

**IMPACT OF STUDENTS ATTITUDE ON MATHEMATICS PERFORMANCE
AMONG PUBLIC SECONDARY SCHOOLS STUDENTS IN MASABA
NORTH SUB COUNTY, NYAMIRA COUNTY**

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DECLARATION

This project is my original work and it has never been presented in any institution for a ward of any degree.

Signed.....date.....

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This project has been submitted for examination with my approval as university supervisor

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DEDICATION

This work is dedicated to my wife Silvia Kerubo and my mother Yobensia Nyamoita for their encouragement and financial support they accorded me to ensure I complete this course.

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LIST OF ABBREVIATIONS AND ACRONYMS

BOG- Board of Governors

CDE- County Director of Education

KCPE- Kenya Certificate of Primary Education

KCSE- Kenya Certificate of Secondary Education

KIE –Kenya Institute of Education

MSQ- Mathematics Students' Questionnaire

MTQ- Mathematics Teachers' Questionnaire

SPSS- Statistical Package for Social Science

ABSTRACT

The aim of the study was to investigate impact of attitude on mathematics performance in public secondary schools in Masaba North Sub County in Nyamira County. The study was guided by the following objectives: to establish attitude that students formed towards mathematics, relationship between attitude and performance in mathematics, factors which lead to formation of various attitudes and possible interventions to control the attitude formed in public secondary schools in Masaba north Sub County in Nyamira County.

The study used descriptive survey design. The targeted population involved 20 public secondary schools. The sample size was 240 respondents comprising of 200 students and 40 teachers. 230 responded of which 40 were teachers and 190 students. Stratified sampling method was used in selecting the respondents. Questionnaires for teachers and students were given out for purpose of data collection. Reliability analysis was done by test retest method and a reliability coefficient of 0.7 deemed the instrument to be reliable.

Primary data that was collected was analyzed using qualitative and quantitative techniques and presented in tables. Secondary data was obtained from schools data base.

The findings showed that most students prejudged that mathematics is a difficult and tedious subject. They showed fear and anxiety during mathematics lessons and examinations. The study also found out that the schools had inadequate mathematics learning resources and most teachers used poor methods such as lecture method to teach mathematics. This made students to develop negative attitude towards the subject.

The study recommends that all education stakeholders to work together to change student mentality about mathematics as a subject and also there is need to invest in purchase of teaching and learning resources if mathematics need to be performed well in Masaba North Sub County in Nyamira County.

CHAPTER ONE

INTRODUCTION

1.1: Background of Study

Attitude is the state of mind or feelings possessed toward somebody, something or any given stimuli. Attitude is manifested by the behavior of a person that is consistent when the stimuli are brought near the person. If the attitude developed is unfavorable, it results to attitude performance problem (Weiss 2005).

According to UNESCO (2010) mathematics knowledge is basic need that must be conferred to every child. This is strengthened by the fact that mathematics is a compulsory subject in Kenya.. This is due the fact that knowledge gained in learning the subject is essential for all members of society (SECANDA 1992). Mathematics knowledge is not too limited only in career choice and advancement. Thus mathematics knowledge has a definite role to play in development of people and the state as a whole. Mathematics knowledge is useful in computation at all production sectors as it increases productivity.

In learning mathematics, a study by national survey in schools done in United States in 2009 found that attitude was responsible for poor performance in sciences and mathematics. Other factors included poor teaching methods and lack of standard learning materials.

Developing countries such as Kenya have been experiencing poor performance in mathematics and practical sciences. A study by Secanda in Africa shows that lack of emphasize in teaching sciences and mathematics has made the continent to lag behind in terms of invention and innovation. (SECANDA 1992)

A study by Kiprono on mathematics performance in Bureti district shows that there will be little achievement that can be met if students were not made to love mathematics just like other subjects. Mathematics should not be learned in secondary schools just for the sake of careers or advancement to the next level but students should be able to learn mathematics with understanding and therefore be able to apply mathematical ideas later in life (Cockcroft 2008)

A research conducted by Ruda to characterize cognitive processes that are important in student performance, shows that the relationship of cognitive processes and effective factors, such as attitude, has not been studied in depth. This study aims to asses to what degree attitude contributes in mathematics performance.

According to curriculum developers KIE, secondary school mathematics syllabus should help students to be accurate, numerate and precise. This is a noble desire by KIE but in contrary many students complete secondary education without achieving the goals. This does not mean that the students have not learnt mathematics, but they learned it superficially without taking deep interest in it.

In Kenya, mathematics as a subject has more lessons than any other subject. Despite the efforts by teachers and other education stake holders, mathematics performance has not been satisfactory. According to SMASSE project report, reasons for poor performance in mathematics was due to poor teaching methods, unfavorable attitude and lack of learning resources (SMASSE 1998), however SMASSE project report did not give ways to curtail this unfavorable attitude. KCSE data available in the county education office shows that mathematics was worst performed subject in 2017. This scenario is shown in the table below

Table 1.1 Students’ performance in KCSE in 2017 Masaba North Sub County

sub	ent	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	X	Y	MSS
Math	3251	8	41	62	89	93	112	173	202	214	507	760	969	14	0	3.37
Chem	3005	29	54	76	86	103	149	185	223	248	801	832	209	11	1	3.95
phy	1025	14	8	44	53	51	103	132	111	85	202	170	52	3	0	4.95
BIO	2727	5	19	760	109	150	187	265	287	341	833	408	58	11	9	4.46

It has been shown that level of education of family members and children bringing up environment influences student performance in mathematics (Orton 2002) this study was to determine if student enjoy doing mathematics or if they fell nervous and dread when called upon to solve mathematics questions. The study gathered the opinion possessed by students about mathematics. For the purpose of this study, mathematics and attitude was defined as follows:

Mathematics was defined as operations that require one to apply logic and number systems in order to derive a relationship between quantities (Orodho 2005)

It involve algebra, geometry, numbers and other operations because these are the most commonly used mathematics operations

While attitude was defined as a state of mind or the feeling that one develop when subjected into a given stimuli.

The study examined some public secondary schools within Masaba north Sub County in Nyamira County, to come out with the correlation between attitude and mathematics performance. Demographic information was obtained in school level to define site characteristics. The study was important in collecting information of factors influencing good performance in mathematics and those hinder performance. Some problems that wewr faced during research included extreme anxiety that was aroused among students.

1.2: Statement of the Problem

Attitude formed by students during learning tend to remain for long period. This attitude may help or hinder learning. Most student join form one with positive attitude only to change this attitude while in secondary. It has been shown by the KNEC report in 2007 that attitude and lack of knowledge in elementary techniques are the greatest hindrance to good performance in mathematics (KNEC 2006). Despite numerous efforts that the government and other education stake holders are putting in place to increase performance in mathematics, still students in public secondary schools performs decimally. The ministry of education has been holding in-service training for mathematics teachers to improve their teaching methods. SMASSE project did a research in Kenya in 1998 that was aimed on how to improve mathematics performance. The project report highlighted student negative attitude, lack of resources and poor teaching methods as the main causes of poor performance. In their report, they did not give to what extent negative attitude affect performance in mathematics.

Student attitude and its relation to performance has not been adequately studied in Kenya and more so in Masaba north sub county in Nyamira county. Therefore this study sought to study the impact of student attitude on learning and performance in mathematics in Masaba north Sub County in Nyamira County.

1.3: Purpose of the Study

The purpose of this study was to investigate the impact of attitude on mathematics performance of public secondary school students in Masaba North Sub County in Nyamira County

1.4: Objectives of the Study

The study used the following objectives:-

- i. To establish attitude that public secondary school students in Masaba North Sub County form towards learning mathematics
- ii. To establish factors which influence formation of various attitudes towards mathematics in public secondary school students in Masaba North Sub County.
- iii. To study relationship between attitude and mathematics score of public secondary school students in Masaba North Sub County.
- iv. To establish possible interventions to control attitude formed by public secondary school students

1.5: Research Questions

The study used the following research questions:-

- i. What are some of the attitudes formed by public secondary school students of Masaba north Sub County towards mathematics?
- ii. What are the factors that contribute to formation of various attitudes by students of Masaba north Sub County?
- iii. What is the relationship between attitudes of students of Masaba north sub county and their score in mathematics?
- iv. What are the possible interventions that can be employed to control the attitude formed by students in Masaba North Sub County?

1.6: Significance of the Study

The study may help to determine the attitude formed by secondary school students and its effect on performance. It may help education stakeholders to monitor the formation of attitude that is favorable for learning mathematics. The findings and recommendations may help teachers on the need of fostering favorable attitude towards learning mathematics. In general, it may enable all education stake holders to create enabling environment for learning mathematics.

1.7: Basic Assumptions of the Study

The study assumed that:-

- i. The respondent gave honest and accurate response to the questionnaire given
- ii. The student that was interrogated had learned adequate content from the prescribed syllabus from KNEC.
- iii. The teachers sampled were trained and had good mastery of content and good teaching strategies.

1.8: Limitation of the Study

Some respondents were unwilling to give detailed information required in the study. The challenge was over come by explaining to the respondent the significance of the study. Also the researcher assured them that the research was purely for academic purposes and no body would be victimized

1.9: Delimitation of the Study

The study was confined to only Masaba North Sub County in Nyamira County. It would have been appropriate for the research to be conducted in whole country. The results which were obtained from the research finding reflected specific student behavior where the research was conducted. The research finding should not be generalized with confidence to reflect the behavior of students in other schools.

1.10: Definition of significant Terms used in the study

Attitude a state of mind or the feeling that one develops when subjected into a given stimuli.

Mathematics is defined as operations that will require one to apply logic and number systems in order to derive a relationship between quantities. It involve algebra, geometry, numbers and other operations because these are the most commonly used mathematics operations

Performance: a score in a particular course gauged by attaining a set cut off marks in exam.

Predisposing: factors which facilitate occurrence of a given trait or behavior

Score: attainment or achievement of a student when particular test is issued

1.11. Organization of the Study

The study has got five chapters: Chapter One consists of the introduction; which has got background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, basic assumptions, and definitions of significant terms and the organization of the study.

Chapter Two consists of literature review; regarding attitude formation by school students, factors reinforcing attitude formation, intervention of attitude formation and relationship between attitude and performance as well as theoretical and conceptual framework.

Chapter Three consist of research methodology; covering research design, target population, sample size and sampling procedures, location of study, research instruments, validity and reliability of research instrument, data collection procedure and data analysis. Chapter Four contains data analysis, interpretation and discussion of findings while Chapter Five gives the summary of study findings, conclusions, recommendations and suggestion for further research

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter overviews the literature related to attitude towards learning. The work is cited from both scholars from within Kenya and outside. Some of the issues tackled in this literature review include; factors that influence student attitude formation, possible interventions to control attitude, relationship between attitudes and score and various attitudes that student form towards learning mathematics.

2.2: ATTITUDES STUDENTS FORM TOWARDS LEARNING

The study of attitude formation is the concern of social psychology. The study of attitude gives an insight to the complex social behavior of man and shows how actions of a person are affected by beliefs. Attitude is an integration of effective and cognition experiences towards a subject (BREHM 2000)

According to Fazio, attitude is viewed as an enduring and stable structure stored in the memory and it varies in its strength. The strength of the attitude stored determines the likelihood and stability of affecting student's behavior. For example in classroom situation, some students have got an in-built feeling that mathematics is a difficult subject. When given any problem in mathematics to solve they will say that it is difficult even when they have not tried to solve it. (Fazio 2007)

Another view of attitude states that attitude is not stored in memory, but they are constructive judgments influenced by the situation or context an individual is in. (Schwarz, 2007). An example in class room situation arises when a student decides to run away from class during mathematics lesson after realizing that the assignment has not been done , sleeping only during mathematics lessons and feeling bored during class.

Early research on attitude formation was started through the use of classical conditioning or operant conditioning experiments. These experiments showed that attitude is fundamentally effective. Using classical conditioning process; it shows that constantly associating positively encouraging word or gifts after one has done a good thing, it results to adopting doing that thing frequently, Example, complementing students who answer questions in class. Also offering gifts

to those best improved and those who top in class. This will help students develop positive attitude and devote their time in doing mathematics. Teachers who constantly encourage their students with words such as can do better, good trials can encourage students to have positive attitude towards mathematics. By use of classical conditioning other vices which hinder performance in mathematics can be controlled. Examples include controlling vices like escaping to attend lessons and sleeping in class using punishment. (Gilbert 2006) On contrary teachers can also make student to develop negative attitude towards mathematics when they fail to notice students who has made small efforts and instead they rebuke them wit words such as poor work or disorganized work when the students are trying their best to change.0

Also attitude formation can be affected by operant conditioning. Verbally reinforced students will clearly influence response. Eg telling students word like good, excellent and well done, motivate them and they develop an attitude that they can hence working hard to achieve better grades. Also other word like poor, below average, depending on where they are used can make a student feel worthless thus developing negative attitude that it is difficult to achieve good score in mathematics (Anthony 2009).

Another recent research on attitude formation is called evaluation condition (EC).In EC a neutral stimuli or unfamiliar stimuli is shown repeatedly with a liked or disliked stimuli. This results to the neutral stimuli taking the feeling of the liked or disliked stimuli. In classroom it can be a case where mathematics (a neutral stimuli) and the teacher (a known stimuli). If the students like the personal traits of the teacher, they will like the subject too. If they dislike the teacher they will dislike the subject too (Chaiken 2015). EC effects are strong when respondents are unaware of the contingency between conditioned and unconditioned stimuli (re Houwer et al, 2001)

2.3: FACTORS INFLUENCING ATTITUDE FORMATION TOWARDS MATHEMATICS

Attitude towards mathematics play a very important role in the teaching and learning process. Attitude can be defined as tendency to act or react in a particular way when approached by a given stimuli (in this case mathematics as subject) . It can also be defined as a feeling possessed by one person to another or something usually reflected by one's behavior

Attitude formed by a person in most cases depends on one's experience with the learning environment. This attitude is then enhanced further by interpersonal interaction. Attitude can be either positive or negative depending on whether the individual involved likes or dislike the stimuli. (Roberts 2006) The following factors influences the attitude that students develop towards learning mathematics

2.3.1: Student interest

Some students develop attitude depending on the function the attitude serve them. They hold the attitude because it helps them to achieve some basic goals. For example students may develop an attitude of not doing mathematics assignment so that he can gain recognition from peers that he is tough. (BREHM 2000)

Attitude formed this way fulfills the following four psychological functions:

- i. Instrumental function: students develop attitude to things that gives them reward or aid. They will try to maximize reward and minimize punishment. Students develop attitude that help them to achieve their goals eg students will form an attitude of reading mathematics so that they can top in their class and get presents.
- ii. Knowledge function: this attitude provide meaningful and structured environment. Students may seek order, stability and clarity in their personal frame of reference. They will develop attitude that will give a standard of evaluation. These are usually attitudes of stereotyping such as mathematics is a difficult subject. It brings order and clarity to the complexity of student's life.
- iii. Value expressive: they give basic values, boost self image example if a student says that mathematics is the favorite subject, the student may reinforce that image by doing a lot of revision on the subject to pass well.
- iv. Ego defensive: These attitudes serve to protect students from acknowledging the truth about themselves or harsh realities of nature. They are defense mechanisms. for example students who have not understood some concepts may pretend to have understood

The student interest may change when it has stopped to serve its function and the person in question feels blocked or frustrated. The attitude does not change in great measure by changing a

person's information or perception towards an object. Attitude change occurs by changing the person's motivation and personality needs. Example as schools brings in new rules and regulation, the attitude of students may change so that they can reflect on the new rules. (Maio 2010)

2.3.2: Students past experience

Using the student's past experience, there are several ways by which attitudes are formed some of the ways are:

- i. Classical conditioning: this involves associating two stimuli repeatedly and the student will respond to them with similar reaction. example include offering
- ii. Instrumental/ operant conditioning: this involves behavior or attitude that is always followed by rewarding consequences or negative consequences. The behavior that is followed by a positive consequence are most likely to be repeated than those followed by negative consequences. Those behavior followed by positive reward persist to form permanent attitude.
- iii. Observation learning: students may watch the behavior of those around them and imitate their behavior. Observation will determine the response students will learn and when reinforced it will determine the response they will express. Example student may see how fellow students learn and adopt the same strategy. (Maio 2010)

2.3.4: Cognitive dissonance

Dissonance is the feeling of tension arising when a person is faced simultaneously of two inconsistent cognitions i.e. when one makes a decision favoring one alternative in spite of having a reason to favor the other one. Example a student may be having one hour of doing revision two subjects, mathematics and English, which he/she has not done adequate revision. He may choose to revise on mathematics instead of English. Dissonance occurs because of the following reasons: (Maio 2010)

- i. Disconfirmed expectations: This is when students are prepared for an event that fails to occur or which occur opposite of their expectation. Example student may be expecting to pass mathematics exam which he had adequately prepared for but he fails.
- ii. Getting inconsistent information: this is when a student gets information that contradicts what the student already knows.

2.3.5: Peer influence

Studies on peer relationship shows that peer can shape one in academic performance. Peer relationship is essential for child development. They help in social development, learning how to associate with others and learning how to receive help and support. (Hawley 2002)

Much of the influence in attitude formation is attributed to influence by peers in school setting. Study by Majeed investigated how peer pressure affects on academic performance in coast Kenya. The result showed that most of the respondent agreed that friendship had a big impact on their studies. They agreed that interest in study increased more when student see their peers studying too. (MAJEED 2010)

In the study by Mukan which studied relationship between peer group influence and student attitude towards mathematics, the findings showed that there was a significant relationship between peer group and the effort one put to study mathematics. The study also showed that peer pressure and student attitude contributed to examination malpractice like cheating in exams. If one associates with a person who is hardworking and keen on the study, he will also be motivate to be keen in the study. (MUKAN 2010)

Peers are also involved in cognitive, behavioral, and effective development. Peers are crucial for any child to develop identity. (Wentzel 2005) peers have got both negative influences in attitude formation and positive too. Peers can motivate or demotivate a student. On motivation, peers can make one develop a feeling of competence, high self esteem, value school, and harbor positive academic emotion. Academically motivated student like learning, participating on school activities and like solving mathematics problems.

On the negative side, peers can demotivate. They can make one engage on time wasting activities instead of learning. They can make one see school as a prison; detest doing school work and hate doing revision (MAJEED 2010).

2.4: POSSIBLE INTERVENTIONS

Attitude formation by students is inevitable and since mathematics is a compulsory subject, all education stake holders have a task to ensure a better learning environment is created to improve performance in mathematics. The following interventions are necessary to make students develop positive attitude towards learning mathematics.

2.4.1 Provision of Adequate Learning and teaching Resources

Sufficient and equal access to learning resources is important. The methods used in teaching in mathematics are to a large extent influenced by the teaching and learning resources available.

The teaching method on the other hand will influence and the quality of participation and the student performance. In general where resources and other facilities such as textbooks, teaching

aid, calculators and learning models are unavailable or inadequate, the teaching method employed tend to be teacher centered. In the approach the teacher dominates as he/ she lecture on the subject while the students have little participation. The teacher demonstrates on the practical aspects of the lesson making students to lack practical aspects or applicability of the subject to daily life situations. The student remains to be passive participants and make the teacher to be the sole source of knowledge. This is risky in the case where the teacher is not sufficiently informed on the content or his/her communication skills are not good. This means the students will miss a lot as they rely on the teacher for information (ORODHO 2013). This means they will result to developing negative attitude towards the subject.

Where the resources and other facilities are enough a qualified teacher will employ learner centered activities. The approach emphasizes on practical activities and the students are encouraged to do experiments, discuss and solve problems. (Students are involved on hand-on activities). The approach has got a tendency of stimulating curiosity, critical thinking and imaginations making the students to like mathematics. (ORODHO 2013) It makes the lesson exciting and captivating to students enabling them develop positive attitude. .

2.4.2: Students background

High level of poverty negatively affects students' learning and performance. Students from poor family do not have access to good learning resources eg parents cannot afford to buy for them revision books (KUSANTO 2012). The society should invest more in education so that students get what is necessary for them to preform better in mathematics.

Parental education also has a role to play in attitude formation. Educated parents are much likely to give their children motivation and other support to enable their children develop positive attitude to their studies. Educated parents will take time to look at the quality of teachers teaching their children and the resources the school has and ensure that their children get quality education. They are also more likely to consult teachers to attend to their children's individual needs (KUSANTO 2012).

The general public view mathematics as a hard subject to tackle. Since the student first interacts with the society before they are in school, they use society thought about mathematics to develop unfavorable attitude. A deliberate effort should be made to counter unfavorable attitude being

formed by students entering form one. The public should be enlightened not to view mathematics as a difficult subject, instead concentrate on benefits of the subject in one's life to motivate the learners (Mukala 2012). Parents should treat their children equally and avoid biased comments. This effort will help to avoid unfavorable attitudes from being formed.

2.4.3 Teacher Student Interaction

Teachers in any learning institution are indispensable resource. But they can be rendered ineffective if teacher student interaction is not goal centered and it's not good. This can occur in the case where there is large classes that overload teachers or overburden them , poor training on the part of the teacher or qualification and no in service training and also lack of adequate teaching and learning resources (Ochuk 2005).

There is a great shortage of mathematics teachers and the few available are shared by large number of students. This makes it impossible for the teachers to pay attention to individual students needs. At times the teachers lack creativity to improvise available resources at school to teach (Ochuk 2005).

Students learn mathematics with the aid from their teacher. Teacher learner interaction should aim specific objectives. For the objectives to be met by learners, a teacher should be conscious of their attitude towards mathematics. A teacher should provide guidance and counseling to students with repeated low grades to change their attitudes.

2.4.4 Enabling Learning Environment

Studies that have been conducted on achievement and attitude indicates that attitude has got a big influence in student effort and achievement Attitude formed could be genetically predisposed or influenced by society expectation (Orton 2002)it can also unconsciously reinforced by teacher or as a result of student, student interaction. The attitude formed could be positive or negative towards mathematics is important to stress the need to improve perception of mathematics in the mind of student by stressing the creative aspect of mathematics and applicability. Also the community should focus on showing mathematics as part and parcel of life by talking good of it.

2.5: Attitude and Performance

Attitude is a bipolar judgment one links to a subject, concept or object. It is a subjective judgment that may make one to like or dislike object objects which may be good or bad. Attitude induces various forms of intentions. The intentions are the probability judgment that can cause somebody to do a specific action. The content which is contained in an individual intention can be observed by the behavior of an individual. And the strength of the intention can be measured by the person's probability that he will do or engage in a given action. (Cheung 2013)

Students with good attitude have a better performance in class compared with those of negative attitude of similar cognitive ability. Student attitude has a potential to impact on classroom interactions, reactions to other students and teachers as well.. According to Wade Borg positive attitude has got a chain of reactions consisting of positive thoughts of outcomes. In class, positive attitude has the following attributes that may help students to perform well: (BORG 2005)

2.5.1: Creates hope

Students with positive attitudes have got high degree of hope in passing. When other students criticize and complain about mathematics or the teacher, those with positive attitude remains with hope that despite the challenges they will pass. They focus on their study and seek help where need be.

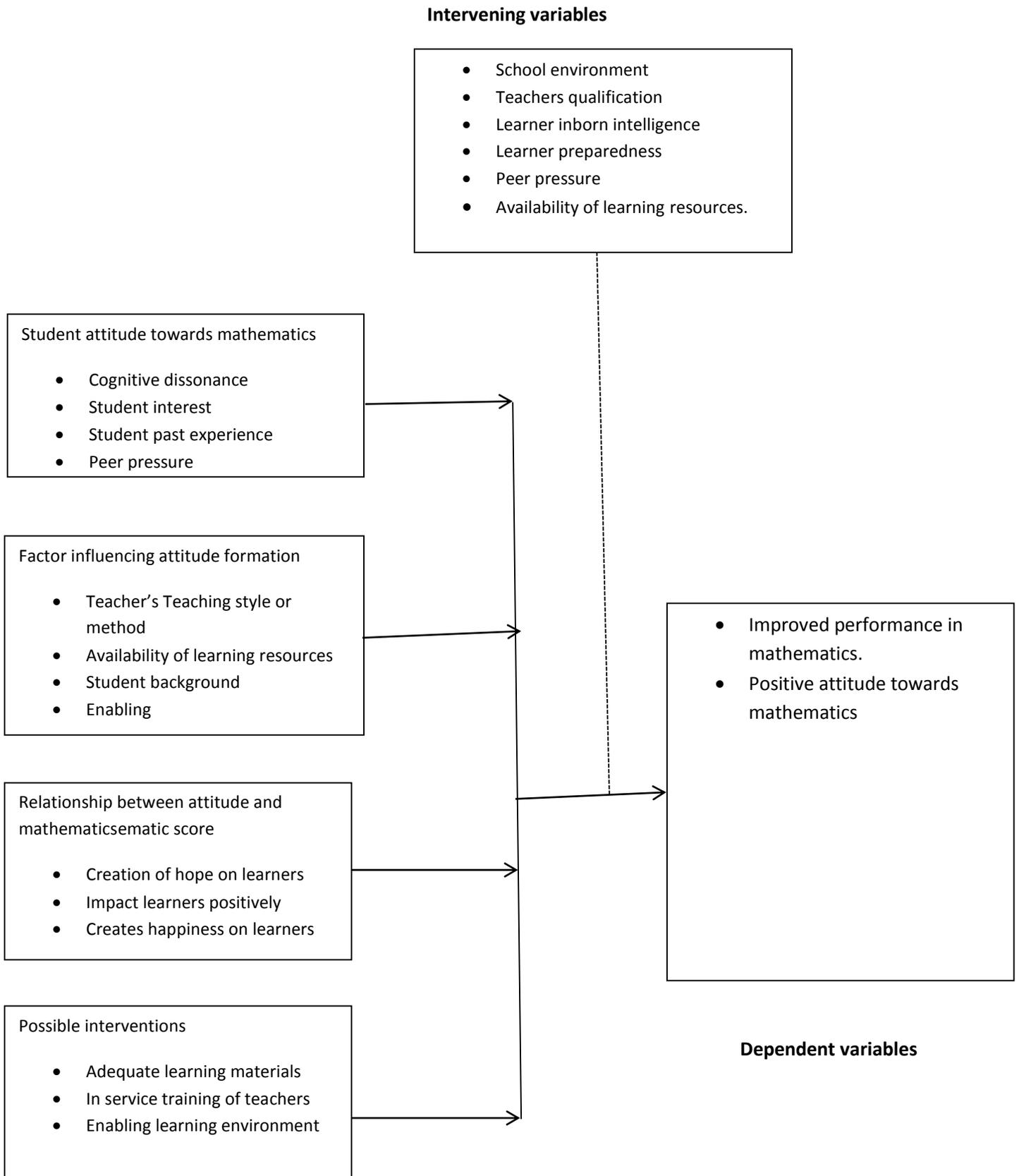
2.5.2: Positive impact

Students with positive attitude impact other students positively. They are eager to help others solve mathematics problems at any time when it is presented to them. This will help them to perform better and it helps the other students too. On contrary those with negative attitude take their time speaking negatively about mathematics thus discouraging others from reading the subject thus affecting their performance on the subject.

2.5.3: Happiness

During class and during mathematics examinations, students with positive attitudes are jovial and prepared. They can answer questions in class and discuss with the teacher and fellow students without fear. They are always prepared and they perform well according to their cognitive ability. While those with negative attitude feel threatened and nervous during mathematics lessons or examination. They have small or no input during classroom discussion. When comparing their score and their cognitive level, they score low.

Figure 1: Conceptual Frame Work



Good performance in mathematics is not only attributed to unique talent, great effort and discipline of the student, but also good attitude and interest of the student to the subject (KASIMBU 2004). Formation of attitude depends on several factors which students are exposed to during learning process. Such factors may include motivation, readiness to learn and organization of mathematical concepts.

Attitude formed by students according to Skinner can be categorized into cognitive, effective and behavioral component. From the components conceptual frame work can be drawn to show attitude formation by secondary school students. Other factors may come into play depending on individual student, learning environment which may comprise of adequate or inadequate learning resources, reinforcement, peer pressure and school experience. Student daily activities in school also may influence interest in mathematics and lead to attitude formation

CHAPTER 3

RESEARCH METHODOLOGY

3.0: Introduction

This chapter shows the procedure and the strategies that were used to collect and analyze data. It shows the research design, targeted population, sample size and sampling techniques, research instruments, validity and reliability of research instruments, data collection procedure and data analysis.

3.1: Research Design

The research used descriptive survey design to investigate relationship between student attitudes and learning mathematics, descriptive survey was used to show if independent variables has effect on dependent variable. Dependent variable was student performance in mathematics, while independent variables was various forms of student attitude that was categorized into student related, teacher related and school related variables. Descriptive survey was used since it help in collecting current phenomena and help in drawing valid conclusion from the data discussed.

3.2: Target Population

The target population was heterogeneous due to the nature of schools in the area. There are 35 public secondary schools in Masaba North Sub County. In these schools there are 140 trained mathematics teachers, with a total number of students being about 15056.

3.3: Sample Size and Sampling Procedure

Stratified random sampling was used so that it could allow participation of all schools. The subjects were randomly chosen from each school and interviewed or given questionnaires to fill. 20 public secondary schools were selected for sampling out of a total of 35 schools in Masaba North Sub County in Nyamira County. Four schools were sampled representing each gender while the rest 12 schools were sampled from mixed schools .Two categories of respondents were targeted that is, students and mathematics teachers. A total of 40 mathematics teachers were sampled out of 79 mathematics teachers who teach in the sampled schools. A total of 200 students were randomly selected and sampled. Samples of 10 students were randomly selected from each school. Only students from form two and form three classes were chosen for the

sampling exercise. This is because the researcher assumed that they have learned adequate content in the prescribed syllabus.

3.3: Location of the Study

The study was carried out in Masaba North Sub-County in Nyamira County. The choice of the region was because it has been ranking last in KCSE in mathematics performance in Nyamira County, despite the fact that they are endowed with adequate resources.

3.4: Research Instruments

Research instruments are the tools that were used to collect information from the respondents. Data was collected using questionnaire for Mathematics teachers and another questionnaire for students.

Semi structured questions were asked together with open ended questions. Most items adopted The Likert Scale that is, Strongly Agree, and Agree, Not Decided, Disagree and Strongly Disagree. The questionnaires were used to identify student attitude and background information. Academic performance was assessed by using end term examinations done by those schools.

3.5: Validity of Instruments

Validity is the degree to which results arrived at gives the correct phenomena under investigation (Mugenda 2003). The instruments were piloted in 4 schools which were 20% of the target 20 schools. Then the procedure was repeated in a week's time. The piloting exercise helped the researcher to eliminate ambiguity in research instrument to ensure correct results were collected. The piloted schools were not subjected to actual study.

3.6: Reliability of Instruments

Reliability is the measure of the degree of the research instrument to give consistent result in repeated trial (Orodho 2005) Test retest method was used to measure reliability of the instrument. Test retest involves giving twice the same instrument to the same group within a period of two weeks. The reliability correlation factor coefficient(r) was calculated using spearman rank order.

3.7: Data Collection Procedure

The researcher got permission from the county director of education (CDE) to undertake the research in Masaba North Sub County. Also the researcher got permission from the head

teachers of the schools concerned to undertake the study. The researcher visited the sampled schools and administered the questionnaires. Appointment to the schools that were sampled was arranged before actual visit to avoid inconveniencing the respondents

3.8 Data Analysis

This is the process of bringing order and meaning to the information gathered (Mugenda 2003). It includes sorting data, editing and processing. The data was analyzed by use of both qualitative and quantitative methods. SPSS was used in analysis. Then tables and graphs were drawn to represent the information.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0 Introduction

This chapter deals with data analysis presentation and interpretation of findings. Based on the data collected the findings of the study are presented in details. The data analyses impact of attitude to learning and performance in mathematics. The study was guided by the following objectives: to establish factors which influence formation of various attitudes towards mathematics; to establish attitude that students formed toward mathematics; and to establish possible interventions to combat attitude formed towards learning and performance in mathematics.

4.1: Response Rate

180 questionnaires were filled out of 200 questionnaires that were given out. The response rate was 90% which was taken for analysis. The discussion of the result was done taking into consideration the objectives of the study. The data was analyzed using frequency tables.

4.2: PART A: DEMOGRAPHIC INFORMATION OF RESPONDENT

4.2.1: Gender of respondents

The sample that was used consisted of 95 boys and 105 girls. The researcher selected respondents from different schools within Masaba North Sub County. In the study done by Casey shows that different gender groups shows different attitudes towards mathematics. The study shows that girls lack confidence and consider mathematics as a male domain. (Casey 2009). But the researcher ignored this finding and it was determined not to consider the gender of the respondents separately.

Respondents were asked to indicate their gender. The response were analyzed in the Table 4.1

Table4.1. Gender of respondents

Gender	Frequency	Percentage (%)
Male	95	47.5
Female	105	52.5
total	200	100

95 male student where used in the survey which comprised of 47.5% while 105 female students were used which comprised of 52.5%.

4.2.2 Form of respondents

The respondents were asked to indicate their form. The response is analyzed in the Table 4.2

Table 4.2. Form of respondents

Form	Frequency	Percentage (%)
one	0	0
two	80	40
three	120	60
four	0	0
total	200	100

80 form two students were used in the study and 120 form three students making a total of 200 students. No form four and form one took part in the survey.

4.2.2 Category of school

The respondents were asked to indicate the category of their schools. The response is analyzed in the Table 4.3

Table 4.3. Category of school

School category	Frequency	Percentage (%)
Boys boarding	5	25
Girls boarding	4	20
Mixed day school	11	55
total	20	100

A total of 5 boys boarding schools were used in the study which comprised of 25%, 4 girls boarding school which comprised 20% and 11 mixed day school which comprised 55%

4.3: PART B: FACTORS INFLUENCING ATTITUDE FORMATION

4.3:1 Challenges in Learning of Mathematics

The respondents were asked to give problems that affected the learning and performance in mathematics and their views are represented in the Table 4.4

Table 4.4. Challenges in Learning of Mathematics

Challenge	Frequency	Percentage (%)
Lack of learning resources	38	20
Lack of confidence	74	40
Lack of interest	47	25
Language barrier	19	10
none	12	5
Total	190	95

As can be seen from the Table 4.4, 20% of the respondents cited lack of learning resources as the main challenge in learning of mathematics, 40% cited lack of confidence in tackling of mathematical problems, 25% cited lack of interest in the subject, 10% cited language barrier in that they didn't clearly comprehend the language used in teaching while 5% reported that they didn't have any problem.

Most respondent have lack of confidence in learning the subject, as was cited by 40% of respondents. Lack of interest was cited by 25 % and inadequate learning resources was cited by 20%, language barrier by 5% and 10% showed that they had no problem with their learning. In general, it has been shown that confidence in learning mathematics plays a big role in the performance. Student who took themselves as cognitive competent will not hesitate to seek help while students who are unsure of their ability will feel threatened while consulting (newman 2011).

4.3.2: Teacher’s Traits and Teaching Methods

The study wanted to find out the teacher’s teaching methods and general behavioral characteristics influenced the student perception on mathematics. The data that was collected is presented in the Lirket scale on Table 4.5

Table 4.5 Teacher’s Traits and Teaching Methods

Student opinion	Strongly agree	agree	undecided	disagree	Strongly disagree
The teacher is too fast that I cant catch up	10	12	4	40	34
I like the way my teacher teaches	28	29	12	25	6
I like my mathematics teacher	45	30	2	10	13
I understand when the teacher is teaching	36	37	7	14	6

From Table 4.5, 22% of the student Agreed and Strongly Agreed that their teacher was too fast that they couldn’t understand the concept when thought, while 74% Disagreed and Strongly Disagreed that their teacher was fast while teaching. 75% of the respondents Agreed and Strongly Agreed that they liked their mathematics teachers while 31 % Disagreed and Strongly Disagreed that they liked their mathematics teachers. Also 73% of the respondents Agreed and Strongly Agreed that they understood in class when the teacher was teaching while 20% Disagreed and Strongly Disagreed that they understood when the teacher was teaching.

4.4: Attitude Developed Towards Learning Mathematics

The study sought to unravel the feelings felt by students towards learning mathematics. It helped to detect the kind of attitude formed towards mathematics. The response was analyzed into five categories under Likert scale as shown in the Table 4.6

Table 4.6. Attitude Developed Towards Learning Mathematics

Student opinion	Strongly agree	agree	undecided	disagree	Strongly disagree
I enjoy learning mathematics	26	36	4	32	3
I would like doing mathematics after secondary	28	29	12	25	6
Mathematics is useful in life	69	24	2	1	3
Mathematics is my favorite subject	26	37	7	24	6
I feel anxious and fearful during mathematics exam	20	24	9	30	17
Mathematics is impossible to learn	15	17	6	29	35
My grades always low in mathematics	16	33	7	31	14
Mathematics is difficult	26	22	7	25	20

From the Table 4.6, 26% and 27 % of the student Strongly Agreed and Agreed respectively that mathematics was their favorite subject taught. Also 48% had negative attitude and cited that mathematics was a difficult subject. 20% and 24% of the respondents Strongly Agreed and Agreed respectively that they felt anxious and fearful during mathematics exams and lessons while 30% and 17 % Disagreed and Strongly Disagreed respectively that they felt anxious and fearful during mathematics examination

15% and 17% of respondents Strongly Agreed and Agreed respectively that mathematics was impossible to learn. This shows a negative attitude the student have developed since the subject can be learnt easily. 64% Disagreed and Strongly Disagreed that mathematics was impossible to learn. While 49% Strongly Agreed and Agreed that they always had low grades in mathematics. 44% of the respondent feels anxious and fearful when tackling mathematics exams compared with 47% who Strongly Disagreed and Disagreed. From the Table 4.6, 48% of the respondents

Strongly Agreed and Agreed that mathematics is a difficult subject while 45% of the respondent Disagreed and Strongly Disagreed that mathematics is a difficult subject.

4.4.1 Student opinion about mathematics

Students were asked about their opinion in mathematics. Their reaction was as shown in the Table 4.7

Table 4.7 Student opinion about mathematics

Opinion about Mathematics	True	False
Mathematics is interesting	85	15
Mathematics is a dull subject	35	70
Mathematics is a tedious subject and requires a lot of time in doing revision	35	50

35% of the students responded that mathematics was a dull subject. This shows that they have a negative attitude towards it. Another 35% of the respondents said that mathematics is a tedious subject and it requires a lot of time in doing revision. While 85% said that mathematics is interesting subject and they enjoy learning it. This shows that they enjoy doing mathematics and they have a positive regard towards it.

4.5: Factors Promoting Attitude Formation in Mathematics

The study sought to unravel the factors that contribute to formation of attitude towards mathematics learning and performance. The results are presented in the Table 4.8.

Table 4.8 Factors Promoting Attitude Formation in Mathematics

Student opinion	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Mathematics lessons not interesting	23	15	4	30	30
Am given a lot of unnecessary assignment	14	21	5	20	40
Am well provided with learning resources	34	34	5	16	11
My gender interferes with learning mathematics	5	7	7	19	62
It's a teacher who makes mathematics learning easy	30	37	12	13	8
I get encouragements from parents and siblings	59	29	3	3	6
My friends don't like learning mathematics	59	28	5	3	5
I like my mathematics teacher	50	20	4	14	16
I learn mathematics well regardless of teacher's gender	37	31	7	11	14
I do exercises on my own	37	42	5	11	5

62% of the respondent Agreed that gender does not interfere with learning. Larfortune states that girls and boys equally performed well in mathematics despite the fact that girls have more negative attitude (Casey 2009). On attitude related to mathematics teachers, 69% Agreed that it's the mathematics teacher who could make mathematics easier. On regard to learning resources 68% of the respondents Agreed that they were provided with adequate learning resources while 27 % said they have inadequate learning resources

The sex of the teacher influence learning according to Goddard Spear. Spear asserts that assessment of boys by a female teacher can produce generous mark and girls also by a male teacher. 60% of the respondents agree that their sibling assist them in learning mathematics which according to Costello depends on the level of education of the sibling. (Costello, 2002)

4.5.1: Number of Lessons Taught By Mathematics Teachers

Teachers were asked to indicate the number of mathematics lessons they teach each week. The responses are analyzed in Table 4.9.

Table 4.9 Numbers of Lessons Taught By Mathematics Teachers

Number of lessons taught each week	Number of teachers	Percentage (%)
Less 6	4	10
6-10	6	15
11-15	18	45
16-20	5	12
21-25	3	8
26-30	4	10
Total	40	100

4 teachers had less than 6 lessons per week while 6 teachers had between 6 to 10 lessons per week. Teacher with 11 to 15 lessons per week were 18 which represented the category with the highest number of teachers. 4 teachers had a load of 21-25 lessons per week while 4 teachers had between 26 to 30 lessons per week. The teacher had a load of 15-30 lessons per week while other subject teachers had 12-25 lessons per week.

The teacher with less teaching lessons had adequate time to plan their lessons, prepare tutorials and mark students' work, than those who had high loads. Overworked teachers complained of no time to plan for their lessons, resulting to poor teaching approach thus enabling development of negative attitudes towards learning and performance in mathematics.

4.5.2: Years of Teaching Experience

Teachers were asked to indicate the number of teaching experience they have, their responses are analyzed in table. The table 4.11 shows the number of years the mathematics teachers in Masaba North Sub County had taught.

Table 4.11 Years of Teaching Experience

Years of teaching	Number of teachers	Percentage (%)
0-5 years	10	25
11-15 years	18	45
16-20 years	8	20
Over 21	4	10
Total	40	100

18 teachers had a teaching experience of between 11 years to 15 years. 10 teachers had a teaching experience of between one year to 5 years. 8 teachers had a teaching experience of between 16 years and 20 years. While 4 teachers had a teaching experience of over 21 years

Teachers with many years of experience had clear understanding of the subject matter and have good teaching methods can influence positive change in attitude.

4.5.2 How the teachers are motivated to teaching mathematics.

The teachers were asked to select how much they liked teaching mathematics. Their response is depicted in the table 4.13 below they teach each week, their response is analyzed in table 4.11 below

Table 4.12 How the teachers are motivated to teaching mathematics

Motivation of teachers to teaching	Frequency.	Percentage (%)
Liked teaching	21	52
Moderately liked teaching	19	48
Compelled to teach	0	0
Total	40	100

52% of the respondent teachers said that they liked teaching the subject while 49% of respondents said that they moderately liked teaching the subject. No teacher responded that they were forced to teach. For a teacher to change the attitude of the student positively; they need to be motivated and like the subject itself. (Costello 2001)

4.6 The Opinion of the Mathematics Teachers about mathematics

Teachers were asked to give their opinion about mathematics whether it was interesting or tedious subject. Their response is represented in the table 4.12 below

Table 4.13 The Opinion of the Mathematics Teachers about mathematics

Opinion	Frequency	Percentage (%)
Very interesting	36	90
Tedious subject	4	10
Total	40	100

90% of the teachers reported that mathematics was an interesting subject which shows that they had positive attitude to it, while 10% responded that it was tedious subject. The teacher' interest in mathematics is intended to create positive attitude to learners. Student's attitude towards mathematics is more positive in a class where students are made to have more interest in the subject created by the teacher. If the subject isn't interesting to the teacher, it will be difficult to motivate learners (NJUE 2008) the teachers were asked about the relationship between specified behavior displayed by students and how the students with such behavior performed.

The teachers cited that those students who had unbecoming attitudes such as of sleeping in class, avoiding mathematics lessons, not doing assignments usually performed decimally in class and in most cases they left blank questions in examination or gave irrelevant answers. They respondent also that those students who eagerly listened in class always made an attempt to answer questions and even if they may be wrong, they have an hint of what is supposed to be done.

4.6.1: What students like in mathematics (teachers' opinion)

Teachers were asked to give their views of what the students liked in mathematics as a subject. Their views are tableted as shown in table 4.13 below

Table 4.14 What students like in mathematics

Student likes	Frequency	Percentage (%)
Teaching method	15	37
Content	20	50
Teacher	5	13
Total	40	100

According to teachers, students liked the content of the subject. This was the response of 50% of the /teacher’s response. This means the teacher should emphasize most on the attitude of students towards the content. 37% responded that student liked the teaching methods; they argue that just only the teaching method can determine the score and the attitude of students towards mathematics. 13% started that students liked the teacher, these means the teacher’s mannerisms and how he/she relates with the students. The teachers stated that lack of time to cover the outlined syllabus content negatively affected the student score

4.7 Strategies of controlling formation of negative attitude towards mathematics

The teachers were asked to give the extent the given strategies helped to change formation of negative attitude. Their response is given in table 4.14 below

Table 4.15 Strategies of controlling formation of negative attitude towards mathematics

Methods of controlling	Never	Sometimes	Often	Always	Very Often
Organizing symposia	0	10	13	60	17
Changing the teaching method	0	10	22	59	9
Informing students importance of mathematics	0	30	15	45	25
Reinforcing with positive comments	0	30	15	40	15
Using teaching aids	0	17	15	55	13
Knowing each student by name	0	20	25	30	25
Providing individual attention	0	20	20	35	25

On symposium, 60% of respondent agreed that it Always enabled student to change attitude, 17% said that symposium Very Often help student change attitude , 13% said it Often help student to change attitude while 10 % said that it Sometimes help student to change attitude.

On changing teaching method, 59% said it Always helped to change attitude, 25% said that Very Often it helps to change attitude, 30 % said it Sometimes help to change attitude while 15% said it Often helps to change attitude.

On informing the students importance of mathematics, 30% responded it Sometimes helped to change attitude, 15% said it Often helped, 45% responded it Always helped to change attitude while 25% responded it Very Often helped to change attitude

With the use of teaching aid, 17% responded it Sometimes helped to change attitude, 15% responded it Often helped, 55% responded it Always helped to change attitude while 13% responded it Very Often helped to change attitude

When reinforcing students with positive comments, 30% responded it Sometimes helped to change attitude, 15% said it Often helped, 40 % responded it Always helped to change attitude while 15% responded it Very Often helped to change attitude.

By providing individual attention, 20% responded it Sometimes helped to change attitude, 20% said it Often helped, 35% responded it Always helped to change attitude while 25% responded it Very Often helped to change attitude

4.7.1: Motivating and Enhancing Learning

The teachers were asked to give the ways and methods that they thought motivated learners. The Table 4.15 shows the number of teachers using the method.

Table 4.16 Motivating and Enhancing Learning

Method of teaching	Frequency	Percentage (%)
Group discussion	38	95
Question and answers	35	88
Lecture method	40	100
Classroom demonstrations (teacher)	40	100
Classroom demonstrations(student)	30	75
Individual student teaching	25	63

100% of the teachers used both lecture method and classroom teacher demonstration. 95 % of the teachers used group discussion. 88% used questions and answers during teaching, 63% pay attention to individual student teaching while 75 % used student classroom demonstration.

Majority of the teacher cited lecture method and teacher classroom demonstration even though it is not effective in motivating learners. This was because they have a lot of content to teach and the numbers of students are many in a single classroom. Group discussion was reported to be used frequently during assignment by forming class groups. Individual student teaching was least preferred while group discussion and lecture method was most liked by the respondents

4.8: DISCUSSIONS OF FINDINGS

4.8.1: Attitudes formed towards Learning and Performance in mathematics

The most experienced feeling in mathematics was that of fear and extreme anxiety .It was evident when 44% of student respondent Strongly Agreed and Agreed that they experience it during examination and when new concept was introduced. However 47% did not feel anxious when mathematics is mentioned. High anxiety level shows negative attitude towards mathematics learning and performance which is associated with test stress, fear of failure, low self confidence and poor attitude towards mathematics learning. When respondent were asked if mathematics should be a compulsory subject 62% Disagreed 48% of the student respondents Strongly Agreed and Agreed that mathematics is a difficult subject when compared to other subjects. This may make the student not to take mathematics seriously after all they have a negative attitude that the subject is difficult. This was supported by 49% of student respondents who Strongly Agreed and Agreed that their grades are always low in mathematics. However 45% of the student respondent said mathematics is not a difficult subject. 94% of student respondent do Agreed and Strongly Agreed that mathematics is useful in life. Despite the high number of students who knows importance of mathematics, only 57% do Agree and Strongly Agree that they would wish to do mathematics in future after secondary education while 31% of the students disagreed and strongly disagreed to do mathematics in future. While 12% of the respondent where undecided whether they are going to do mathematics after secondary or not. When asked if they enjoy learning mathematic, 35% Strongly Disagreed and Disagreed. This shows that they are compelled to do mathematics since the subject is compulsory in in Kenyan education system. It can be seen that 26% and 27 % of the student Strongly Agrees and Agrees respectively that mathematics was their favorite subject thought . This is an indication of positive

attitude towards learning mathematics which may yield to good performance while 24 % disagree that mathematics is their favorite subject.

When the students were asked to give their opinion about mathematics as a subject 35% of the students responded that mathematics was a dull subject. This shows that they have a negative attitude towards it. Another 35% of the respondents said that mathematics is a tedious subject and it requires a lot of time in doing revision. While 85% said that mathematics is an interesting subject and they enjoy learning it. This shows that they enjoy doing mathematics and they have a positive regard towards it.

The poor performance in mathematics is also attributed to the fact that some students could not find immediate applicability of the concept taught in class. 61% agreed that gender has nothing to do with attitude, learning and performance in mathematics.

It has been seen that there is a big influence from the teacher, sibling, parents and peer in terms of imparting knowledge and development of attitude towards mathematics. The negative attitude developed by students towards learning was due to the poor learning methods that discourage student participation making students to develop unfounded beliefs that mathematics is difficult.

The findings should enlighten education stakeholders in order to enhance positive attitudes towards mathematics as a subject. This is because, it has been seen in the study, there is a clear connection between attitude learning and performance. Learning activities in the classroom should encourage student participation for them to draw inferences, bring out an analogy and figure the real life applications of concepts learned. As a matter of concern, school management should act with speed to develop positive attitudes on learners.

4.8.2: Factors Encouraging Attitude Formation

When students were asked whether they liked their mathematics teacher, 14% and 16% Disagreed and Strongly Disagreed respectively that they liked their mathematics teacher. The dislike of the teacher may lead to formation of negative attitude towards mathematics.

When students were asked whether they were well provided with the learning materials 34% and 34% strongly agreed and agreed respectively that they were given adequate learning resources. While 16% and 11% Disagreed and Strongly Disagreed that they were given adequate revision. Adequate revision material is an integral part in student good performance

(Costello 2001). If the learning materials are not enough, learning will become a problem students may result to formation of negative attitude.

Also lack of learning resources discouraged many students' thus poor performance and negative attitudes. Dissatisfaction of students on how a particular teacher tackled a given topic and not thoroughly covering it to show its application also plays a big role poor performance and development of negative attitudes on learners

It can be seen from the study that 30 % and 37% Strongly Agreed and Agreed that it is the mathematics teacher who can make mathematics learning. From this it is evident that 30% who Strongly Disagreed and Disagreed that they liked they mathematics teacher will have a problem in learning and this will result to formation of negative attitude towards the subject.

23% and 15% Strongly Agreed and Agreed respectively that mathematics lessons are not interesting. The lesson being not interesting may be due to poor teaching methods from the teacher or the negative attitude from the students that makes them to dislike the lessons. Heavy workload on teacher: the workload compromise the quality of teaching as the teacher does not plan adequately to teach, also it make teachers to failure to attend class, and failure to mark students assignments (KUSANTO 2012).

Encouragement: encouragement of the students by peers and relatives influence their attitude and performance. 3% and 6% Disagreed and Strongly Disagreed that they get encouragement from their parents and sibling and peers to work hard in mathematics.

10% and 12% of the student respondents Strongly Agreed and Agreed respectively that their mathematics teacher was too fast that they cannot understand when there are being thought. When the teacher is too fast that the students cannot catch up, it will make the student to detest mathematics and develop negative attitude towards it.

When the students where asked if they liked the way their mathematics teacher teaches, 28% and 29% strongly agreed and agreed respectively. While 25 % and 6% disagreed and strongly disagreed that they liked the way their mathematics teacher thought. Poor teaching methods and strategy makes students to develop negative attitudes while saying that mathematics is a difficult subject.

When the students where asked if mathematics if mathematics was useful in life, 69% and 24% Strongly Agreed and Agreed that the subject is useful in life. While 1% and 3% disagreed and

strongly disagreed that mathematics is useful in life. Students with little interest in mathematics thought that mathematics has little application in real life and hence they had poor attitude towards it.

4.9 INTERVENTIONS TO CONTROL NEGATIVE ATTITUDE

When the teachers were asked on how the negative attitudes can be controlled, 60% of the respondents said organizing symposia always worked to alleviate negative attitude. 10% suggested organizing symposia Very Often changed the attitude. Using symposia enable students to interact thus sharing different issues concerning mathematics, it also gives student moral when they see their fellow students solving sums which on their part they thought it was difficult.

On changing the teaching methods, 59% of the respondent argued it Always changed the attitude, 22% responded that it Often changed the attitude, 9% said that it Very Often help to change the attitude while 10% were of the opinion that it Sometimes helped to change the attitude. There is need for teachers to change their teaching method. Mathematics is thought using lecture method, this put off many students and makes them to hate the subject. 37% of the teacher agreed that the students liked teaching methods in mathematics. Frequent in service training for teachers is necessary and staffing should be done to lower teacher student ratio so that teachers can pay attention to individual student.

55% of teacher respondent accepted that adequate learning resources Always saved to change students attitude. This is in relation with the 50% of teachers who responded that students liked the content more than teaching method and the teacher. There is need for more books and other revision materials to allow students to do their own research at free time and not for them to depend on teachers. Teachers also need to be creative so that they can improvise on locally available materials to teach.

On the aspect of providing each student with individual attention, 35% of the teacher respondent said it always helped to control student attitude formation. 25% responded that it Very Often helped to control attitude formation. Monitoring individual student behavior is important as the teacher can be able to control unbecoming behavior before it gets out of hand. The teacher will know those students who don't do assignment, who does not attend classes and those whose min

tend to wander during class time. All these activities may be the indicators of negative attitude towards mathematics.

Attitude and score

When the students were asked if they were given a lot of unnecessary assignment, 14% and 21% Strongly Agreed and Agreed respectively. The 14% and the 21% who Strongly Agreed and Agreed, 90% of them also when asked whether their grades are always low in mathematics, 60% strongly agreed and 40% agreed. Students with negative attitude perceive that the assignment they are given is unnecessary and no need for it. These students in turn their grades may be low since they do not take time to practice doing mathematics.

When asked whether mathematics lessons are not interesting, 23% and 15% strongly agreed and agreed. 100% of the students who gave this response Disagreed and Strongly Disagreed that they do mathematics exercise on their own. From this we can conclude that these students must be performing poorly. Students with negative attitude do not enjoy mathematics lessons, and owing to the fact that the same student does not do exercise on their own, the probability of performing poorly is very high.

60% combined of the students who Disagreed and Strongly Disagreed that mathematics lessons are not interesting, also Disagreed and Strongly Disagreed that their grades are always low in mathematics, these students also Strongly Agreed and Agreed that they enjoy learning mathematics.

There is a direct relationship between performance in mathematics and the attitude of a student. Students with positive attitudes perform well in mathematics while those with negative attitude perform poorly and they even lack basic mathematical concepts. Attitude, to a large extent, is created by teachers' teaching methods. There is need for teacher to be trained on how to prevent the negative attitude formation and way they can reverse the already formed attitudes.

Some students view mathematics as an abstract subject and its not applicable to every day life situation. They learn it for the purpose of passing examinations. There is need to inform the application of mathematics as a subject in their day to day life.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter highlighted the project summary, conclusion and recommendations. This will help to improve the attitude formed by students when learning mathematics, hence improve their performance.

5.1 Summary of findings

The project was aimed at determining the attitude formed by students towards learning mathematics and see whether it contributed towards performance in schools in Masaba North Sub County. The study also sought to unravel the factors that contributed to formation of particular attitudes that are aimed to learning and performance in mathematics and ways the attitudes can be controlled. Descriptive survey was adopted in the survey.

- The findings of the study indicated that the major setback in learning mathematics was lack of confidence in tackling mathematics problems which is experienced by 44% of the respondents. Lack of learning resources in learning mathematics was reported at 20%. 56% of the respondent accepted that they enjoy learning mathematics as a subject, but yet this students perform poorly in mathematics test as was indicated by the teacher respondent. Out of 56% of students who agreed that they are interested in mathematics, 49% showed interest to do mathematics in higher levels of learning. 38% percent of respondents disagreed that undertaking mathematics was difficult while 70% accepted that mathematics skills are vital in life
- The study showed that 59% Strongly Disagreed that they were given lot of unnecessary assignment in mathematics and 35 % of the respondent accepted that they were well equipped with mathematics books and other learning materials. 69% of the respondents agreed that it is mathematics teacher who will make learning mathematics easy.
- The study also showed that 10% of the respondents reported that they experienced difficult in comprehending the language their mathematics teacher used during learning.

25% of the responded reported that they lacked interest in mathematics while 48% accepted that mathematics is a difficult subject. 22% reported that their mathematics teachers were too fast when teaching in that they cannot catch up with them.

- The findings showed that 23% of the respondents Strongly Disagreed and Disagreed that they liked their mathematics teacher while 31% of the responded Strongly Disagreed and Disagreed that they liked how their mathematic teacher thought.
- The study showed that 35% of the student respondents reported that they didn't enjoy learning mathematics while 49% reported that their grades are always low in mathematics. 32% of the respondents reported that mathematics was impossible to learn and another 44% said that they feel anxious and fearful during mathematics exams.
- The findings also indicated that 35% of the students reported that was a tedious subject and it required a lot of time in doing revision. While another 35% reported that mathematics was a dull subject. . About 87% of the teacher said that mathematics was interesting while 13% said that it was a tedious subject.
- The study also sought to get how student unfavorable attitude towards mathematics can be changed. 77% of the teachers said that symposium was a common method of fostering positive attitude to students. 60% of the teachers suggested providing individual attention was important in changing attitude while 70% cited changing of teaching method would help to change student attitude. 13% of the teachers took time to tell the students importance of mathematics in every day life as a way of fostering positive attitude to students.
- Also the study sought to know the methods used by teachers in teaching mathematics. 42% of the teachers despised lecture method of teaching as they said that it never enhanced learning but it was used by 46% of respondents in teaching. Classroom demonstration by teacher was used by 90% while group discussion was used by 80%. 63% often used teaching aids in teaching for students to understand better and to motivate learners improve their attitudes towards learning mathematics.

5.2 Conclusions of the study

- From the study, it's evident that a secondary school student knows the importance of mathematics. However the attitude they have obtained from previous encounter from parents, teachers, peers and sibling hinders their learning of the subject. Teachers need to be aware that there are some aspects in students that need to be improved for them to learn and perform mathematics better. Organizing symposia, using appropriate teaching methods, providing individual student with attention and reinforcing students with positive comments will help in changing negative attitudes to positive.
- Students also need to be given non routine and challenging mathematics questions to open their thinking and reasoning capacity, learning material should be adequately provided and students need to be frequently reminded on the importance of mathematics on their future life. these will help them not to consider giving mathematics maximum attention and work hard to perform well. This requires teachers to take an extra mile in leading students to the path where they can develop positive attitudes, good teaching methods should be embraced and teachers to frequently organize symposiums.
- Teachers should embrace usage of teaching aid and application of mathematics in real life situation. Mathematics learning should not focus on theoretical aspects and passing of exams only, but encompass practical learning whereby students are able to associate mathematical knowledge gained to their daily activities. This will make the subject be interesting to students. By so doing, students will have a better understanding of the subject hence develop positive attitude hence promoting learning and performance.
- From the study Students mentioned the teacher being too fast and some using vocabularies that students does not always comprehend. There is need for the teacher to pay attention to individual students. This way the teacher will understand the needs of every learner and give assistance where necessary

5.3 Recommendation

The study identified connections between attitude learning and performance and it came out with following recommendation

- Positive attitude towards mathematics is necessary if students have to perform well in mathematics at secondary level. Hence there is need for all education stake holders to enhance development of positive attitude.
- Negative attitude towards learning mathematics should be prevented earlier enough before students give up in learning mathematics as a subject.
- Mathematics teachers should be creative enough for them to use local available resources to foster positive attitudes to students.
- Parents and all education stakeholders should invest more to buy mathematics learning resources so that it will enable students to get relevant content whenever required
- Teachers should use good teaching methods that will foster positive attitudes to students when teaching mathematics.
- Students need not to compare mathematics with other subjects and they should not be too judgmental on the teachers since this is what results to them forming poor attitudes to teachers and mathematics subject itself

5.4 Suggestion for Further Research

- The study was carried out in Gesima zone only. Similar research can be conducted in other areas of the country.
- The study was centered on students' attitude towards learning and performance there is a need to learn teachers' attitude towards teaching and performance.

Bibliography

- Callahan. "Adolescent Attitudes Towards Mathematics." *Mathematics Teacher*. (66 No 4 pp 751-755.), 2010: Vol 66 No 4 pp 751-755.
- Casey. "Spatial-Mechanical Reasoning Skills Versus Mathematical Self-Confidence As Mediators Of Gender Differences On Mathematics Subtests Using Cross-National Gender-Based Items." *Journal For Research In Mathematics Education*, 32(1), 2009: 28-57.
- Cockcroft. *Mathematics Counts*. London: H.M. Stationery Office., 2008.
- Costello. *Teaching and Learning Mathematics*. London:: Routledge, 2001.
- Eshiwani. *A study of Women Access to Higher Education in Kenya with a Special Reference to Mathematics and Science Education*. nairobi: Kenyatta University, 2016.
- KASIMBU. *The Relationship between the Attitudes towards Mathematics and Achievement in some Selected Schools In Mutomo Sub-District*., NAIROBI: Unpublished M.Ed Project,, 2004.
- KIRAGU. *An investigation of the Factors that Contribute to Mass Failure in KCSE. Achievement in Mathematics*., NAIROBI: KENYATTA UNIVERSITY, 2012.
- KNEC. *Year 2006 KCSE Examination Report*. NAIROBI: KNEC Press., 2006.
- MWANGI. *Factors Influencing the Performance and Learning of Mathematics Among Secondary School Students in Kenya*. NAIROBI: Kenyatta University., 2009.
- Newman. "Children"s help -seeking in the classroom." *Journal of Educational Psychology*, 2011: 82(1), 71-80.
- Newman. "Children"s help -seeking in the classroom: The role of motivational factors and attitudes." *Journal of Educational Psychology*., 2010: 71-80.
- NJUE. *Analysis of Teachers" Attitudes towards Proposed Introduction of Sex –Education in Kenya*. NAIROBI: Unpublished M.Ed. Project. Kenyatta University., 2008.

- Okech. *Analysis of Attitudes Towards Mathematics of Standard Six Pupils and their Teachers*".
NAIROBI: Kenyatta University Press., 2017.
- Oppenheim. *Attitude Measurement*. London: Heinemann Educational Books., 2006.
- Orodho. *Elements of Education and Social Science Research Methods*. Nairobi:: Masola Publishers., 2005.
- Orton. *Learning Mathematics Issues Theory and Classroom Practice*. London: Cassel Education Ltd., 2002.
- RUKANGU. *Pupils Development of Spatial Ability in Mathematics. An Issue of Learning Environment in Selected Secondary schools in Kenya*. Kenyatta University.: Unpublished PhD Thesis,, 2000.
- SECANDA. *Ethnicity, Social Class, Language, and Achievement in Mathematics*. New York:: Macmillan, 1992.
- SMASSE. *Baseline Studies Project*. NAIROBI: UNPUBLISHED RESEARCH REPORT, 1998.
- Twoli. *Sex difference in Science Achievement Among Secondary School students in Kenya*. Flinders University of South Australia: Unpublished PhD, 1999.
- WasiKe. *Teaching Techniques That Enhance Students Performance in Mathematics in Selected Public secondary schools in Butere-Mumias District*. Kenyatta University.: Unpublished M.Ed Thesis., 2006.
- Weiss. *Child Psychology*. NEW YORK: John Wiley Sons Inc., 2005.
- Ying. *Attitudes Towards Learning Mathematics Among Secondary School Students in Hong Kong*. Educational Journal vol 19 (No.1) pp 13-18, 2011.

SECTION 3: INFORMATION ABOUT MATHEMATICS/ TEACHER OPINION

1. Do your students give a lot of value mathematics when compared to other subjects

Yes [] No []

Why?.....

\

2. What is your opinion on mathematics as a subject

Dull [] tedious [] interesting [] very interesting []

3. What are the general attitude of your students towards mathematics

Very responsive [] positive [] negative [] very negative []

4. Is the syllabus content relevant to the societal needs?

Not Relevant [] Some How Relevant []

Relevant [] Very Relevant []

5. What do your students like about mathematics?

Teaching [] The Teacher [] The Subject Content []

any other (specify).....

6. How can students be encouraged to like mathematics and perform

better.....

7. In case when you realize your students are not interested on the subject what do you do?

i) Telling them importance of mathematics as a subject []

ii) Using different teaching methods []

iii) Do nothing []

iv) Others (specify).....

SECTION 4: MATHEMATICS TEACHING METHODS

1. The following methods are used in enhancing mathematics learning. In the following methods indicate against each how frequent you use it.

Teaching method	never	Sometimes	often	Very often	always
Lecture method					
Group discussion					
Student demonstration					
Assisting individual student					
Questions and answers					
Any other (specify)					

Of the above methods which one do you think enhance learning to your students

.....

why.....

.....

2. The following are techniques used to motivate students to enhance learning mathematics.
Indicate against each how often you use:-

Motivation method	never	Sometimes	often	Very often	always
Using positive comments					
Using teaching aid					
Using different teaching methods					
Giving frequent feedback					
Providing individual attention					
Giving incentives					
Knowing students by name					
Any other (specify)					

What do you think can be done to improve learning and performance

.....

.....

.....

End

Thank you.

APPENDIX B: MATHEMATICS STUDENTS' QUESTIONNAIRE

Dear students

The aim of this questionnaire is to investigate the students' attitudes towards learning mathematics. The information you will give about your feelings towards mathematics will be kept confidential. Please give honest response. Do not write your name on the questionnaire. Just mark with a tick in the box on the appropriate answer. You may give brief comments where necessary

SECTION 1: DEMOGRAPHIC INFORMATION OF RESPONDENT

General information

1. Gender: Male [] Female []

2. Which of the following problems affects you during learning mathematics
 - (a) Lack of interest in mathematics []
 - (b) Inadequate learning resources []
 - (c) Language used by teacher []
 - (d) Lack of confidence []
 - (e) Any other (specify).....

SECTION B: STUDENT OPINION TOWARDS MATHEMATICS

Your feelings towards mathematics

1. What is your opinion on mathematics as a subject

Dull [<input type="checkbox"/>]	tedious [<input type="checkbox"/>]
interesting [<input type="checkbox"/>]	very interesting [<input type="checkbox"/>]

Decide carefully on the following feelings and mark against each statement

feeling	Strongly agree	agree	Not decided	disagree	Strongly disagree
I enjoy learning mathematics					
Mathematics classes are not interesting					
I would like doing mathematics after secondary school					
Mathematics is difficult to understand					
Mathematics is useful in life					
It's the teacher who can make mathematics easier					
Mathematics is my favorite subject					
I have adequate learning resources					
I feel anxious and fearful during mathematics examination					
Mathematics should not be a compulsory subject					
I do a lot of mathematics exercise on my own					
Mathematics is impossible to learn					
Best way to learn mathematics is by discovering concept on my own					
My marks are always low in mathematics					
I like my mathematics teacher					
I do mathematics just because it compulsory					
My gender interferes with my learning mathematics					
I learn mathematics well regardless of my teachers gender					

According to you, what do you think can be done to make mathematics learning easier?.....

.....
.....