].

When pupils express lack of interest in the subject, it affects the way they react or listen to the teacher. And when many of the pupils believe that they cannot pass, the teacher is also affected. This is because aside of this negative response from the pupils, he/she as well is already being confronted by a lot of other factors (e.g., low income, low status in society, large teacher-pupils ratio) and so on. These may cause him or her to resorts to the easiest way of disseminating knowledge that is 'chalk and talk' without the use of instructional materials. He may not also bother to vary his teaching styles to suit individuals; therefore the cycle goes on [16].

One unfortunate outcome of this is that, the negative attitude towards the subject is passed down from one generation of pupils to another and therefore the cycle keeps enlarging. What then could be done to break such a cycle of failure? This has been the question by many mathematics educators and researchers [17]. A lot of new and modified old methodologies have been proposed to improve performance in the subject [18] etc. Mathematics need not be learned by students in secondary for the sake of career choice or advancement but students should be able to learn mathematics with understanding and therefore be able to apply mathematical ideas later in life [19].

2. Materials and Method

A total of One hundred questionnaires were administered in the four randomly selected schools within Taiama and Njala towns respectively. Bases on the sample size selected and the structure of the questionnaires, a simple random sampling was used to capture the emotion of pupils' toward the impact of motivation in mathematics. This method of sampling is appropriate when each students is recognized in the study has an equal chance of being included or selected in the sample**.** Motivation for Academic Performance Questionnaire (MAPQ) was used and SPSS was used for data analysis.

3. Results

Figure 1 shows the gender distribution of the targeted pupils in the researcher. The graph also gives a clear illustration that 69% of the pupils are male while 31% are female.

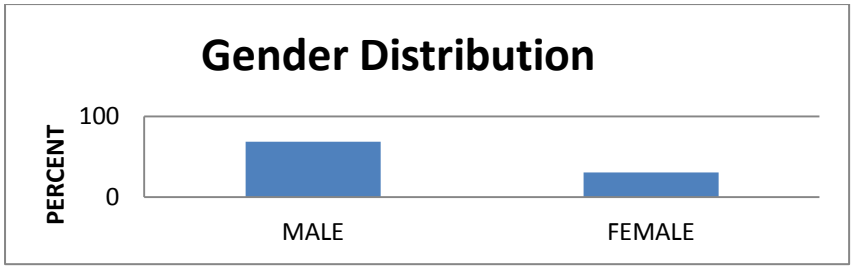

Figure 1: Gender Distribution, Source: Field data September 2014.

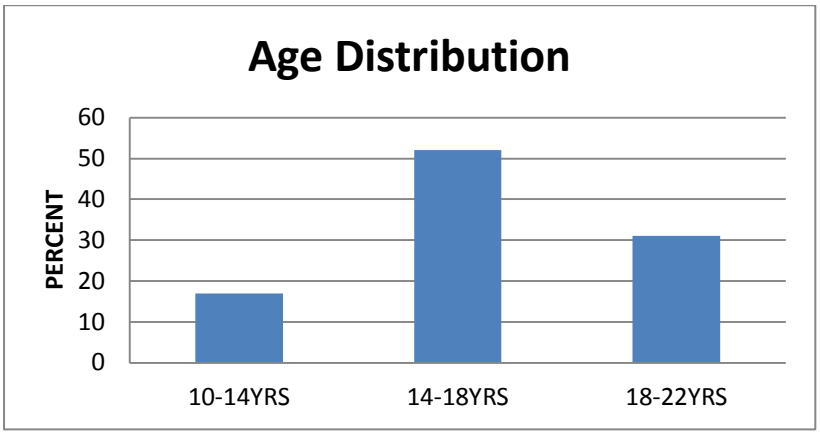

Figure 2: Age Distribution of Pupils. Source: Field data September 2014

The diagram above indicates that 17% of the students were in the age between 10-14 years. 52% of the students were in the age group of 14-18 years and 31% of the students were 18-22 years of age. This clearly shows that majority of the targeted pupil's falls within the age group of 14-18 years of age.

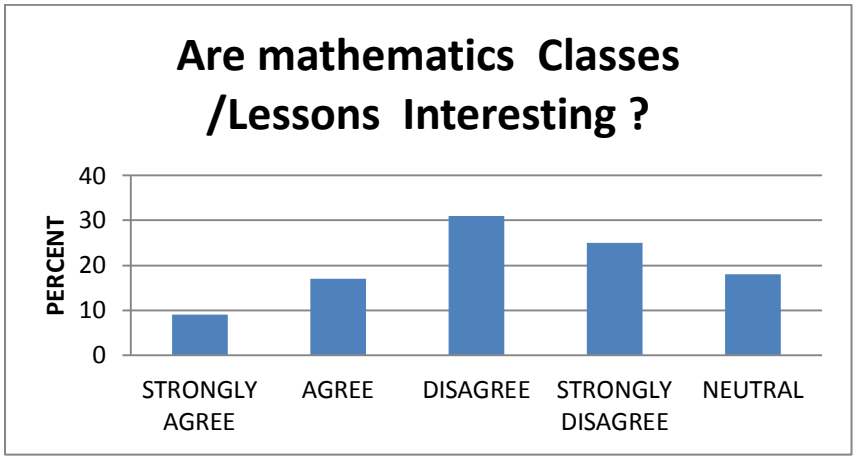

Figure 3: Mathematics Classes/Lessons Interesting. Source: Field data September 2014.

Figure 3 above shows that 9% of the pupils strongly agree that mathematics classes/lessons are interesting,

17% of the students agree to the statement that mathematics classes/lessons are interesting. 31% of the pupils disagree to the statement above, 25% are strongly disagreeing to the above statement and 18% of the students neither agree nor disagree to the statement. This is clear manifestations that a good number of the students disagree to the statement that mathematics classes/lessons are not interesting.

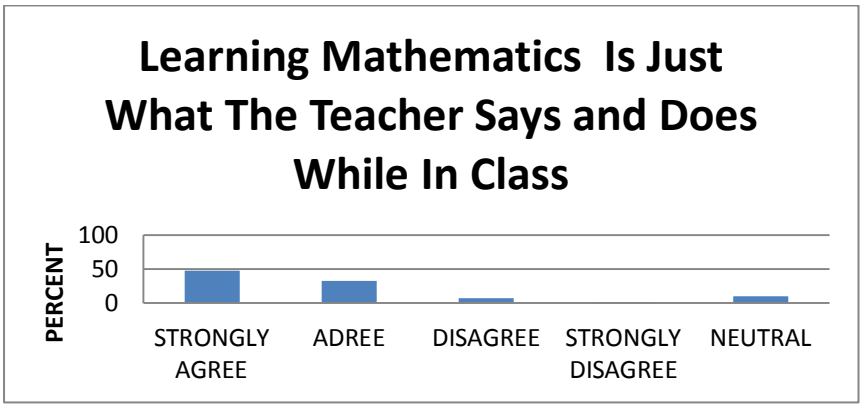

Figure 4: Learning Mathematics Is Just Remembering What The Teacher Says and Does While In Class. Source: Field data September 2014.

The chart above indicate that 48% of the students strongly agree to the statement that learning mathematics is just remembering what the teacher says and does while in class, 33% also agree to the statement. 7% disagree to the statement, 2% strongly disagree to the statement and 10% of the students neither agree nor disagree to the statement. This means 48% of the students strongly agree to the statement that learning mathematics is just remembering what the teacher says and does while in class.

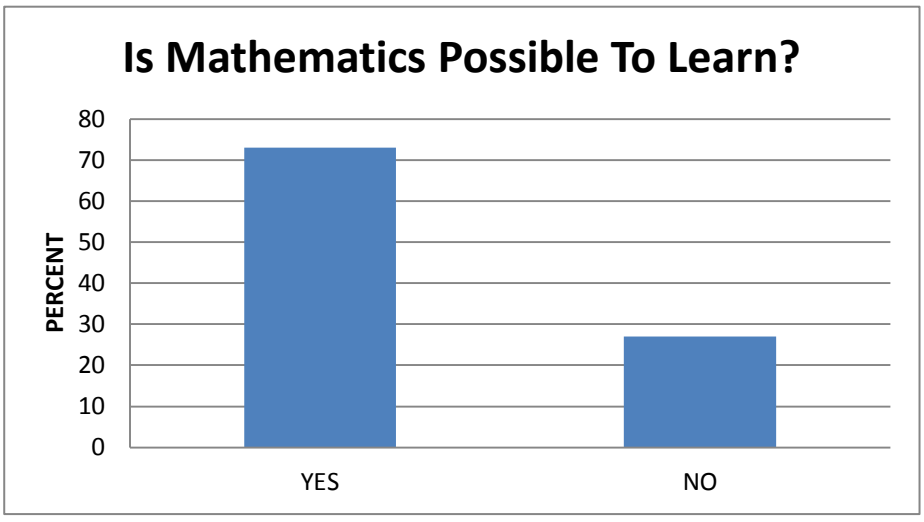

Figure 5: Is Mathematics Possible to Learn. Source: Field data September 2014.

From the above chart, 73% of the students responded by saying yes that mathematics is possible to learn while 27% of the targeted students say no to the statement. Base on the percentage above, there is clear evidence that mathematics is possible to learn.

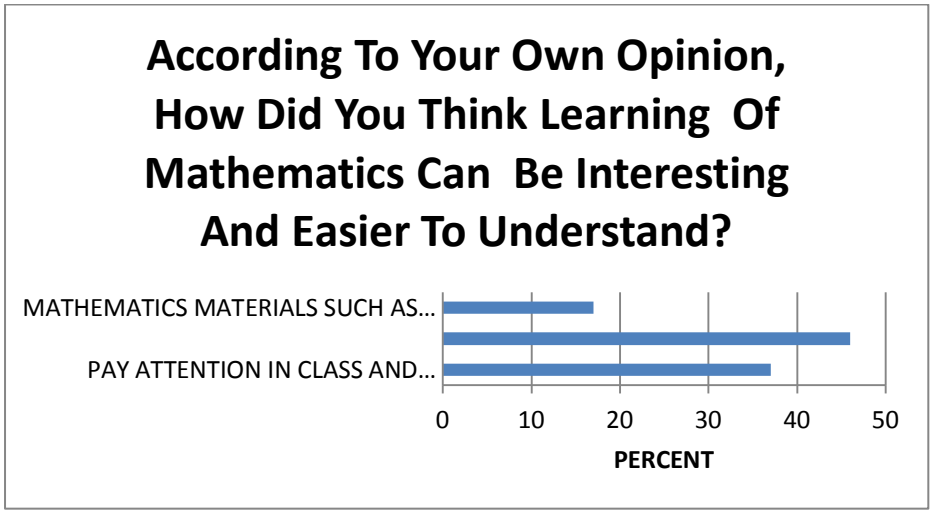

Figure 6: According To Your Own Opinion, How Did You Think Learning Of Mathematics Can Be Interesting And Easier To Understand? Source: Field data September 2014.

The graph above shows that 37% of the students said , paying attention in class and continues practice can make learning of mathematics interesting and easier to understand,46% of the students also comment that employment of trained and qualify teachers can make mathematics interesting and easier to understand. While 17% of the students said mathematics materials such as textbooks, calculator etc will make learning of mathematics interesting and easier to understand. The graph clearly manifests that employment of trained and qualified teachers make learning of mathematics interesting and easier to understand.

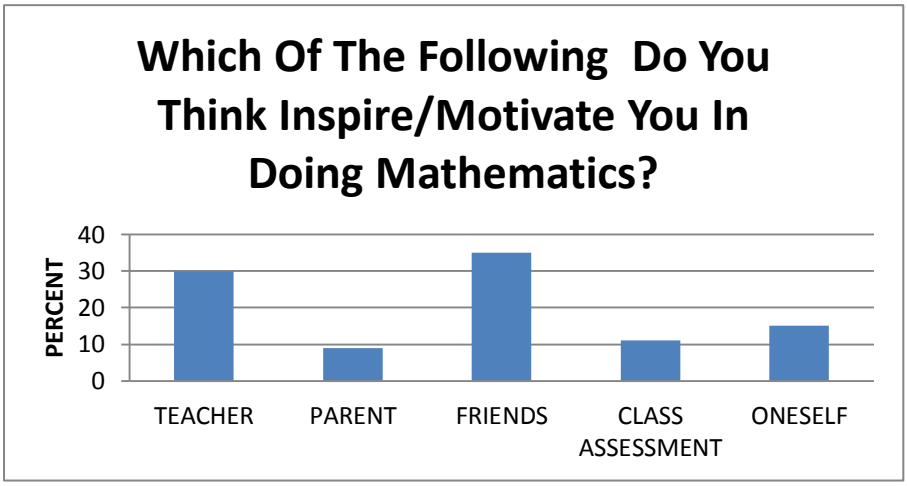

Figure 7: Which of The Following Inspire/Motivate You Mostly In Doing Mathematics. Source: Field data September 2014.

The graph above shows 30% of students have been motivated by their teachers in doing mathematics, 9% of then says their parents have been motivating them in doing mathematics. 35% of them say their friends. While 11% of says class assessment and 15% says oneself. From the information provided shows that majority of the pupils have been motivated in doing mathematics by their friends.

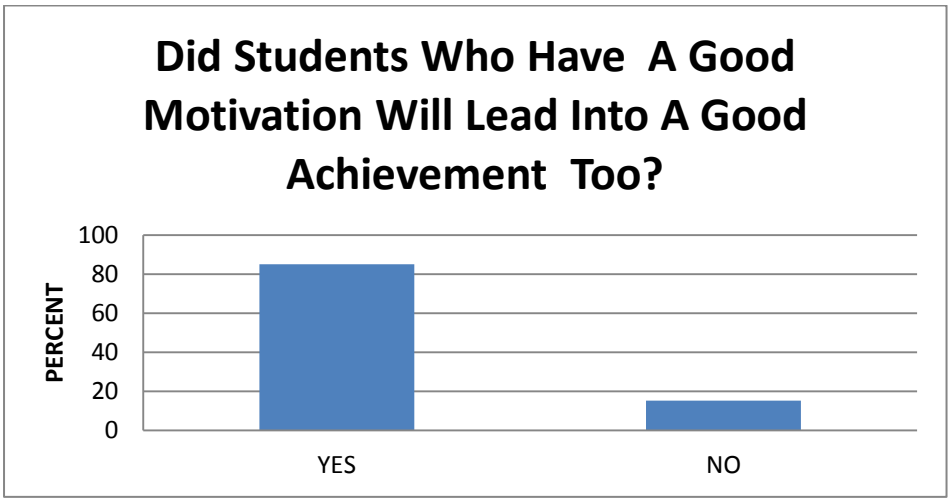

Figure 8: Students Who Have A Good Motivation Will Lead Into A Good Achievement Too. Source: Field data September 2014.

The figure above indicate that 85% of the students respond to the statement that students who have a good motivator will lead into good achievement too while 15% of the students did not agree to the statement. Therefore a good number of the students strongly agree to the statement that a good motivation will lead into a good achievement.

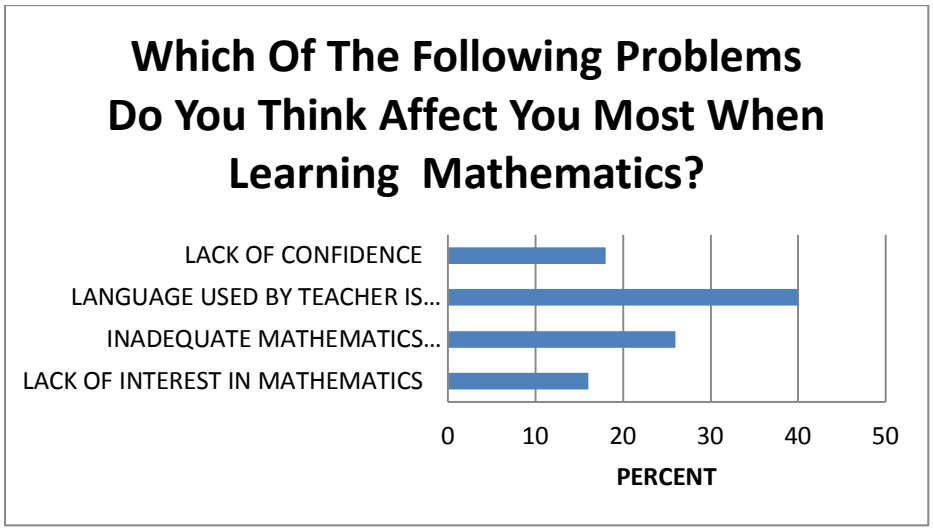

Figure 9: Which Of the Following Problems Do You Think Affect You Most When Learning Mathematics. Source: Field data September 2014.

The graph above clearly shows the problems faced by students in doing mathematics with their respective

percentages. 40% of the students said the language used by teachers is difficult to understand, 26% also declare that inadequate mathematics textbooks and learning resources. While 18% says lack of interest in mathematics and lack of confidence respectively. This mean 40% of the students clearly agree that language used by teacher leads mathematics difficult to understand.

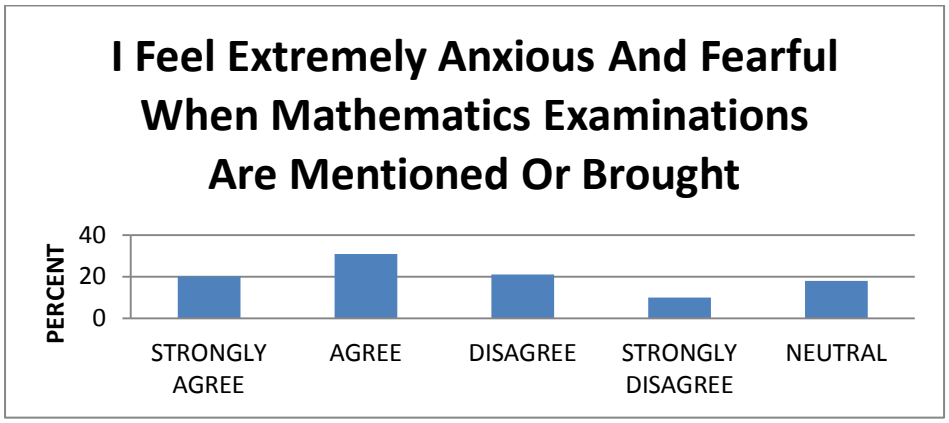

Figure 10: I Feel Extremely Anxious And Fearful When Mathematics Examinations Are Mentioned or Brought. Source: Field data September 2014.

The figure above shows that, 20% of the students strongly agree that they feel extremely anxious and fearful when mathematics examination are mention or brought, 31% of the students also agree to the statement that they feel extremely anxious and fearful, when mathematics examination are mention or brought. While 21% of the students disagree to the statement above, 10% of the pupils were strongly disagreed and 18% of the targeted students neither agreed nor disagreed the statements. The study shows that majority of the then agree to the statement that they feel extremely anxious and fearful when, mathematics examination are mention or brought.

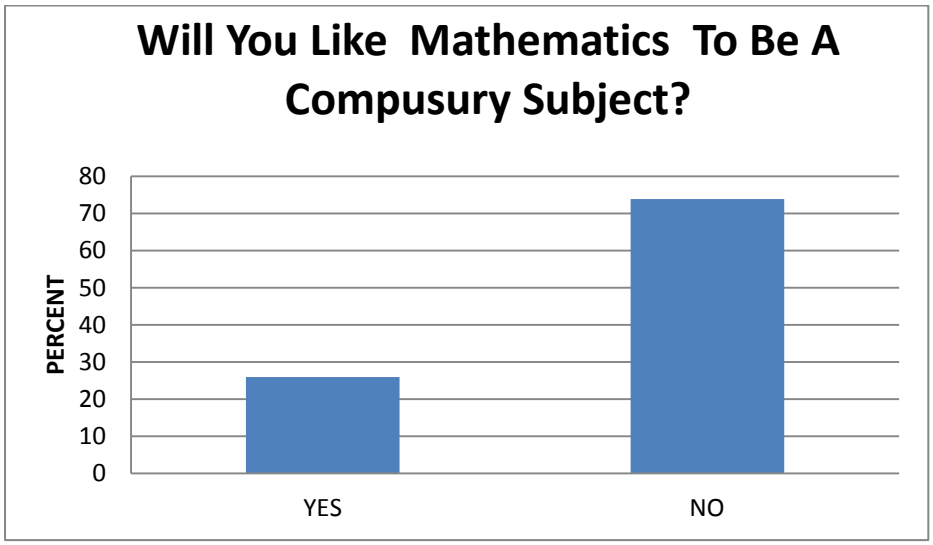

Figure 11: Will You Like Mathematics to Be A Compulsory Subject. Source: Field data September 2014.

The graph shows that, 75% of the targeted students say mathematics should not be a compulsory subject while 25% say mathematics should be a compulsory subject. This is a clear manifestation that a good number of the students disagree to the statement above.

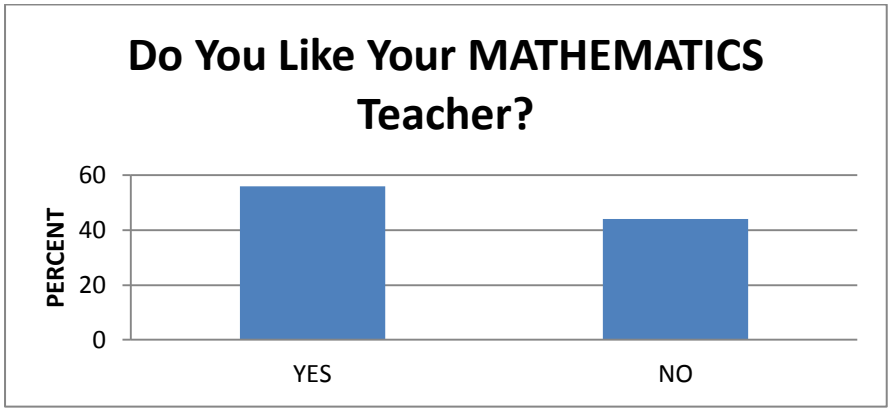

Figure 12: Do You Like Your Mathematics Teacher? (If Yes Why). Source: Field data September 2014.

The graph above shows that, 55.4% of the targeted students say they like their mathematics teachers, 44.6% did not like their mathematics teacher. These mean good numbers of the students like their mathematics teachers.

3.1 Hypothesis test

H_O: There is no significant different between male and female pupils performance in mathematics.

H_1: There is significant different between male and female pupils performance in mathematics.

Table 1: Shows the academic performance of male and female in mathematics. Source: Field data September 2014.

GENDER	HOW DO YOU RATE YOUR PERFORMANCE IN MATHEMATICS?					Total
	EXCELLENT	VERY GOOD	GOOD	POOR	VERY POOR	
MALE	1(4)	8(10)	26(25)	25(21)	9(10)	69
FEMALE	5(2)	6(4)	10(11)	6(10)	4(4)	31
Total	6	14	36	31	13	100

Calculation:

$$\chi^2 = \sum \frac{(Oi - Ei)^2}{Ei} = \frac{(1-4.14)^2}{4.14} + \frac{(8-9.66)^2}{9.66} + \frac{(26-24.84)^2}{24.84} + \ldots + \frac{(4-4.03)^2}{4.03}$$

Then,

$$\chi^2 = 12.78$$

Degree of freedom (c-1) (r-1), where c=5,r=2 then (4*1)=4

$\chi^2_{0.05}(2)= 9.886$

Decision

From the analysis in table 1 above, since the χ^2 (13.12) is greater than critical value (9.886), there is a strong evidence to accept the Alternative hypothesis.

Conclusion

Therefore, we can conclude there is significant different between male and female pupils performance in mathematics.

4. Conclusion

Base on the finding the following conclusions were made:

- There is significant different between male and female pupils performance in mathematics.
- Sixty nine percent (69%) of the students are male that responded to the questionnaire.
- That Majority of the students including male and female falls within the age group (14-18) years of age that responded.
- A good number of the students disagree to the statement that mathematics classes/lessons are not interesting.
- Forty eight percent (48%) of the students strongly agree to the statement that learning mathematics is just remembering what the teacher says and does while in class.
- Seventy three percent (73%) of the student says mathematics is possible to learn
- That trained and qualifies teacher's need to be employed in order to make learning of mathematics interesting and easier to understand.
- Most pupils are motivated by their friends in doing mathematics.
- Pupils strongly agree to the statement that a good motivation will lead into an achievement
- Nearly forty percent (40%) of the Pupils agree that the language used by teachers make mathematics difficult to understand.
- Most of the pupils feel extremely anxious and fearful when, mathematics examinations are mention.

Acknowledgment

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