

**ATTITUDE OF TEACHERS AND STUDENTS TOWARDS TEACHING AND  
LEARNING OF MATHEMATICS IN SECONDARY SCHOOLS IN KISII**

**CENTRAL SUB-COUNTY, KENYA**

**BY**

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**DECLARATION**

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This thesis is my original work and has not been presented to any other university or institution for a degree.

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## **DEDICATION**

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## ABSTRACT

Attitude plays a critical role in the teaching and learning situation as it determines the level of achievement. It has a substantial influence on Mathematics instruction and learning outcomes. In Kisii Central Sub-County, secondary school students have continued to attain poor results in Mathematics subject in the Kenya Certificate of Secondary Education (K.C.S.E) examination. From the year 2006 to 2012, the mean scores in Mathematics subject have ranged between 2.57 and 3.68 out of the possible 12.00 points. This poor performance may be linked to students' attitude towards the subject. Teachers too may have a share of blame for the results since their attitude towards the teaching of Mathematics plays a significant role in shaping the attitude of students towards the learning of the subject. No known study conducted in the sub-county has established the attitudes of teachers and students on the subject. The purpose of this study was to investigate the attitudes of teachers and students towards teaching and learning of Mathematics. Objectives of the study were to: determine the status of attitudes of teachers and students towards teaching and learning of Mathematics; determine reasons for attitudes of teachers and students towards teaching and learning of Mathematics; establish differences in attitude towards teaching and learning of Mathematics between teachers and students and establish ways of enhancing attitudes of teachers and students towards teaching and learning of Mathematics. Descriptive survey design was used in this study. The study targeted a population of 2080 form four students of 2013, 64 form four Mathematics teachers and 52 Heads of Mathematics department in Kisii Central Sub-County. Krejcie and Morgan (1970) formula was used to select 327 students of which stratified sampling technique was used to select 168 females and 159 males. Saturation sampling technique was used to sample 57 form four Mathematics teachers and simple random sampling technique was used to select 17 Heads of Mathematics department. Data was collected using questionnaire and interview schedule. Validity of the instruments was ascertained by experts from the Department of Educational Communication, Technology and Curriculum Studies of Maseno University. A pilot study was carried out on 208 form four students, 7 Mathematics teachers and 5 Heads of Mathematics department in 7 secondary schools to establish reliability of research instruments. Coefficients of 0.81 and 0.84 were realized for students' and teachers' questionnaires respectively and hence deemed reliable. Quantitative data were analyzed using descriptive statistics, while inferential statistics (*t*-test) was used to determine differences in the attitude between students and teachers. Qualitative data was organized, categorized, and a report made from the emergent themes. The study revealed that teachers and students had a positive attitude towards Teaching/Learning (T/L) of Mathematics. The difference between teachers' and students' attitude towards T/L of Mathematics was statistically significant;  $t(382) = -10.65, p = .00$ . Reasons for enhancement of attitude of students towards learning of Mathematics is a basic requirement for joining a good career, key to understanding other subjects, while teachers is due to their training. Strategies of enhancing attitude is through use of variety of teaching methods, allow more practice for learners and regular tests. The study therefore recommends that enhancement of students' attitude should be based on content arrangement, career choice and use of variety of teaching methods. The findings of this study may be of value to the Ministry of Education, teachers, parents and students on issues of attitudes in learning/teaching of Mathematics in secondary schools.

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## **ABBREVIATIONS AND ACRONYMS**

D.E.O	District Education Officer
EFA	Education For All
HOD	Head of Department
JICA	Japanese International Co-operation Agency
KCE	Kenya Certificate of Education
KCSE	Kenya Certificate of Secondary Education
KEMI	Kenya Education Management Institute
KESI	Kenya Education Staff Institute
KNEC	Kenya National Examinations Council
ROK	Republic of Kenya
SMASSE	Strengthening of Mathematics and Science in Secondary Education
SPSS	Statistical Package for Social Sciences
TIMSS	Third International Mathematics and Sciences Study
T/L	Teaching and Learning
USA	United States of America

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Attitude is one of the key factors that determine implementation of the curriculum. According to Whitley (2010) attitude is an expression of favour or disfavour towards a phenomena. It is learned tendency to evaluate things in a certain way. This can include evaluations of people, issues, objects or events. Such evaluations are often positive or negative, but they can also be uncertain at times. Moreover, attitudes can also be explicit and implicit. Explicit attitudes are those that we are consciously aware of and that clearly influence our behaviours and beliefs. Implicit attitudes are unconscious, but still have an effect on our beliefs and behaviours (Huckenbury, 2007).

Attitude plays a crucial role in determining the level of success of any academic endeavor. Learning Mathematics has become a necessity for an individual's full development in today's complex society (Hodges, 2007). Despite its utility and importance, Mathematics is perceived by most pupils as difficult, boring, not very practical, and abstract (Ignacio, Nieto & Barona, 2006). However, attitude is a key in determining students' success in Mathematics (Peker & Mirasyedioglu, 2008; Kogce, et al., 2009).

Research (Grootenboer & Hemmings, 2007; Schenkel, 2009) indicates that attitude toward Mathematics has a substantial influence on Mathematics instruction and learning outcomes. Schenkel (2009) study of elementary school pupils found out that there is positive correlation between student attitude and student performance. The study further found out that student beliefs and attitudes have the potential to either facilitate or inhibit learning. Similarly, Yara

(2009) noted that teachers with positive attitude towards Mathematics were inclined to stimulate favourable attitudes in their learners. Thus, the evidence of the relationship between teacher attitude and student attitude towards Mathematics play a very significant role in teaching/learning of the subject hence the need to undertake this study for practical evidence.

Teaching as a profession is regarded differently by many people including teachers themselves and this is to do with the attitude they hold towards the profession. Bennell (2004) indicates that teaching has become unpopular among university graduates and secondary school leavers. This is because about one-half of junior secondary school leavers in Malawi and Tanzania who finished school in 1990 were employed as teachers in 2001. Consequently; teachers often lack a strong, long term commitment to teaching as a vocation. In Kenya, the teaching profession is perceived negatively by many people. This is because the students who join the profession are mostly those who failed to secure the more prestigious careers like medicine and engineering (Taaliu, 2010). This has a big impact on the education system in the country. At the same time teaching has been associated with low social economic status making it unattractive to most people and the few who join the profession do so as a last resort. This kind of scenario may contribute to the attitude a teacher may hold when teaching Mathematics subject.

In Kenya, the government has underscored the importance of promoting Mathematics literacy in educational institutions due to the fact that the subject plays an important role in scientific and technological development of any nation. The fundamental role of Mathematics lies in its day to day application in most social sciences, business, economics, medicine and management studies (Gitaari, et al., 2013). Having recognized the role of Mathematics in national development, the Kenya government has made Mathematics compulsory in primary and secondary schools under the 8:4:4 system of education. As such, students' performance in Mathematics subject is of great



concern to education stakeholders (KNEC, 2007). Furthermore, the government of Kenya through partnership with development partners has embraced several initiatives such as the Strengthening of Mathematics and Science in Secondary Education (SMASSE) project. This is a joint venture between Japanese government through the Japanese International Development Agency (JICA). It was initiated in 1998 to improve the capacity of young Kenyans in Science and Mathematics through In-Service Education and Training (INSET) Centre for Mathematics and Technology Education in Africa (CEMASTEIA, 2008).

Despite the important role that Mathematics subject plays in the society, there has been poor performance in the subject in national examinations as noted by Ramani (2004) and Siringi (2005a). This poor performance witnessed over the years in Mathematics and Sciences led to initiation of SMASSE in Kenya on 1<sup>st</sup> July 1998. The national trainers' team then conducted a baseline study to find out the factors causing poor performance and participation in Mathematics and Sciences in Secondary schools (Kibe, et al., 2008). These factors were further categorized into factors that SMASSE could address and those that SMASSE could not address. The factors grouped as those that SMASSE could address included: negative attitude, lack of appropriate teaching methodology, poor mastery of subject content, inadequate assignments to students and infrequent inspection. In this baseline survey by SMASSE (1998), negative attitude was not only witnessed among students but also among teachers. Similarly, report by KNEC (2007) also indicated that the poor performance in Mathematics may be related by attitude formed by students and teachers towards the subject among other factors. However, the study by SMASSE (1998) and KNEC (2007) failed to establish status of attitudes of students and teachers and at the same time how those attitudes affected delivery of Secondary Schools Mathematics with specific reference to objectives, content, methods and evaluation procedures. This necessitated the

researcher to conduct the study on status of attitude of teachers and students towards teaching and learning of Mathematic in secondary schools in Kisii Central Sub-county.

Reasons for attitudes of teachers and students towards teaching/learning of Mathematics have been carried out by various scholars. Research that was done in USA by Noyce (2001); Sunal and Whitaker (2001) asserted that most children enter school ready to learn and with positive attitudes towards Mathematics. However, those positive attitudes may with time turn sour as they see themselves poor learners and impossible to learn Mathematics. This implies that some learners change their attitude towards Mathematics with time as they progress on their education in school. In Kenya, a research done by Nui and Wahome (2006) in secondary education showed that there is consistent failure in Mathematics and Sciences and this was attributed to attitudes of students and teachers that they hold towards the subject. In agreement to this study, Manoah, Indoshi and Othuon (2011) in their study observed that attitude play a critical role in students' performance. However, this study looked at the attitude of the learners only towards Mathematics ignoring the aspect of teachers whose attitude may contribute to the success of delivery of Mathematics in secondary schools. The studies done by Noyce (2001); Sunal and Whitaker (2001) were done in USA which may not be fully related to Kenyan situation.

Teachers' attitude towards Mathematics has an effect on the nature of the attitude students are going to form in school. The relationship between the teacher and a student should be good for better learning and teaching to take place (Schenkel, 2009). Similar studies, Aduda (2005) found that teachers' attitude towards Mathematics teaching is one of the key contributors towards explaining the variance in students' cognitive achievement. Mutahi (2008) confirmed that teachers' attitude towards Integrated Science teaching affect their students' attitude and achievement in the subject. Similarly, Balozi and Njung'e (2004) found significant causal

relationship between the teachers' attitude and students' achievement in Integrated Science. Thus, the nature of the attitude a teachers may hold will be affecting the teaching and learning process in school and in particular Mathematics curriculum. Kuranchie, et al., (2013) studied how the teachers' attitude contributed to students' attitude and academic achievement. The study revealed that students taught with devoted teachers performed well in class work. The study also disclosed that learners taught with devoted teachers had a courage and determination to face difficulties in school life. This study shows the effect of the teachers' attitude towards Mathematics and learners' understanding the subject. Although much has been studied on attitude no known study has established the difference in attitude towards teaching and learning of Mathematics between teachers and students. Thus, the current study aimed at establishing differences in attitudes of teachers and students towards teaching and learning of Mathematics.

Teaching/Learning of Mathematics requires proper strategies to be put in place in order to enhance both teachers' and students' attitude towards the subject. A study by Olatoye (2001) found that learners attitude towards a subject had significant direct effect on learners' achievement in the subject. Positive attitude towards a subject promote students' academic achievement and negative attitude leads to low academic achievement. A study on Nigerian students learning Science by Adesokan (2002) noted that in spite of the recognition given to a subject, it was evident that students still showed negative attitude towards the subject thereby leading to poor performance and low enrolments. The learners who perform well in a subject generally had positive attitudes towards that subject and those who had negative attitudes seemed to perform poorly in the subject (Adebisi, 2006). A study done in Kenya by Auma (2004) on the relationship between teacher factors and students' Mathematics achievement showed that there is positive relationship on the teachers' attitude and learners' achievement. This study however,

focused on various factors held by a teacher that may contribute to learners' achievement in Mathematics. The current study focused specifically on attitudes of teachers' and students' towards teaching and learning of Mathematics. On other hand, Kibe et al. (2008) asserted that for teaching and learning of science to be interesting and stimulating, there has to be motivation on the part of both the teacher and student so as to ensure the development of positive attitude and subsequently maximum academic achievement. Feedback is also seen to influences learning in that it provides an opportunity to learners to know what they need to do in order to excel. Alavi and Kaivanpanah (2007) investigated how English language learners perceived teachers' feedback when committing oral mistakes. They found that feedback influences learning as it assists learners correct the errors they make in speech. A study done in Kenya by Achieng (2006) on effect of teacher characteristics on teaching of Mathematics also found that there is positive relationship on teachers' attitude and learners' achievement. However, this study focused on teachers' characteristics on learners' achievement. The current study focused on various strategies that could enhance teachers' and students' attitudes towards teaching and learning of Mathematics.

Mathematics is a compulsory subject in both the primary and secondary school curriculum in Kenya as already mentioned. The general objectives of secondary school Mathematics as outlined by the Kenya Institute of Education Syllabus (K.I.E, 2006) are to enable students to:

- a) Develop a positive attitude towards learning Mathematics
- b) Perform mathematical operations and manipulations with confidence, speed and accuracy
- c) Think and reason precisely, logically and critically in any given situation
- d) Develop investigative skills in Mathematics

- e) Identify, concretize, symbolize and use mathematical relationships in every life
- f) Comprehend, analyze, synthesize, evaluate and make generalizations so as to solve mathematical problems
- g) Collect, organize, represent, analyze, interpret data and make conclusions and predictions from its results
- h) Apply mathematical knowledge and skills to familiar and unfamiliar situations
- i) Appreciate the role, value and use of Mathematics in society
- j) Develop a willingness to work collaboratively
- k) Acquire knowledge and skills for further education and training
- l) Communicate mathematical ideals

These objectives spell out the competencies required of learners at the end of secondary education. Thus, attitude is one of the areas in Mathematics to be developed in curriculum of secondary education in order to enhance better performance in the subject. Mutahi (2008) confirmed that attitude towards Integrated Science teaching affect students' achievement in the subject.

There has been public outcry on the low mean scores of Mathematics every time KCSE results are released (Njoroge, 2004). The low scores have been occurring despite the fact that some topics were removed while others re-organized in the Mathematics secondary syllabus (K.I.E, 2006). The low mean scores have been noted in Kisii Central Sub-County also over the years as shown in the results of KCSE for the years 2006-2012 with a mean score of 2.62, 2.57, 2.68, 3.16, 3.68, 3.13 and 3.55 respectively (Kisii Central Sub-County Education Office, 2013). The results of Mathematics and Science subjects are given in Table 1.

Table 1: K.C.S.E Mathematics and Sciences Examination Results for Kisii Central Sub-County

YEAR/	2006	2007	2008	2009	2010	2011	2012
SUBJECT							
BIOLOGY	4.44	4.67	5.04	4.35	4.84	5.11	4.89
PHYSICS	5.05	5.12	4.84	4.49	5.05	5.23	5.33
CHEMISTRY	4.88	4.75	4.78	4.33	4.03	4.61	4.74
MATHEMATICS	2.62	2.57	2.68	3.35	3.68	3.13	3.55

(Source: Kisii Central Sub-County Education Office, 2013)

Mathematics has been the worst performing subject when compared with the Sciences in the past seven years as depicted from Table 1. This performance in Mathematics in KCSE results has been fluctuating over the years. The mean score of Mathematics for the seven years consecutively is below mean score of 4.0. This is a worrying pattern of performance and the root cause need be sought. Effort to improve the subject has been put by allocating more lessons of Mathematics than those of Sciences (Mutai, 2010). Despite concerted efforts of teachers, school administrators, parents and all other education stakeholders to enhance learning of Mathematics among secondary school students, performance and success in learning Mathematics is still not satisfactory. According to SMASSE (1998), the reasons for low performance in Mathematics examination resulting from poor learning of the subject are likely to be due to formed attitudes towards the subject by teachers and students; teaching methods which are not appropriate and lack of resources among others. However, the SMASSE (1998) failed to address how the formation of unfavourable attitudes among students and teachers can be curtailed and how favourable attitudes towards learning of the subject can be encouraged on this aspect of attitude. Moreover, there has been persistent poor performance in this subject as revealed in Table 1

above despite teachers of Mathematics in Kisii Sub-County having gone through SMASSE INSETS. Therefore, it was important to undertake a study of attitudes of teachers and students towards teaching and learning of Mathematics in secondary schools in Kisii Central Sub-County.

## **1.2 Statement of the Problem**

Attitude towards Mathematics has been considered an important factor in influencing participation and success in the subject in schools. Over the past seven years low achievement in Mathematics in national examinations in Kisii Central Sub-County as revealed in KCSE results of 2006 to 2012 as 2.62, 2.57, 2.68, 3.16, 3.68, 3.13 and 3.55 respectively out of the possible 12.00 points suggest that performance in the subject is below average. Moreover, Mathematics subject has posted low scores as compared to Science subjects as shown in Table 1. Several reasons have been given to account for this low performance in Mathematics. KNEC (2007) indicated the causes of low performance in Mathematics as inadequate coverage of the syllabus, inadequate assignments to students, lack of appropriate teaching methods and attitude formed towards the subject. Similarly, SMASSE (1998) indicated that the reason for poor performance in Mathematics examination is resulting from poor teaching and learning of the subject due to the formed attitudes towards the subject by the students and teachers among other factors. However, SMASSE report failed to address how the formation of unfavourable attitudes among teachers and students can be curtailed with specific reference to four elements of Mathematics namely objectives, content, methods and evaluation procedures and how to enhance better performance in the subject in the process of teaching and learning. Research has proven a significant relationship between attitude towards Mathematics and students' academic achievement. This aspect of attitude towards teaching and learning of Mathematics had not been fully studied. No known structured survey has been undertaken in Kisii Central Sub-County to

establish the attitudes of teachers and students towards teaching and learning of Mathematics as well as the reasons behind the attitudes. Given the importance of Mathematics as a core subject that is taught in secondary school curriculum, it is necessary to focus on examining the attitudes of the teachers and students in teaching/learning of the subject. Therefore, this study was designed to analyze the attitudes of teachers and students towards teaching and learning of Mathematics in order to determine the strategies that may enhance better performance in the subject in Kisii Central Sub-County.

### **1.3 Purpose of the Study**

The purpose of this study was to investigate the attitudes of teachers and students towards teaching and learning of Mathematics in secondary schools in Kisii Central Sub-County.

### **1.4 Objectives of the Study**

The specific objectives of the study were to:

- (i) Determine the status of attitudes of teachers and students towards teaching/learning of Mathematics.
- (ii) Determine reasons for attitudes of teachers and students towards teaching/learning of Mathematics.
- (iii) Establish differences in attitude towards teaching and learning of Mathematics between teachers and students.
- (iv) Establish ways of enhancing attitudes of teachers and students towards teaching/learning of Mathematics.



## **1.5 Research Questions**

The following were the research questions:

- (i) What is the status of attitude of teachers and students towards teaching/learning of Mathematics?
- (ii) What are the reasons for attitudes of teachers and students towards teaching/learning of Mathematics?
- (iii) What differences in attitude might be between teachers and students towards teaching/learning of Mathematics?
- (iv) What strategies can be used to enhance attitudes of teachers and students towards teaching/learning of Mathematics?

## **1.6 Assumptions of the Study**

The following were the assumptions of the study:

- (a) The respondents provided accurate and honest responses to the questionnaire.
- (b) The students in form four had learned the same amount of content of Mathematics as prescribed by Kenya Institute of Education (KIE) syllabus for Mathematics.
- (c) All teachers who were sampled were trained and had good mastery of subject content and teaching strategies.

## **1.7 Scope of the Study**

The study was carried out within the secondary schools in Kisii Central Sub-County. Only form four students participated in this study since they had studied for four years at the secondary schools and so were likely to have fairly formed attitudes compared to their colleagues in the lower forms. It was expected that they had completed the syllabus and thus well acquainted with

its objectives, content, methods and evaluation strategies. Teachers too, who taught form four Mathematics were part of this study since they handled these students under study.

### **1.8 Limitations of the Study**

Use of closed ended questionnaire for data collection may lead to floor and ceiling effect. This is due to the fact that the respondents may respond to some questions giving scores that may be difficult to measure the true extent of high-scoring or low-scoring on the test item content. The respondents may also form a tendency to inflate or deflate their responses to the questions in a way that they feel is desirable to them. This was reduced by inclusion of open ended items in the questionnaire that provided respondents with an opportunity to explain the answers further.

### **1.9 Conceptual Framework**

In this study the dependent variable is teaching/learning while independent variable is attitude. Attitude is one of the factors influencing teaching/learning. Its formation is a complex area based on various dynamics as outlined by Albert Bandura (1976). According to Bandura's social learning theory as cited by Pajares and Schunk (2001). The theory attempts to tackle the forces that influence one to behave in a certain way, in this case the influences that change the learners' and teachers' attitudes to be either positive or negative towards Mathematics. The theory further point out that human behavior is due to a reciprocal determinism that involves behavioral, cognitive, and environmental factors. Contemporary psychologists agree that attitudes are vital due to the fact that they act as directive factors in daily endeavours of mankind. Jung (2006) asserts that the basic work of attitudes is to give some form of organization of the universe we live in. Moreover, they act as standards that assist human beings to understand the world. Both the students and teachers will always form certain opinions in regard to the tasks ahead of them.

Mathematics may therefore be viewed either negatively or positively and this will determine the level of success in the task to be undertaken.

According to social cognitive theory, self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment (Pajares, 2009). Unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties. These self-perceptions touch virtually every aspect of people's lives whether they think productively, pessimistically or optimistically; how well they motivate themselves and persevere in the face of adversities; their vulnerability to stress and depression; and the life choices they make. Self-efficacy is also a critical determinant of the self-regulatory practices in which individuals engage as they go about the important task of self-correcting their actions and cognitions.

Many studies have shown that there is a positive and significant correlation between self-efficacy with academic achievements (Vorgt, 2008; Purzer, 2011; Pampaka et al., 2011; Louis & Mistele, 2011; and Jones et al., 2010). These studies have shown that regardless of age, gender, domains, disciplines and countries, a student with higher sense of self-efficacy will achieve better academic performance. For instance, in a research done in the United States, Louis and Mistele (2011) observed that although there were differences in level of self-efficacy by gender in young adolescents taking Mathematics and Science, self-efficacy is still found to be a good predictor of the achievement scores.

Understanding the mechanisms in Bandura's theory that determine perceived self-efficacy judgment is important. Pillai et al. (2011) pointed that general self-efficacy is positively related to the abilities of individuals and the motivation of individuals. Hence attitude a person has is

likely to influence the way one will perceive the objectives, content, methods and even evaluation strategies used in Mathematics. Teachers with high instructional self-efficacy are more likely to develop classrooms with mastery goal structures; focused on learning and improvement (Wolters & Daugherty, 2007). They view difficult students as reachable, and regard classroom problems as surmountable by inventiveness and extra effort. The methods and techniques applied when teaching Mathematics and evaluation strategies will be guided by self-efficacy. The same belief will also apply to students on how they select what to understand in content that is being taught by a teacher in class.

To understand Bandura’s learning theory in regard to the teaching and learning of Mathematics in secondary schools conceptual framework was developed by the researcher. The relationship between attitude and teaching/learning is shown in Figure 1 below.

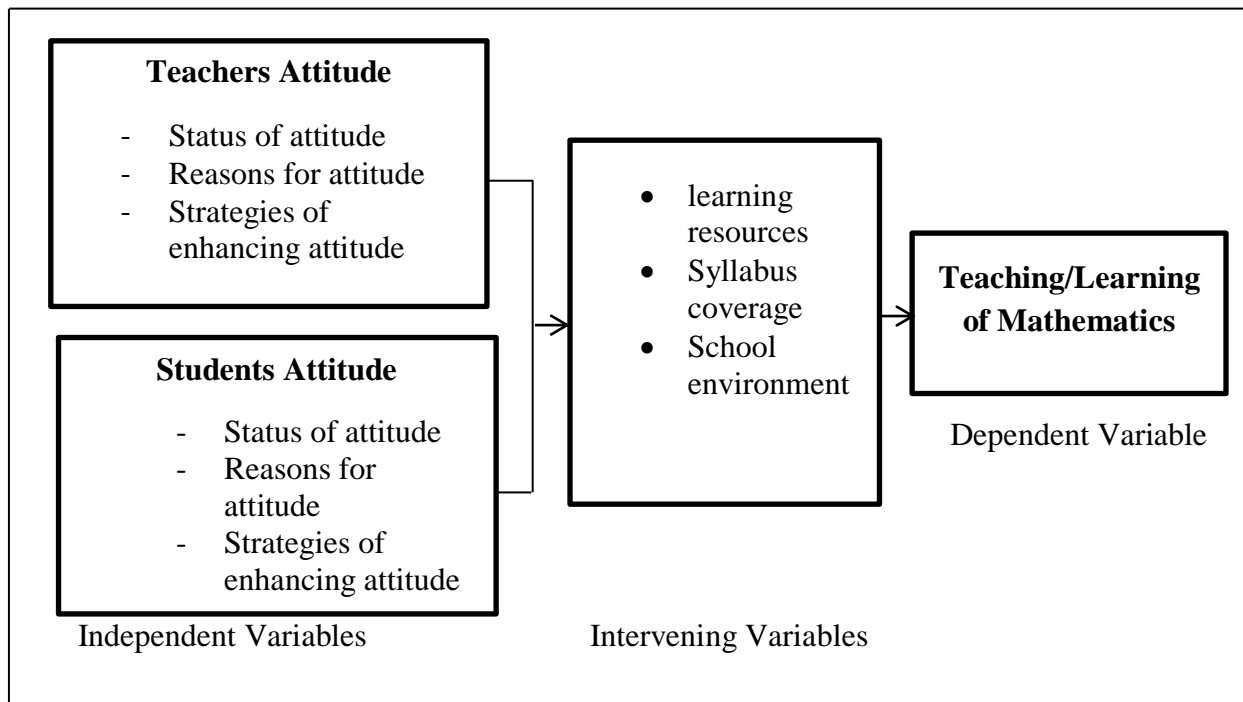


Figure 1: Conceptual Framework

(Source: Researcher)

Figure 1 shows independent variable (attitudes of teachers and students) and dependent variable (teaching/learning). Teaching and learning process may also be affected by other factors such as learning resources, school environment and syllabus coverage among others. This study sought to find out the status of attitudes held by teachers and students in the process of teaching/learning of Mathematics in secondary schools in Kisii central Sub-county. It also sought to find out the reasons for such attitudes of both the teachers and students and attempted to come up with strategies that would be put in place to promote effective teaching and learning of Mathematics.

In the process of teaching and learning, attitude held by an individual play a critical role in implementation of curriculum in schools. Attitude as a concept is concerned with an individual's way of thinking, acting and behaving. It is formed as result of some kind of experiences one passes through.

#### **1.10 Significance of the Study**

The findings of this study might assist educational stake-holders such as the Ministry of Education, Kenya Education Management Institute, schools administration and parents in the following ways:

- i. To consider the implication of attitudes of teachers and students towards teaching/learning of Mathematics in the process of delivery of Mathematics in secondary schools.
- ii. The findings of this study might also act a basis for further research on other issues affecting the implementation of Mathematics in secondary schools.
- iii. It might also assist curriculum developers to check on content delivery to students in Mathematics and make adjustments where necessary.

- iv. The findings on attitude might inform all stake-holders the challenges Mathematics face in its smooth implementation in secondary schools.

### **1.11 Definition of Terms**

Key terms used in this study are defined as follows.

**Attitude** in this study will refer to student's and teachers' inclination towards Mathematics, which may be either positive or negative.

**Curriculum Elements** refers to the four components of the curriculum including objectives, content, methods and evaluation.

**Mathematics** refers to a program of instruction which clearly states the objective, content, methods and evaluation strategies of Mathematics.

**Negative Attitude** refers to students' or teachers' emotional disposition towards 'disliking' Mathematics.

**Positive Attitude** refers to students' or teachers' emotional disposition towards 'liking' Mathematics.

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1 Status of Attitudes of Teachers and Students towards teaching and learning of Mathematics**

Attitudes can be viewed as more or less positive. A positive attitude towards Mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards Mathematics relates to a negative emotional disposition (Zan & Martino, 2008). These emotional dispositions have an effect on an individual's behavior, as one is likely to achieve good grades in a subject that one enjoys, has confidence in or finds useful (Eshun, 2004). For this reason positive attitudes towards Mathematics are desirable since they may influence one's willingness to learn and also the benefits one can derive from Mathematics instructions. Similarly, Nicolaidou and Philippou (2003) observed that negative attitudes are the result of regular and repeated failures when dealing with Mathematical tasks and these negative attitudes may become relatively permanent. According to these authors when children first go to school, they normally have positive attitudes towards Mathematics. However, as they progress their attitudes becomes less positive and frequently become negative at high school. This study was done in elementary school in 5<sup>th</sup> grade on pupils' attitude towards Mathematics in relation to achievement while the current study focused on attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools.

Mattern and Schau (2002) assert that positive attitude towards a subject is related positively to performance. In support, Olatoye (2001) in a study carried out in Nigeria found out that students' attitude towards a subject has a significant direct effect on students' achievement in a subject.

Students get motivated to learn various Mathematics skills that are being taught in class by teachers while young. However, with time the attitude may start to change negatively as they grow. Research done in the USA by Noyce (2001); Sunal and Whitaker (2001) point out that, most children enter school ready to learn and with positive attitudes towards Mathematics. However, those positive attitudes may with time turn negative as they see themselves poor learners in Mathematics. The pressure exercised on students to cope with highly demanding tasks, often at a pace beyond their ambition, together with unimaginative instruction will discourage some of them as their attitude changes towards Mathematics. There is need to establish how attitude towards teaching/learning of Mathematics affect achievement of learners in the Kenya since the above studies were done elsewhere.

Research done by some key stakeholders in Kenya (Nui & Wahome, 2006) in secondary education, has shown that consistent failure in Mathematics and Sciences may be attributed to attitudes of students and teachers have towards the subjects. Based on this research, it means attitude is a key component that influences performance. In agreement to this Monoah, Indoshi and Othuon (2011) in their study observed that attitudes play a critical role in students' performance. Students with positive attitude tend to perform well in an exam which is an indicator that it is a very essential element in learning of Mathematics. The role of attitude from these literature shows that it is one of key factor in determining how well a curriculum is implemented in learning institutions and in particular Mathematics subject.

The above discussion shows that attitude plays a great role in determining the level of performance in schools. Manoah, Indoshi and Othuon (2011) looked at attitudes of learners while ignoring the attitudes of the teachers towards teaching of Mathematics. Other studies like (Noyce 2001; Olatoye 2001; Sunal & Whitaker 2001) were done outside Kenya and may not



reflect the actual state in the Kenyan situation. This study therefore focused to establish status of attitudes of teachers and students towards teaching/learning of Mathematics in totality. Effective implementation of a curriculum can only take place if the consumers and implementers have positive attitude towards all the four elements of the curriculum. This fact made it necessary to conduct the study with a focus on the attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools.

### **2.1.1 Attitude towards Mathematics Objectives**

Mathematical achievement has been identified as a critical component to lives of children and adults living in the 21<sup>st</sup> Century successfully (Kilpatrick, Swafford & Findell, 2001). This kind of success can only be attained when the attitude of students and teachers towards the subject is positive. Kamau and Ndiith (2004) study on performance in Mathematics and Sciences in K.C.S.E national examinations established that performance in Mathematics and Sciences had remained generally poor compared to other subjects and reasons advanced to this scenario was attributed to attitudes held by both teachers and students. Their study was covering general factors that were affecting performance in Science subjects. The current study focused on specifically on attitudes of both teachers and students towards teaching/learning of Mathematics unlike above study that covered all the factors affecting performance.

A study carried out by SMASSE (1998) also indicated that most teachers lacked clear vision on the set objectives in Mathematics and Sciences. The perception of the teachers towards objectives may affect the level of the achievement of a lesson that is being presented in class. However, the study done by SMASSE looked at the way teachers view objectives of Mathematics without examining the attitude of those teachers towards the said objectives and the manner in which they deliver the lessons in class. This is supported by Kemp (1986) who asserts

that for curriculum planning to be rational, it must start with clear and specific aims and objectives, and then, address it to discovering the means, the content and methods in terms of which the objectives are to be achieved. Since curriculum is implemented by teachers, they ought to be clear on what to be achieved at the end of the lesson.

### **2.1.2 Attitude towards Mathematics Content**

The intention of curriculum developers at the Kenya Institute of Education (KIE) is to develop secondary schools Mathematics syllabus that will help students become numerate, accurate and precise in thought KIE (2002). This is in line with National Goals of Education of Kenya KIE (2002). As much as this could be a noble desire of curriculum developers, a learner may complete secondary school education without necessarily being numerate, accurate and precise in thought. SMASSE (1998) attributes poor learning and consequently poor performance in Mathematics to teachers reinforcing negative attitudes towards the subject among the students. The teachers may knowingly or unknowingly depict high achievers as the probable achievers in Mathematics examinations but low-attainers to be the automatic failures in examinations and they show it openly Wasiche (2006). This may create a negative attitude towards the subject among the low achievers, who may not learn the subject effectively.

Chitwa and Njunge (2004) study on content coverage in secondary schools found out that content coverage was poor while teaching was not up to learners' level leading to low performance of students in K.C.S.E. Similarly, Bashora (2004) study on the content in secondary schools in Gucha Sub-County, many teachers still struggle with the whole question on whether it was the process or content that was important for effective learning. This leads to the formation of attitude on the content on the side of the teachers which eventually affect the perception they

will be having towards the subject. The study further showed that experiments were shallow with teachers concentrating on completing the syllabus at the expense of students' understanding of concepts. In this study it can be seen that the attitude formed by teachers on the content may have a direct impact in the manner in which one handles a given content when presenting it in class. Further, Bashore (2004) study was done basing on how Science teachers perform experiments for the learners only aiming at final results instead of involving the entire class in each stage when performing those experiments. The current study was looking at the content of Mathematics specifically and possible attitudes teachers and students hold in regard to content.

According to Ball (2003), a teacher with good mathematical pedagogical content knowledge can break down knowledge into less polished and abstract forms, thus making it accessible to students who are at different cognitive levels. Through this, interest is created making learners to enjoy the content presented to them and at the same time it may influence a change of attitude as they get attracted to the presentation.

The Report of the Commission of Inquiry into the Education System of Kenya (Republic of Kenya, 1999) expressed similar sentiments. It suggested the revision of some of the subjects' content and reducing the number of examinable subjects in the KCSE examination. Furthermore, the Commission cited the integration of some topics within a given subject as reasons for overcrowding of the curriculum especially the Mathematics. It therefore recommended revision of the secondary school curriculum with view of removing inappropriate content thus making all the subjects manageable. This would reduce the work load and at the same time it could promote the attitude of teachers and students since the content would be manageable. In this report, they looked at the content coverage by learners while in this study the researcher sought to find out the attitudes of teachers and students have towards Mathematics content.

### **2.1.3 Attitude towards Mathematics Methods**

Studies in the area of Mathematics have shown that instruction, especially at the secondary school level remains overwhelmingly teacher-centered, with greater emphasis being placed on lecturing and textbook than on helping students to think critically across subject area and applying their skills of reading in discovering on their own new knowledge (Butty, 2001). This is because some instructors believe that lessons should be teacher-centered, where the teacher is the expert and the authority in presenting information. Others take a learner-centered approach, viewing their role as more of a facilitator of student's learning ignoring collective participation in the process of learning/teaching (Ahmad & Aziz, 2009). Teachers should allow participatory approach while teaching in class to make learning interesting.

Students may express liking or disliking of Mathematics depending on the manner in which the content is delivered. This is because learners' attitudes are influenced by the teaching methods their teachers employ in the class (Duatpe-Paksu & Ubuz, 2009). They naturally form a given attitude on the subject that eventually determines the levels of success in that particular course. Balozi and Njunge (2004) carried out a study on teaching methodology in secondary schools and explained that, teaching and learning of Sciences and Mathematics had been subject of debate for a long time. Attitude being one of the key components that determines proper implementation of curriculum, the debate centered on the teaching approach and methodology is important. They observed that one particular method that brings some dislike of the subject was traditional or teacher centered methods of teaching which results in learners not enjoying lessons and missing the benefits of discovering what they know on their own. This has led to the low achievement in examinations. In support, Ng'ong'ah (2002) in his study observes that Kenya school leavers continue to perform poorly in English due to poor teaching methods or strategies. However, this

study was done in language while the current study is on Mathematics and focused on attitudes of teachers and students on methods applied in the process of teaching/learning.

Sentiments echoed by SMASSE (1998) observed that some Mathematics and Science teachers are still using lecture methods and students are given rigidly formulated statements, which they have to memorize and regurgitate when required to do so by the teacher. In addition, little or no emphasis is placed on understanding. This makes learners unable to conceptualize what is being taught in class and may lead to the formation of negative attitude towards the subject. On the other hand, Duatepe-Paksu and Ubuz (2009) study on 102 seventh grade students from a public school in Turkey were engaged in either a drama-based instruction or non drama-based instruction. The results showed that the drama-based instruction had a significant effect on students' achievement compared to results from the control group. Also, students' attitudes towards geometry and Mathematics in general significantly improved through the use of drama-based instruction. This study based on students' use of drama-based methods of instruction to learn geometry and the attitude learners formed while using the method which showed learning was made easier and their attitude improved while the present study sought to find out the attitudes of both the teachers and students have towards various methods in teaching/learning of Mathematics in secondary schools in Kisii Central Sub-County.

#### **2.1.4 Attitude towards Mathematics Evaluation Strategies**

Assessment is arguably the most powerful element in teaching and learning. It is a key component in Mathematics and it requires both the students and teachers to view it positively. It also important that when performing evaluation all aspects in behavioural, affective and psychomotor domains are assessed in overall evaluation process which has been supported by

Brown, Oke and Brown (1992). However, Nyanjom (2007) in a study on career guidance and implication for the curriculum in secondary schools in Kisumu Sub-County, found out that the curriculum was examination oriented and ignored practical approach and evaluation as it only tested on memorization and ignored high order cognitive skills such as reasoning and problem solving which the employees needed most. A similar study done on English by Ng'ong'ah (2002) also observes that the English syllabus was silent on assessment of individual learners' achievements at every level and does not give direction on what should be done with the assessment results. It is clear from the above studies that evaluation should take into account all aspects of behavioural, affective and psychomotor domain when assessing. However, the studies of Nyanjom and Ng'ong'ah were done in different fields while the current study focused at Mathematics.

Siringi (2009b) notes that in a study conducted by Synovate under its Research Club of Kenya Project indicated that most secondary school students feel that some subjects taught are irrelevant and laid too much emphasis on examinations. As such, students want the 8-4-4 system reviewed to make it more relevant and learner-focused. The survey sampled 1500 students from 10 schools in Kenya. Also the study done by Ng'ong'ah (2002) covered English subject in the secondary curriculum. The current study specifically sought to find out the attitude teachers and students have towards teaching/learning of Mathematics in secondary schools in Kisii Central Sub-County.

## **2.2 Reasons for Attitude of teachers and students towards teaching/learning of Mathematics**

The competence gain in the study of Mathematics is widely used in all spheres of human life hence necessary for learners when selecting future careers. Mathematics plays a key role in shaping how individuals deal with the various spheres of private, social, and civil life (Anthony & Walshaw, 2009). This justifies the compulsory of the study of the subject by all students who go through basic and secondary education.

Various reasons may be attributed to the causes of differences in attitude towards Mathematics as a subject. One of this is anxiety which is a condition in students that usually make them experience negative reactions to mathematical concepts as identified by Cates and Rhymer (2003). The study found out that when students react negatively to what is being taught in class their understanding level is greatly reduced. Anxious people may avoid Mathematics classes, may be more likely to have negative attitudes to Mathematics related activities, or if they become elementary teachers, may not spend as much time teaching Mathematics as their less anxious colleagues (Ho, et al., 2000). Further, it is believed that lack of confidence when working in mathematical situations as described by Stuart (2000) may be the cause of Mathematics anxiety. Highly Mathematics anxious people will be less fluent in computation, less knowledgeable about the subject, and less likely to have discovered special techniques and relationships within the Mathematics domain. However, Burks, et al. (2009) asserted that teachers' beliefs about Mathematics such as the usefulness of Mathematics, the way Mathematics should be learned, the difficulty or ease of Mathematics, as well as gender ability and beliefs also affect their attitude towards the subject and impact on students' performance.

In Kenya, the intention of curriculum developers at the Kenya Institute of Education (KIE) is to develop secondary schools Mathematics syllabus that will help students acquire knowledge and skills for further education and training (KIE, 2002). This is in line with National Goals of Education of Kenya. As much as this could be a noble desire of curriculum developers, a student may complete secondary school education without having acquired necessary skills and knowledge that may enable such a learner to join a good career upon completion of secondary education. One of the factors that may lead to this scenario is the teacher's role which is inspiring learners to have positive attitude towards a subject being taught. Orado (2008) teachers are said to be effective when their teaching lead to students' learning. Nothing has been taught until it has been learnt and this happens when the teacher succeeds in causing a change in behavior in the learner. It is therefore important that the teacher must see teaching as an attempt to transfer skills and knowledge to the learner.

Teachers act as role models whose behaviours are easily copied by students. However, many teachers seldom realize that how they teach, how they behave and how they interact with learners can be more paramount than what they teach (Yara, 2009). Kuranchie, et al. (2013) observed that teachers with positive attitude towards Mathematics was significantly related to high achievement in learners on the study carried out to find out how teachers' attitude contributed their academic performance. The study further revealed that students with committed teachers had the courage and determination to face difficulties in school life. Burks, et al. (2009) also observed that teachers' exhibition of self confidence when teaching Mathematics motivates students through creating interest and promoting better results in the subject.

Attitude can also be gender related. There are many who hold the view that boys do better in Mathematics than girls. This belief tends to affect the attitude of girls towards Mathematics.



Farooq and Shah (2008) in a study of secondary school students in Pakistan found that there was no significant difference in confidence of male and female students towards Mathematics at secondary school level. They rather found that students' success in Mathematics depended on attitude towards the subject. However, some studies have found gender difference in students' confidence in Mathematics. Compared to boys, girls lacked confidence, perceived Mathematics as a male domain and were anxious about Mathematics (Casey, Nuttal & Pezaris, 2001). In the study, girls were found to have lower self-confidence in Mathematics than boys.

In Botswana as reported by Kaino and Salani (2001) indicate the cultural expectations of the society could result in differences in performance between boys and girls in certain school subjects such as Mathematics. The study showed that a cultural expectation has an influence in determining the perception of different roles that should be done by either gender. This argument has been equally supported by Bassey, Joshua and Asim (2007) in Nigeria where males are regarded to be superior to girls in schools particularly in Mathematics and Sciences.

Teachers' attitude towards teaching may be as result of some joining the profession as a last resort after failing to join first choice of their career in the university. There is evidence that people may choose to teach because of the lack of other employment options. Bennell (2004) indicates that teaching has become employment of the last resort among university graduates and secondary school leavers. Consequently, teachers often lack a strong, long term commitment to teaching as a vocation. In Kenya, the teaching profession is perceived negatively by many people. This is because the students who join the profession are mostly those who failed to secure the more prestigious careers like medicine and engineering (Taaliu, 2010). This kind of scenario may contribute to the attitude a teacher may hold while teaching.

The study done by Farooq and Shah (2008) showed that gender difference may contribute to the attitude held by boys and girls while learning in school. Kaino and Salani (2001) on cultural expectation the society hold towards the achievement of boys and girls may also have an impact on the performance of learners in school. These studies mentioned were done in different countries while the current study was done in Kenya. Further, study done on teachers' motivation level to teach by Taaliu (2010) showed that some teachers chose to become teachers as a last resort hence they may be holding some attitudes that affect their performance to deliver since teaching was not their first choice in career selection. The current study sought to determine if there existed specific attitudinal reasons by teachers and students that might be hindering better performance of Mathematics in the process of teaching and learning in secondary schools in Kisii Central Sub-County.

### **2.3 Differences in attitude between Teachers and Students towards teaching/learning of Mathematics**

Attitude is concerned with an individual's way of thinking, acting and behaving. It has been defined as positive or negative emotional disposition (Aiken, 2000). Musau (2002) in a study on language attitudes and their implication for language planning in Kenya noted that there was need to establish through research the kind of attitudes that people held towards learning a language. He further pointed that by the mere fact that Kiswahili is taught as a compulsory subject in Kenyan schools, it does not guarantee positive attitude towards it. The current study sought to establish the differences in attitudes between teachers and students towards teaching and learning of Mathematics.

The teachers' attitude towards teaching of Mathematics has an effect on the nature of the attitude learners are going to form in school. The relationship between the teacher and a student should be good for better teaching/learning to take place (Schenkel, 2009). The underlying basis for interaction is that students have come to school to be taught. Ediger and Rao (2000) points out that those students need to experience teachers who possess ample knowledge of the subject matter as well as methods of teaching Mathematics because this will enhance formation of the right attitude by learners in the course of studying in school.

Pidgeon (2000) posited that students' conception of their own capabilities influenced their performance in school academics. If students are led to believe that they are capable of very little, this low expectation of themselves will make them have little self motivation and will in fact affect their academic achievement. In a study on motivating language learners, Chamber (2005) noted that learning occurred more easily, when the student had a positive attitude towards language and learning.

The teachers' attitude reinforces the attitudes formed by the learners towards learning of new concepts (Mutai, 2007). A teacher's way of perceiving at issues generally and in particular, mathematical concepts influences the learner. A student would like to learn a new concept depending on how the teacher presents it. In support Aduda (2005) found that teachers' attitude towards Mathematics teaching is one of the prime contributors towards explaining the variance in students' cognitive achievement. Mutahi (2008) confirmed that teachers' attitude towards Integrated Science teaching affect their students' attitude to and achievement in the subject. Similarly Balozzi (2004) found significant causal relationship between the teachers' attitude and students' achievement in Integrated Science.

Studies confirm that emotional responses towards Mathematics that are found in the teachers include like and dislike of Mathematics, anxiety associated with Mathematics and self-confidence in relation to Mathematics (Brady & Bowd, 2005; Henderson & Rodingues, 2008). These emotional factors have an impact on learners' performance. In their study of teachers' self-esteem connected to Mathematics, Henderson and Rodingues (2008) found that approximately half of the participating pre-service teachers some of whom were well qualified lacked self-esteem in relation to Mathematics. For learning to take place a teacher should be well composed with confidence. In support, Burk et al. (2009) point that teachers' exhibition of self-confidence when teaching Mathematics motivate learners leading to better performance.

Teachers with positive attitude towards Mathematics significantly relate to high achievement of the learners (Leoni & Ratliff, 2009). Kuranchie, et al. (2013) studied how the teachers' attitude contributed to learners' academic achievement and behavior. The study revealed that learners taught by devoted teachers performed well in class work. The study also disclosed that learners taught by devoted teachers had the courage and determination to face difficulties in school life. However, this study looked at the attitude of the teacher in relation to the teaching of Mathematics and study done by Musau (2002) and Chamber (2005) looked specifically on languages. The current study aimed at establishing differences in attitudes of teachers and students towards teaching/learning of Mathematics.

#### **2.4 Strategies for Enhancing Attitudes of Teachers and Students towards Teaching/Learning of Mathematics**

High achievement in Mathematics requires strategies to be put in place that will enhance results in the country and in particular Kisii Central Sub-County. Okoth (2002) explains that academic

difficulties involving lack of organization in the study habits by the learners and effective use of time may be symptoms of some psychological stress. This could be due to practical results of inadequacy of schools in teaching students how best they as individuals may learn. This may also result from inability to read quickly and sensibly, read notes or they may rise from a combination of both.

It is believed that when the learner exhibits the expected behaviour or response, the value attached determines very significantly the effectiveness of the learning processes in any aspect of education. Kibe, et al. (2008) stipulates that for teaching and learning of science to be interesting and stimulating, there has to be motivation on the part of both the teacher and the learner so as to ensure the development of positive attitude and subsequently maximum academic achievement. Popham (2005) asserts that students' attitudes or interests should be enormously important to teachers, because affective dispositions are powerful predictors of students' subsequent behaviour. In a similar study, Erdogan, et al. (2008) found that there is a positive relationship between students' attitudes towards modern learning technologies and their academic achievement. Academic achievement increases with the use of modern technologies positively. There is a strong association between individuals' attitudes towards education and their academic performance and commitment. Students who have negative attitudes towards education activities are found to exhibit challenging behaviour including anti-social and off-task behaviour (Awang, et al., 2013). All these studies put emphasis on need to consider learners' response to learning which the teacher should focus to ensure maximum attainment for concepts taught in class. Moreover, the studies done above did not study specifically Mathematics subject for their findings.

Teachers should also provide immediate feedback to the learners since it is one way of motivating them. Feedback is seen to be essential for improving both teaching and learning (Assessment Reform Group, 2002). Feedback is the information that is conveyed orally, in writing or as a question that causes students to reflect on their actions (Hattie & Timperly, 2007). This tends to assist learners to figure out what needs improvement and how to improve on it (Black, Harrison, Lee & William, 2003). Feedback is also seen to influence learning in that it provides an opportunity to learners to know what they need to do in order to excel. Alavi and Kaivanpanah (2007) investigated how English language learners perceived teacher's feedback when committing oral mistakes. They found that feedback influences learning as it assists learners correct the errors they make in speech. The above study focused on strategy of improving performance in English through feedback on oral mistakes committed by learners while the current study aimed at finding of strategies of enhancing attitude of teachers and students towards teaching/learning of Mathematics in secondary schools.

Counseling of the learners in school is essential in tackling challenges they may be experiencing in the process of learning. According to Okoth (2002) points out that if inability to study has psychological origins, it may be helped by counseling or psychotherapy while if the students' inability to study arises from ineffective study habits, then the guidance counselor may be able to help the student in practical way by organizing together individual study patterns. This is very important because a student needs guidance and counseling in the manner they perceive Mathematics in school and aspirations in future life (Rao, 1997). However, guidance and counseling in most schools is lacking, hence there has been a lot of peer and cultural influence which are negative towards Mathematics and sciences.

Research suggests that greater teacher content knowledge is a contributing factor to increased student learning (Ball, Hill & Bass, 2005). Teachers in Asian countries have stronger mathematics knowledge and more training, on average, than teachers in the United States, and students in Asian countries typically perform better than students in the U.S. on International Math Assessments (Ball, 2003). Moreover, a successful Mathematics teacher needs also to have a deep understanding of Mathematics content to create mathematically rich task structures and to adapt to meet the needs of individual students (Siegel, 2004)

Findings from the international comparative literature highlight pedagogical differences that seem to impact students' Mathematics learning. In Asian countries teachers tend to assign students to do richer mathematical tasks. While in Japan, lessons follow a structure where students try something out; a teacher provides direct instruction on that challenge; the students work on the problem again (often as a whole class) and the lesson ends with a review of the concepts covered (Siegel, 2004). In this structure, Asian teachers have the opportunity to explicitly point students to critical concepts, use student errors to better explain math reasoning while in Japan learners are able to come up with their own discovery on the concepts be taught.

Mattern and Schau (2002) noted out that positive attitude towards a subject is positively related to better performance. In agreement, Olatoye (2001) study on school factors as determinants in Science achievement found that students' attitude towards a subject had significant on students' achievement in the subject. This means that the nature of attitude a student holds towards the subject influence the level of achievement in it. A study on Nigeria students learning Science by Adesokan (2002) observed that in in spite of the recognition given to a subject, it was evident that students still showed negative attitude towards the subject thereby leading to poor performance and low enrolments. Similarly, Adebeye (2006) observed that learners who

performed well in a subject generally had positive attitudes towards that subject and those who had negative attitudes seemed to perform poorly in the subject. Studies done by Adesokan (2002) and Adebeye (2006) focused on attitudes of learners towards a subject and both of them were conducted outside Kenya. While on the other hand, the study by Olatoye (2001) on school factors which showed they significantly influenced students' achievement, the study was also conducted in Nigeria. The findings of these studies may not be generalized to Kenyan situation. The current study sought to establish strategies of enhancing attitudes of teachers and students in teaching/learning of Mathematics in secondary schools.

Presentations of various concepts of Mathematics in class by the teacher will also influence the learners' understanding in class. Yara (2009) asserts that teachers with positive attitude towards Mathematics are likely to stimulate favorable attitude in their learners. Thus, this will motivate the pupils in class to try to master the content being taught and in turn learning of Mathematics may be enhanced. Similarly, Njuguna (2005) observed that the success of Science lesson taught in class depends greatly on the classroom teacher as he is the one that synthesizes, translates and disseminate all required details. A study done in Kenya by Achieng (2006) on effect of teacher characteristics on teaching of Mathematics in public secondary schools found that there was positive relationship on teachers' attitude and learners' achievement. The study done above by Njuguna explored some of the aspect that contributes achievement in a subject in teaching and learning in schools. However, this study did not specifically focus on attitude of teachers and students and how to enhance those attitudes for better achievement. Therefore, this study sought to find out the strategies to enhance positive attitude towards teaching/learning of Mathematics in secondary schools in Kisii Central Sub-County.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Research Design**

A descriptive survey design was used in this study. A descriptive survey design was adopted because the study sought to establish a detailed description of the current attitudes held by teachers and students towards teaching/learning of Mathematics in secondary schools in Kisii Central Sub-County. Mugenda and Mugenda (2003) note that survey research seeks to obtain information that describes existing phenomena by asking individuals about their attitude and behavior. Gay (1992) asserts that descriptive survey design involves data collection in order to answer questions concerning the status of the subject of study. The design was preferred for this study because of its appropriateness of the educational fact-finding as it yields accurate information.

#### **3.2 Study Area**

The study area was Kisii Central Sub-County in Kenya. The area covers a surface area of 123.7 square kilometers, and lies between Latitude  $0^{\circ}30'$  and  $0^{\circ}58'$  South and Longitude  $34^{\circ}42'$  and  $35^{\circ}05'$  East (Republic of Kenya, 2002). The Sub-County is estimated to have a total population of 252153. It has three divisions in total: Keumbu, Kiogoro and Township. It borders Marani, Kisii South, Manga, Masaba and Gucha Sub-Counties. The economic activity in this Sub-County on average is mixed farming. There are fifty two secondary schools in the Sub-County having classes from form one to four. The student population stands at 18918. There are 714 teachers in total (Kisii Central Sub-County Office, Statistics Department, 2013).

The choice of Kisii Central Sub-county was because in the comparison of performance in key subjects taught in secondary schools curriculum Mathematics and Sciences, Mathematics had performed poorly as shown in Table 1. The researcher was interested in examining attitudes of teachers and students towards teaching/learning of Mathematics in the sub-county. Most students in secondary schools in Kisii Central Sub-County have posted poor results in Mathematics subject in the past seven years, attaining mean scores of 2.62, 2.57, 2.68, 3.35, 3.68, 3.13 and 3.55 from 2006 to 2012 respectively. The choice of the sub-county was also because of familiarity of the locality to the researcher. This made it easier to establish a rapport with the respondents hence making data collection effective. The map showing the location of Kisii Central Sub-County is attached as Appendix VIII.

### **3.3 Study Population**

The study population consisted of 64 form four Mathematics teachers, 52 Head of Mathematics Department and 2080 form four students of 2013 from 52 secondary schools in Kisii Central Sub-County (Kisii Central Sub-County Education Office, Statistics Department, 2013).

### **3.4 Sample and Sampling Techniques**

Saturation sampling technique was used to select a sample of 57 form four Mathematics teachers from a population of 64 form four Mathematics teachers after using 10% of the population for pilot study. Simple random sampling technique was used to select 17 Heads of Mathematics department. This translated into one third of the population which was representative of the population under study (Gall, Borg & Gall, 2007). Krejcie and Morgan (1970) formula was used to select a sample of 327 form four students of which stratified sampling technique was used to select 168 females and 159 males. The sample estimation table is attached as Appendix VI.

The sample sizes for the study are given in Table 2.

**Table 2: Population and Sample Frame**

Category	Population (N)	Sample (n)	Percentage (%)
Mathematics Teachers	64	57	90
Heads of Department	52	17	33
Form Four Students	2080	327 (168 Females, 159 Males)	16

Source: Kisii Central Sub-County Education Office (2013).

### **3.5 Instruments of Data Collection**

The instruments that were used in data collection were questionnaire for students and Mathematics teachers and interview schedule for Heads of Department of Mathematics.

#### **3.5.1 Students' Questionnaire**

The students' questionnaire collected data concerning their attitudes towards learning of Mathematics in relation to its objectives, content, methods and evaluation. It contained four sections. Section A solicited students' general information. Section B sought information related to reasons for showing attitude towards learning of Mathematics. Section C sought information about their attitude towards Mathematics objectives (1-10), Content (11-20), Methods (21-30) and Evaluation Strategies (31-40). Section D sought information about strategies of improving learning of Mathematics. Questionnaire is attached as Appendix I.

### **3.5.2 Teachers' Questionnaire**

The teachers' questionnaire collected data concerning teachers' attitude towards teaching of Mathematics. It contained four sections. Section A sought background information, Section B sought reasons for attitude towards teaching of Mathematics, Section C sought information about their attitude towards Mathematics objectives (1-10), Content (11-20), Methods (21-30) and Evaluation Strategies (31-40) and Section D sought information on strategies for enhancing teaching of Mathematics. The Questionnaire is attached as Appendix II.

### **3.5.3 Interview schedule for the Head of Mathematics Department**

Interview schedule for the Heads of Mathematics Department was used to compliment the questionnaire on information regarding to teaching and learning of Mathematics since they are in charge of supervision of all matters relating to T/L of the subject in the school. Interview schedule for HODs was used to collect data on attitudes of teachers and students towards teaching/learning of Mathematics. The Interview Schedule for the HODs Mathematics is attached as Appendix III.

### **3.6 Validity of the Instruments**

Validity is the extent to which a test measures what it is supposed to measure (Kombo & Tromp, 2006). A research instrument is valid if its content is relevant and appropriate to research objectives. Validation of the instruments was done before the commencement of the actual research. The instruments were presented to experts from the Department of Educational Communication, Technology and Curriculum Studies, Maseno University for scrutiny and examination. Their suggestions and recommendations were incorporated thus improved the accuracy of the instruments.

### **3.7 Reliability of the Instruments**

Kombo and Tromp (2006) note that reliability is a measure of how consistent the results from a test are. To determine reliability of research instruments, a pilot study was carried out on 208 form four students, 7 Mathematics teachers and 5 Heads of Mathematics Department in 7 secondary schools to test the effectiveness of the instruments. This was done through test-retest method in order to determine for the internal consistency of the instruments. Hinton-Bayre (2010) notes that in test-retest reliability method, the same test is administered to the same sample on two different occasions to determine internal consistency. The research instruments were given to respondents twice at an interval of two weeks and their results compared. The mean scores of the students and teachers obtained from the attitude scale during the two occasions were separately summed up. Pearson Product Moment Correlation Coefficient was used to measure the magnitude of the relationship of the grand total score obtained during the test – retest process. The resulting value was 0.81 and 0.84 for students' and teachers' questionnaires respectively. This means that the instruments were reliable enough to be used in the actual study. Orodho (2004) observes that a correlation coefficient of about 0.8 is high enough to judge the instruments as reliable for study. Reliability of interview schedule was established through test-retest method to ascertain its consistency when used in collecting data.

### **3.8 Data Collection Procedure**

The researcher sought permission to carry out research study from the School of Graduate Studies, Maseno University. The researcher then sought permission from the sub-county Education Office. On obtaining the permission, the researcher sent letters to heads of the schools he intended to collect data from informing them of his intention. The researcher then made

personal visits to the schools sampled, met the respective head teachers and informed them about the research and arranged for possible dates of data collection. The researcher administered personally the questionnaires and interview schedules and made clarifications when need arose.

### **3.9 Methods of Data Analysis**

Data was coded and organized for analysis using the Statistical Package for Social Sciences (SPSS) data editor. Responses of “undecided” were not considered in this analysis because they denote ambivalence, hence difficult to categorize. The researcher scored the items on attitude towards teaching/learning of Mathematics on a 4-points Likert type scale adapted from Fennema and Scherman Mathematics Attitude Scale (Fennema & Scherman, 1976). A total of forty (40) items were developed to constitute the item pool. In scoring the positively stated items, Strongly Agree (SA) = 4; Agree (A) = 3; Disagree (D) = 2 and Strongly Disagree (SD) = 1. However for the negatively stated items, the scoring was reversed to control for social desirability and the scores assigned as follows: Strongly Agree (SA) = 1; Agree (A) = 2; Disagree (D) = 3; and Strongly Disagree (SD) = 4. The items sought attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools. The scaling choice for the questionnaire was the Likert scale because it allowed the researcher to capture and solicit participants’ attitude about the selected issues on Mathematics. The attitude was categorized as negative or positive. A value below 2.50 was taken to be negative and above 2.50 to be positive. The data on attitude was analyzed by using frequencies, means and percentages.

The t-test was used to determine differences in attitude between teachers and students towards teaching/learning of Mathematics in the study. Qualitative data were organized, categorized, and a report made from the emergent themes. In reporting data from the open-ended items in the

questionnaire, teachers and students were assigned numbers as Mathematics teacher 1 to 57 and HODs of Mathematics 1 to 17 while students were assigned as student 1 to 327. These numbers were used as pseudonyms for confidentiality of the information. Teachers and students were therefore referred to by use of these numbers while reporting the data from open-ended questions.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents the results and discussion of the data collected during the study on attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools in Kisii Central Sub-County. The findings of the study are presented based on the research questions. Each question is addressed based on the data collected from the questionnaire and interview guide. The summaries of the findings are presented in means, frequencies counts, percentages, and inferential statistics using *t*-test.

#### 4.2 Status of Attitude of Teachers and Students towards Teaching/Learning of Mathematics

The attitude of the students and teachers was first determined by adding up the score of each student and teacher for the ten items representing the four elements of Mathematics. The sum was then divided by the number of items to obtain the mean score of each student and teacher for each element. The mean scores for each student and teacher were finally summed up and divided with the total number of students and teachers respectively to obtain the general mean score for each element as shown in Appendix IV. A value below 2.50 was taken to be negative attitude and above 2.50 indicated positive attitude. This was in line with the likert format that was adapted in the questionnaires to establish attitude of teachers and students towards teaching/learning of Mathematics. The findings of attitude of teachers and students towards teaching/learning of Mathematics are presented on Table 3.



**Table 3: Attitude of Teachers and Students towards Teaching/Learning of Mathematics**

<b>Curriculum Elements</b>		<b>Mean Score</b>	<b>Attitude</b>	<b>Key</b>
Objectives	S	3.04	Positive	<b>S-</b> Studen ts
	T	3.37	Positive	
Content	S	2.48	Negative	
	T	3.34	Positive	
Methods	S	2.24	Negative	
	T	2.93	Positive	
Evaluation Strategies	S	2.37	Negative	
	T	3.12	Positive	
<b>Overall</b>	<b>S</b>	<b>2.53</b>	<b>Positive</b>	
	<b>T</b>	<b>3.19</b>	<b>Positive</b>	

**T- Teachers**

From the Table 3 above attitude of students towards objectives was positive with a mean score of 3.04 while other the hand, the attitude of teachers towards objective had a mean score of 3.37 which is also positive. Both students and teachers had positive attitude towards Mathematics objectives as shown on Table 3 above, however, the results of KCSE has not been impressive. During the interview with the HODs on their opinion on regard to Mathematics teachers' understanding of the Mathematics syllabus objectives. Five HODs said that the teachers' understanding of the objectives of the syllabus for Mathematics was good. The intention of curriculum developers at the Kenya Institute of Education (KIE) is to develop secondary schools Mathematics syllabus that will help students become numerate, accurate and precise in thought KIE (2002). This is in line with National Goals of Education of Kenya KIE (2002). As much as

this could be a noble desire of curriculum developers, a student may complete his/her secondary school education without necessarily being numerate, accurate and precise in thought. This could be due to the fact that some learners perceive the subject negatively because of attitude. Again fear of future failure or experience of past failure in Mathematics is also a serious problem working against Mathematics education. For instance, academic problems identified affecting teaching and learning of Mathematics in Nigeria secondary schools included fear and poor attitude toward Mathematics among others (Adebule, 2004). The above study was done in Nigeria and looked at factors affecting achievement of Mathematics while the current study focused specifically on attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools in Kisii Sub-county in Kenya.

Students' attitude towards Mathematics content had a mean score of 2.48 which is negative while teacher's attitude towards Mathematics content had a mean score of 3.34 which is positive. This implies that students' attitude differed from that of the teachers on content of Mathematics. During the interview with HODs, they were asked to give their opinion on students' attitude towards Mathematics content. The study found that the majority of HODs who were interviewed were on opinion that students' attitude towards content was fairly good. Despite teachers having positive attitude towards Mathematics content, still the subject remain a challenge to some learners. The public image of Mathematics is being labeled as a difficult, cold, abstract, and theoretical and subject (Eshun, 2004). On contrast, some studies show that students tend to have a relatively positive attitude towards Mathematics content (Tezer & Karasel, 2010; Yilmaz, et al., 2010). However, this might be true from these studies, other researchers view Mathematics as being largely masculine subject (Eshun, 2004). Several studies also gives evidence that compared to boys, girls lack confidence in doing mathematical sums and viewed Mathematics as

a male domain (Meelissen & Luyten, 2008). The studies above based their study on comparing how attitude affect learning among the boys and girls in schools. The current study looked at attitudes of teachers and students towards teaching/learning of Mathematics.

Attitude of students towards methods of teaching was negative with a mean score of 2.24 while teachers' attitude towards teaching methods was positive with a mean score of 2.93. This result suggests that teachers viewed positively on teaching methods that they use in teaching Mathematics lessons. On the hand the students had a negative attitude towards methods of teaching Mathematics. This shows that the learners perceived negatively the approaches that teachers used in the teaching Mathematics in class. A student would like to learn a new concept depending on how the teacher presents it. Flanders (1965) also found that learners of teachers who vary their teaching style have positive attitudes and these teachers are able to teach a concept better and learning is made easier. She further, added that it is paramount for such a teacher to have a mastery of content being taught. If this be the case students' attitudes towards learning of Mathematics may be enhanced. Teaching and learning takes place also, when a teacher uses an effective instructional method. In support of this, Rasmussen and Marrongelle (2006) point that it is important for teachers to adopt instructional methods to attain higher achievement rates in Mathematics. Considering students' needs and comprehension of higher-order mathematical knowledge, teachers should adapt teaching methods that can be easily understood and followed in lesson presentation. That is why educators believe that instructional design is a linking science of a body of knowledge that prescribes instructional actions to optimize desired instructional outcomes, such as achievement (Saritas, 2004). Similarly, the teachers are seen by students as role models whose behaviours are easily copied by students. What teachers like or dislike, appreciate and their feeling about learning can have an impact on

the students (Yara, 2009). On this study the researcher found out that the attitude of students towards methods used in teaching Mathematics was negative and this could be attributed to the variety of approaches different teachers use while teaching Mathematics lessons in class. Some of these methods may be liked by learners while others may be disliked. According to Ball (2003), a teacher with good mathematical pedagogical content knowledge can break down mathematical knowledge into less polished and abstract forms, thus making it accessible to students who are at different cognitive levels. Similarly, a teacher with good pedagogical content knowledge can unpack the Mathematics into its discrete elements and can explain a concept or procedure at a level that includes the steps necessary for the students to make sense of the reasoning. In this study the researcher found that the attitude of teachers towards teaching methods as positive and this may be attributed due to the fact that teachers have been trained on methods of teaching Mathematics. Therefore, it is important for teachers to have good mathematical pedagogical content knowledge and positive attitude in order to understand areas where students may be having trouble when learning the subject.

However, it has been observed that teachers teach science in a way that merely requires the pupils to listen, read and memorize concepts (Alao & Adeleke, 2000). This depicts negative attitude to teaching and the end results affect the students' achievement in the subject.

Students' attitude towards evaluation strategies was negative with a mean score of 2.37 while teachers' attitude towards evaluation strategies was positive with a mean score of 3.12. This indicates that students' attitude and teachers' attitude towards evaluation procedures used in schools is not the same. Evaluation is critical in learning and teaching processes in delivery of any curriculum in schools. Effective evaluation practices are essential since it supports Mathematics instruction that produces improved students' performance. During interview with

HODs of Mathematics, one said that despite many learners find exams challenging to them, they have come to accept the testing policy of their school that is being done in every fourth night. This implies some students have come to accept testing policies used in their schools.

Moreover, evaluation is seen a key component in determining the level of success in a given subject and in particular to the set goals. However, when evaluation is done it may result in creating some discomfort among the students depending how the learner has performed. Nicolaidou and Philippou (2003) on their study on attitude of students towards learning of Mathematics showed that negative attitudes are the result of frequent and repeated failures or problems when dealing with mathematical tasks and these negative attitudes may become relatively permanent. According to these authors when children first go to school they usually have positive attitudes towards Mathematics. But as they progress their attitudes become less positive and frequently become negative at high school. Kogce, et al. (2009) found significant differences between younger and older students' attitudes towards Mathematics with 8<sup>th</sup> graders having lower attitudes than 6<sup>th</sup> graders. This scenario has been associated with fact there are a number of factors which can explain why attitudes towards Mathematics become more negative with the school grade, such as the pressure to perform well, over demanding tasks, uninteresting lessons and less than positive attitudes on the part of teachers (Nicolaidou & Philippou, 2003). Thus, many of these factors may have contributed to the attainment of negative attitude on the part of students in this study towards evaluation.

The overall attitude of students towards learning of Mathematics was positive with a mean score of 2.53 while the overall attitude of teachers towards teaching of Mathematics was positive with a mean score of 3.19. This indicates that attitude of students towards learning of Mathematics

was the same as those of the teachers. During interview with HODs of Mathematics one said that attitude of teachers towards teaching of Mathematics was good. Attitudes of teachers and students towards teaching/learning of Mathematics has been viewed an important factor in influencing and success in Mathematics. A number of studies have been undertaken to try to reach an understanding of the relationship between students' attitudes towards learning of Mathematics and academic achievement (Mato & Torre, 2010; Mohammed & Waheed, 2011; Fraser & Kahle, 2007). These studies point out a positive correlation between students' attitudes towards learning of Mathematics and students' academic achievement. Similar observations were obtained by Nicolaidou and Philippou (2003) which revealed significant correlations between attitudes and performance. Students having positive attitudes achieved better. Mato and Torre (2010) in a study with secondary school students also showed that those with better academic performance have more positive attitudes regarding Mathematics than those with poorer academic performance.

Similarly, teachers' attitude towards the teaching of Mathematics plays a significant role in shaping the attitude of students towards the learning of Mathematics. In support of this, the result also agrees with that of Mji and Makgato (2006), Chiriswa (2003), and Yeya (2002) who found that student's positive attitude towards science could be enhanced by teacher's enthusiasm, resourcefulness and helpful behaviour, teachers' thorough knowledge of the subject matter and their making science quite interesting.

### 4.3 Reasons for Attitudes of Teachers and Students towards Teaching/Learning of Mathematics

Data regarding reasons for the attitudes of teachers and students towards teaching/learning of Mathematics was obtained from the teachers' and students' questionnaire. The data was analyzed and presented as follows.

#### 4.3.1 Reasons for Students' Liking Learning of Mathematics

Students were also asked to indicate whether they liked Mathematics and provided reasons for liking learning of Mathematics. Their responses are shown in Table 4 below.

**Table 4: Students' Reasons for Liking Learning of Mathematics (n= 230)**

SN	Reason	Frequency (F)	Percentage (%)
1.	It is a requirement for joining a good career	194	84.3
2.	Key to understanding other related subjects	152	66.1
3.	The school culture	71	30.9
4.	Well taught by Mathematics teachers in class	36	15.7
5.	It is enjoyable/love subject	24	10.4
6.	Peer influence	22	9.5
7.	Parental influence	17	7.4

Table 4 shows students' reasons for liking Mathematics. The table reveals that most of the students 194(84.3%) liked Mathematics because it is a requirement for joining a good career after completion of secondary education. The importance of Mathematics is for students to

regard Mathematics as a subject not only crucial for passing the examination but can also be used for joining a good career in future. The reason that it is a requirement for joining a good career, to some extent, made most students liked the subject hence they see it as a means of enabling them to join in a good career in future. This explains the students' positive attitude towards Mathematics objectives where one of the objectives in secondary Mathematics is to acquire knowledge and skills for further education and training (K.I.E, 2006). Recognition of Mathematics as a career subject shows students' awareness of the importance of Mathematics in the society. The study also revealed by 152(66.1%) students liked the subject because of the fact that it is a key to understanding of other related subjects. While 71(30.9%) of the students liked the subject because it is part of the school culture which demand one to be part of the system in the school. Oppendekker and Damme (2006) stress that good teaching and building relationships with the students will enhance positive attitude and better achievement in academic work. Thus, there is need for teachers to create a good rapport with their learners as a means of making learners like the subject in school. Good achievement in Mathematics examinations may not be better if the learning of the subject was not sufficiently adequate. The low grades may be improved if learning of the subject was enhanced by ensuring that students had favourable attitudes towards the subject and towards the learning process itself (Mutai, 2010).

#### **4.3.2 Teachers' Reasons for Liking Teaching of Mathematics**

Teachers were asked give reasons for they liking Mathematics and provided the following results in the Table 5 below.



**Table 5: Teachers' Reasons for liking Teaching Mathematics (n= 55)**

SN	Reasons	Frequency (F)	Percentage (%)
1.	Qualified to teach Mathematics	55	100.0
2.	Interesting to teach	51	92.7
3.	Applicable in everyday life.	43	78.1

Table 5 shows teachers' reasons for liking teaching Mathematics. The table reveals that most of the teachers 55 (100.0%) liked teaching Mathematics because they qualified to teach the subject while 51(92.7%) said they liked the subject because it is interesting to teach. The role of the teacher is to facilitate learning and this contribution to students' achievement. Njuguna (2005) assert that the success of our science programme depends greatly on the classroom teacher as he is the one who synthesises, translates and disseminate all our thoughts into action. This can be done when the teacher is having an interest on the subject. The teachers' positive attitudes towards a subject can create a positive attitude among the students in a class, thus, leading students to have more interest in the subject. It must be noted that students' attitudes towards Mathematics tend to be more positive in classrooms where students perceive greater interest in the subject by their teachers. If the teachers find the subject less interesting, it becomes hard to motivate the students and create positive attitudes among them towards the subject (Scope, 1973).

### 4.3.3 Reasons for Students Disliking Learning of Mathematics

Students were also asked to indicate whether they disliked Mathematics and provided reasons for that. Their responses are provided in Table 6 below.

**Table 6: Students' Reasons for Disliking Learning of Mathematics (n= 97)**

SN	Reason	Frequency (F)	Percentage (%)
1.	It is boring	50	51.5
2.	Mathematics has got a lot of assignments	36	37.1
3.	It is a difficult subject	20	20.6
4.	It is too wide in content coverage	9	9.3

Table 6 shows students' reasons for disliking Mathematics. The table indicates that most of the students 50(51.5%) disliked Mathematics because they believe that it is a boring subject. This may be as a result of the manner in which the content is delivered in class by Mathematics teachers. Schmidt, Houang, and Cogan (2002) point out that instructional practice may influence student learning and liking the subject. What teachers do in the classroom may account for students liking the subject and better performance in it. Other reasons for disliking Mathematics include, Mathematics has a lot of assignments 36(37.1%) and it is a difficult subject 20(20.6%). These reasons are related to methods of delivery and evaluation procedures used in Mathematics. Results of students' dislike of the subject may be a result of many variables which in one way or another make learners to have low opinion towards it. Duncan, et al. (2007) on the study of

school readiness and later achievement of learners found that students' attitude, students' understanding and Mathematics anxiety has a bearing on learners whether to like Mathematics or not. Bursal and Paznokas (2006) study on students' attitude towards Mathematics found that negative school experiences might also contribute to the Mathematics anxiety. For example, teachers' threatening and authoritarian attitudes could lead to fearsome classroom climate in which student might hesitate to ask questions or answer the teachers' questions. Furthermore, students fearing their Mathematics teacher might have a conditioned reaction to Mathematics as well. This will have an effect to the students from liking the subject in school since they perceive their Mathematics teacher as unfriendly person. The natural reaction of the mind of the students with this attitude when they see the Mathematics teacher will have at the same time a negative impact on the subject.

A study on students' achievement in English essay writing by Fakeye (2002) found that students' attitude to a language was one of the variables that affected learning of the language. He further suggested that there was need to stress the importance of developing favorable attitudes as a means of enhancing performance in the learning of a second language. The attitude of the learners in the subject may have resulted to some of them developing low opinion towards Mathematics hence disliking it. This study used an ex-post facto design to establish the influence of students' attitude on academic achievement in English language. The current study used descriptive survey design to find out specifically on the effects of attitude towards the delivery of Mathematics curriculum in secondary schools.

#### **4.3.4 Teachers reasons for disliking Teaching of Mathematics**

Teachers were asked to give reasons as to why they disliked teaching of Mathematics subject, only two teachers gave reasons why they do not like teaching of Mathematics and their reasons were because the subject requires daily marking of assignments and also most students do not pass the subject when final exam is given to them. Great failure of students in the subject may have contributed to this kind of response from teachers. Mji and Makgato (2006) in South Africa, pointed out that few students take Mathematics and those who do so do not perform well because they are not motivated which ultimately may lead to mass failures.

#### **4.4 Differences in Attitudes between Teachers and Students towards Teaching/Learning of Mathematics**

After identifying teachers' and students' attitudes towards teaching/learning of Mathematics, the study then sought to find out if there was any significant difference in attitude between teachers and students towards teaching/learning of Mathematics. To determine whether there existed any significant difference in attitude between teachers and students towards teaching/learning of Mathematics, a two tailed t-test for independent samples was carried out. The results for the test are displayed in Table 7 below.

**Table 7: Means, Standard Deviation and *t* values for Teachers and Students towards Teaching/Learning of Mathematics**

Curriculum Elements	Mean		Sd		Df	<i>T</i>	<i>P</i> value
	S	T	S	T			
Objective	3.04	3.37	0.85	0.49	382	-5.70	.00
Content	2.48	3.34	2.12	0.43	382	-3.11	.01
Methods	2.24	2.93	0.43	0.86	382	-13.87	.00
Evaluation Strategies	2.37	3.12	0.31	0.62	382	-19.91	.00
Overall	2.53	3.19	0.93	0.60	382	-10.65	.00

p>0.05

From Table 7 above Students and teachers had a positive attitude towards objectives of Mathematics with mean of 3.04 and 3.37 respectively. The test yielded a statistically significant difference on attitude for student (M= 3.04, SD= 0.85) and teachers (M= 3.37, SD=0 .49) on objectives;  $t(382) = -5.70$ ,  $p = .00$  (see Table 7). The results suggest that students and teachers held the same opinion on objectives of Mathematics but the degree of their attitude towards objective slightly differed. Manoah, et al. (2011) found that attitude played a role on learners' academic achievement. They did not compare attitudes of teachers and students towards teaching/learning of Mathematics. This study therefore established that the difference between teachers' and students' attitude towards objective was significant.

Students had a negative attitude while teachers had a positive attitude towards content of Mathematics with mean score of 2.48 and 3.34 respectively. The test yielded a statistically significant difference on attitude for students ( $M= 2.48$ ,  $SD= 2.12$ ) and teachers ( $M= 3.34$ ,  $SD= 0.43$ ) on content;  $t(382) = -3.11$ ,  $p = .01$  (see Table 7). These results suggest that students and teachers had different attitudes towards content of Mathematics. Teachers' knowledge of Mathematics contents relate significantly with students attitude towards Mathematics in secondary schools. This finding is supported by findings of an earlier study by Etuk, et al. (2013) who reported that 98% of students totally depend on the knowledge of the contents of the subject which is possessed by their teachers. However, this study did not compare the attitude of students and teachers towards Mathematics content. The current study sought to establish the attitudes of teachers and students towards objectives of Mathematics subject. The study established that the difference between students' and teachers' attitude towards Mathematics objectives was significant.

Students had a negative attitude with mean score of 2.24 while teachers had a positive attitude with a mean score of 2.93 towards methods used in teaching/learning of Mathematics. There was a statistically significant difference in attitude for students ( $M= 2.24$ ,  $SD=0 .43$ ) and teachers ( $M= 2.93$ ,  $SD=0 .86$ ) on methods;  $t(382) = -13.87$ ,  $p = .00$  as shown in Table 7 above. These suggest that students held different attitude from teachers on methods used in teaching Mathematics. This could be attributed to the fact that teachers have undergone training and are more experienced than students, knowing that it is better to have a learner-centered than a teacher-centered lesson may have influenced the teachers' way of response thus were biased. A study by Ahmad and Aziz (2009) observed that students felt that they experienced more student-centered teaching compared to teacher-centered teaching. Similarly, Zekia (2009) found that

gestures as non-verbal teaching technique was an important source of motivation and concentration for students' learning as well as a tool for maintaining attention. Thus, for effective learning to take place learners need to be involved more in teaching/learning processes because this makes them retain and remember what they have learnt. However, these studies did not get teachers' and students' attitude towards teaching methods. The current study established attitudes of teachers and students towards teaching methods used in Mathematics and went further to establish the difference in their attitude which turned out to be significant.

Students had a negative attitude with a mean score of 2.37 and while teachers had a positive attitude with a mean score of 3.12 towards evaluation strategies used in teaching/learning of Mathematics. There was a statistically significant difference in attitude for students ( $M= 2.37$ ,  $SD= 0.31$ ) and teachers ( $M= 3.12$ ,  $SD= 0.62$ ) on evaluation;  $t(382)= -19.91$ ,  $p = .00$  as shown on Table 7 above. These imply that students held different opinion from that of teachers on evaluation strategies that are used in teaching/learning of Mathematics. Alavi and Kaivanpanah (2007) noted that assessment plays a crucial role in motivating further learning. This is because it informs learners about the degree of their learning or their needs for improvement. They investigated how English language learners perceive teachers' assessment when committing oral mistakes. The current study investigated students' and teachers' attitude towards evaluation strategies used in Mathematics. The study found that students had a negative attitude while teachers had a positive attitude towards Mathematics evaluation procedures and further established that the difference in attitude was significant.

Overall both teachers and Students in Kisii Central Sub-County had a positive attitude with a mean score of 3.19 and 2.53 respectively towards the statements presented to them in the questionnaire with regard to the four elements of Mathematics in secondary schools. The mean

score of teachers compared to students was higher on attitude towards Mathematics. This may be attributed due the qualification teachers have unlike students. There was a statistically significant difference in the attitude for students ( $M= 2.53, SD=0.93$ ) and teachers ( $M= 3.19, SD=0.60$ ) on Mathematics;  $t(382) = -10.65, p= .00$  (see Table 7). These results suggest that students and teachers had the same attitude towards Mathematics. However, the results of students' attitude towards learning of Mathematics which is positive contradict the outcome on performance in Mathematics which is dismal in national examination. Teachers' attitude towards the teaching of Mathematics subject plays a significant role in shaping the attitude of learners of Mathematics. Onocha (1985) noted in one of his findings that teachers' attitude towards Science is a significant predictor of learners' Science achievement as well as their attitude towards Science. Similarly, a study done on Nigerian students learning science by Adesokan (2002) observed also that in spite of the recognition given to a subject, it was evident that students still showed negative attitude towards the subject thereby leading to poor performance. The students who perform well in a subject generally have more positive attitudes towards that subject and those who have negative attitudes tend to perform poorly in the subject (Adebisi, 2006). All these researches focused on learners' attitude towards science subjects in Nigeria which may not be related to Kenyan situation. The current study sought to establish of attitude of teachers and students towards teaching/learning of Mathematics and found a significant difference between their attitudes. The difference can be attributed to experience and the training that teachers have had in the subject unlike the students.



## 4.5 Strategies of Enhancing Attitude towards Teaching and Learning of Mathematics in Secondary Schools

This study also sought to find out strategies that can be used to enhance attitudes of teachers and students towards teaching/learning of Mathematics in secondary schools. Their responses were as follows.

### 4.5.1 Strategies for Enhancing Attitude of Students towards Learning of Mathematics in Schools

Based on the findings of the study the following are the responses given in relation to the strategies of enhancing attitude of students towards learning of Mathematics in the secondary schools. The responses are on Table 8 below.

**Table 8: Responses of Students on Enhancing Attitude towards Mathematics (n= 327)**

SN	Response	Frequency (F)	Percentage (%)
1.	Change of attitude that Mathematics is difficult subject to handle.	286	87.5
2.	Teachers to use variety of methods when teaching the subject.	242	74.0
3.	More time to be given to the subject to allow more practice.	226	69.1
4.	Group work to be encouraged by teachers among learners.	212	64.8
5.	Rewards to be given to well performance in order to motivate them.	209	63.9
6.	Regular tests to be given to them.	199	60.9
7.	Teachers to give individual attention particularly to slow learners.	168	51.4

From the Table 8 students gave their feelings on what should be done to promote learning of Mathematics in secondary schools. Large number 286(87.5%) of students were for the opinion that there is need for them to change the attitude towards Mathematics from being negative to positive in order to perform well in the subject. Generally, the perceptions students hold about learning of Mathematics determine how they approach the subject. In many cases, students have been found to approach learning of Mathematics as procedural and rule oriented (Kuranchie, Kyere & Mensah, 2013). This prevents them from experiencing the richness of Mathematics and the many approaches that could be used to develop competence in the subject.

Sizeable number 242(74.0%) of the students were for the opinion that there is need to for teachers to employ variety of teaching methods to enable them understand various concepts being taught in Mathematics. This means that learners felt that for them to understand much better various concepts taught in class teachers need to employ a number of teaching methods. A student would like to learn a new concept in Mathematics depending on how the instructor presents it. Flanders (1976) also found that learners of a teacher who vary their teaching style have positive attitudes and this teacher is able to teach a concept better and learning is made easier and friendly. Large number 226(69.1%) of the students were for the opinion that more time to be given to subject to enable them do more practice. During interview with HODs of Mathematics majority of them said that there is need to regularly encourage learners to perceive Mathematics positively in order for them to perform well in the subject.

This is in line with Maina, Adoyo and Indoshi (2011) who pointed that, the Kenyan Mathematics syllabus is too wide, and time allocated for it on the time table is inadequate, thus the need for extra time for remedial lessons. Mathematics being a practical subject regular practice is required in order to perform well. Another 212(64.8%) of the students were for the

opinion that group work to be encouraged amongst them in order to share ideals and do more practice on the sums given by their teachers. While 209(63.9%) of the students felt that in order to be encouraged to work hard in Mathematics they should be rewarded whenever they perform well in the subject. Other suggestions given in order to promote Mathematics were regular tests to be given to them, teachers to avoid skipping some steps when explaining sums and teachers to give individual attention particularly to weak students.

#### 4.5.2 Teachers' Strategies for Enhancing Teaching of Mathematics in Schools

Based on the findings of this study the following were the responses by teachers on regards to the strategies that can be used to improve teaching of Mathematics in secondary schools. The responses are in the Table 9 below.

**Table 9: Teachers' Responses on Strategies for Enhancing Teaching of Mathematics (n= 57).**

SN	Response	Frequency (f)	Percentage (%)
1.	Regular counseling on change of negative attitude of students towards Mathematics.	57	100.0
2.	Students to be given more assignment for practice.	54	94.0
3.	Having remedial classes to assist weak students in class.	49	85.4
4.	Regular tests to access level of understanding of students in various concepts taught in class.	45	78.2
5.	Promoting group work activities in class.	36	63.8
6.	Rewarding deserving students in class whenever they perform well.	29	50.0
7.	Mathematics teachers to be rewarded more for the work they do in school.	19	32.6

From the Table 9, all teachers 57(100%) were for the opinion that there is need to do regular counseling of students to change their negative attitude towards Mathematics. Large number 54(94.0%) of the teachers were for the opinion that students should be given a lot of assignment for them to keep on practicing what had been taught in class. A sizeable number 49(85.4%) of the teachers were for the opinion that students who are weak in class to be given remedial lesson in order for them to catch up with rest of the students in class. During interview with HODs one of them said that teachers need to be allowed to attend Mathematics workshops in order for them to learn new approaches of handling Mathematics and at the same time this motivates the teachers as they share their experiences with other teachers from different institutions.

Motivation may either be intrinsic and extrinsic. A teacher who is intrinsically motivated may be observed to undertake a task for its own sake, for the satisfaction it provide or for the feeling of accomplishment and self-actualization. While on the other hand, an extrinsically motivated teacher may perform the work or duty in order to get some rewards such as salary. Extrinsic motivation plays a crucial role in people's life. It is pre-eminent in influencing a person's behavior (Ofoegbu, 2004). Hence motivated teachers have very high chances of assisting learners in class to understand concepts being taught. According to a National Research Council Report (2004), research shows that teachers can increase student motivation by encouraging students to do their best in their academic endeavors in class. Teachers can also increase motivation of their students by setting high expectations for homework completion, attendance, behavior, and academic performance. On the other hand, for learning to be effective a teacher needs to follow three major steps to maximize students' retention of major concepts and themes (Rafael, 2006). First, teachers need to identify essential concepts and outcomes of their curriculum, as well as the skills needed to learn these subjects. Second, teachers must become

familiar with students' learning needs. Third, they must use this information to provide differentiation opportunities for the students to create their own understanding by connecting prior knowledge with the new information. This implies that a teacher is required to provide the learners with basic concepts of the subject and the skills needed to acquire maximum benefit from learning the curriculum.

Anorue (2004) pointed that an effective learning is where a teacher uses varied teaching styles for instruction. In a study on approaches to teaching and learning life sciences, Tanner (2009) observed that teachers dominated classroom talk and students talked only when called upon like in the case of answering questions that have been asked by the teacher. Callahan (2005) observed that the lecture-based format of most secondary school instruction lacked the flexibility necessary to meet the linguistic and academic needs of learners. Roblyer (2006) pointed that constructivists believe that knowledge is generated by the learners through experience-based activities rather than directed by instructors. Chika (2012) opined that learners are to be responsible for their own learning.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary of the Findings

Findings of the study are summarized per study objective as follows:

##### 5.1.1 Status of Attitude of Teachers and Students towards Teaching/Learning of Mathematics

The findings of the study on attitudes of teachers and students towards teaching/learning of Mathematics are as follows: Students had similar attitudes with their teachers on attitudes towards objectives of Mathematics with a mean score of 3.04 which is positive while teachers had a mean score of 3.37 which also a positive attitude. On content students had a negative attitude with a mean score of 2.48 and teachers had a positive attitude with a mean score of 3.34. Regarding to the methods that are used in teaching Mathematics, students differed with their teachers. The students had a mean score of 2.24 which is a negative while teachers had a positive attitude with a mean score of 2.93. On procedures of evaluation used in Mathematics, students differed with the teachers on attitudes they had towards evaluation. The students had a mean score of 2.37 which is negative while the teachers had a positive attitude with a mean score of 3.12.

##### 5.1.2 Reasons for Attitudes of Teachers and Students towards Teaching/Learning of Mathematics

The findings of the study on reasons for attitudes of teachers and students towards teaching/learning of Mathematics are as follows: 194(84.3%) of the students liked Mathematics

because it is a requirement for joining a good career after completion of secondary education. While 152(66.1%) of the students liked the subject because it is a key to the understanding of other related subjects in the school.

When teachers asked to give reasons as to why they liked Mathematics, all of them 55(100.0%) said that it is because they are well trained to teach the subject. Majority of the teachers 51(92.7%) also said that the subject is interesting to teach in class. Other reason given was that it is applicable in everyday life.

When students asked reasons they disliked Mathematics, 50(51.5%) of the students said the subject is boring in class when it is being taught. While on the other hand, 36(37.1%) of the students said they disliked Mathematics because it has a lot of assignments and 20(20.6%) of the students said the subject has a wide content to cover in school making it more involving.

Only two teachers responded for disliking teaching Mathematics and reasons given for that was the subject involve a lot of marking and one said most learners do not pass the subject.

### **5.1.3 Differences in Attitude towards Teaching/Learning of Mathematics between Teachers and Students**

The difference in attitude towards teaching/learning of Mathematics between teachers and students was done with specific reference to four elements of Mathematics namely: objective, content, methods and evaluation procedures. The test yielded a statistically significant difference on attitude for students ( $M= 3.04$ ,  $SD= 0.85$ ) and teachers ( $M= 3.37$ ,  $SD= 0.49$ ) on objectives;  $t(382) = -5.70$ ,  $p = .00$ . There was a statistically significant difference on attitude for students ( $M= 2.48$ ,  $SD= 2.12$ ) and teachers ( $M= 3.34$ ,  $SD= 0.43$ ) on content;  $t(382) = -3.11$ ,  $p = .01$ . There was a statistically significant difference in attitude for students ( $M= 2.24$ ,  $SD= 0.43$ ) and

teachers (M 2.93, SD= 0.86) on methods;  $t(382) = -13.87, p = .00$ . There was a statistically significant difference in attitude for students (M= 2.37, SD= 0.31) and teachers (M= 3.12, SD= 0.62) on evaluation;  $t(382) = -19.91, p = .00$ . Overall there was a statistically significant difference in the attitude for students (M= 2.53, SD= 0.93) and teachers (M= 3.19, SD= 0.60) on Mathematics;  $t(382) = -10.65, p = .00$ .

#### **5.1.4 Strategies of Enhancing Attitudes of Teachers and Students towards Teaching/Learning of Mathematics**

The findings of this study obtained the following suggestion on how to enhance students' and teachers' attitudes towards teaching/learning of mathematics. Majority of students 286(87.5%) had a feeling that there is need for them to change the attitude towards Mathematics from being negative to positive in order to perform well in the subject. All teachers were on opinion that there was need to have regular counseling sessions with the students to change their negative attitude towards Mathematics. While sizeable number of students 242(74.0%) were for the opinion that there is need for teachers to employ variety of teaching methods to enable them understand various concepts being taught in Mathematics. While on the other hand, all the teachers 57(100.0%) were for the opinion that students should be guided and counseled to perceive Mathematics positively. Majority of the teachers 54(94.0%) were also on the opinion that students should be given a lot of assignment for them to practice what has been taught in class.

#### **5.2 Conclusion**

Based on the findings of the study, the following four conclusions were made as per the objectives of the study.



### **5.2.1 Status of Attitude of Teachers and Students towards Teaching/Learning of Mathematics**

Students had positive attitude towards learning of Mathematics in overall in this study. However, these results contradict KCSE performance in Mathematics which is generally poor in Kisii Sub-County. There were variations of attitude towards the four elements in Mathematics by the students and these may have contributed to the low achievement. This is confirmed in a study done by Webster and Fisher (2000) revealed that rural and urban students' attitude towards Mathematics subject positively affected their performance. It may be argued from this study that the students' attitude affected their performance.

While teachers on the other hand the overall attitude towards teaching of Mathematics was positive. There were no variations on attitude on the elements of Mathematics since the four elements teachers showed a positive attitude. From these results teachers' positive attitude towards Mathematics curriculum seems not to have been of any great help in improving students' performance. However, teachers needs to strive towards improving the level of performance in the subject since studies have shown that what the teacher do has direct influence on learners' attitude and subsequent performance in the subject.

From these findings, it can be concluded that teachers' attitude towards the teaching of Mathematics was good despite the fact that the students' performance in national examination seems to be below average. However, it should be noted that the attitude of both the teachers and students is a key to the success of Mathematics in secondary schools. If the learners have positive attitude, they will excel in Mathematics subject. On the contrary, if the learners have a negative attitude, they will realize poor academic achievement in Mathematics subject. Teachers

need to put more effort to guide the learners and this will enhance performance in Mathematics. This can be done through making Mathematics lessons interesting and providing a lot of assignments for practice.

### **5.2.2 Reasons for Attitudes of Teachers and Students towards Teaching/Learning of Mathematics**

The following are some of the reasons given by teachers and students on relation to attitude towards teaching/learning of Mathematics in this study.

The study established that most students who said that they liked Mathematics cited the reasons for this was because the subject is prerequisite for joining a good career after completion of secondary school education. With this in mind many students had some sense of interest to work hard on the subject in order for them to join good courses after leaving form four. These feelings of students agree with Aguele and Agwagah (2007) who observed that Mathematics is a requirement in many careers and trainings. Other reasons given by the students why they liked Mathematics were because of the fact that Mathematics is a key to understanding of other subjects in school and while others said it is due to their school culture of working hard to perform well in the subject.

Teachers also gave their reasons as to why they liked Mathematics and these were the findings. Majority liked the subject because they were well trained to handle it and hence they were competent. It is because of this fact the results of the findings in this study found that teachers are having positive attitude towards the four elements of Mathematics. Other reasons cited as to why they liked the subject is because they enjoy teaching it class and it is the best subject to handle and present in class.

Reasons given by students as to why they disliked Mathematics was because the subject is boring to them in class when it is being taught. They also cited that the subject has a lot of assignments unlike other subjects. This kind of attitude of the learners may have contributed to low performance in the subject in the area.

### **5.2.3 Differences in Attitudes towards Teaching/Learning of Mathematics between Teachers and Students**

In overall, students have similar attitude towards teaching/learning of Mathematics as teachers. The difference in attitude is significant. This may be as a result of teachers having gone through secondary education and have been trained to teach Mathematics subject. While on the other hand students are still developing and learning that may have led to this kind of findings on this study. What the teachers do greatly influences the learners since they see their teachers as role model. Eshiwani (1984) asserts that teachers are a major determinant in students learning of Mathematics and to a large extent determine what the students might achieve. He further explained that because of the teacher's inherent attributes such as qualification and training, general behaviour and attitudes towards Mathematics the learners will always copy what they see on those teachers. Hence, teachers' attitude towards the teaching of Mathematics plays a significant role in shaping the attitude of students towards the learning of Mathematics.

### **5.2.4 Strategies of Enhancing Attitudes of Teachers and Students towards Teaching/Learning of Mathematics**

The majority of the students in this study felt that there was need to perceive learning of Mathematics positively. These was due to the fact that learners know if they pass well in the subject they are likely to join a good career after completion of their secondary education. This

was a motivation for them to perceive learning of Mathematics positively. Another large number of students felt that Mathematics is a means of getting to understand other subjects that are offered in the secondary school since they are related. The interrelationship of some of the subjects taught in secondary education could have led learners need to work hard and get to understand various concepts in Mathematics. Other strategies offered to enhance attitude were group work assignment, rewards for better performing learners, regular tests and individual attention from teachers.

On the other hand, teachers were for the opinion that there was need for regular counseling of students to change the negative attitude towards the subject. Teachers felt that that it is through guidance and counseling of students that may assist them view learning of Mathematics positively. While others were for the opinion that students should be given more assignments to assist them grasp concepts taught in class. Regular practice on concepts taught in order for learners to master the new ideas. Other strategies suggested by teachers were remedial classes for weak students, regular tests and promotion of group work in class.

### **5.3 Recommendations**

The following recommendations were made from the study:

1. Learners were negative on Mathematics content. Therefore, there is need to enhance their attitude towards content through reorganization of Mathematics topics in the syllabus.
2. Mathematics being a basic requirement for most careers, then it is paramount for the students' attitude to be enhanced to improve their performance.

3. Attitude is a key component for effective teaching/learning processes in schools. Therefore there is need for teachers to enhance students' attitude towards learning of Mathematics in secondary schools.
4. To enhance learning of Mathematics in secondary schools there is need for teachers to use of variety of teaching methods in class, allow more practice by learners and give regular tests.

#### **5.4 Suggested for further Research**

Based on the limitations, findings and conclusions reached in this study, the following are suggestions for further research:

1. The study sought to find out attitudes of teachers and students towards teaching/learning of Mathematics. A similar study should be replicated in other sub-counties to compare the findings of the present study since attitude is a key factor in teaching/learning process.
2. There is need to find out the extent to which learners' attitude towards learning of Mathematics affect their academic achievement since performance in the subject is still dismal.
3. There is need to carry out a research on methods used in teaching and evaluation procedures used by Mathematics teachers in the teaching/learning process in secondary schools. This is because the learners had a negative attitude towards teaching methods and evaluation procedures used by teachers in teaching Mathematics.
4. There is need to carry out a research to determine what other factors contribute to dismal performance in teaching/learning of Mathematics apart from attitude since performance analysis of KCSE results shows that the subject achievement is still low.

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## Appendix I

### Students' Questionnaire

#### Instructions

This questionnaire is meant to collect data for the study entitled: “Attitude of Teachers and Students towards Teaching and Learning of Mathematics in Secondary Schools in Kisii Central Sub-County”. You are requested to complete it as adequately as you can. Put a tick in an appropriate space/or comment where necessary.

#### Note:

The information you provide will be held confidential. Do not write your name nor append your signature anywhere.

#### SECTION A: BACKGROUND INFORMATION FOR STUDENTS

(a) What is name of your school?

.....

(b) Type of the school; National ( ) Provincial ( ) District ( )

(c) Your sex Male ( ) Female ( )

#### SECTION B: REASONS FOR ATTITUDE OF STUDENTS TOWARDS LEARNING OF MATHEMATICS

1. (a) Which of the following reason(s) make you like Mathematics?

i) It is a requirement for joining a good career [ ]

ii) The school culture [ ]

- iii) Key to understanding other subjects [ ]
- iv) Well presented by Mathematics teacher [ ]
- v) Parental influence [ ]
- vi) It is enjoyable/love subject [ ]
- vii) Peer influence [ ]

b) Which of the following reason(s) make you dislike Mathematics?

- i) It is boring [ ]
- ii) It has a lot of assignments [ ]
- iii) It is a difficult subject [ ]
- iv) It is too wide in content coverage [ ]

Any other, specify

.....  
 .....

**SECTION C: ATTITUDE SCALE.**

This part of the questionnaire contains statements which describe some of the issues related to the objectives, content, methods and evaluation strategies used in Mathematics. Select and tick (✓) the column that best agrees with your opinion towards learning mathematics. There may be items for which you are not sure. In that case tick against undecided. Supplied are five options corresponding to the statements.



**Strongly Agree (SA); Agree (A); Undecided (U); Disagree (D); and Strongly Disagree (SD).**

No	Statement	Responses				
		SA	A	U	D	SD
1.	For students to pass Mathematics, they should develop a positive attitude towards the subject.					
2.	I have developed confidence in Mathematics					
3.	I do not like Mathematics because it has complicated skills that are not necessary in my future life.					
4.	Mathematics symbols and formulae make me feel uncomfortable and nervous.					
5.	I enjoy learning Mathematics in class.					
6.	I am interested and willing to use mathematical skills learnt to make conclusions and prediction from the result found.					
7.	I cannot apply mathematical knowledge and skills of familiar and unfamiliar situation.					
8.	I have a good feeling towards the role of Mathematics					
9.	I am happy for the mathematical skills that I have gained.					
10.	When I hear the idea of Mathematics, I have a feel a feeling of dislike.					
11.	Content set for the learners should only relate to needs of the present but not abstract.					
12.	Learning all the topics in Mathematics in secondary school is important for the students.					
13.	It is easier to understand Mathematics than any other subject.					
14.	It does not make any difference to the learners whether they are taught Mathematics or not.					
15.	Mathematics should be allocated more time in the school					

	time table.					
16.	Understanding of Mathematics content does not necessary requires regular practice.					
17.	Some topics in Mathematics should not be taught because they are not applicable anywhere after school.					
18.	There is need to re-organize topics in Mathematics to syllabus for effective understanding.					
19.	Mathematics is the greatest nightmare for students in the subjects taught in school.					
20.	Mathematics syllabus is too wide to cover effectively.					
21.	Peer teaching succeeds only with bright students.					
22.	Mathematics can be learnt without the use of the calculator.					
23.	I do not like working in a group to solve Mathematics problems due to the fact that later some lazy students earn marks for nothing.					
24.	Group work assignment in class is a waste of time.					
25.	I understand mathematical concept well when I discover new methods of solving them on my own.					
26.	Too many projects are given to us in Mathematics.					
27.	It is difficult for me to revise Mathematics questions from tests and past examinations.					
28.	It is not possible to teach all topics in Mathematics using one method.					
29.	I understand well when a teacher uses practical activities in a Mathematics lesson.					
30.	Use of activity methods as well as project work makes Mathematics enjoyable.					
31.	Continuous Assessment Test should count forward to the student final grade.					

32.	Emphasis on examination should not be done at the expense of students understanding of the content in Mathematics.					
33.	Mathematics should not be examined nationally.					
34.	For faster syllabus coverage in Mathematics short tests should be done away with.					
35.	The joint examination in Mathematics is a predictor of the students' final score in KCSE.					
36.	Testing of Mathematics should be done regularly since it is a practical subject.					
37.	Assignment given for every Mathematics lesson taught in class is waste of time.					
38.	I have discovered that marks awarded to me by the Mathematics teacher in the CATs and end term exams are not very useful.					
39.	I am aware that many good courses available to form 4 leavers are for those who have performed well in the subject.					
40.	There is no need to be examined in two papers i.e paper 1 and paper 2 in national examination.					

**SECTION D: WAYS OF ENHANCING ATTITUDE OF LEARNERS TOWARDS MATHEMATICS IN SECONDARY SCHOOLS**

1. Which of the following strategies (strategy) do you think may enhance learning of Mathematics.
  - a) Positive change of attitude towards the subject [ ]
  - b) Use of reward motivation for well done work [ ]
  - c) Teachers to use variety of methods while teaching [ ]

- d) More allocation of time for practice [ ]
- e) Regular tests to be given [ ]
- f) Teachers to give individual attention to each learner [ ]

## Appendix – II

### Teachers' Questionnaire

#### Instructions:

This questionnaire is meant to collect data for the study entitled: “Attitude of Teachers and Students towards Teaching and Learning of Mathematics in Secondary Schools in Kisii Central Sub-County”. You are requested to complete it as adequately as you can. Put a tick in an appropriate space/or comment where necessary.

#### Note:

The information you provide will be held confidential. Do not write your name nor append your signature anywhere.

#### SECTION A: BACKGROUND INFORMATION

1. What is your qualification?

SI ( )

UT Graduate ( )

Graduate ( )

UT ( )

2. What are your teaching subjects?

.....  
.....

3. Did you train as a Mathematics teacher? Yes ( ) No. ( )

**SECTION B: REASONS FOR ATTITUDE OF TEACHERS TOWARDS TEACHING OF MATHEMATICS.**

1(a) Which of the following reason(s) make you like teaching Mathematics?

- i) Qualified to teach Mathematics [ ]
- ii) Applicable in everyday life [ ]
- iii) Interesting to teach [ ]

(b) Which of the following reason(s) make you dislike teaching Mathematics?

- i) Most students don't pass the subject [ ]
- ii) It requires a lot of marking daily [ ]

Any other, specify

.....  
.....

**SECTION C: ATTITUDE SCALE**

This part of the questionnaire contains statements which describe some of the issues related to the objectives, content, methods and evaluation strategies used in Mathematics. Select and tick (✓) the column that best agrees with your opinion towards learning mathematics. There may be items for which you are not sure. In that case tick against undecided. Supplied are five options corresponding to the statements.

**Strongly Agree (SA); Agree (A); Undecided (U); Disagree (D); and Strongly Disagree (SD).**

No	Statement	Responses				
		SA	A	U	D	SD
1.	For teachers to teach Mathematics effectively, they should develop a positive attitude towards the subject.					
2.	I have developed confidence in teaching Mathematics.					
3.	I do not like teaching Mathematics because it has complicated skills that are not necessary for students.					
4.	Mathematics symbols and formulae make me feel uncomfortable and nervous.					
5.	I enjoy teaching Mathematics in class.					
6.	I am interested and willing to teach mathematical skills to enable learners to make conclusions and prediction from the result find.					
7.	I do not manage to teach learners to apply mathematical knowledge and skills to familiar and unfamiliar situation.					
8.	I have a good feeling towards the role of Mathematics in the society.					
9.	I am happy for the mathematical skills that I have taught to the learners.					
10.	When I hear the idea of Mathematics, I have a feel a feeling of dislike.					
11.	Content set for the learners should only relate to needs of the present but not abstract.					
12.	Teaching all the topics in Mathematics in secondary school is important for the students.					
13.	It is easier for learners to understand Mathematics than any other subject.					

14.	It does not make any difference to the learners whether they are taught Mathematics or not.					
15.	Mathematics should be allocated more time in the school time table.					
16.	Understanding of Mathematics content does not necessary requires regular practice.					
17.	Some topics in Mathematics should not be taught because they are not applicable anywhere after school.					
18.	There is need to re-organize topics in Mathematics to syllabus for effective understanding.					
19.	Mathematics is the greatest nightmare for students in the subjects taught in school.					
20.	Mathematics syllabus is too wide to cover effectively.					
21.	Peer teaching succeeds only with bright students.					
22.	Mathematics can be learnt without the use of the calculator.					
23.	I do not like involving learners in groups to solve Mathematics problems due to the fact that some lazy students earn marks for nothing.					
24.	Group work assignment in class is a waste of time.					
25.	Learners understand mathematical concept well when they discover a new method of solving a given problem on their own.					
26.	Teachers give too many projects in Mathematics than any other subjects.					
27.	It is difficult for me to revise Mathematics questions from tests and past examinations.					
28.	It is not possible to teach all topics in Mathematics using one method.					
29.	I teach well when I use practical activities in a Mathematics lesson.					



30.	Use of activity methods as well as project work makes Mathematics enjoyable.					
31.	Continuous Assessment Test should count forward to the student final grade.					
32.	Emphasis on examination should not be done at the expense of students understanding of the content in Mathematics.					
33.	Mathematics should not be examined nationally.					
34.	For faster syllabus coverage in Mathematics short tests should be done away with.					
35.	The joint examination in Mathematics is a predictor of the students' final score in KCSE.					
36.	Testing of Mathematics should be done regularly since it is a practical subject.					
37.	Assignment given for every Mathematics lesson taught in class is waste of time.					
38.	I have discovered that marks awarded to the learner by the Mathematics teacher in the CATs and end term exams are not very useful.					
39.	I am aware that many good courses available to form 4 leavers are for those who have performed well in the subject.					
40.	There is no need to examine learners in two papers i.e paper 1 and paper 2 in national examination.					

**SECTION D: STRATEGIES FOR ENHANCING TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS**

1. Which of the following strategies (strategy) do you think may enhance teaching of Mathematics?

- a) Regular counseling on change of negative attitude [ ]
- b) Regular tests be given to learners [ ]
- c) Promote group work activities [ ]
- d) Remedial classes for weak learners [ ]
- e) More assignments to be given to learners [ ]
- f) Teachers to be motivated by the school administration [ ]
- g) Reward deserving students in class [ ]

Any other, specify

.....  
.....

### **Appendix III**

#### **Interview Schedule for Head of Department**

Name of the school.....

1. How do you rate teachers' perceptions in teaching of Mathematics in your school?
2. Do your students in your school like Mathematics subject?
3. What is your opinion on teachers' understanding of syllabus objectives in Mathematics syllabus?
4. What is your opinion on the students' attitude towards the content in Mathematics syllabus?
5. What is your opinion on the students' attitude on assessment policy used in your school?
6. What can be done to enhance attitudes of teachers and students towards T/L of Mathematics in your school?

## Appendix IV

### Attitude of Students towards Learning of Mathematics

No	Statement	SA, no.,%	A, no.,%	D, no.,%	SD, no.,%	Total Score	Mean Score
1.	For Students to pass Mathematics they should develop a positive attitude towards the subject.	180 (63.2)	38 (13.3)	29 (10.2)	38 (13.3)	930	3.26
2.	I have developed confidence in Mathematics.	89 (29.8)	132 (44.1)	37 (12.4)	41 (13.7)	867	2.90
3.	I do not like Mathematics because it has complicated skills that are not necessary in my future life.	28 (8.9)	30 (9.6)	123 (39.2)	133 (42.4)	1016	3.24
4.	Mathematics symbols and formulae make me feel uncomfortable and nervous.	31 (9.8)	37 (11.7)	121 (38.4)	126 (40.0)	972	3.09
5.	I enjoy learning Mathematics in class.	138 (43.0)	127 (39.6)	14 (4.2)	42 (13.1)	1003	3.12
6.	I am interested and willing to use Mathematical skills learnt to make conclusion and prediction from	127 (39.4)	102 (31.4)	79 (24.3)	17 (5.2)	989	3.04

	result found.						
7.	I cannot apply Math knowledge and skills to familiar and unfamiliar situations.	15 (5.0)	49 (16.3)	161 (53.7)	75 (25.0)	896	2.99
8.	I have a good feeling towards the role of Mathematics.	82 (25.3)	85 (26.2)	84 (25.9)	73 (22.5)	824	2.54
9.	I am happy for the Mathematics skills that I have gained.	75 (27.2)	179 (64.9)	8 (2.9)	14 (5.1)	867	3.14
10.	When I hear the idea of Mathematics, I have a feel of dislike.	17 (5.2)	79 (24.4)	102 (31.5)	126 (38.9)	985	3.04
11.	Content set to the learners should only relate to the needs of present but not abstract.	52 (16.6)	106 (33.9)	80 (25.6)	75 (24.0)	804	2.57
12.	Learning all the topics in Mathematics in secondary school is important for students.	147 (46.1)	117 (36.7)	34 (10.9)	21 (6.6)	1028	3.22
13.	It is easier to understanding of Mathematics than any other subject.	93 (28.9)	105 (32.6)	54 (16.8)	70 (21.7)	866	2.69
14.	It does not make any difference to	58(18.	50	141	73(22	873	2.71

	learners whether they are taught Mathematics or not.	0)	(15.5)	(43.8)	.7)		
15.	Mathematics should be allocated more time in the school time table.	146 (46.1)	118 (37.0)	34 (10.7)	21 (6.6)	1027	3.22
16.	Understanding of Mathematics content does not necessary requires regular practice.	8 (2.9)	22 (7.9)	112 (43.9)	136 (48.9)	932	3.35
17.	Some topics in Mathematics should not be taught because they are not applicable anywhere after school.	133 (40.7)	106 (34.2)	47 (15.2)	24 (7.7)	582	1.88
18.	There is need to re-organize topics in Mathematics syllabus for effective understanding.	133 (42.1)	100 (31.6)	45 (14.2)	38 (12.0)	960	3.04
19.	Mathematics is the greatest nightmare for students in subjects taught in school.	58 (18.0)	68 (21.1)	122 (37.9)	74 (23.0)	856	2.66
20.	Mathematics syllabus is too wide to cover effectively.	31 (10.1)	34 (11.1)	198 (64.5)	44 (14.7)	869	2.83
21.	Peer teaching succeeds only with bright students.	110(34 .4)	111 (34.7)	52 (16.3)	47(14	676	2.11

					.7)		
22.	Mathematics can be learnt without the use of a calculator.	83 (26.6)	71 (22.8)	97 (31.1)	61 (19.6)	760	2.44
23.	I do not like working in a group to solve Mathematics problems due to the fact that some lazy students earn marks for nothing.	101 (33.0)	131 (42.8)	43 (14.1)	31 (10.1)	616	2.01
24.	Group work assignment in class is a waste of time.	180 (55.7)	106 (32.8)	18 (5.6)	19 (5.9)	522	1.62
25.	I understand Mathematical concept well when I discover new methods of solving them on my own.	121 (38.3)	121 (38.3)	38 (12.0)	36 (11.8)	964	3.05
26.	Too many projects are given to us in Mathematics.	140 (45.9)	70 (23.0)	57 (18.7)	38 (12.5)	603	1.98
27.	It is difficult for me to revise Mathematics questions from tests and past examinations.	200 (62.1)	66 (20.5)	47 (14.6)	9 (2.8)	509	1.58
28.	It is not possible to teach all topics in Mathematic using one method.	143(46 .4)	76 (24.7)	54 (17.5)	35(11 .4)	943	3.06
29.	I understand well when a teacher	93	135	80	12	949	2.97

	uses practical activities in a Mathematics lesson.	(29.1)	(42.2)	(25.0)	(3.8)		
30.	Use of Activity methods as well as Project work makes Mathematics enjoyable.	18 (5.7)	29 (9.2)	127 (40.4)	140 (44.6)	493	1.57
31.	Continuous Assessment Test should count forward to the student final grade.	50 (15.5)	43 (13.3)	191 (59.1)	39 (12.1)	750	2.32
32.	Emphasis on examination should not be done at the expense of students understanding of content in Mathematics.	59 (18.3)	69 (21.4)	126 (39.1)	68 (21.1)	822	2.55
33.	Mathematics should not be examined nationally.	40 (14.3)	37 (13.2)	124 (44.3)	79 (28.2)	802	2.86
34.	For faster syllabus coverage in Mathematics short tests should be done away with.	138 (42.9)	98 (30.4)	42 (13.0)	44 (13.7)	636	1.98
35.	The joint examination in Mathematics is a predictor of students' final scores in KCSE.	142 (44.0)	92 (28.5)	42 (13.0)	47(14 .6)	975	3.02



36.	Testing of Mathematics should be done regularly since it is a practical subject.	64 (20.1)	50 (15.7)	134 (42.0)	71 (22.3)	745	2.34
37.	Assignment given for every Mathematics lesson taught in class is waste of time.	146 (45.3)	98 (30.4)	41 (12.7)	37 (11.5)	613	1.91
38.	I have discovered that marks awarded to me by the Mathematics teacher in the CATs and end term exams are not very useful.	142 (46.3)	103 (33.6)	26 (8.5)	36 (11.7)	570	1.86
39.	I am aware that many good courses available to form 4 leavers are for those who have performed well in the subject.	140 (43.9)	71 (23.3)	75 (23.5)	33 (10.3)	956	3.00
40.	There is no need to be examined in two papers i.e paper 1 and paper 2 in national examination.	136 (41.6)	123 (37.6)	49 (15.0)	19 (5.8)	605	1.85

## Appendix V

### Attitudes of Teachers towards Teaching of Mathematics

No	Statement	SA, no.,%	A, no.,%	D, no.,%	SD, no.,%	Total Score	Mean Score
1.	Teachers should develop a positive attitude to enable them teach math.	39 (69.6)	6 (10.7)	5 (8.9)	6 (10.7)	190	3.40
2.	Developed confidence in teaching Mathematics.	28 (50.0)	16 (28.6)	7 (12.5)	5 (8.9)	189	3.38
3.	Not necessary to teach complicated skills in math since they are not required in future life.	4 (7.1)	4 (7.1)	21 (37.5)	27 (48.2)	183	3.27
4.	Math symbols and formulae make one feel uncomfortable and nervous.	2 (3.6)	3 (5.4)	18 (32.1)	33 (58.9)	194	3.46
5.	Teaching Math in class is enjoyable.	38 (66.7)	13 (22.8)	4 (7.0)	2 (3.5)	201	3.53
6.	Use Math skills taught to make conclusion and prediction.	35 (62.5)	16 (28.6)	3 (5.4)	2 (3.6)	196	3.50
7.	Not able to teach learners to apply	3	7	29	16	168	3.05

	Math knowledge and skills to familiar and unfamiliar situations.	(5.4)	(12.5)	(51.8)	(28.6)		
8.	Math serves a great role and it is appreciated.	26 (45.6)	22 (38.6)	6 (10.5)	3 (5.3)	185	3.25
9.	Math skills taught useful	35 (62.5)	17 (30.4)	2 (3.6)	2 (3.6)	197	3.52
10.	Dislike of Math experienced when the subject is mentioned.	2 (3.5)	3 (5.3)	27 (47.4)	25 (43.9)	189	3.32
11.	Content set to the learners relate to the needs of present.	31 (55.0)	20 (35.1)	2 (3.5)	4 (7.5)	192	3.37
12.	Teaching all the topics in Mathematics in secondary school is important for learners.	21 (38.2)	16 (29.1)	10 (18.2)	8 (14.5)	160	2.91
13.	Understanding of Math is easier than any other subject.	34 (60.4)	18 (31.1)	2 (3.5)	3(4.6)	197	3.46
14.	Learners when taught Math or not make no difference.	5 (9.3)	6 (11.1)	8 (14.8)	35(64 .8)	181	3.35
15.	Math to be allocated more time.	34 (59.6)	16 (28.1)	6 (10.5)	1 (1.8)	197	3.46

16.	To understand Math content one does not always require regular practice.	1 (1.8)	3 (5.3)	22 (38.6)	31 (54.4)	197	3.46
17.	Some topics should not be taught since are not applicable after school.	4 (7.4)	3 (5.6)	24 (44.4)	23 (42.6)	174	3.22
18.	Re-organization of topics in Math for effective understanding.	29 (52.7)	23 (41.8)	2 (3.6)	1 (1.8)	190	3.45
19.	Math is the greatest nightmare of the subject taught in school.	3 (5.8)	2 (4.1)	30 (54.1)	22 (38.3)	185	3.25
20.	Syllabus for Math is too wide to be covered effectively.	3 (5.5)	4 (7.2)	11 (2.0)	37 (67.3)	192	3.49
21.	Peer teaching succeeds only with bright students.	13 (22.8)	20 (35.1)	12 (21.1)	12 (21.1)	157	2.75
22.	Math can be done without use of a calculator.	21 (38.2)	14 (25.5)	12 (21.8)	8 (14.5)	158	2.87
23.	Lazy students earn undeserved marks when working in groups.	17 (32.1)	22 (41.5)	8 (15.1)	6 (11.3)	156	2.94
24.	Assignment given in groups is a	4	6	19	27	181	3.23

	waste of time.	(7.1)	(10.7)	(33.9)	(48.2)		
25.	Math concepts well understood when new methods are discovered by a student.	11 (20.3)	9 (16.7)	17 (31.5)	17 (31.5)	148	2.74
26.	Too many projects are given in Math to the students.	7 (13.5)	9 (17.3)	13 (25.0)	23 (44.2)	156	3.00
27.	Revising Math questions from tests and past papers exam is difficult.	1 (1.8)	8 (14.3)	12 (21.4)	35 (62.5)	197	3.45
28.	Not possible to teach Math using one method.	14 (25.9)	23 (42.6)	10 (18.5)	7 (13.0)	104	1.93
29.	Use of practical activities in Math by the teacher make a learner understand.	20 (35.1)	24 (42.1)	12 (21.1)	1 (3.5)	177	3.11
30.	Activity/Project methods make Math enjoyable.	24 (43.6)	23 (41.8)	5 (9.1)	3 (5.1)	178	3.24
31.	Final marks to include CATS.	37 (67.3)	13 (23.6)	2 (3.6)	3(5.5)	148	2.69
32.	Examination emphasis should not be at expense of students	22	12	10	12	156	2.79

	understanding of content in Math.	(39.3)	(21.4)	(17.9)	(21.4)		
33.	Math should not be examined nationally.	7 (12.5)	6 (10.7)	8 (14.3)	35 (62.5)	183	3.27
34.	Short tests in Math be done away with for faster syllabus coverage.	8 (14.0)	9 (15.8)	6 (10.5)	34 (59.7)	180	3.16
35.	Joint exam in Math is a predictor of the final score in KCSE.	25 (45.5)	16 (29.1)	7 (12.7)	7 (12.7)	169	3.07
36.	Regular testing in Math required since it is a practical subject.	32 (57.1)	18 (32.1)	2 (3.6)	4 (7.1)	190	3.39
37.	Assignment given in Math is a waste of time.	7 (12.5)	6 (10.7)	17 (30.4)	26 (46.4)	174	3.11
38.	Marks awarded in CATs and end term exam are not useful.	6 (11.1)	5 (9.3)	18 (33.3)	25 (46.3)	171	3.17
39.	Good courses offered to form 4 leavers are those who performed well in Math.	35 (62.5)	15 (26.8)	3 (5.4)	3 (5.4)	194	3.46
40.	No need to examine a learner two papers in Math in national exam.	7 (13.0)	5 (9.3)	20 (37.0)	22 (40.7)	165	3.06

## APPENDIX VI

### Sample Size Determination Using Krejcie and Morgan Table

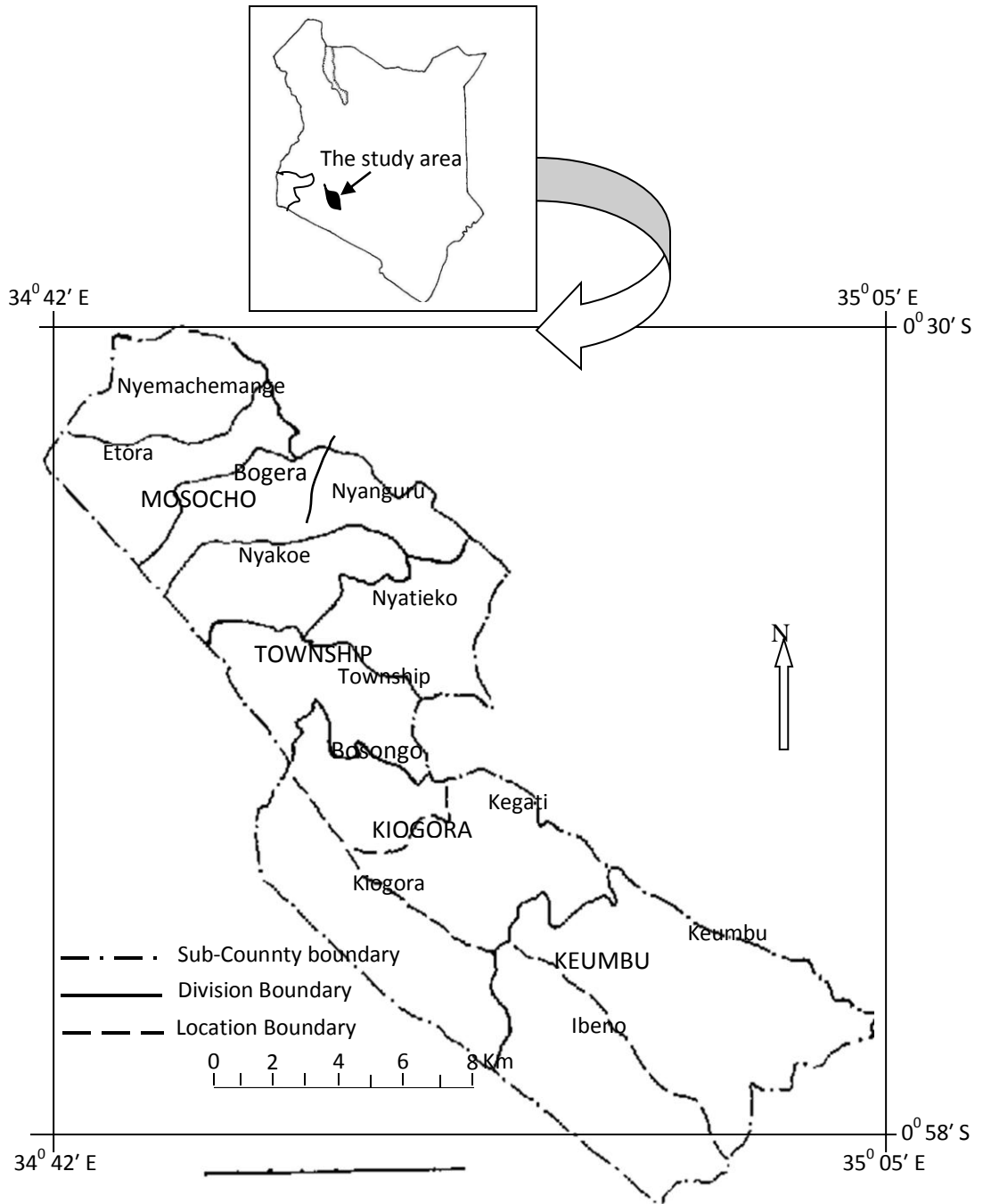
<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	44	105	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note – *N* is population size; *S* is sample size.

Source: Krejcie & Morgan, 1970

# Appendix VII

## Map of Kisii Central Sub-County







**MASENO UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**

*Office of the Director*

**Our Ref:** PG/MED/052/2010

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FAX: 254-057-351153/351221  
Email: [sgs@maseno.ac.ke](mailto:sgs@maseno.ac.ke)

Date: 16<sup>th</sup> April 2013

**TO WHOM IT MAY CONCERN**

**RE: PROPOSAL APPROVAL FOR KEBWARO GEORGE MAGATI—  
PG/MED/052/2010**

The above named is registered in the Master of Education in Curriculum Studies Programme of the Faculty of Education, Maseno University. This is to confirm that his research proposal titled “Students and Teachers Attitudes towards Mathematics Curriculum in Secondary Schools in Kisii Central District, Kenya” has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.



Prof. P.O. Owuor  
DIRECTOR, SCHOOL OF GRADUATE STUDIES

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